

Supplementary Data for “Using flux theory in dynamic omics data sets to identify differentially changing signals using DPoP”

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Contents

Downloading and Using DPoP	3
S1 - Supplementary Information About App Files.....	3
Supplementary data	4
S2 – Lists of Results from Ven Diagram Comparison.....	4
Supplementary data S2.1 - Phosphoproteomic Ven Diagram.....	4
Supplementary Data S2.2 - Transcriptomic Ven Diagram	30
S3 - Temporal GO Description of Time Courses of <i>A. nidulans Exposed to Micafungin</i>	91
Supplementary Data S3.1 – Temporal GO Description of DPoP analysis of Phosphoproteomic Data	91
Supplementary Data S3.2– Temporal GO Description of Volcano Analysis of Phospho Data.....	97
Supplementary Data S3.3– Temporal GO Description of DPoP analysis Transcriptomic Data	103
Supplementary Data S3.4– Temporal GO Description of DEseq2 analysis Transcriptomic Data	109
S4 - Comparison of DPoP Results With Published Findings From <i>S. cerevisiae</i>	122

Note: Use the table of contents to navigate this document easier.

Downloading and Using DPoP

DPoP is available on [MathWorks File Exchange](#) as an open source-addition to MATLAB. The app is only functional on Windows PCs. The app can be installed and run locally on your PC with the proper toolboxes, or it can be installed on MATLABs cloud-based version, MATLAB Online which will assure toolbox compatibility for you. Below is a description of all data files present for download from that file.

S1- Supplementary Information About App Files

File name	Description
Derivative_Profiling_App_wGO_V1_3.mlapp	Developable app file
DPoP.mlappinstall	MATLAB app installable
AppFormatData_original_WT1405_dyn_mica_phospho_AverageBRs.xlsx	Dynamic phosphoproteomic time course of <i>A. nidulans</i> under micafungin, example Excel file.
AppFormatData_original_WT1405_dyn_mica_phospho_AverageBRs.mat	Dynamic phosphoproteomic time course of <i>A. nidulans</i> exposed to micafungin, example MATLAB file
AppFormatData_original_WT1405_dyn_mica_Transcript_Average3BRs.xlsx	Dynamic transcriptomic time course of <i>A. nidulans</i> exposed to micafungin, example Excel file
Aspgd.gaf	GO database reference file for <i>A. nidulans</i>
AppFormatData_Kanshin2015_Phospho12and3P.xlsx	Dynamic phosphoproteomic time course of <i>S. cerevisiae</i> exposed to high-osmolarity conditions, example Excel file
Sgd.gaf	GO database reference for <i>S. cerevisiae</i>
README.txt	Technical instructions for operating the DPoP app
License.txt	Matlab Open-source licensing

Supplementary data

S2 – Lists of Results from Ven Diagram Comparison

Supplementary data S2.1- Phosphoproteomic Ven Diagram

Method of Analysis →	DPoP 452 Total	Volcano 583 Total	M/A 202 Total	MARS 1690 Total
List of Significant Signals ↓ (Uniprot ID, P-site)	C8V891 13 Q5B1A4 407 Q5B8I5 478 C8VA49 440 Q5AYS0 68 Q5B8Z7 680 C8V2A5 966 Q5ARI0 237 Q5AYU8 6 Q5B4N2 6 Q5B5B0 637 Q5B9N1 718 Q5B8N0 34 Q5B3S5 351 C8V858 304 C8VA69 37 Q5B5B0 628 C8V794 106 C8V5G6 825 Q5B4R9 231 Q5AZL2 332 Q5B6C1 816 Q5AVT6 40 Q5B950 38 C8VIG9 368 Q5B3I8 940 C8V9I8 159 Q5B907 344 Q5AZJ6 654 Q5B587 1274 Q5AXG7 637 Q5B8S4 206 C8V9I8 156 Q5BBY2 145 C8VK54 154 Q5BAD8 403 Q5ARL7 517 Q5BC55 138 Q5B9K4 218 Q5B434 412 Q5AU19 1634 Q5B6T4 34 C8V766 31 Q5B7N3 398 C8V5G6 911 Q5BFQ3 83 Q5AXK8 3 Q5BH07 345 Q5B2S6 1292 Q5B712 638 Q5B5B3 276 Q5B1E9 545	Q5BF26 1569 Q5BE73 14 C8VIY2 77 C8VKD7 39 C8VS54 634 C8VB27 585 Q5BC36 382 Q5BEP8 186 Q5B2S6 294 Q5AW27 447 Q5BB58 155 Q5BG69 346 Q5B8B7 107 C8VTS7 467 Q5B795 127 Q5BD26 48 Q5BGL6 88 Q5B3B7 553 Q5BDK0 622 Q5BDK0 623 Q5AUG3 738 Q5BDK0 619 Q5B6P5 272 Q5B4L2 704 Q5B7V5 156 Q5B3F1 177 Q5B0E2 557 Q5BG67 436 C8V1V6 92 Q5AZL8 69 Q5B5J2 243 Q5B194 160 G5EB09 517 Q5BH96 83 Q5AVM1 16 C8VMA9 797 Q5BFV7 573 Q5BGS7 2 Q5B7M3 347 Q5ASC1 501 Q5AW57 11 Q5AYP0 459 G5EB26 44 C8V1G2 44 Q5B434 194 Q5AZW6 1033 Q5AS56 647 Q5BAZ5 11 C8VBH5 517 Q5B3E4 169 Q5B152 214 Q5B1U5 988	Q5B3R2 485 Q5BG90 183 C8VN11 458 C8V2U2 930 Q5B3F1 474 Q5B712 510 Q5AYL5 912 Q5B6C4 72 Q5B1A3 714 Q5B5J3 716 C8V5G6 290 Q5B4Q3 59 C8V1W0 43 Q5BCF3 241 Q5BB55 166 C8VTF1 86 Q5AWK9 413 Q5BBV0 42 C8V742 377 Q5B5B0 640 C8V4I7 152 G5EB50 298 Q5BCF3 236 Q5B6U5 67 Q5B1T1 978 C8VFE5 39 Q5B161 99 C8VFE5 37 Q5BCN3 367 Q5B3C8 863 Q5B5K9 5 C8VR18 741 C8V1P9 255 Q5AYS4 173 C8V1M3 23 Q5B2V4 400 Q5B2N3 1047 Q5B2N3 1045 C8VTS7 468 C8V8Q8 95 Q5BBV0 49 Q5B436 312 C8V2U2 925 C8VJ53 455 C8VJ53 453 Q5B424 1764 Q5BDZ7 386 Q5ARI8 421 Q5ARI3 451 C8V0C1 405 Q5AWR8 1457 C8VB12 318	C8V1M3 15 C8V2A5 288 C8VFE1 145 Q5ARD4 1009 Q5AXV5 1535 Q5AZA6 358 Q5B010 1082 Q5B568 238 Q5BCM2 9 Q5BGL6 88 Q5B6C4 72 Q5B8S4 253 Q5B8Z7 687 C8V5G6 35 Q5B6U5 188 Q5B8I5 507 Q5BDW4 11 Q5AZQ2 1176 Q5B0E9 631 Q5BDP0 15 Q5AVG6 153 Q5AYN2 312 Q5AZQ2 1367 Q5B0E9 533 Q5B1Y7 268 Q5B425 520 Q5BFV5 804 Q5BG68 400 C8V7N4 122 C8VTS7 80 Q5B2V4 400 Q5BE66 526 Q5AYS0 62 Q5BB65 37 C8V7M9 21 Q5AYL5 1466 Q5B161 65 Q5BB41 12 Q5BB49 499 C8VFD0 151 C8VN52 82 Q5AQI2 156 Q5ASM0 275 Q5AU54 54 Q5AUF4 667 Q5B8I8 336 Q5BCF3 52 Q5AZQ2 414 C8V2A5 966 C8V6A1 382 C8V7V5 365 Q5AXG7 637

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C8V9B5 76	Q5BCK1 190	Q5AZW5 301	Q5BG55 653
Q5AYF4 233	C8V1M3 3	Q5AYL5 940	Q5ASA5 697
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C8VKW2 600	Q5BGR9 11	Q5AXU1 24	Q5BE05 264
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C8VAY4 261	Q5B1L2 11	C8VKT7 114	Q5ATZ3 228
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Q5B674 12	Q5AVL0 247	Q5BGL3 111	Q5B5G9 999
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Q5BF43 546	Q5AW79 10		Q5AVW7 713
Q5AYC1 147	Q5AZQ2 484		Q5B178 189
Q5BDD7 1287	Q5AZC9 261		Q5B436 47
C8V3Q8 871	Q5AWR8 436		Q5B4N2 58
Q5B1L2 6	C8VFE1 334		Q5B9C3 520
Q5B606 551	Q5BF26 403		Q5BCQ6 220
Q5B0B8 434	Q5B0E9 344		Q5BDK5 359
Q5AXK0 259	Q5BD26 49		Q5AUJ5 449
Q5AUM0 647	Q5BB56 5		Q5B706 27
Q5AVQ0 109	Q5BGE6 182		C8V494 12
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Q5BC59 257	C8VIQ3 438	Q5ASA7 377
C8VOJ3 2	Q5B5H4 451	Q5BE59 257
Q5AVN0 26	C8VHD2 649	C8VAK9 51
Q5BBK4 397	C8VHD2 652	Q5AYL5 441
Q5B1L6 88	Q5B9M1 18	Q5B7N5 649
Q5BDG0 517	Q5B705 172	Q5B9C6 298
Q5B7M3 345	C8VB99 358	Q5BGV2 797
C8VQM0 591	Q5BBK8 97	Q5BAE0 6
Q5B3H7 47	Q5B5K9 500	Q9P4R5 467
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Q5BEU9 177	Q5BEU9 179	C8VK54 266
Q5B4I8 84	Q5ASM0 289	Q5B010 378
C8V0Z9 538	Q5AS72 384	Q5B0B8 155
Q5AVK2 21	Q5B511 359	Q5B1T1 978
Q5B434 964	C8VP26 125	Q5BC57 214
Q5BF43 80	Q5BDF8 163	Q5BCM2 110
Q5AU19 1623	Q5BBH4 84	Q5BDK5 26
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C8VUB4 787	G5EAY1 642	Q5BFF5 370
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C8VSE7 137	Q5B3G8 303	C8V0Z9 485
Q5B1K7 153	C8VUL9 345	C8V4L4 654
C8V116 61	Q5AXG9 68	C8VQ45 563
C8VBH5 744	Q5AXT8 510	Q5AUF4 511
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C8V000 405	Q5BB69 65	Q5B3S5 230
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Q5AXK8 197	Q5B8J6 458	G5EB54 2
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Q5B3F1 38	C8VKH5 630	C8V9G4 121
Q5B7V5 142	Q5AVC0 433	C8V9Z0 52
Q5BCP0 13	Q5B7J9 6	C8VUP2 195
Q5AS94 512	Q5B5L1 219	Q5B9L0 345
Q5B568 120	Q5BEZ7 187	Q5AYL5 943
G5EB64 495	Q5BFC7 373	Q5AZQ2 481
Q5AZZ8 219	C8VGA0 635	Q5B3H8 303
C8VAQ7 383	Q5B411 468	Q5BDA5 172
Q5B9A8 573	Q5AZM3 936	G5EB77 15
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Q5BHA9 357	Q5B4D3 134	C8VCW1 213
Q5B5F7 2183	Q5B7V5 142	Q5AUJ9 648
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C8VJD2 761	Q5BEZ2 180	Q5BBW4 2879

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C8V007 401	Q5B9K7 94	Q5B362 327
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C8VIC6 114	Q5AVX6 10	Q5AYC1 390
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C8V2U2 933	Q5AVY3 1482	Q5B9K9 14
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				Q5AYD4 230 Q5B3F1 650 Q5BAY0 65 C8VC57 457 Q5B1A3 713 Q5B5B0 1039 Q5BBK9 304 Q5AZL2 332 C8VP27 317 Q5B1G3 39 Q5B706 290 Q5BEV6 408 C8VK94 1031 Q5B424 9 Q5BE59 628 C8V097 751 O43100 412 Q5AW49 528 Q5B6P5 275 Q5BDD7 444 Q5BE74 708 C8V9T2 783 Q5BBE4 292 Q5BDD7 449 Q5ATX5 659 Q5AZN7 210 Q5B0L9 494 G5EB00 561 Q5AUJ2 446 C8VN24 305 C8V010 567 C8V8H5 521 Q5B3I8 878 Q5BHB3 23 Q00757 64 Q5AS84 437 Q5AZL4 360 Q5B3A7 277 Q5B4F9 991 Q5B963 3 C8VHJ7 374 Q5AXG1 125 Q5B6Y4 209 Q5B615 12 C8V733 179 Q5AW92 1063 Q5AZQ2 482 Q5BGX6 481 Q5BC59 257 G5EAY1 1141 Q5ASU2 55 Q5BGR2 19 Q5B5B5 81 Q5B9N1 747 Q5BBZ5 114 C8VK94 202 Q5AS94 405 Q5AYD4 245 Q5B152 851 Q5B3E4 188 C8V1D8 1113 Q5B8Q8 371 C8V9E9 139 Q5AYL5 1528 Q5BBL2 682 Q5AW79 3
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				Q5B1X4 266 Q5BH93 210 C8VAK8 421 Q5AW49 100 Q5AT23 4 Q5B0H6 53 Q5B0X8 218 Q5B2S6 225 Q5BAY0 736 Q5BDU2 76 C8VUJ9 169 G5EAU0 337 Q5B7M3 306 Q5AWR8 1459 Q5AYD4 276 Q5BE20 169 Q5BEV6 414 Q5AZQ2 1091 Q5AWL9 38 Q5B2N6 226 Q5BD80 427 Q5BCC9 285 G5EB50 418 O42777 24 Q5AS94 780 Q5AVJ4 426 Q5AZM3 939 Q5B1A3 854 C8VK54 258 Q5BC17 588 Q5BD56 3 C8UZZ9 137 C8V3I8 292 C8VH46 159 Q5AQB5 99 Q5ASM0 328 Q5AVY3 708 Q5B8E7 125 C8V9T2 786 C8VHR4 296 C8VUU8 91 Q5B8E4 790 Q5BBH9 883 C8V4A6 135 C8V4D4 44 Q5AZM3 1093 Q5AV97 522 Q5AUG3 738 Q5B606 135 Q5AS96 183 C8V8H5 681 Q5B1A3 870 Q5ASC5 159 Q5AVY6 428 Q5AX03 137 C8VF13 184 Q5B436 77 Q5BFV7 248 C8V0I4 205 G5EAU0 589 Q5AT42 2 Q5B6U5 67 Q5B8X5 400 Q5BB65 41 Q5BBW4 3586 C8VFJ6 211
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				C8VG86 872 Q5AWK9 413 Q5BCIO 686 Q5BGT8 635 C8VF70 9 Q5ARL7 519 Q5B712 509 C8VCK1 430 C8VS08 2 Q5BC21 12 C8V4L4 401 Q5B4W2 212 Q5BE59 840 C8VQ27 2 Q5ASD3 9 Q5B1I5 363 O60039 891 Q5B3B7 793 Q5B8R7 562 Q5BDG0 523 Q5BER4 56 C8V116 295 C8VS54 732 Q5BEV6 411 Q5AUH4 973 C8VDQ4 876 Q5B2S6 966 Q5B5U8 416 Q5B7N3 454 Q5BAY0 738 Q5BB56 71 C8VRX2 48 Q5BF15 14 C8V9T1 1003 Q5B0Y5 62 Q5B8X5 405 Q5BFV7 569 Q5AVT0 230 C8VJB5 534 Q5BBJ7 353 Q5BF63 265 C8V3I8 80 Q5B0E9 733 Q5B9L0 349 Q5BH68 56 C8V116 62 Q5B5H0 1320 Q5B0E9 794 Q5B2P4 197 Q5B6L5 729 Q5BDK6 113 Q5BEE9 163 Q5BG90 462 Q5BDK0 622 C8VP26 526 Q5BBY2 630 C8V9K6 34 Q5AXK8 197 Q5B3F1 294 Q5B8J3 222 C8VUL9 391 Q5B1P4 326 Q5B3B7 787 Q5B9K4 205 Q5BBY2 705 C8V3I8 294
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				G5EB07 457 Q5AW75 32 Q5BF86 229 Q5BGE6 290 Q5B3Y5 26 Q5ASA5 699 Q5AS85 194 Q5B1A4 422 Q5B4D3 190 Q5B5Z2 126 Q5AYC1 750 Q5AZE9 690 Q5B550 6 Q5B706 470 Q5BB34 840 C8V7M9 16 C8V972 120 Q5B6U8 643 Q5B8J3 200 Q5BDZ7 383 Q5BHB6 249 Q5B7M3 107 C8VN44 850 C8VRL9 126 C8VU21 218 Q5ARH5 532 Q5BCS0 1481 Q5BDQ5 616 C8VHC5 591 C8VIQ4 131 Q5B5R8 260 Q5B5K8 239 C8V1P9 268 P0C8Q0 142 Q5ASA5 834 Q5B3T0 2 C8VF13 189 Q5BGM8 469 Q5BCQ9 314 Q5ARI5 188 Q5AVD1 284 C8V1W0 184 Q5AXF0 115 Q5B8G1 185 C8V9T1 1059 Q5AVD1 34 Q5AZU3 416 Q5B3J1 73 C8V179 123 Q5AS91 655 Q5B2T9 13 Q5BCF3 448 C8VGM0 608 Q5ASS0 197 Q5B0Y7 286 Q5B9K9 105 Q5BE20 105 Q5B0E2 559 Q5B0E9 757 C8V1M3 3 C8VB12 318 Q5AZF7 216 Q5B6P5 566 Q5B8K7 365 Q5BCL2 156 Q5BES9 276
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				C8V095 132 C8V9W6 221 Q5B1C8 1219 Q5AYL7 177 C8VUP2 588 Q5AYT7 213 Q5B1A3 701 Q5B8G1 167 C8V8I3 201 C8VLE8 278 Q5B0C3 258 Q5BBY2 709 Q5BCL2 158 Q5B4Q3 32 Q5BDL3 107 C8V9H0 255 Q5AS72 476 Q5ATL5 19 Q5AXX7 50 Q5B6P5 272 Q5B8X0 32 Q5BEK5 3 C8VCK1 333 Q5AUH4 868 Q5BB90 313 C8VBH4 166 Q00202 549 C8V9Z0 47 Q00647 1052 Q5BC28 447 Q5B5J1 3 Q5BDC7 165 C8V1T1 201 C8VH90 7 Q5BH96 82 Q5AVV2 23 Q5AUH4 1054 Q5B323 487 Q5B8P8 862 Q5BDD7 501 Q5BGR2 32 C8VOC1 467 C8VT03 194 Q5B392 345 Q5B8J0 131 C8VHJ2 483 C8VT75 174 Q5BBD7 20 Q5B2L4 586 C8V7F2 3 Q5AVT0 248 Q5B7N3 410 C8V8H5 670 C8VU21 145 C8VCK1 198 Q5AYC4 446 Q00202 525 C8V5G6 471 C8VTA0 45 Q5BD94 265 Q5BFG5 309 C8VGM0 109 C8VUP2 229 Q5BEN5 770 Q5AZN9 231 Q5B1A3 869
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				Q5B3I8 643 Q5B9M9 497 Q5BEY8 479 C8VAQ7 41 Q5B425 226 Q5B5E1 27 Q5BBY2 623 Q8TFN0 121 Q5B7M3 345 Q5BCH1 124 Q5BE66 334 Q5BBW4 320 Q5B7N2 559 Q5B6Y7 96 C8V5G6 825 C8VID5 31 Q5B4F9 178 Q5B4I4 442 Q5BGS7 132 Q5B3S8 145 C8VS08 970 Q5AZQ2 418 Q5BF43 131 Q5BE74 1170 C8VH53 22 P18819 2 Q5B122 70 Q5B224 1433 Q5B5E4 2 Q5B6C4 131 C8V9E9 144 Q5BCI4 714 C8V9V9 96 Q5AXU1 22 Q5B4S4 517 C8VLZ4 172 C8VM55 182 Q5AVG3 239 Q5BBK4 684 Q5BE74 1059 Q5BB58 170 C8V199 50 C8VFC8 922 Q5BBJ4 813 Q5BBY2 664 C8V9W6 223 Q5BGR2 18 C8VHJ1 751 C8VTU4 169 G5EAY1 784 C8V4P5 319 C8VHD2 237 Q5AVK0 624 Q5B5B3 41 Q5BE39 8 Q5BG55 794 C8VJB5 464 C8VTU6 249 O42631 203 Q5B9C6 33 Q5AYC1 760 Q5BD26 253 Q5BES9 279 Q5BC28 314 Q5BCF3 48 C8UZY7 260
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				Q5B2T9 356 Q5B9S9 1115 C8V9T2 775 C8VGM0 616 Q5BBZ5 112 Q5BGL3 684 Q5BDC7 153 C8V3Q8 30 Q5B136 93 Q5B6S0 315 Q5BH98 130 C8V1J5 15 Q5B1Y1 493 Q5B4Q3 115 Q5B8S4 157 Q5BHA9 912 Q5B0H6 45 Q5B3I9 272 Q5BF43 261 Q5B7N2 13 C8VBH3 470 Q5AVD1 70 Q5AVN0 752 Q5BAH3 442 Q5AVV8 1819 Q5BCC9 16 Q5AVV8 412 Q5AVW7 717 Q5BB33 528 C8VAK9 116 Q5B5B3 55 Q5B077 708 Q5BBE4 449 Q5BH53 285 C8VH90 8 Q5AVT0 265 Q5B6P5 288 Q5BDB4 8 C8VSS2 454 Q5B4J3 504 Q5B010 1297 Q5B1U5 984 Q5B4W2 254 Q5B7M5 552 Q5B3C8 697 Q00083 655 Q5B178 353 Q5BE74 1296 Q5AZC2 81 C8UZY7 128 C8V9W6 166 C8VU49 11 Q5ATX5 624 Q5B5B3 481 Q5BDK0 657 C8V0I4 190 Q5BE74 830 Q5BEC4 264 Q5BF78 190 Q5B5V7 7 Q5B425 248 C8VKT1 226 C8VUS6 2 P11837 510 Q5AWR8 1557 Q5BBK4 345
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				Q5BEV7 291 C8VNBK3 644 Q5BDY6 128 Q5AUJ2 2 Q5AWN4 1478 Q5BE20 192 Q5BEB0 158 Q9P896 543 Q5B7V5 156 Q5AU19 1623 Q5BCR1 194 C8VIY6 250 C8VJ09 202 Q5AXD2 48 Q5AZC9 505 Q5B0E2 1125 Q5B3H7 9 Q5AYU2 1108 Q5B1K5 499 C8VAQ7 274 Q5ATX5 1123 Q5B178 340 Q5B3F1 899 Q5BBU6 204 Q5BBX0 218 C8VP26 91 Q5B3C8 694 C8VIZ6 48 P18819 397 Q5AZU0 11 Q5BHB1 334 Q5AUB3 313 Q5B9P0 105 C8VHB7 97 Q5ATZ6 219 Q5B5V7 2 Q5B7Q7 146 Q5BCQ6 208 Q5BB17 275 Q5BEN0 10 C8VMC8 360 Q5B1L0 505 Q5BBY2 685 Q5BFQ3 230 Q5B5U1 278 Q5AZB0 470 Q5BDY6 127 Q5BCI4 27 C8VGM0 583 C8V8H5 428 C8VJ33 302 C8VRL9 46 Q5B104 348 P48457 413 Q5BEJ2 1108 Q5BHB7 341 Q5AVN0 308 Q5B6L5 563 Q5B8I5 478 Q5BAY8 106 Q5ARK3 808 Q5B223 62 C8VHJ1 754 Q5BBL2 842 Q5B0E9 375 Q5B608 118
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				Q5B1Y7 266 Q5B6C4 69 C8V115 227 Q5B4F9 445 Q5B6T7 702 Q5BE74 1261 Q5BEK5 468 Q5BCQ6 318 Q5B125 255 Q5BDF8 161 Q5AVD1 181 Q5B4F9 352 Q5B9C6 44 Q5BB69 69 Q5BBT8 433 Q5ASJ4 131 Q5AYD5 993 Q5BB13 613 Q5AW39 214 Q5B3C0 78 Q5B5I8 122 C8VCR2 304 Q5B6T7 705 C8V5J4 706 C8VB27 466 Q5B5Z2 373 Q5B4G9 220 Q5AZQ2 255 C8V1S9 385 Q5B5X9 222 Q5B9K7 600 Q5BAE0 15 C8VCK1 258 C8VRW7 300 Q5ASA5 50 C8VAW6 13 C8VTU7 728 Q5B3C8 654 C8V1J5 220 C8V3Z7 80 C8V733 198 C8VB27 445 P0C8Q0 139 C8VEV9 498 G5EB50 308 Q5AYN2 309 Q5BCK9 290 C8UZZ9 135 C8VCW1 11 Q5AWR8 897 C8VT05 103 O42777 750 Q5ARL7 46 Q5BDC7 102 Q5BF66 31 C8V179 93 Q5AX75 67 Q5BB49 257 Q5BHB6 266 C8V002 237 Q5B4B7 695 Q5B1E9 1066 Q5B4F0 52 Q5B613 65 C8V751 293 Q5AXT8 97
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				Q5BDJ1 268 Q5BFN6 5 Q5BGL6 344 Q5B1Y1 457 C8VKK1 187 Q5B1A3 169 Q5B178 342 C8VA01 1177 Q5BDY6 117 Q5BE20 162 C8V9H0 252 C8VIZ6 59 Q5AWL9 35 C8VF24 349 Q5AUF9 371 Q5B2V1 546 Q5BBJ4 808 Q5BDD7 453 Q5ARD4 1011 Q5B2Q3 49 Q5B8X5 202 Q5AXQ8 294 Q5AZC6 1313 Q5B2K1 303 Q5BF43 118 C8VCK1 250 Q5B1I5 23 Q5ASC1 495 Q5AWN3 573 Q5B1A3 876 Q5B549 302 Q5B5K9 33 Q5BE74 1033 C8V904 188 Q5AZW4 402 Q5AW39 2 Q5B3D5 110 Q5BBE5 219 Q5BCL2 142 Q5BFJ6 315 C8VK54 156 Q5BAD4 924 Q5AW99 375 Q5B3C0 49 Q5B534 420 Q5B9N6 3 C8VAY4 340 Q5BF63 17 C8VP27 362 Q5AXV5 793 Q5B1E0 325 Q5B602 1086 Q5B674 12 Q5BCP0 41 Q5AS83 19 Q5AVD1 280 Q5AVV8 1448 Q5B568 343 C8VIY5 97 Q5AYL5 817 Q5B0D4 28 Q5B4K7 1768 Q5B5B0 1233 C8VG45 325 C8VS08 1042 Q5AU15 362
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				Q5BE74 828 C8V2U2 875 Q5B706 266 C8VK50 25 C8V9G9 157 Q5B1Y4 563 C8VQL3 1231 C8VS08 1044 Q5BE62 125 Q5BGL3 1011 Q5B0U1 282 Q5B2L8 1184 Q5B943 90 Q5BFK2 63 Q5B7M3 266 Q9P896 534 C8V733 80 C8VMX1 47 Q5B0E2 549 Q5B982 756 Q5BDQ6 943 C8VBT0 191 C8VHC5 154 C8VA27 611 C8VQ45 561 C8VRP6 416 Q5AU15 358 Q5BFG5 339 Q5AVD1 185 Q5BE59 845 C8VA31 414 Q5ASD3 28 C8VA69 646 C8VFC8 672 G5EB26 44 G5EAZ5 56 Q5AYK0 92 Q5BBD7 1022 Q5AVV4 1173 Q5B1C8 658 C8V007 192 Q5BBV0 42 C8VIY2 76 Q5AX75 65 Q5B4B6 10 Q5B9A9 310 G5EB90 49 Q5B531 766 Q5BCP0 9 Q5B4G0 19 Q5AVN0 305 C8VHR4 293 Q5BCF3 236 Q6SIF1 508 G5EAZ0 339 Q5AVD1 313 Q5B323 466 Q5BBJ7 195 Q5BCF3 217 Q5BE72 1290 Q5BBD7 9 Q5B9C6 310 C8VSX4 145 G5EAT2 11 Q5AUI2 164 Q5B5R8 409
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				Q5BCS0 1229 G5EB05 302 Q5B104 72 Q5B392 289 Q5B010 1130 Q5B8R7 566 Q5B434 388 Q5BB58 173 Q5BE74 1300 Q5BEG9 4 C8VHD2 1138 Q5BBY2 633 C8V9H4 32 Q5B1D1 432 Q5B4Q3 54 Q5B154 413 C8VCK1 202 G5EB41 401 G5EB90 51 C8V997 239 C8VBj9 641 Q5AW55 8 Q5BEC4 260 C8V4M8 16 Q5BE23 2 Q5BGE6 241 Q5AW90 7 C8VG90 562 P17120 1058 Q5BFV5 740 Q5AW75 1086 Q5B3F1 621 C8VEH4 282 Q5AW57 57 Q5AXR8 21 Q5BF26 151 C8VHC5 256 Q00202 511 Q5AVS9 329 Q5BGS7 105 C8V2X5 212 C8V9K6 547 C8VSQ5 109 Q5AW56 67 C8VRX2 15 Q5BBV0 245 Q5BFU7 60 Q5B8N7 87 C8V3I8 318 Q5BE74 829 Q5B3H7 42 C8VBH5 872 Q5BGB8 268 Q5BDE6 213
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Supplementary Data S2.2- Transcriptomic Ven Diagram

Method of Analysis →	DPoP 795 Total	Volcano 828 Total	M/A 442 Total	MARS 3966 Total	DEseq2 3107
List of Significant Signals ↓	AN0102 AN0489 AN0019 AN6414 AN5218 AN6958 AN7984 AN7319 AN5465 AN2712 AN3514 AN8411 AN3495 AN9299 AN5467 AN7412 AN9181 AN2352 AN8647 AN8052 AN2471 AN2806 AN0341 AN0100 AN7781 AN5509 AN9200 AN0723 AN5069 AN2605 AN8662 AN7232 AN7881 AN5823 AN6929 AN6234 AN1627 AN8582 AN8487 AN2031 AN4950 AN8371 AN0492 AN8728 AN6023 AN5289 AN3398 AN7378 AN3241 AN8609 AN3485 AN6947 AN2943 AN0993 AN1737 AN0972 AN2609 AN8611	AN3339 AN2469 AN1035 AN2116 AN8060 AN1548 AN4109 AN0216 AN1600 AN5841 AN2571 AN4106 AN8996 AN2562 AN2186 AN3571 AN2320 AN0523 AN4110 AN2960 AN2558 AN4111 AN2959 AN7859 AN8597 AN6873 AN7413 AN7598 AN3531 AN7053 AN0008 AN8132 AN7854 AN8551 AN9210 AN2028 AN4131 AN7066 AN8112 AN7531 AN0016 AN2706 AN1317 AN7237 AN3537 AN2840 AN6359 AN0552 AN0993 AN8157 AN7268 AN7333 AN4879 AN3305 AN8446 AN2393 AN4770 AN6936	AN3531 AN9375 AN1548 AN7826 AN2469 AN7702 AN1858 AN2698 AN5218 AN6963 AN8941 AN5558 AN1742 AN1312 AN9490 AN9299 AN2827 AN5467 AN0941 AN5977 AN4879 AN2118 AN5611 AN8158 AN0958 AN5652 AN5017 AN4109 AN5859 AN0553 AN1664 AN5424 AN0723 AN5069 AN3333 AN7232 AN7881 AN0020 AN0500 AN5171 AN2913 AN4142 AN4106 AN7683 AN6023 AN6847 AN2228 AN2656 AN6659 AN1677 AN3996 AN7866 AN9242 AN7167 AN7333 AN9001 AN2038 AN1574	AN0004 AN0005 AN0046 AN0047 AN0055 AN0078 AN0096 AN0104 AN0114 AN0128 AN0139 AN0147 AN0155 AN0157 AN0169 AN0178 AN0188 AN0213 AN0214 AN0229 AN0230 AN0233 AN0243 AN0260 AN0284 AN0296 AN0324 AN0331 AN0352 AN0357 AN0363 AN0365 AN0373 AN0377 AN0378 AN0392 AN0399 AN0418 AN0436 AN0455 AN0456 AN0466 AN0486 AN0487 AN0497 AN0499 AN0511 AN0520 AN0527 AN0529 AN0535 AN0552 AN0609 AN0638 AN0639 AN0674 AN0676 AN0692	AN0045 AN0314 AN0373 AN0471 AN0599 AN0600 AN0709 AN0742 AN0777 AN0859 AN0904 AN0930 AN1071 AN1250 AN1356 AN1549 AN1607 AN1620 AN1653 AN1871 AN1894 AN1935 AN1936 AN2011 AN2020 AN2421 AN2427 AN2477 AN2532 AN2581 AN2601 AN2685 AN2695 AN2776 AN2822 AN2911 AN2945 AN3085 AN3086 AN3101 AN3148 AN3287 AN3751 AN4088 AN4089 AN4104 AN4113 AN4266 AN4483 AN4566 AN4696 AN4712 AN4770 AN4824 AN4878 AN4879 AN4913 AN4920

AN7856	AN6281	AN2336	AN0710	AN4995
AN8442	AN1664	AN0993	AN0722	AN5017
AN9280	AN3393	AN7392	AN0725	AN5159
AN8927	AN8349	AN5421	AN0749	AN5213
AN0517	AN3333	AN9179	AN0763	AN5856
AN6281	AN4257	AN0488	AN0767	AN5858
AN9318	AN1594	AN2099	AN0776	AN6004
AN4049	AN8594	AN1616	AN0777	AN6071
AN8909	AN0964	AN0392	AN0778	AN6091
AN5444	AN8968	AN2197	AN0787	AN6114
AN3109	AN5424	AN0366	AN0789	AN6241
AN5845	AN2719	AN3888	AN0832	AN6277
AN2679	AN7385	AN0234	AN0859	AN6397
AN0609	AN7668	AN5053	AN0868	AN6404
AN6957	AN1203	AN6281	AN0874	AN6573
AN6273	AN8949	AN2557	AN0875	AN6634
AN2638	AN2598	AN5845	AN0894	AN6820
AN7753	AN5546	AN6833	AN0911	AN6835
AN4143	AN3414	AN0973	AN0917	AN6849
AN7322	AN5449	AN3433	AN0922	AN6871
AN8134	AN3612	AN7541	AN0938	AN6873
AN0220	AN1677	AN8446	AN0939	AN6982
AN1752	AN0234	AN0045	AN0940	AN7018
AN6089	AN6963	AN0694	AN0949	AN7170
AN3078	AN5558	AN7322	AN0963	AN7463
AN5029	AN1042	AN8134	AN0972	AN7530
AN3503	AN9470	AN3783	AN0982	AN7549
AN6377	AN3314	AN8095	AN0991	AN7604
AN3387	AN1312	AN7832	AN0992	AN7605
AN5435	AN8341	AN5015	AN0998	AN7670
AN3043	AN8342	AN1752	AN1000	AN7717
AN8554	AN7083	AN5338	AN1014	AN7992
AN8685	AN9303	AN9206	AN1018	AN8311
AN5937	AN7683	AN0215	AN1027	AN8534
AN3562	AN7160	AN7953	AN1030	AN8797
AN0336	AN6018	AN7870	AN1040	AN9168
AN7196	AN0148	AN3043	AN1042	AN0214
AN6691	AN7170	AN5271	AN1091	AN0644
AN8107	AN0916	AN5272	AN1120	AN0645
AN1623	AN7825	AN8587	AN1138	AN0651
AN2821	AN3282	AN8366	AN1139	AN0750
AN9183	AN2704	AN7557	AN1143	AN0789
AN4257	AN6648	AN0974	AN1162	AN0823
AN6959	AN7225	AN1893	AN1181	AN0833
AN7806	AN2357	AN2821	AN1183	AN0866
AN8139	AN9263	AN2392	AN1188	AN0983
AN3479	AN6657	AN4257	AN1198	AN1102
AN7095	AN4888	AN8082	AN1209	AN1251
AN9487	AN2943	AN7057	AN1222	AN1328
AN8338	AN2488	AN1203	AN1228	AN1535
AN0006	AN3163	AN5831	AN1245	AN1574
AN6021	AN5130	AN0467	AN1259	AN1580
AN3303	AN7856	AN9212	AN1261	AN1619
AN2402	AN7867	AN8639	AN1290	AN1622
AN4436	AN8314	AN7992	AN1301	AN1656
AN6668	AN1378	AN3303	AN1302	AN1676
AN2833	AN6810	AN8619	AN1307	AN1752
AN7065	AN2286	AN8781	AN1311	AN1797
AN2788	AN5611	AN9191	AN1321	AN1855
AN7867	AN9031	AN2404	AN1327	AN1870
AN9278	AN7866	AN1600	AN1337	AN1918
AN8365	AN4119	AN7600	AN1377	AN2010
AN4660	AN7278	AN2559	AN1424	AN2189
AN2787	AN8554	AN2833	AN1432	AN2286
AN3915	AN9244	AN9243	AN1441	AN2357
AN9223	AN1034	AN3570	AN1445	AN2391

AN9248	AN9207	AN2034	AN1450	AN2408
AN3243	AN2821	AN1898	AN1471	AN2488
AN3255	AN2572	AN3023	AN1486	AN2669
AN7179	AN4376	AN3271	AN1490	AN2682
AN1199	AN9032	AN8365	AN1501	AN2704
AN0342	AN9042	AN1582	AN1505	AN2749
AN8477	AN2532	AN3304	AN1508	AN2798
AN9182	AN5370	AN1631	AN1509	AN2826
AN5938	AN7855	AN3781	AN1512	AN2919
AN8953	AN3698	AN4111	AN1540	AN2943
AN6766	AN8514	AN2894	AN1548	AN3049
AN2196	AN7916	AN1199	AN1555	AN3163
AN8277	AN8556	AN5090	AN1557	AN3265
AN8140	AN9269	AN2655	AN1562	AN3415
AN0005	AN6057	AN9205	AN1572	AN3417
AN7519	AN7865	AN3571	AN1598	AN3420
AN2319	AN8652	AN8451	AN1599	AN3433
AN8404	AN3276	AN2588	AN1603	AN3526
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				AN1715	
				AN2828	
				AN3680	
				AN4027	
				AN4029	
				AN4471	
				AN4958	
				AN4990	
				AN5619	
				AN7584	
				AN7894	
				AN8908	
				AN9221	
				AN0454	

				AN1103 AN3159 AN4376 AN4662 AN5628 AN7484 AN7594 AN9075 AN9156 AN1101 AN2763 AN2857 AN3788 AN3840 AN4350 AN5687 AN5699 AN6568 AN8100 AN0265 AN1286 AN1727 AN2698 AN3279 AN3959 AN6789 AN8044 AN8345 AN2878 AN2990 AN3228 AN3945 AN6762 AN7239 AN8449 AN0075 AN0803 AN2289 AN2776 AN3783 AN4757 AN4832 AN5911 AN7721 AN9433 AN1703 AN1880 AN1897 AN2083 AN2898 AN6009 AN7500 AN7553 AN8627 AN8720 AN0414 AN0551 AN1178 AN1488 AN3276 AN3562 AN4373 AN5946 AN7246 AN7699 AN7855	
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				AN8085 AN9198 AN0918 AN3600 AN6257 AN7340 AN7422 AN8900 AN9145 AN0383 AN3504 AN4539 AN5898 AN6842 AN7048 AN8265 AN9111 AN9119 AN0805 AN1419 AN1595 AN2390 AN4053 AN5240 AN6296 AN7709 AN8078 AN1986 AN3341 AN4818 AN5304 AN5984 AN7887 AN8737 AN0630 AN1350 AN2082 AN2481 AN3805 AN4116 AN4621 AN4910 AN6500 AN6799 AN8809 AN0782 AN0901 AN1340 AN2223 AN2231 AN2717 AN3331 AN3730 AN7732 AN7889 AN8063 AN0018 AN0477 AN1474 AN2177 AN2449 AN3150 AN4507 AN4792 AN4917 AN6267	
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				AN6872 AN7180 AN8754 AN9146 AN0372 AN1241 AN2482 AN2997 AN3516 AN3679 AN5177 AN7022 AN8278 AN9072	
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S3- Temporal GO Description of Time Courses of *A. nidulans* Exposed to Micafungin

Following images were taken from the results of the output of DPoP after a GO term enrichment analysis of the results. Each image represents results of one timepoint, neglecting timepoint 13.

Supplementary Data S3.1 – Temporal GO Description of DPoP analysis of Phosphoproteomic Data

Each one of the following pictures is an aggregation of outputs of a GO term enrichment analysis on the results of DPoP at each specific point along the phosphoproteomic time course.

Supplementary Data S3.1.1

Timepoint 1

Molecular Function

131 / 597	"Catalysis of a biochemical reaction at physiological temperatures. In biologically catalyzed reactions, the reactants are known as substrates, and the catalysts are naturally occurring macromolecular substances kn
12 / 114	"Binding to an RNA molecule or a portion thereof." [GOC:j], GOC:mah]
9 / 73	"Binding to a nucleic acid region that regulates a nucleic acid-based process. Such processes include transcription, DNA replication, and DNA repair." [GOC:txnOH]
9 / 73	"Binding to a methylated cytosine/guanine dinucleotide." [GOC:j], PMID:11746232]
9 / 73	"Any selective and non-covalent interaction with a nucleic acid involved in the initiation, activation, perpetuation, repression or termination of polypeptide synthesis at the ribosome." [GOC:dph, GOC:tb, GOC:vw]
9 / 72	"Binding to a RNA/DNA hybrid." [GOC:ecd]
8 / 66	"Binding to a ribonucleotide, any compound consisting of a ribonucleoside that is esterified with [ortho]phosphate or an oligophosphate at any hydroxyl group on the ribose moiety." [GOC:mah]
8 / 65	"Binding to a nucleotide, any compound consisting of a nucleoside that is esterified with [ortho]phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose." [GOC:mah, ISBN:0198547684]
20 / 60	"Binding to damaged DNA." [GOC:j]
8 / 64	"Binding to nicotinamide adenine dinucleotide, a coenzyme involved in many redox and biosynthetic reactions; binding may be to either the oxidized form, NAD ⁺ , or the reduced form, NADH." [GOC:ai]

Biological Process

2 / 39	"Any process that modulates the frequency, rate or extent of cellular DNA-templated transcription." [GOC:go_curators, GOC:txnOH]
0 / 22	"Any process involved in the conversion of a primary ribosomal RNA (rRNA) transcript into one or more mature rRNA molecules." [GOC:curators]
0 / 21	"Any process that results in the conversion of one or more primary non-coding RNA (ncRNA) transcripts into one or more mature ncRNA molecules." [GOC:mah]
1 / 26	"Any process involved in the maturation of a precursor Small SubUnit (SSU) ribosomal RNA (rRNA) molecule into a mature SSU-rRNA molecule." [GOC:curators]
3 / 3	"The conversion of a single-cell organism from one mating type to another by the precise replacement of a DNA sequence at the expressed mating type locus with a copy of a sequence from a donor locus." [PMID:99]
3 / 3	"A process that forms a boundary that limits the spreading of heterochromatin along a chromosome." [GOC:mah]
0 / 17	"Any process involved in the maturation of a precursor 5.8S ribosomal RNA (rRNA) molecule into a mature 5.8S rRNA molecule." [GOC:curators]
0 / 17	"Any process involved in forming the mature 5' end of an rRNA molecule." [GOC:krc]
0 / 16	"Any phosphodiester bond hydrolysis involved in the conversion of a primary ribosomal RNA (rRNA) transcript into a mature rRNA molecule." [GOC:curators]
0 / 16	"The chemical reactions and pathways involving rRNA, ribosomal RNA, a structural constituent of ribosomes." [ISBN:0198506732]

Cellular Compartment

4 / 5	"A region of a chromosome at which a DNA double-strand break has occurred. DNA damage signaling and repair proteins accumulate at the lesion to respond to the damage and repair the DNA to form a continuous
4 / 5	"A region of a chromosome at which DNA damage has occurred. DNA damage signaling and repair proteins accumulate at the lesion to respond to the damage and repair the DNA to form a continuous DNA helix."
0 / 19	"The chemical reactions and pathways involving an organic substance, any molecular entity containing carbon." [GOC:mah]
16 / 107	"The volume enclosed by the nuclear inner membrane." [GOC:mah, GOC:pz]
0 / 15	"The chemical reactions and pathways resulting in the formation of substances; typically the energy-requiring part of metabolism in which simpler substances are transformed into more complex ones." [GOC:curat
0 / 14	"The chemical reactions and pathways involving organic or inorganic compounds that contain nitrogen." [GOC:j], ISBN:0198506732]
0 / 14	"The chemical reactions and pathways resulting in many of the chemical changes of compounds that are not necessarily required for growth and maintenance of cells, and are often unique to a taxon. In multicellu
3 / 4	"Any process that results in a change in state or activity of a cell (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of deprivation of iron ions." [GOC:mg]
153 / 677	"A stable assembly of two or more macromolecules, i.e. proteins, nucleic acids, carbohydrates or lipids, in which at least one component is a protein and the constituent parts function together." [GOC:dos, GOC:ma
20 / 118	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curat

Supplementary Data S3.1.2

Timepoint 2

Molecular Function

133 / 597	"Catalysis of a biochemical reaction at physiological temperatures. In biologically catalyzed reactions, the reactants are known as substrates, and the catalysts are naturally occurring macromolecular substances kn
12 / 114	"Binding to an RNA molecule or a portion thereof." [GOC:j], GOC:mah]
8 / 73	"Binding to a methylated cytosine/guanine dinucleotide." [GOC:j], PMID:11746232]
7 / 66	"Binding to a ribonucleotide, any compound consisting of a ribonucleoside that is esterified with [ortho]phosphate or an oligophosphate at any hydroxyl group on the ribose moiety." [GOC:mah]
7 / 65	"Binding to a nucleotide, any compound consisting of a nucleoside that is esterified with [ortho]phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose." [GOC:mah, ISBN:0198547684]
7 / 64	"Binding to nicotinamide adenine dinucleotide, a coenzyme involved in many redox and biosynthetic reactions; binding may be to either the oxidized form, NAD ⁺ , or the reduced form, NADH." [GOC:ai]
7 / 63	"Binding to a small molecule, any low molecular weight, monomeric, non-encoded molecule." [GOC:curators, GOC:pd, GOC:pm]
7 / 63	"Binding to FAD, flavin-adenine dinucleotide, the coenzyme or the prosthetic group of various flavoprotein oxidoreductase enzymes, in either the oxidized form, FAD, or the reduced form, FADH ₂ ." [GOC:ai, GOC:im]
7 / 63	"Binding to nicotinamide-adenine dinucleotide phosphate, a coenzyme involved in many redox and biosynthetic reactions; binding may be to either the oxidized form, NADP ⁺ , or the reduced form, NADPH." [GOC:ai]
9 / 73	"Binding to a nucleic acid region that regulates a nucleic acid-based process. Such processes include transcription, DNA replication, and DNA repair." [GOC:txnOH]

Biological Process

2 / 39	"Any process that modulates the frequency, rate or extent of cellular DNA-templated transcription." [GOC:go_curators, GOC:txnOH]
0 / 21	"Any process that results in the conversion of one or more primary non-coding RNA (ncRNA) transcripts into one or more mature ncRNA molecules." [GOC:mah]
3 / 3	"The conversion of a single-cell organism from one mating type to another by the precise replacement of a DNA sequence at the expressed mating type locus with a copy of a sequence from a donor locus." [PMID:99]
3 / 3	"A process that forms a boundary that limits the spreading of heterochromatin along a chromosome." [GOC:mah]
0 / 17	"Any process involved in the maturation of a precursor 5.8S ribosomal RNA (rRNA) molecule into a mature 5.8S rRNA molecule." [GOC:curators]
0 / 17	"Any process involved in forming the mature 5' end of an rRNA molecule." [GOC:krc]
0 / 16	"Any phosphodiester bond hydrolysis involved in the conversion of a primary ribosomal RNA (rRNA) transcript into a mature rRNA molecule." [GOC:curators]
0 / 16	"The chemical reactions and pathways involving rRNA, ribosomal RNA, a structural constituent of ribosomes." [ISBN:0198506732]
0 / 16	"Any process involved in forming the mature 3' end of an rRNA molecule." [GOC:mah]
2 / 30	"Any process that modulates the frequency, rate or extent of transcription mediated by RNA polymerase I." [GOC:go_curators]

Cellular Compartment

4 / 4	"Any process that results in a change in state or activity of a cell (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of deprivation of iron ions." [GOC:mg]
4 / 5	"A region of a chromosome at which a DNA double-strand break has occurred. DNA damage signaling and repair proteins accumulate at the lesion to respond to the damage and repair the DNA to form a continuous
4 / 5	"A region of a chromosome at which DNA damage has occurred. DNA damage signaling and repair proteins accumulate at the lesion to respond to the damage and repair the DNA to form a continuous DNA helix."
0 / 19	"The chemical reactions and pathways involving an organic substance, any molecular entity containing carbon." [GOC:mah]
3 / 3	"Any process involved in the maintenance of an internal steady state of iron ions at the level of a cell." [GOC:ai, GOC:mah]
16 / 107	"The volume enclosed by the nuclear inner membrane." [GOC:mah, GOC:pz]
10 / 25	"A multisubunit guanine nucleotide exchange factor which catalyzes the exchange of GDP bound to initiation factor eIF2 for GTP, generating active eIF2-GTP. In humans, it is composed of five subunits, alpha, beta, i
0 / 15	"The chemical reactions and pathways resulting in the formation of substances; typically the energy-requiring part of metabolism in which simpler substances are transformed into more complex ones." [GOC:curat
9 / 23	"A protein complex that possesses magnesium-dependent protein serine/threonine phosphatase (AMD phosphatase) activity, and consists of a catalytic subunit and one or more regulatory subunits that dictates th
9 / 23	"A complex consisting of methionyl- and glutamyl-tRNA synthetases. The tRNA synthetases present in the complex bind to their cognate tRNAs more efficiently than they do as monomers." [GOC:mcc, PMID:11069]

Supplementary Data S3.1.3

Timepoint 3

Molecular Function

133 / 597	"Catalysis of a biochemical reaction at physiological temperatures. In biologically catalyzed reactions, the reactants are known as substrates, and the catalysts are naturally occurring macromolecular substances known as enzymes." [GOC:jl, GOC:mah]
12 / 114	"Binding to an RNA molecule or a portion thereof." [GOC:jl, GOC:mah]
8 / 73	"Binding to a methylated cytosine/guanine dinucleotide." [GOC:jl, PMID:11746232]
7 / 65	"Binding to a nucleotide, any compound consisting of a nucleoside that is esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose or deoxyribose." [GOC:mah, ISBN:0198547684]
7 / 64	"Binding to nicotinamide adenine dinucleotide, a coenzyme involved in many redox and biosynthetic reactions; binding may be to either the oxidized form, NAD+, or the reduced form, NADH." [GOC:ai]
7 / 63	"Binding to a small molecule, any low molecular weight, monomeric, non-encoded molecule." [GOC:curators, GOC:pde, GOC:pm]
7 / 63	"Binding to FAD, flavin-adenine dinucleotide, the coenzyme or the prosthetic group of various flavoprotein oxidoreductase enzymes, in either the oxidized form, FAD, or the reduced form, FADH2." [GOC:ai, GOC:im]
7 / 63	"Binding to nicotinamide-adenine dinucleotide phosphate, a coenzyme involved in many redox and biosynthetic reactions; binding may be to either the oxidized form, NADP+, or the reduced form, NADPH." [GOC:ai]
9 / 73	"Binding to a nucleic acid region that regulates a nucleic acid-based process. Such processes include transcription, DNA replication, and DNA repair." [GOC:txnOH]
9 / 73	"Any selective and non-covalent interaction with a nucleic acid involved in the initiation, activation, perpetuation, repression or termination of polypeptide synthesis at the ribosome." [GOC:dph, GOC:tb, GOC:vw]

Biological Process

2 / 39	"Any process that modulates the frequency, rate or extent of cellular DNA-templated transcription." [GOC:go_curators, GOC:txnOH]
0 / 21	"Any process that results in the conversion of one or more primary non-coding RNA (ncRNA) transcripts into one or more mature ncRNA molecules." [GOC:mah]
3 / 3	"The conversion of a single-cell organism from one mating type to another by the precise replacement of a DNA sequence at the expressed mating type locus with a copy of a sequence from a donor locus." [PMID:99, GOC:mah]
3 / 3	"A process that forms a boundary that limits the spreading of heterochromatin along a chromosome." [GOC:mah]
0 / 17	"Any process involved in the maturation of a precursor 5.8S ribosomal RNA (rRNA) molecule into a mature 5.8S rRNA molecule." [GOC:curators]
0 / 17	"Any process involved in forming the mature 5' end of an rRNA molecule." [GOC:krc]
0 / 16	"Any phosphodiester bond hydrolysis involved in the conversion of a primary ribosomal RNA (rRNA) transcript into a mature rRNA molecule." [GOC:curators]
0 / 16	"The chemical reactions and pathways involving rRNA, ribosomal RNA, a structural constituent of ribosomes." [ISBN:0198506732]
0 / 16	"Any process involved in forming the mature 3' end of an rRNA molecule." [GOC:mah]
2 / 30	"Any process that modulates the frequency, rate or extent of transcription mediated by RNA polymerase I." [GOC:go_curators]

Cellular Compartment

4 / 4	"Any process that results in a change in state or activity of a cell (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of deprivation of iron ions." [GOC:mg]
0 / 19	"The chemical reactions and pathways involving an organic substance, any molecular entity containing carbon." [GOC:mah]
4 / 5	"A region of a chromosome at which a DNA double-strand break has occurred. DNA damage signaling and repair proteins accumulate at the lesion to respond to the damage and repair the DNA to form a continuous DNA helix." [GOC:mah]
4 / 5	"A region of a chromosome at which DNA damage has occurred. DNA damage signaling and repair proteins accumulate at the lesion to respond to the damage and repair the DNA to form a continuous DNA helix." [GOC:mah]
3 / 3	"Any process involved in the maintenance of an internal steady state of iron ions at the level of a cell." [GOC:ai, GOC:mah]
10 / 25	"A multisubunit guanine nucleotide exchange factor which catalyzes the exchange of GDP bound to initiation factor eIF2 for GTP, generating active eIF2-GTP. In humans, it is composed of five subunits, alpha, beta, gamma, delta, and epsilon." [GOC:curators]
0 / 15	"The chemical reactions and pathways resulting in the formation of substances; typically the energy-requiring part of metabolism in which simpler substances are transformed into more complex ones." [GOC:curators]
19 / 118	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators]
19 / 117	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell division." [GOC:ai]
19 / 117	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecules." [GOC:ai]

Supplementary Data S3.1.4

Timepoint 4

Molecular Function

14 / 114	"Binding to an RNA molecule or a portion thereof." [GOC:jl, GOC:mah]
8 / 73	"Binding to a methylated cytosine/guanine dinucleotide." [GOC:jl, PMID:11746232]
7 / 64	"Binding to nicotinamide adenine dinucleotide, a coenzyme involved in many redox and biosynthetic reactions; binding may be to either the oxidized form, NAD+, or the reduced form, NADH." [GOC:ai]
7 / 63	"Binding to a small molecule, any low molecular weight, monomeric, non-encoded molecule." [GOC:curators, GOC:pde, GOC:pm]
7 / 63	"Binding to FAD, flavin-adenine dinucleotide, the coenzyme or the prosthetic group of various flavoprotein oxidoreductase enzymes, in either the oxidized form, FAD, or the reduced form, FADH2." [GOC:ai, GOC:im]
7 / 62	"Binding to a methylated cytosine/unspecified/guanine trinucleotide." [PMID:17239600]
7 / 62	"Binding to a methylated cytosine/unspecified/unspecified trinucleotide." [PMID:17239600]
7 / 62	"Binding to a purine nucleotide, a compound consisting of a purine nucleoside esterified with (ortho)phosphate." [GOC:ai]
7 / 62	"Binding to a pyrimidine nucleotide, a pyrimidine nucleoside esterified with (ortho)phosphate." [GOC:ai]
7 / 62	"Binding to a cyclic nucleotide, a nucleotide in which the phosphate group is in diester linkage to two positions on the sugar residue." [GOC:ai]

Biological Process

6 / 9	"The series of molecular signals generated as a consequence of the presence of unfolded proteins in the endoplasmic reticulum (ER) or other ER-related stress; results in changes in the regulation of transcription and translation." [GOC:ai]
8 / 15	"The cellular process in which a signal is conveyed to trigger a change in the activity or state of a cell. Signal transduction begins with reception of a signal (e.g. a ligand binding to a receptor or receptor activation) and results in a change in the activity or state of the cell." [GOC:ai]
3 / 39	"Any process that modulates the frequency, rate or extent of cellular DNA-templated transcription." [GOC:go_curators, GOC:txnOH]
3 / 3	"The conversion of a single-cell organism from one mating type to another by the precise replacement of a DNA sequence at the expressed mating type locus with a copy of a sequence from a donor locus." [GOC:mah]
3 / 3	"A process that forms a boundary that limits the spreading of heterochromatin along a chromosome." [GOC:mah]
3 / 3	"Any process that modulates the frequency, rate or extent of filamentous growth of a population of unicellular organisms in response to biotic stimulus." [GOC:di, GOC:TermGenie]
0 / 17	"Any process involved in the maturation of a precursor 5.8S ribosomal RNA (rRNA) molecule into a mature 5.8S rRNA molecule." [GOC:curators]
9 / 20	"The process in which a signal is passed on to downstream components within the cell, which become activated themselves to further propagate the signal and finally trigger a change in the function or state of the cell." [GOC:ai]
5 / 8	"The cascade of processes by which a signal interacts with a receptor, causing a change in the level or activity of a second messenger or other downstream target, and ultimately leading to the activation, perpetuation, repression or termination of a biological process." [GOC:ai]
5 / 8	"The series of molecular signals initiated by activation of a receptor on the surface of a cell. The pathway begins with binding of an extracellular ligand to a cell surface receptor, or for receptors that signal in the cytoplasm, with binding of an intracellular ligand to a cytoplasmic receptor." [GOC:ai]

Cellular Compartment

4 / 4	"Any process that results in a change in state or activity of a cell (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of deprivation of iron ions." [GOC:mg]
3 / 3	"Any process involved in the maintenance of an internal steady state of iron ions at the level of a cell." [GOC:ai, GOC:mah]
0 / 15	"The chemical reactions and pathways resulting in the formation of substances; typically the energy-requiring part of metabolism in which simpler substances are transformed into more complex ones." [GOC:curators]
19 / 118	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators]
19 / 117	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell division." [GOC:ai]
19 / 117	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecules." [GOC:ai]
3 / 4	"An endocytic patch that consists of an actin-containing structure found at the plasma membrane in cells; formed of networks of branched actin filaments that lie just beneath the plasma membrane and are involved in the internalization of macromolecules." [GOC:mah]
3 / 4	"The portion of the actin cytoskeleton, comprising filamentous actin and associated proteins, that lies just beneath the plasma membrane." [GOC:mah]
3 / 4	"A complex that localizes to actin cortical patches at sites of endocytosis and negatively regulates barbed end F-actin assembly, resulting in the generation of free actin pools. The Aim21-Tda2 complex is involved in the regulation of actin dynamics." [GOC:ai, ISBN:0198547684]

Supplementary Data S3.1.5

Timepoint 5

Molecular Function

126 / 598	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transp
13 / 114	"Binding to an RNA molecule or a portion thereof." [GOC:jl, GOC:mah]
10 / 20	"Binds to and modulates the activity of a GTPase." [GOC:mah]
5 / 7	"Stimulates the exchange of GDP to GTP on a signaling GTPase, changing its conformation to its active form. Guanine nucleotide exchange factors (GEFs) act by stimulating the release of guanosine diphosp
8 / 73	"Binding to a methylated cytosine/guanine dinucleotide." [GOC:jl, PMID:11746232]
7 / 64	"Binding to nicotinamide adenine dinucleotide, a coenzyme involved in many redox and biosynthetic reactions; binding may be to either the oxidized form, NAD+, or the reduced form, NADH." [GOC:ai]
7 / 63	"Binding to a small molecule, any low molecular weight, monomeric, non-encoded molecule." [GOC:curators, GOC:pde, GOC:pm]
7 / 63	"Binding to FAD, flavin-adenine dinucleotide, the coenzyme or the prosthetic group of various flavoprotein oxidoreductase enzymes, in either the oxidized form, FAD, or the reduced form, FADH2." [GOC:
7 / 62	"Binding to a methylated cytosine/unspecified/guanine trinucleotide." [PMID:17239600]
7 / 62	"Binding to a methylated cytosine/unspecified/unspecified trinucleotide." [PMID:17239600]

Biological Process

11 / 15	"The cellular process in which a signal is conveyed to trigger a change in the activity or state of a cell. Signal transduction begins with reception of a signal (e.g. a ligand binding to a receptor or receptor activa
12 / 20	"The process in which a signal is passed on to downstream components within the cell, which become activated themselves to further propagate the signal and finally trigger a change in the function or state
7 / 9	"The series of molecular signals generated as a consequence of the presence of unfolded proteins in the endoplasmic reticulum (ER) or other ER-related stress; results in changes in the regulation of transcrip
6 / 8	"The cascade of processes by which a signal interacts with a receptor, causing a change in the level or activity of a second messenger or other downstream target, and ultimately leading to the activation, per
6 / 8	"The series of molecular signals initiated by activation of a receptor on the surface of a cell. The pathway begins with binding of an extracellular ligand to a cell surface receptor, or for receptors that signal in
6 / 8	"The series of molecular signals initiated by a ligand binding to its receptor, in which the activated receptor promotes the exchange of GDP for GTP on the alpha-subunit of an associated heterotrimeric G-pro
6 / 8	"The series of molecular signals generated as a consequence of a serotonin receptor binding to one of its physiological ligands." [GOC:mah]
6 / 8	"The series of molecular signals generated as a consequence of a dopamine receptor binding to one of its physiological ligands." [GOC:mah, PMID:21711983]
6 / 8	"The sequence of reactions within a cell required to convert absorbed photons into a molecular signal." [GOC:go_curators]
6 / 8	"The series of molecular signals mediated by the detection of a hormone." [GOC:sm]

Cellular Compartment

4 / 4	"Any process that results in a change in state or activity of a cell (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of deprivation of iron ions." [GOC:mg]
4 / 5	"The end, or tip, of a fungal hypha, where polarized growth occurs during hyphal elongation." [GOC:mcc]
3 / 3	"Any process involved in the maintenance of an internal steady state of iron ions at the level of a cell." [GOC:ai, GOC:mah]
0 / 16	"The chemical reactions and pathways by which individual cells transform chemical substances." [GOC:go_curators]
18 / 118	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go
18 / 118	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
3 / 4	"Any part of a cell where non-isotropic growth takes place." [GOC:mah]
3 / 4	"An endocytic patch that consists of an actin-containing structure found at the plasma membrane in cells; formed of networks of branched actin filaments that lie just beneath the plasma membrane and as
3 / 4	"The portion of the actin cytoskeleton, comprising filamentous actin and associated proteins, that lies just beneath the plasma membrane." [GOC:mah]
3 / 4	"The end, or tip, of a fungal hypha, where polarized growth occurs during hyphal elongation." [GOC:mcc]

Supplementary Data S3.1.6

Timepoint 6

Molecular Function

132 / 598	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transp
11 / 20	"Binds to and modulates the activity of a GTPase." [GOC:mah]
7 / 64	"Binding to nicotinamide adenine dinucleotide, a coenzyme involved in many redox and biosynthetic reactions; binding may be to either the oxidized form, NAD+, or the reduced form, NADH." [GOC:ai]
5 / 7	"Stimulates the exchange of GDP to GTP on a signaling GTPase, changing its conformation to its active form. Guanine nucleotide exchange factors (GEFs) act by stimulating the release of guanosine diphosph
7 / 63	"Binding to a small molecule, any low molecular weight, monomeric, non-encoded molecule." [GOC:curators, GOC:pde, GOC:pm]
7 / 63	"Binding to FAD, flavin-adenine dinucleotide, the coenzyme or the prosthetic group of various flavoprotein oxidoreductase enzymes, in either the oxidized form, FAD, or the reduced form, FADH2." [GOC:
17 / 114	"Binding to an RNA molecule or a portion thereof." [GOC:jl, GOC:mah]
9 / 73	"Binding to a methylated cytosine/guanine dinucleotide." [GOC:jl, PMID:11746232]
7 / 62	"Binding to a methylated cytosine/unspecified/guanine trinucleotide." [PMID:17239600]
7 / 62	"Binding to a methylated cytosine/unspecified/unspecified trinucleotide." [PMID:17239600]

Biological Process

12 / 15	"The cellular process in which a signal is conveyed to trigger a change in the activity or state of a cell. Signal transduction begins with reception of a signal (e.g. a ligand binding to a receptor or receptor activa
13 / 20	"The process in which a signal is passed on to downstream components within the cell, which become activated themselves to further propagate the signal and finally trigger a change in the function or state
8 / 9	"The series of molecular signals generated as a consequence of the presence of unfolded proteins in the endoplasmic reticulum (ER) or other ER-related stress; results in changes in the regulation of transcrip
7 / 8	"The cascade of processes by which a signal interacts with a receptor, causing a change in the level or activity of a second messenger or other downstream target, and ultimately leading to the activation, per
7 / 8	"The series of molecular signals initiated by activation of a receptor on the surface of a cell. The pathway begins with binding of an extracellular ligand to a cell surface receptor, or for receptors that signal in
7 / 8	"The series of molecular signals initiated by a ligand binding to its receptor, in which the activated receptor promotes the exchange of GDP for GTP on the alpha-subunit of an associated heterotrimeric G-pro
7 / 8	"The series of molecular signals generated as a consequence of a serotonin receptor binding to one of its physiological ligands." [GOC:mah]
7 / 8	"The series of molecular signals generated as a consequence of a dopamine receptor binding to one of its physiological ligands." [GOC:mah, PMID:21711983]
7 / 8	"The sequence of reactions within a cell required to convert absorbed photons into a molecular signal." [GOC:go_curators]
7 / 8	"The series of molecular signals mediated by the detection of a hormone." [GOC:sm]

Cellular Compartment

4 / 5	"The end, or tip, of a fungal hypha, where polarized growth occurs during hyphal elongation." [GOC:mcc]
0 / 16	"The chemical reactions and pathways by which individual cells transform chemical substances." [GOC:go_curators]
7 / 15	"A lipid bilayer along with all the proteins and protein complexes embedded in it an attached to it." [GOC:dos, GOC:mah, ISBN:0815316194]
0 / 15	"The chemical reactions and pathways resulting in the formation of substances; typically the energy-requiring part of metabolism in which simpler substances are transformed into more complex ones." [GO
0 / 15	"The component of the organelle membrane consisting of the gene products having at least some part of their peptide sequence embedded in the hydrophobic region of the membrane." [GOC:dos, GOC:ma
0 / 14	"The chemical reactions and pathways involving organic or inorganic compounds that contain nitrogen." [GOC:jl, ISBN:0198506732]
0 / 14	"The chemical reactions and pathways resulting in many of the chemical changes of compounds that are not necessarily required for growth and maintenance of cells, and are often unique to a taxon. In mult
3 / 4	"The component of a plasma membrane consisting of gene products and protein complexes that are loosely bound to one of its surfaces, but not integrated into the hydrophobic region." [GOC:curators, GOC
3 / 4	"Any part of a cell where non-isotropic growth takes place." [GOC:mah]

Supplementary Data S3.1.7

Timepoint 7

Molecular Function

133 / 598	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transp
12 / 20	"Binds to and modulates the activity of a GTPase." [GOC:mah]
7 / 64	"Binding to nicotinamide adenine dinucleotide, a coenzyme involved in many redox and biosynthetic reactions; binding may be to either the oxidized form, NAD ⁺ , or the reduced form, NADH." [GOC:ai]
5 / 7	"Stimulates the exchange of GDP to GTP on a signaling GTPase, changing its conformation to its active form. Guanine nucleotide exchange factors (GEFs) act by stimulating the release of guanosine diphosph
7 / 63	"Binding to a small molecule, any low molecular weight, monomeric, non-encoded molecule." [GOC:curators, GOC:pde, GOC:pm]
7 / 63	"Binding to FAD, flavin-adenine dinucleotide, the coenzyme or the prosthetic group of various flavoprotein oxidoreductase enzymes, in either the oxidized form, FAD, or the reduced form, FADH ₂ ." [GOC:
9 / 73	"Binding to a methylated cytosine/guanine dinucleotide." [GOC:jl, PMID:11746232]
7 / 62	"Binding to a methylated cytosine/unspecified/guanine trinucleotide." [PMID:17239600]
7 / 62	"Binding to a methylated cytosine/unspecified/unspecified trinucleotide." [PMID:17239600]
7 / 62	"Binding to a purine nucleotide, a compound consisting of a purine nucleoside esterified with (ortho)phosphate." [GOC:ai]

Biological Process

12 / 15	"The cellular process in which a signal is conveyed to trigger a change in the activity or state of a cell. Signal transduction begins with reception of a signal (e.g. a ligand binding to a receptor or receptor activa
13 / 20	"The process in which a signal is passed on to downstream components within the cell, which become activated themselves to further propagate the signal and finally trigger a change in the function or state
8 / 9	"The series of molecular signals generated as a consequence of the presence of unfolded proteins in the endoplasmic reticulum (ER) or other ER-related stress; results in changes in the regulation of transcri
7 / 8	"The cascade of processes by which a signal interacts with a receptor, causing a change in the level or activity of a second messenger or other downstream target, and ultimately leading to the activation, per
7 / 8	"The series of molecular signals initiated by activation of a receptor on the surface of a cell. The pathway begins with binding of an extracellular ligand to a cell surface receptor, or for receptors that signal in
7 / 8	"The series of molecular signals initiated by a ligand binding to its receptor, in which the activated receptor promotes the exchange of GDP for GTP on the alpha-subunit of an associated heterotrimeric G-pr
7 / 8	"The series of molecular signals generated as a consequence of a serotonin receptor binding to one of its physiological ligands." [GOC:mah]
7 / 8	"The series of molecular signals generated as a consequence of a dopamine receptor binding to one of its physiological ligands." [GOC:mah, PMID:21711983]
7 / 8	"The sequence of reactions within a cell required to convert absorbed photons into a molecular signal." [GOC:go_curators]
7 / 8	"The series of molecular signals mediated by the detection of a hormone." [GOC:sm]

Cellular Compartment

4 / 4	"An endocytic patch that consists of an actin-containing structure found at the plasma membrane in cells; formed of networks of branched actin filaments that lie just beneath the plasma membrane and assi
4 / 4	"The portion of the actin cytoskeleton, comprising filamentous actin and associated proteins, that lies just beneath the plasma membrane." [GOC:mah]
4 / 4	"A complex that localizes to actin cortical patches at sites of endocytosis and negatively regulates barbed end F-actin assembly, resulting in the generation of free actin pools. The Aim21-Tda2 complex is nec
4 / 5	"The end, or tip, of a fungal hypha, where polarized growth occurs during hyphal elongation." [GOC:mcc]
0 / 16	"The chemical reactions and pathways by which individual cells transform chemical substances." [GOC:go_curators]
0 / 15	"The chemical reactions and pathways resulting in the formation of substances; typically the energy-requiring part of metabolism in which simpler substances are transformed into more complex ones." [GO
0 / 15	"The component of the organelle membrane consisting of the gene products having at least some part of their peptide sequence embedded in the hydrophobic region of the membrane." [GOC:dos, GOC:ma
7 / 15	"A lipid bilayer along with all the proteins and protein complexes embedded in it an attached to it." [GOC:dos, GOC:mah, ISBN:0815316194]
0 / 14	"The chemical reactions and pathways involving organic or inorganic compounds that contain nitrogen." [GOC:jl, ISBN:0198506732]
0 / 14	"The chemical reactions and pathways resulting in many of the chemical changes of compounds that are not necessarily required for growth and maintenance of cells, and are often unique to a stage. In mult

Supplementary Data S3.1.8

Timepoint 8

Molecular Function

121 / 597	"Catalysis of a biochemical reaction at physiological temperatures. In biologically catalyzed reactions, the reactants are known as substrates, and the catalysts are naturally occurring macromolecular substa
122 / 598	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transp
10 / 20	"Binds to and modulates the activity of a GTPase." [GOC:mah]
116 / 586	"A molecular process that can be carried out by the action of a single macromolecular machine, usually via direct physical interactions with other molecular entities. Function in this sense denotes an action
3 / 3	"Binding to a histone H3 in which the lysine residue at position 27 has been modified by trimethylation." [GOC:dph, PMID:23948251]
3 / 3	"Binding to a histone H3 in which the lysine residue at position 9 has been modified by trimethylation." [PMID:30110338]
3 / 3	"Binding to a protein upon methylation of the target protein." [PMID:26060076]
3 / 3	"Binding to a histone H4 in which the lysine residue at position 20 has been modified by trimethylation." [PMID:22150589]
24 / 79	"Binding to a transition metal ions; a transition metal is an element whose atom has an incomplete d-subshell of extranuclear electrons, or which gives rise to a cation or cations with an incomplete d-subsh
23 / 75	"Binding to a zinc ion (Zn)." [GOC:ai]

Biological Process

3 / 15	"The cellular process in which a signal is conveyed to trigger a change in the activity or state of a cell. Signal transduction begins with reception of a signal (e.g. a ligand binding to a receptor or receptor activa
10 / 20	"The process in which a signal is passed on to downstream components within the cell, which become activated themselves to further propagate the signal and finally trigger a change in the function or state
5 / 9	"Any cellular process that results in the specification, formation or maintenance of polarized actin-based cytoskeletal structures." [GOC:mah]
5 / 9	"The series of molecular signals generated as a consequence of the presence of unfolded proteins in the endoplasmic reticulum (ER) or other ER-related stress; results in changes in the regulation of transcri
5 / 7	"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of cytoskeletal structures." [GOC:dph, GOC:jl, GOC:mah]
3 / 3	"Any process that activates or increases the frequency, rate or extent of heterochromatin formation." [GOC:mah]
3 / 3	"Any process that modulates the direction of cell growth." [GOC:mah, GOC:vw]
5 / 8	"The cascade of processes by which a signal interacts with a receptor, causing a change in the level or activity of a second messenger or other downstream target, and ultimately leading to the activation, per
5 / 8	"The series of molecular signals initiated by activation of a receptor on the surface of a cell. The pathway begins with binding of an extracellular ligand to a cell surface receptor, or for receptors that signal in
5 / 8	"The series of molecular signals initiated by a ligand binding to its receptor, in which the activated receptor promotes the exchange of GDP for GTP on the alpha-subunit of an associated heterotrimeric G-pr

Cellular Compartment

4 / 4	"An endocytic patch that consists of an actin-containing structure found at the plasma membrane in cells; formed of networks of branched actin filaments that lie just beneath the plasma membrane and assi
4 / 4	"The portion of the actin cytoskeleton, comprising filamentous actin and associated proteins, that lies just beneath the plasma membrane." [GOC:mah]
4 / 4	"The region at the end of the longest axis of a cylindrical or elongated cell." [GOC:ai, GOC:mah]
4 / 4	"A complex that localizes to actin cortical patches at sites of endocytosis and negatively regulates barbed end F-actin assembly, resulting in the generation of free actin pools. The Aim21-Tda2 complex is nec
4 / 5	"The end, or tip, of a fungal hypha, where polarized growth occurs during hyphal elongation." [GOC:mcc]
3 / 3	"Structure within the hyphal tip of filamentous fungi that acts as an organizing center for hyphal tip growth; may function to supply vesicles to the elongating tip and/or to organize cytoskeletal microfilamen
3 / 3	"Protein complex that has a role in determining cell polarity, found at the tip of a growing fungal hypha." [PMID:15976451]
0 / 16	"The chemical reactions and pathways by which individual cells transform chemical substances." [GOC:go_curators]
3 / 4	"The component of a plasma membrane consisting of gene products and protein complexes that are loosely bound to one of its surfaces, but not integrated into the hydrophobic region." [GOC:curators, GOC

Supplementary Data S3.1.9

Timepoint 9

Molecular Function

109 / 598	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transp
24 / 79	"Binding to a transition metal ion; a transition metal is an element whose atom has an incomplete d-subshell of extranuclear electrons, or which gives rise to a cation or cations with an incomplete d-subsh
23 / 75	"Binding to a zinc ion (Zn)." [GOC:ai]
23 / 75	"Binding to and responding, e.g. by conformational change, to changes in the cellular level of zinc." [GOC:vw, PMID:31239353]
3 / 3	"Binding to a histone H3 in which the lysine residue at position 27 has been modified by trimethylation." [GOC:dph, PMID:23948251]
3 / 3	"Binding to a histone H3 in which the lysine residue at position 9 has been modified by trimethylation." [PMID:30110338]
3 / 3	"Binding to a protein upon methylation of the target protein." [PMID:26060076]
3 / 3	"Binding to a histone H4 in which the lysine residue at position 20 has been modified by trimethylation." [PMID:22150589]
4 / 6	"Catalysis of the formation of aminoacyl-tRNA from ATP, amino acid, and tRNA with the release of diphosphate and AMP." [ISBN:0198506732]
8 / 20	"Binds to and modulates the activity of a GTPase." [GOC:mah]

Biological Process

6 / 9	"Any cellular process that results in the specification, formation or maintenance of polarized actin-based cytoskeletal structures." [GOC:mah]
0 / 24	"The chemical reactions and pathways resulting in the breakdown of a protein or peptide by hydrolysis of its peptide bonds, initiated by the covalent attachment of ubiquitin, and mediated by the proteasom
5 / 7	"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of cytoskeletal structures." [GOC:dph, GOC:jl, GOC:mah]
4 / 5	"The process of coupling alanine to alanyl-tRNA, catalyzed by alanyl-tRNA synthetase. The alanyl-tRNA synthetase is a class-II synthetases. The activated amino acid is transferred to the 3'-OH group of an ala
4 / 5	"The process of coupling arginine to arginyl-tRNA, catalyzed by arginyl-tRNA synthetase. The arginyl-tRNA synthetase is a class-I synthetase. The activated amino acid is transferred to the 2'-OH group of an a
4 / 5	"The process of coupling asparagine to asparaginyl-tRNA, catalyzed by asparaginyl-tRNA synthetase. The asparaginyl-tRNA synthetase is a class-II synthetase. The activated amino acid is transferred to the 3'-
4 / 5	"The process of coupling aspartate to aspartyl-tRNA, catalyzed by aspartyl-tRNA synthetase. The aspartyl-tRNA synthetase is a class-II synthetase. The activated amino acid is transferred to the 3'-OH group o
4 / 5	"The process of coupling cysteine to cysteinyl-tRNA, catalyzed by cysteinyl-tRNA synthetase. A cysteinyl-tRNA synthetase is a class-I synthetase. The activated amino acid is transferred to the 2'-OH group of
4 / 5	"The process of coupling glutamate to glutamyl-tRNA, catalyzed by glutamyl-tRNA synthetase. The glutamyl-tRNA synthetase is a class-I synthetase. The activated amino acid is transferred to the 2'-OH group
4 / 5	"The process of coupling glutamine to glutaminyl-tRNA, catalyzed by glutaminyl-tRNA synthetase. The glutaminyl-tRNA synthetase is a class-I synthetase. The activated amino acid is transferred to the 2'-OH

Cellular Compartment

4 / 4	"An endocytic patch that consists of an actin-containing structure found at the plasma membrane in cells; formed of networks of branched actin filaments that lie just beneath the plasma membrane and ass
4 / 4	"The portion of the actin cytoskeleton, comprising filamentous actin and associated proteins, that lies just beneath the plasma membrane." [GOC:mah]
4 / 4	"A complex that localizes to actin cortical patches at sites of endocytosis and negatively regulates barbed end F-actin assembly, resulting in the generation of free actin pools. The Aim21-Tda2 complex is nec
16 / 54	"A component of a cell contained within (but not including) the plasma membrane. In eukaryotes it includes the nucleus and cytoplasm." [ISBN:0198506732]
3 / 4	"The component of a plasma membrane consisting of gene products and protein complexes that are loosely bound to one of its surfaces, but not integrated into the hydrophobic region." [GOC:curators, GOC
3 / 4	"The region at the end of the longest axis of a cylindrical or elongated cell." [GOC:ai, GOC:mah]
9 / 25	"A complex of protein and RNA which facilitates translocation of proteins across membranes." [GOC:mig]
4 / 7	"The part of the cell cortex consisting of an aggregation of proteins that will give rise to an endocytic vesicle." [GOC:dph, PMID:22949647]
9 / 26	"A ribonucleoprotein complex that contains the small ribosomal subunit, a translation initiation ternary complex (i.e. an initiator tRNA, GTP, and an IF2 or eIF2 complex), and an mRNA." [GOC:hjd, GOC:mah]
0 / 16	"The chemical reactions and pathways by which individual cells transform chemical substances." [GOC:go, curators]

Supplementary Data S3.1.10

Timepoint 10

Molecular Function

122 / 598	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport aga
26 / 79	"Binding to a transition metal ion; a transition metal is an element whose atom has an incomplete d-subshell of extranuclear electrons, or which gives rise to a cation or cations with an incomplete d-subshell. Tra
2 / 39	"Catalysis of the reaction: a nucleoside triphosphate + H2O = nucleoside diphosphate + phosphate." [RHEA:23680]
24 / 75	"Binding to a zinc ion (Zn)." [GOC:ai]
24 / 75	"Binding to and responding, e.g. by conformational change, to changes in the cellular level of zinc." [GOC:vw, PMID:31239353]
3 / 3	"Binding to a histone H3 in which the lysine residue at position 27 has been modified by trimethylation." [GOC:dph, PMID:23948251]
3 / 3	"Binding to a histone H3 in which the lysine residue at position 9 has been modified by trimethylation." [PMID:30110338]
3 / 3	"Binding to a protein upon methylation of the target protein." [PMID:26060076]
3 / 3	"Binding to a histone H4 in which the lysine residue at position 20 has been modified by trimethylation." [PMID:22150589]
120 / 587	"The action of a molecule that contributes to the structural integrity of a complex or its assembly within or outside a cell." [GOC:mah, GOC:vw]

Biological Process

6 / 9	"Any cellular process that results in the specification, formation or maintenance of polarized actin-based cytoskeletal structures." [GOC:mah]
5 / 7	"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of cytoskeletal structures." [GOC:dph, GOC:jl, GOC:mah]
3 / 3	"Any process that modulates the direction of cell growth." [GOC:mah, GOC:vw]
0 / 17	"A cellular process that results in the biosynthesis of constituent macromolecules, assembly, and arrangement of constituent parts of a complex containing RNA and proteins. Includes the biosynthesis of the constitue
1 / 24	"The chemical reactions and pathways resulting in the breakdown of a protein or peptide by hydrolysis of its peptide bonds, initiated by the covalent attachment of ubiquitin, and mediated by the proteasome." [GOC
4 / 6	"The changes in the actin cytoskeleton that are necessary for the movement of cells along radial glial cells as a component of the process of cerebral cortex glial-mediated radial cell migration." [GO_REF:0000021, GC
4 / 6	"Any cellular process that depends upon or alters the actin cytoskeleton, that part of the cytoskeleton comprising actin filaments and their associated proteins." [GOC:mah]
4 / 6	"Covalent modification of an actin molecule." [GOC:mah]
4 / 6	"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of cytoskeletal structures containing both actin and myosin or paramyosin. The myosi
4 / 6	"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of a filament composed of myosin molecules." [GOC:mah]

Cellular Compartment

4 / 4	"An endocytic patch that consists of an actin-containing structure found at the plasma membrane in cells; formed of networks of branched actin filaments that lie just beneath the plasma membrane and assemble, i
4 / 4	"The portion of the actin cytoskeleton, comprising filamentous actin and associated proteins, that lies just beneath the plasma membrane." [GOC:mah]
4 / 4	"A complex that localizes to actin cortical patches at sites of endocytosis and negatively regulates barbed end F-actin assembly, resulting in the generation of free actin pools. The Aim21-Tda2 complex is necessary fc
18 / 54	"A component of a cell contained within (but not including) the plasma membrane. In eukaryotes it includes the nucleus and cytoplasm." [ISBN:0198506732]
11 / 32	"Circular DNA structures that are not part of a chromosome." [GOC:ai]
11 / 32	"A membranous cellular structure that bears the photosynthetic pigments in plants, algae, and cyanobacteria. In cyanobacteria thylakoids are of various shapes and are attached to, or continuous with, the plasma m
11 / 32	"A discrete intracellular part formed of aggregated molecules such as proteins or other biopolymers." [GOC:mah, PMID:11121744]
11 / 32	"A multienzyme complex found in all multicellular eukaryotes composed of eight proteins with aminoacyl-tRNA synthetase activities (abbreviated as: ArgRS, AspRS, GluProRS, GlnRS, IleRS, LeuRS, LysRS, MetRS where
11 / 32	"A protein complex, that caps one or both ends of the proteasome core complex and regulates entry into, or exit from, the proteasome core complex." [GOC:mtg_sensu]
11 / 32	"A protein-pigment complex that may be closely or peripherally associated to photosynthetic reaction centers that participate in harvesting and transferring radiant energy to the reaction center." [GOC:lir]

Supplementary Data S3.1.11

Timepoint 11

Molecular Function

126 / 598	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport against a concentration gradient." [RHEA:130]
2 / 39	"Catalysis of the reaction: a nucleoside triphosphate + H ₂ O = nucleoside diphosphate + phosphate." [RHEA:23680]
25 / 79	"Binding to a transition metal ion; a transition metal is an element whose atom has an incomplete d-subshell of extranuclear electrons, or which gives rise to a cation or cations with an incomplete d-subshell. Transition metal ions are typically found in coordination complexes." [GOC:ai]
24 / 75	"Binding to a zinc ion (Zn)." [GOC:ai]
24 / 75	"Binding to and responding, e.g. by conformational change, to changes in the cellular level of zinc." [GOC:vw, PMID:31239353]
3 / 3	"Binding to a histone H3 in which the lysine residue at position 27 has been modified by trimethylation." [GOC:dph, PMID:23948251]
3 / 3	"Binding to a histone H3 in which the lysine residue at position 9 has been modified by trimethylation." [PMID:30110338]
3 / 3	"Binding to a protein upon methylation of the target protein." [PMID:26060076]
3 / 3	"Binding to a histone H4 in which the lysine residue at position 20 has been modified by trimethylation." [PMID:22150589]
2 / 31	"Catalysis of the reaction: ATP + H ₂ O = ADP + H ⁺ + Pi. ATP hydrolysis is used in some reactions as an energy source, for example to catalyze a reaction or drive transport against a concentration gradient." [RHEA:130]

Biological Process

6 / 9	"Any cellular process that results in the specification, formation or maintenance of polarized actin-based cytoskeletal structures." [GOC:mah]
2 / 32	"A cellular process that results in the biosynthesis of constituent macromolecules, assembly, and arrangement of constituent parts of ribosome subunits; includes transport to the sites of protein synthesis." [GOC:ma, GOC:dph, GOC:jl, GOC:mah]
5 / 7	"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of cytoskeletal structures." [GOC:dph, GOC:jl, GOC:mah]
0 / 17	"A cellular process that results in the biosynthesis of constituent macromolecules, assembly, and arrangement of constituent parts of a complex containing RNA and proteins. Includes the biosynthesis of the constituent macromolecules, assembly, and arrangement of constituent parts of a complex containing RNA and proteins." [GOC:ma, GOC:dph, GOC:jl, GOC:mah]
1 / 24	"The chemical reactions and pathways resulting in the breakdown of a protein or peptide by hydrolysis of its peptide bonds, initiated by the covalent attachment of ubiquitin, and mediated by the proteasome." [GOC:curators]
0 / 16	"Endonucleolytic cleavage between the SSU-rRNA and the 5.8S rRNA of an rRNA molecule originally produced as a tricistronic rRNA transcript that contained the Small SubUnit (SSU) rRNA, the 5.8S rRNA, and the Large SubUnit (LSU) rRNA." [GOC:curators]
1 / 23	"Any process involved in the maturation of a precursor Large SubUnit (LSU) ribosomal RNA (rRNA) molecule into a mature LSU-rRNA molecule." [GOC:curators]
2 / 28	"Any cellular metabolic process involving deoxyribonucleic acid. This is one of the two main types of nucleic acid, consisting of a long, unbranched macromolecule formed from one, or more commonly, two, strands of deoxyribose sugar and phosphate groups." [GOC:curators]
1 / 21	"The repair of double-strand breaks in DNA via homologous and nonhomologous mechanisms to reform a continuous DNA helix." [GOC:elh]
1 / 21	"The chemical reactions and pathways resulting in the breakdown of a protein or peptide by hydrolysis of its peptide bonds, initiated by the covalent attachment of a ubiquitin group, or multiple ubiquitin groups, to the protein." [GOC:curators]

Cellular Compartment

4 / 4	"An endocytic patch that consists of an actin-containing structure found at the plasma membrane in cells; formed of networks of branched actin filaments that lie just beneath the plasma membrane and assemble, and disassemble, to mediate the entry of macromolecules into the cell." [GOC:mah]
4 / 4	"The portion of the actin cytoskeleton, comprising filamentous actin and associated proteins, that lies just beneath the plasma membrane." [GOC:mah]
4 / 4	"A complex that localizes to actin cortical patches at sites of endocytosis and negatively regulates barbed end F-actin assembly, resulting in the generation of free actin pools. The Aim21-Tda2 complex is necessary for the formation of the endocytic patch." [GOC:mah]
15 / 107	"The volume enclosed by the nuclear inner membrane." [GOC:mah, GOC:pz]
14 / 97	"Organized structure of distinctive morphology and function, bounded by a single or double lipid bilayer membrane and occurring within the cell. Includes the nucleus, mitochondria, plastids, vacuoles, and vesicles. Includes the nucleus, mitochondria, plastids, vacuoles, and vesicles." [GOC:curators]
1 / 23	"The component of a membrane consisting of the gene products having some covalently attached portion, for example part of a peptide sequence or some other covalently attached group such as a GPI anchor, which is embedded in the lipid bilayer." [GOC:curators]
0 / 15	"The component of the organelle membrane consisting of the gene products having at least some part of their peptide sequence embedded in the hydrophobic region of the membrane." [GOC:dos, GOC:mah]
3 / 4	"The directed movement of inorganic anions into, out of or within a cell, or between cells, by means of some agent such as a transporter or pore. Inorganic anions are atoms or small molecules with a negative charge." [GOC:curators, GOC:dos]
3 / 4	"The component of a plasma membrane consisting of gene products and protein complexes that are loosely bound to one of its surfaces, but not integrated into the hydrophobic region." [GOC:curators, GOC:dos]
4 / 7	"The part of the cell cortex consisting of an aggregation of proteins that will give rise to an endocytic vesicle." [GOC:dph, PMID:22949647]

Supplementary Data S3.1.12

Timepoint 12

Molecular Function

129 / 597	"Catalysis of a biochemical reaction at physiological temperatures. In biologically catalyzed reactions, the reactants are known as substrates, and the catalysts are naturally occurring macromolecular substances known as enzymes." [GOC:curators]
126 / 586	"A molecular process that can be carried out by the action of a single macromolecular machine, usually via direct physical interactions with other molecular entities. Function in this sense denotes an action, or activity, that is carried out by a single macromolecular machine, usually via direct physical interactions with other molecular entities." [GOC:ai]
9 / 18	"Binding to a lipid." [GOC:ai]
9 / 18	"Binding to a phosphatidylethanolamine, a class of glycerophospholipids in which a phosphatidyl group is esterified to the hydroxyl group of ethanolamine." [ISBN:0198506732]
9 / 18	"Binding to lysophosphatidic acid (LPA), a phospholipid derivative that acts as a potent mitogen due to its activation of high-affinity G protein-coupled receptors." [GOC:curators]
9 / 18	"Binding to phosphatidic acid, any of a class of glycerol phosphate in which both the remaining hydroxyl groups of the glycerol moiety are esterified with fatty acids." [CHEBI:16337, GOC:jp, ISBN:0198506732]
9 / 18	"Binding to phosphatidylglycerol." [GOC:kmv, GOC:TermGenie]
9 / 18	"Binding to ceramide 1-phosphate." [GOC:TermGenie, PMID:23863933]
25 / 75	"Binding to a zinc ion (Zn)." [GOC:ai]
25 / 75	"Binding to and responding, e.g. by conformational change, to changes in the cellular level of zinc." [GOC:vw, PMID:31239353]

Biological Process

6 / 9	"The series of molecular signals generated as a consequence of the presence of unfolded proteins in the endoplasmic reticulum (ER) or other ER-related stress; results in changes in the regulation of transcription and translation." [GOC:curators]
5 / 7	"Any process that results in the specification, formation or maintenance of the physical structure of eukaryotic heterochromatin, a compact and highly condensed form of chromatin." [GOC:mah]
0 / 16	"Endonucleolytic cleavage between the SSU-rRNA and the 5.8S rRNA of an rRNA molecule originally produced as a tricistronic rRNA transcript that contained the Small SubUnit (SSU) rRNA, the 5.8S rRNA, and the Large SubUnit (LSU) rRNA." [GOC:curators]
0 / 16	"Any process involved in the maturation of a precursor Small SubUnit (SSU) ribosomal RNA (rRNA) molecule into a mature SSU-rRNA molecule from the pre-rRNA molecule originally produced as a tricistronic rRNA transcript that contained the Small SubUnit (SSU) rRNA, the 5.8S rRNA, and the Large SubUnit (LSU) rRNA." [GOC:curators]
4 / 5	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of detection of, or exposure to, a hypotonic environment." [GOC:curators]
3 / 3	"Any process that modulates the frequency, rate or extent of any process in which a protein is transported to, or maintained in, a specific location." [GOC:dph, GOC:mah, GOC:tb]
3 / 3	"A process that forms a boundary that limits the spreading of heterochromatin along a chromosome." [GOC:mah]
3 / 3	"Any process that modulates the direction of cell growth." [GOC:mah, GOC:vw]
3 / 3	"Any process that modulates the frequency, rate or extent of protein localization to chromatin." [GO_REF:0000058, GOC:TermGenie, PMID:20889714]
1 / 22	"Any process involved in the conversion of a primary ribosomal RNA (rRNA) transcript into one or more mature rRNA molecules." [GOC:curators]

Cellular Compartment

4 / 4	"The directed movement of inorganic anions into, out of or within a cell, or between cells, by means of some agent such as a transporter or pore. Inorganic anions are atoms or small molecules with a negative charge." [GOC:curators, GOC:dos]
4 / 4	"An endocytic patch that consists of an actin-containing structure found at the plasma membrane in cells; formed of networks of branched actin filaments that lie just beneath the plasma membrane and assemble, and disassemble, to mediate the entry of macromolecules into the cell." [GOC:mah]
4 / 4	"The portion of the actin cytoskeleton, comprising filamentous actin and associated proteins, that lies just beneath the plasma membrane." [GOC:mah]
4 / 4	"A complex that localizes to actin cortical patches at sites of endocytosis and negatively regulates barbed end F-actin assembly, resulting in the generation of free actin pools. The Aim21-Tda2 complex is necessary for the formation of the endocytic patch." [GOC:mah]
4 / 5	"The end, or tip, of a fungal hypha, where polarized growth occurs during hyphal elongation." [GOC:mcc]
3 / 3	"A compact and highly condensed form of chromatin that is refractory to transcription." [PMID:32017156]
3 / 3	"A membrane coat found on a coated vesicle." [GOC:mah]
3 / 4	"The component of a plasma membrane consisting of gene products and protein complexes that are loosely bound to one of its surfaces, but not integrated into the hydrophobic region." [GOC:curators, GOC:dos]
3 / 4	"Any part of a cell where non-isotropic growth takes place." [GOC:mah]
3 / 4	"The region at the end of the longest axis of a cylindrical or elongated cell." [GOC:ai, GOC:mah]

Supplementary Data S3.2— Temporal GO Description of Volcano Analysis of Phosphoproteomic Data

Each one of the following pictures is an aggregation of outputs of a GO term enrichment analysis on the results of Volcano analysis at each specific point along the phosphoproteomic time course.

Supplementary Data S3.2.1

GO_Term	P_val	Counts	MolFunc_Description
GO:0003824		0 38 / 825	"Catalysis of a biochemical reaction at physiological temperatures. In biologically catalyzed reactions, the reactants are known as substrates, and the catalysts are naturally occurring macromolecular substance"
GO:0004843	0.006745564	3 / 9	"An thiol-dependent isopeptidase activity that cleaves ubiquitin from a target protein to which it is conjugated." [GOC:jh2, PMID:30783221]
GO:0061815	0.006745564	3 / 9	"Catalysis of the hydrolysis of ubiquitin units from Met1-linked (or linear) polyubiquitin chains." [GOC:dph, PMID:26503766, PMID:27702987]
GO:0101005	0.006745564	3 / 9	"An isopeptidase activity that cleaves ubiquitin from a target protein to which it is conjugated." [GOC:mec, PMID:30783221]
GO:0008234	0.00919957	3 / 10	"Catalysis of the hydrolysis of peptide bonds in a polypeptide chain by a mechanism in which the sulfhydryl group of a cysteine residue at the active center acts as a nucleophile." [GOC:mah, https://www.ebi.
GO:0046914	0.009330992	1 / 124	"Binding to a transition metal ions; a transition metal is an element whose atom has an incomplete d-subshell of extranuclear electrons, or which gives rise to a cation or cations with an incomplete d-subshell"
GO:0008270	0.013112867	1 / 117	"Binding to a zinc ion (Zn)." [GOC:ai]
GO:0003677	0.039001363	5 / 193	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GOC:dph, GOC:jl, GOC:tb, GOC:vw]
GO:0005515	0.047822674	4 / 32	"Binding to a protein." [GOC:go_curators]
GO:0000403	0.048484848	1 / 1	"Binding to a DNA segment shaped like a Y. This shape occurs when DNA contains a region of paired double-stranded DNA on one end and a region of unpaired DNA strands on the opposite end." [GOC:elh, PI
GO_Term	P_val	Counts	BioProc_Description
GO:0051056	0.00127099	4 / 11	"Any process that modulates the frequency, rate or extent of small GTPase mediated signal transduction." [GOC:go_curators]
GO:0032012	0.003326913	2 / 7	"Any process that modulates the frequency, rate or extent of ARF protein signal transduction." [GOC:mah]
GO:0048285	0.006915867	2 / 3	"The creation of two or more organelles by division of one organelle." [GOC:jid]
GO:0051052	0.006915867	2 / 3	"Any process that modulates the frequency, rate or extent of the chemical reactions and pathways involving DNA." [GOC:ai]
GO:0061389	0.006915867	2 / 3	"Any process that modulates the direction of cell growth." [GOC:mah, GOC:vw]
GO:0035023	0.009883499	3 / 10	"Any process that modulates the frequency, rate or extent of Rho protein signal transduction." [GOC:bf]
GO:0141124	0.012954317	3 / 11	"An intracellular signaling module that is part of larger signaling pathways that can be initiated either intracellularly or by cell surface receptors. Intracellular signaling cassettes are discrete signaling units that
GO:0007006	0.013173864	2 / 4	"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of a mitochondrial membrane, either of the lipid bilayer surrounding a mitoch
GO:0030382	0.013173864	2 / 4	"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of sperm mitochondria; the process in which they take on their characteristic
GO:0033108	0.013173864	2 / 4	"The aggregation, arrangement and bonding together of a set of components to form a mitochondrial respiratory chain complex." [GOC:mah]
GO_Term	P_val	Counts	CellComp_Description
GO:1901564	0.001587834	3 / 6	"The chemical reactions and pathways involving organonitrogen compound." [GOC:pr, GOC:TermGenie]
GO:0006213	0.002059832	2 / 7	"The chemical reactions and pathways involving any pyrimidine nucleoside, one of a family of organic molecules consisting of a pyrimidine base covalently bonded to ribose (a ribonucleoside) or deoxyribose (
GO:0009116	0.002059832	2 / 2	"The chemical reactions and pathways involving a nucleoside, a nucleobase linked to either beta-D-ribofuranose (a ribonucleoside) or 2-deoxy-beta-D-ribofuranose, (a deoxyribonucleoside), e.g. adenosine, gu
GO:0009119	0.002059832	2 / 2	"The chemical reactions and pathways involving any ribonucleoside, a nucleoside in which purine or pyrimidine base is linked to a ribose (beta-D-ribofuranose) molecule." [GOC:jl]
GO:0009120	0.002059832	2 / 2	"The chemical reactions and pathways involving any one of a family of organic molecules consisting of a purine or pyrimidine base covalently bonded to a sugar deoxyribose (a deoxyribonucleoside)." [GOC:jl]
GO:0009163	0.002059832	2 / 2	"The chemical reactions and pathways resulting in the formation of any one of a family of organic molecules consisting of a purine or pyrimidine base covalently bonded to a sugar ribose (a ribonucleoside) or
GO:0009164	0.002059832	2 / 2	"The chemical reactions and pathways resulting in the breakdown of any one of a family of organic molecules consisting of a purine or pyrimidine base covalently bonded to a sugar ribose (a ribonucleoside) o
GO:0042278	0.002059832	2 / 2	"The chemical reactions and pathways involving one of a family of organic molecules consisting of a purine base covalently bonded to a sugar ribose (a ribonucleoside) or deoxyribose (a deoxyribonucleoside).
GO:0070637	0.002059832	2 / 2	"The chemical reactions and pathways involving any pyridine nucleoside, a nucleoside in which a pyridine base covalently bonded to a sugar, usually ribose." [GOC:mah]
GO:1901072	0.002059832	2 / 2	"The chemical reactions and pathways resulting in the breakdown of glucosamine-containing compounds (glucosamines)." [GOC:TermGenie]

Supplementary Data S3.2.2

GO_Term	P_val	Counts	MolFunc_Description
GO:0005096	7.04624E-05	5 / 15	"Binds to and increases the activity of a GTPase, an enzyme that catalyzes the hydrolysis of GTP." [GOC:mah]
GO:0008047	0.000401464	5 / 21	"Binds to and increases the activity of an enzyme." [GOC:dph, GOC:mah, GOC:tb]
GO:0008429	0.00264363	4 / 19	"Binding to a phosphatidylethanolamine, a class of glycerophospholipids in which a phosphatidyl group is esterified to the hydroxyl group of ethanolamine." [ISBN:0198506732]
GO:0035727	0.00264363	4 / 19	"Binding to lysophosphatidic acid (LPA), a phospholipid derivative that acts as a potent mitogen due to its activation of high-affinity G protein-coupled receptors." [GOC:curators]
GO:0070300	0.00264363	4 / 19	"Binding to phosphatidic acid, any of a class of glycerol phosphate in which both the remaining hydroxyl groups of the glycerol moiety are esterified with fatty acids." [CHEBI:16337, GOC:jp, ISBN:0198506732]
GO:1901611	0.00264363	4 / 19	"Binding to phosphatidylglycerol." [GOC:kmv, GOC:TermGenie]
GO:1902387	0.00264363	4 / 19	"Binding to ceramide 1-phosphate." [GOC:TermGenie, PMID:23863933]
GO:0001786	0.00320614	4 / 20	"Binding to phosphatidylserine, a class of glycerophospholipids in which a phosphatidyl group is esterified to the hydroxyl group of L-serine." [ISBN:0198506732, PMID:12000961]
GO:0005544	0.00320614	4 / 20	"Binding to a phospholipid, a class of lipids containing phosphoric acid as a mono- or diester, in the presence of calcium." [GOC:jl]
GO:0031210	0.00320614	4 / 20	"Binding to a phosphatidylcholine, a glycerophospholipid in which a phosphatidyl group is esterified to the hydroxyl group of choline." [GOC:mah, ISBN:0198506732]
GO_Term	P_val	Counts	BioProc_Description
GO:0032012	0.001510595	3 / 7	"Any process that modulates the frequency, rate or extent of ARF protein signal transduction." [GOC:mah]
GO:0002764	0.00233321	3 / 8	"The cascade of processes by which a signal interacts with a receptor, causing a change in the level or activity of a second messenger or other downstream target, and ultimately leading to the activation, perp
GO:0007166	0.00233321	3 / 8	"The series of molecular signals initiated by activation of a receptor on the surface of a cell. The pathway begins with binding of an extracellular ligand to a cell surface receptor, or for receptors that signal in tl
GO:0007186	0.00233321	3 / 8	"The series of molecular signals initiated by a ligand binding to its receptor, in which the activated receptor promotes the exchange of GDP for GTP on the alpha-subunit of an associated heterotrimeric G-prot
GO:0007210	0.00233321	3 / 8	"The series of molecular signals generated as a consequence of a serotonin receptor binding to one of its physiological ligands." [GOC:mah]
GO:0007212	0.00233321	3 / 8	"The series of molecular signals generated as a consequence of a dopamine receptor binding to one of its physiological ligands." [GOC:mah, PMID:21711983]
GO:0007602	0.00233321	3 / 8	"The sequence of reactions within a cell required to convert absorbed photons into a molecular signal." [GOC:go_curators]
GO:0009755	0.00233321	3 / 8	"The series of molecular signals mediated by the detection of a hormone." [GOC:sm]
GO:0009756	0.00233321	3 / 8	"The series of molecular signals mediated by the detection of carbohydrate." [GOC:sm]
GO:0009863	0.00233321	3 / 8	"The series of molecular signals mediated by salicylic acid." [GOC:jy]
GO_Term	P_val	Counts	CellComp_Description
GO:0031981	0.006964485	1 / 148	"The volume enclosed by the nuclear inner membrane." [GOC:mah, GOC:pz]
GO:0140513	0.009829028	1 / 140	"A stable assembly of two or more macromolecules, i.e. proteins, nucleic acids, carbohydrates or lipids, in which at least one component is a protein and the constituent parts function together in the nucleus
GO:0043231	0.012147807	1 / 135	"Organized structure of distinctive morphology and function, bounded by a single or double lipid bilayer membrane and occurring within the cell. Includes the nucleus, mitochondria, plastids, vacuoles, and ve
GO:0000943	0.018398757	1 / 125	"A complex of the retrotransposon RNA genome, reverse transcriptase, integrase, and associated molecules required for reproduction and integration of the retrotransposon into the host genome; the main s
GO:0005634	0.018398757	1 / 125	"A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organellar chromosomes, ar
GO:0005880	0.018398757	1 / 125	"Any microtubule in the nucleus of a cell." [GOC:mah]
GO:0031039	0.018398757	1 / 125	"A membrane-bounded organelle of ciliated protozoan cells that contains polyploid copies of a portion of the cell's complete genome. Transcription of genes occurs in macronuclei. Some ciliate species may c
GO:0031040	0.018398757	1 / 125	"A membrane-bounded organelle of ciliated protozoan cells that contains a diploid copy of the cell's complete genome. Sections of contiguous sequence in the macronucleus are often interrupted by internal
GO:0042405	0.018398757	1 / 125	"An intranuclear focus at which aggregated proteins have been sequestered." [GOC:jl]
GO:0043073	0.018398757	1 / 125	"The nucleus of a germ cell, a reproductive cell in multicellular organisms." [CL:0000586, GOC:go_curators]

GO_Term	P_val	Counts	MolFunc_Description
GO:0003824		0 33 / 825	Catalysis of a biochemical reaction at physiological temperatures. In biologically catalyzed reactions, the reactants are known as substrates, and the catalysts are naturally occurring macromolecular substances.
GO:0005096	0.018350567	3 / 15	"Binds to and increases the activity of a GTPase, an enzyme that catalyzes the hydrolysis of GTP." [GOC:mah]
GO:0004043	0.041212121	1 / 1	"Binding to a DNA segment shaped like a Y. This shape occurs when DNA contains a region of paired double-stranded DNA on one end and a region of unpaired DNA strands on the opposite end." [GOC:clb, GOC:phd]
GO:0004045	0.041212121	1 / 1	"Binding to DNA segment that contains a bubble. A bubble occurs when DNA contains a region of unpaired, single-stranded DNA flanked on both sides by regions of paired, double-stranded DNA." [GOC:clb, GOC:phd]
GO:0009076	0.041212121	1 / 1	"Binding to a specific sequence of DNA that is part of a regulatory region that controls transcription of that section of the DNA. The transcribed region might be described as a gene, cistron, or operon." [GOC:clb, GOC:phd]
GO:0001016	0.041212121	1 / 1	"Binding to a DNA region that controls the transcription of a gene by RNA polymerase III. Binding may occur as a sequence specific interaction or as an interaction observed only once a factor has been recruited to the DNA." [GOC:clb, GOC:phd]
GO:0001018	0.041212121	1 / 1	"Binding to a DNA region that controls the transcription of the mitochondrial DNA." [GOC:txnhOH, GOC:cwv, PMID:20056105]
GO:0001019	0.041212121	1 / 1	"Binding to a DNA region that controls transcription by a plastid RNA polymerase. Binding may occur as a sequence specific interaction or as an interaction observed only once a factor has been recruited to the DNA." [GOC:clb, GOC:phd]
GO:0001046	0.041212121	1 / 1	"Binding to a sequence of DNA that is part of a core promoter region. The core promoter is composed of the transcription start site and binding sites for the RNA polymerase and the basal transcription machinery." [GOC:clb, GOC:phd]
GO:0001147	0.041212121	1 / 1	"Binding to a sequence of DNA that promotes termination by RNA polymerase. The transcribed region might be described as a gene, cistron, or operon." [GOC:txnhOH, PMID:18280161, PMID:18391175]

GO_Term	P_val	Counts	BioProc_Description
GO:0009987	0.0073844	3	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go]
GO:0042539	0.002082947	2 / 2	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of detection of, or exposure to, a decrease in the concentration of a specific substance." [GOC:go]
GO:0046907	0.002588526	5 / 23	"The directed movement of substances within a cell." [GOC:ai]
GO:1903468	0.005974248	2 / 3	"Any process that activates or increases the frequency, rate or extent of DNA replication initiation involved in mitotic DNA replication." [GO_REF:0000058, GOC:mtg_cell_cycle, GOC:TermGenie, PMID:1234]
GO:0061951	0.011422818	2 / 4	"The directed movement of a protein to a specific location in a plasma membrane." [GOC:dph, GOC:wc]
GO:0006888	0.013556648	3 / 12	"The directed movement of substances from the endoplasmic reticulum (ER) to the Golgi, mediated by COPII vesicles. Small COPII coated vesicles form from the ER and then fuse directly with the cis-Golgi." [GOC:go]
GO:0000076	0.018199451	2 / 5	"A signal transduction process that contributes to a DNA replication checkpoint, that prevents the initiation of nuclear division until DNA replication is complete, thereby ensuring that progeny inherit a full complement of chromosomes." [GOC:go]
GO:0006890	0.018199451	2 / 5	"The directed movement of substances from the Golgi back to the endoplasmic reticulum, mediated by vesicles bearing specific protein coats such as COPI or COG." [ISBN:0716731363, PMID:10516024]
GO:0006971	0.018199451	2 / 5	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of detection of, or exposure to, a hypotonic environment." [GOC:go]
GO:0033134	0.018199451	2 / 5	"A signal transduction process that contributes to a mitotic DNA replication checkpoint." [GOC:mtg_cell_cycle]

GO_Term	P_val	Counts	CellComp_Description
GO:0009067	0.005662065	2 / 3	"The chemical reactions and pathways resulting in the formation of amino acids of the aspartate family, comprising asparagine, aspartate, lysine, methionine and threonine." [GOC:ai]
GO:0008150	0.044691114	3 / 154	"A biological process is the execution of a genetically-encoded biological module or program. It consists of all the steps required to achieve the specific biological objective of the module. A biological process is a series of events that are ordered in time and space, and that are the result of the interaction of many different components." [GOC:go]
GO:0008152	0.044691114	3 / 154	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include the transformation of macromolecules." [GOC:go]
GO:0001100	0.044878049	1 / 1	"Any process involved in the inhibition of progression from anaphase/telophase (high mitotic Cdk activity) to G1 (low mitotic Cdk activity)." [GOC:rm]
GO:0006044	0.044878049	1 / 1	"The chemical reactions and pathways involving N-acetylglucosamine. The D isomer is a common structural unit of glycoproteins in plants, bacteria and animals; it is often the terminal sugar of an oligosaccharide." [GOC:go]
GO:0006046	0.044878049	1 / 1	"The chemical reactions and pathways resulting in the breakdown of N-acetylglucosamine. The D isomer is a common structural unit of glycoproteins in plants, bacteria and animals; it is often the terminal sugar of an oligosaccharide." [GOC:go]
GO:0006052	0.044878049	1 / 1	"The chemical reactions and pathways involving asparagine, 2-amino-3-carbamoylpropanoic acid." [GOC:go, curators]
GO:0006529	0.044878049	1 / 1	"The chemical reactions and pathways resulting in the formation of asparagine, 2-amino-3-carbamoylpropanoic acid." [GOC:go, curators]
GO:0006053	0.044878049	1 / 1	"The chemical reactions and pathways involving lysine, 2,6-diaminohexanoic acid." [GOC:go, curators]
GO:0009099	0.044878049	1 / 1	"The chemical reactions and pathways resulting in the formation of valine, 2-amino-3-methylbutanoic acid." [GOC:ai]

GO_Term	P_val	Counts	MolFunc_Description
GO:0003824		0 36 / 825	Catalysis of a biochemical reaction at physiological temperatures. In biologically catalyzed reactions, the reactants are known as substrates, and the catalysts are naturally occurring macromolecular substances.
GO:0016779		0.005933355 2 / 3	"Catalysis of the transfer of a nucleotide/ group to a reactant." [ISBN:198506732]
GO:0003674		0.015132917 34 / 802	"A molecular process that can be carried out by the action of a single macromolecular machine, usually via direct physical interactions with other molecular entities. Function in this sense denotes an action, or a process, that is catalyzed by a single macromolecular machine." [ISBN:198506732]
GO:0005096		0.024332542 3 / 15	"Binds to and increases the activity of a GTPase, an enzyme that catalyzes the hydrolysis of GTP." [GOC:mac]
GO:0016301		0.025932821 2 / 6	"Catalysis of the transfer of a phosphate group, usually from ATP, to a substrate molecule." [ISBN:198506732]
GO:0005198		0.034543442 34 / 795	"The action of a molecule that contributes to the structural integrity of a complex." [GOC:mac, GOC:gw]
GO:0016772		0.034710083 2 / 7	"Catalysis of the transfer of a phosphorus-containing group from one compound (donor) to another (acceptor)." [GOC:glj, ISBN:198506732]
GO:0016772		0.034710083 2 / 7	"Catalysis of the transfer of a phosphorus-containing group from one compound (donor) to an alcohol group (acceptor)." [GOC:glj]
GO:00040673		0.040606066 1 / 1	"Catalysis of the reaction: ATP + protein L-histidine = ADP + protein phospho-L-histidine." [EC:2.7.13.3, GOC:mac]
GO:0004712		0.040606066 1 / 1	"Catalysis of the reactions: ATP + a protein serine = ADP + protein serine phosphate; ATP + a protein threonine = ADP + protein threonine phosphate; and ATP + a protein tyrosine = ADP + protein tyrosine phosphate." [EC:2.7.13.3, GOC:mac]

GO_Term	P_val	Counts	BioProc_Description
GO:0071396	0.005421648	3 / 8	"Any process that results in a change in state or activity of a cell (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a lipid stimulus." [GOC:mah]
GO:0001403	0.007244183	2 / 3	"A growth pattern exhibited by budding haploid cells under certain growth conditions, in which cells retain the typical axial budding pattern of haploids, but become elongated and fail to separate after division." [GOC:mah]
GO:0036267	0.007244183	2 / 3	"The growth of colonies in filamentous chains of cells into a substrate." [GOC:di, PMID:22276126]
GO:0042144	0.007244183	2 / 3	"The fusion of two vacuole membranes to form a single vacuole." [GOC:jr]
GO:0008104	0.007743358	3 / 9	"Any process in which a protein is transported to, or maintained in, a specific location." [GOC:ai]
GO:0000282	0.013782036	2 / 4	"The specification of the site where a daughter cell will form, in organisms that reproduce by budding. An example of this process is found in <i>Saccharomyces cerevisiae</i> ." [GOC:mah]
GO:0000378	0.013782036	2 / 4	"The RNA metabolic process that joins two exons, each of which has free ends that were generated by endonucleolytic cleavages, by a ligation reaction." [GOC:krc, ISBN:0879695897]
GO:0000959	0.013782036	2 / 4	"The chemical reactions and pathways involving RNA transcribed from the mitochondrial genome and occurring in the mitochondrion." [GOC:krc, GOC:mah]
GO:0010501	0.013782036	2 / 4	"The process in which a secondary structure of RNA are broken or 'melted'." [PMID:17169986]
GO:0034660	0.013782036	2 / 4	"The chemical reactions and pathways involving non-coding RNA transcripts (ncRNAs)." [GOC:mah]

GO_Term	P_val	Counts	CellComp_Description
GO:0031396	0.001672108	1 / 148	"The volume enclosed by the nuclear inner membrane." [GOC:mah, GOC:pz]
GO:0140513	0.00297959	1 / 148	"A stable assembly of two or more macromolecules, i.e. proteins, nucleic acids, carbohydrates or lipids, in which at least one component is a protein and the constituent parts function together in the nucleus." [GOC:mah]
GO:0043231	0.00340729	1 / 135	"Organized structure of distinctive morphology and function, bounded by a single or double lipid bilayer membrane and occurring within the cell. Includes the nucleus, mitochondria, plastids, vacuoles, and vesicles." [GOC:mah]
GO:0000943	0.00580691	1 / 125	"A complex of the retrotransposon RNA genome, reverse transcriptase, integrase, and associated molecules required for reproduction and integration of the retrotransposon into the host genome; the main source of new retrotransposon insertions." [GOC:mah]
GO:0005654	0.00580691	1 / 125	"A membrane-bounded organelle of eukaryotic cells in which chromosomes are housed and replicated. In most cells, the nucleus contains all of the cell's chromosomes except the organelle chromosomes, and is the site of DNA replication and transcription." [GOC:mah]
GO:0050691	0.00580691	1 / 125	"Any microtubule in the nucleus of a cell." [GOC:mah]
GO:0031039	0.00580691	1 / 125	"A membrane-bounded organelle of ciliated protozoan cells that contains polyploid copies of a portion of the cell's complete genome. Transcription of genes occurs in macronuclei. Some ciliate species may contain multiple macronuclei." [GOC:mah]
GO:0031040	0.00580691	1 / 125	"A membrane-bounded organelle of ciliated protozoan cells that contains a diploid copy of the cell's complete genome. Sections of contiguous sequence in the macronucleus are often interrupted by internal deletions." [GOC:mah]
GO:0042405	0.00580691	1 / 125	"An intranuclear focus at which aggregated proteins have been sequestered." [GOC:jr]
GO:0043073	0.00580691	1 / 125	"The nucleus of a euk. cell. A reproductive cell in multicellular organisms." [CI:0000586, GOC:ao, curator]

Supplementary Data S3.2.5

GO_Term	P_val	Counts	MolFunc_Description
GO:0003935	0.036363636 1 / 1		"Catalysis of the reaction: GTP + 4 H ₂ O = 2,5-diamino-6-hydroxy-4-[5-phosphoribosylamino]-pyrimidine + formate + 3 H ⁺ + 2 phosphate." [EC:3.5.4.25, RHEA:23704]
GO:0004072	0.036363636 1 / 1		"Catalysis of the reaction: L-aspartate + ATP = 4-phospho-L-aspartate + ADP + H ⁺ ." [EC:2.7.2.4, RHEA:23776]
GO:0019202	0.036363636 1 / 1		"Catalysis of the transfer of a phosphate group, usually from ATP, to an amino acid substrate." [GOC:j]l
GO:1990380	0.036363636 1 / 1		"Hydrolysis of a ubiquitin unit from a ubiquitinated protein linked via the Lys48 residue of ubiquitin." [GOC:bf, GOC:PARL, PMID:22970133]
GO:0003912	0.070167696 1 / 2		"Catalysis of the reaction: deoxynucleoside triphosphate + DNA(n) = diphosphate + DNA(n+1)." [EC:2.7.7.31]
GO:0003933	0.070167696 1 / 2		"Catalysis of the hydrolysis of the imidazole ring of GTP, releasing formate. Two C-N bonds are hydrolyzed and the pentase unit is isomerized." [GOC:curators]
GO:0004103	0.070167696 1 / 2		"Catalysis of the reaction: ATP + choline = ADP + choline phosphate + 2 H ⁺ ." [EC:2.7.1.32, RHEA:12837]
GO:0004305	0.070167696 1 / 2		"Catalysis of the reaction: ATP + ethanolamine = ADP + 2 H ⁺ + phosphoethanolamine." [EC:2.7.1.82, RHEA:13069]
GO:0004654	0.070167696 1 / 2		"Catalysis of the reaction: RNA(n+1) + phosphate = RNA(n) + a nucleoside diphosphate." [EC:2.7.7.8]
GO:0008195	0.070167696 1 / 2		"Catalysis of the reaction: a 1,2-diacylglycerol 3-phosphate + H ₂ O = a 1,2-diacyl-sn-glycerol + phosphate." [GOC:pr, PMID:25814022, RHEA:27429]
GO_Term	P_val	Counts	BioProc_Description
GO:0015031	0.001710648 4 / 14		"The directed movement of proteins into, out of or within a cell, or between cells, by means of some agent such as a transporter or pore." [GOC:al]
GO:0006890	0.014832795 2 / 5		"The directed movement of substances from the Golgi back to the endoplasmic reticulum, mediated by vesicles bearing specific protein coats such as COPI or COG." [ISBN:0716731363, PMID:16510524]
GO:0048206	0.014832795 2 / 5		"The process in which vesicles are directed to specific destination membranes during transport from the cis-Golgi to the rough ER." [GOC:j]d, GOC:mah, ISBN:0716731363, PMID:10219233]
GO:1990669	0.014832795 2 / 5		"The joining of the lipid bilayer membrane around an ERGIC-derived vesicle to the lipid bilayer membrane of the ER. Such vesicles include COPI-coated transport vesicles involved in retrograde transport." [GOC:j]d, GOC:mah, ISBN:0716731363, PMID:10219233]
GO:1990688	0.014832795 2 / 5		"The joining of the lipid bilayer membrane around a Golgi vesicle to the lipid bilayer membrane of the ERGIC. Such vesicles include COPI-coated transport vesicles involved in retrograde transport." [GOC:j]d, GOC:mah, ISBN:0716731363, PMID:10219233]
GO:0070086	0.015531911 3 / 14		"Endocytosis of a protein that requires the substrate to be modified by ubiquitination. Several plasma membrane proteins, including cell surface permeases and some receptors, are targeted for internalization
GO:0043328	0.022087172 3 / 16		"The process of directing proteins towards the vacuole that contributes to protein catabolism via the multivesicular body (MVB) pathway." [GOC:j]l, PMID:11511343]
GO:0043001	0.028745325 2 / 7		"The directed movement of proteins from the Golgi to the plasma membrane in transport vesicles that move from the trans-Golgi network to the plasma membrane." [ISBN:0716731363]
GO:0046474	0.028745325 2 / 7		"The chemical reactions and pathways resulting in the formation of glycerophospholipids, any derivative of glycerophosphate that contains at least one O-acyl, O-alkyl, or O-alkenyl group attached to the glycer
GO:0006611	0.036815996 2 / 8		"The directed movement of a protein from the nucleus into the cytoplasm." [GOC:j]l
GO_Term	P_val	Counts	CellComp_Description
GO:0009987	0.011478007 1 / 153		"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_cu
GO:0040007	0.011921926 2 / 152		"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
GO:0030120	0.012640969 2 / 5		"A membrane coat found on a coated vesicle." [GOC:mah]
GO:0022414	0.014939954 1 / 146		"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or par
GO:0044419	0.015507258 1 / 145		"Any process evolved to enable an interaction with an organism of a different species." [GOC:c]
GO:0050896	0.015507258 1 / 145		"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus. The process begins with de
GO:0098754	0.015507258 1 / 145		"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequ
GO:0000003	0.016094512 1 / 144		"The production of new individuals that contain some portion of genetic material inherited from one or more parent organisms." [GOC:go_curators, GOC:isa_complete, GOC:j]l, ISBN:0198506732]
GO:0002376	0.016094512 1 / 144		"Any process involved in the development or functioning of the immune system, an organismal system for calibrated responses to potential internal or invasive threats." [GO_REF:0000022, GOC:add]
GO:0016032	0.016094512 1 / 144		"A multi-organism process in which a virus is a participant. The other participant is the host. Includes infection of a host cell, replication of the viral genome, and assembly of progeny virus particles. In some cas

Supplementary Data S3.2.7

GO_Term	P_val	Counts	MolFunc_Description
GO:0003824	0.24 / 825		"Catalysis of a biochemical reaction at physiological temperatures. In biologically catalyzed reactions, the reactants are known as substrates, and the catalysts are naturally occurring macromolecular substance
GO:0008429	0.002004887 4 / 19		"Binding to a phosphatidylethanolamine, a class of glycerophospholipids in which a phosphatidyl group is esterified to the hydroxyl group of ethanolamine." [ISBN:0198506732]
GO:0035727	0.002004887 4 / 19		"Binding to lysophosphatidic acid (LPA), a phospholipid derivative that acts as a potent mitogen due to its activation of high-affinity G protein-coupled receptors." [GOC:curators]
GO:0070300	0.002004887 4 / 19		"Binding to phosphatidic acid, any of a class of glycerol phosphate in which both the remaining hydroxyl groups of the glycerol moiety are esterified with fatty acids." [CHEBI:16337, GOC:jp, ISBN:0198506732]
GO:1901611	0.002004887 4 / 19		"Binding to phosphatidylglycerol." [GOC:kmv, GOC:TermGenie]
GO:1902387	0.002004887 4 / 19		"Binding to ceramide 1-phosphate." [GOC:TermGenie, PMID:23863933]
GO:0001786	0.002437704 4 / 20		"Binding to phosphatidylserine, a class of glycerophospholipids in which a phosphatidyl group is esterified to the hydroxyl group of L-serine." [ISBN:0198506732, PMID:12000961]
GO:0005544	0.002437704 4 / 20		"Binding to a phospholipid, a class of lipids containing phosphoric acid as a mono- or diester, in the presence of calcium." [GOC:j]l
GO:0031210	0.002437704 4 / 20		"Binding to a phosphatidylcholine, a glycerophospholipid in which a phosphatidyl group is esterified to the hydroxyl group of choline." [GOC:mah, ISBN:0198506732]
GO:0008289	0.002928985 4 / 21		"Binding to a lipid." [GOC:al]
GO_Term	P_val	Counts	BioProc_Description
GO:0009987	0.29 / 844		"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_cu
GO:0061389	0.00354636 2 / 3		"Any process that modulates the direction of cell growth." [GOC:mah, GOC:vw]
GO:0030950	0.003879839 3 / 10		"Any cellular process that results in the specification, formation or maintenance of polarized actin-based cytoskeletal structures." [GOC:mah]
GO:0046907	0.006318908 4 / 23		"The directed movement of substances within a cell." [GOC:al]
GO:0030866	0.006659669 3 / 12		"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of actin-based cytoskeletal structures in the cell cortex, i.e. just beneath the pl
GO:0098657	0.006659669 3 / 12		"The directed movement of some substance from outside of a cell into a cell. This may occur via transport across the plasma membrane or via endocytosis." [GOC:dos]
GO:0003378	0.006856577 2 / 4		"The RNA metabolic process that joins two exons, each of which has free ends that were generated by endonucleolytic cleavages, by a ligation reaction." [GOC:krc, ISBN:0879695897]
GO:0000959	0.006856577 2 / 4		"The chemical reactions and pathways involving RNA transcribed from the mitochondrial genome and occurring in the mitochondrion." [GOC:krc, GOC:mah]
GO:0010501	0.006856577 2 / 4		"The process in which a secondary structure of RNA are broken or 'melted'." [PMID:17169986]
GO:0030994	0.006856577 2 / 4		"Dissolution of the primary septum during cell separation." [PMID:12665550]
GO_Term	P_val	Counts	CellComp_Description
GO:0000012	0.009512598 2 / 4		"The repair of single strand breaks in DNA. Repair of such breaks is mediated by the same enzyme systems as are used in base excision repair." [PMID:18626472]
GO:0000725	0.009512598 2 / 4		"A DNA repair process that involves the exchange, reciprocal or nonreciprocal, of genetic material between the broken DNA molecule and a homologous DNA region." [GOC:elh]
GO:0006284	0.009512598 2 / 4		"In base excision repair, an altered base is removed by a DNA glycosylase enzyme, followed by excision of the resulting sugar phosphate. The small gap left in the DNA helix is filled in by the sequential action c
GO:0006289	0.009512598 2 / 4		"A DNA repair process in which a small region of the strand surrounding the damage is removed from the DNA helix as an oligonucleotide. The small gap left in the DNA helix is filled in by the sequential action
GO:0006290	0.009512598 2 / 4		"The repair of UV-induced T-T, C-T and C-C dimers." [ISBN:0815316194]
GO:0006298	0.009512598 2 / 4		"A system for the correction of errors in which an incorrect base, which cannot form hydrogen bonds with the corresponding base in the parent strand, is incorporated into the daughter strand. The mismatch
GO:0006307	0.009512598 2 / 4		"The repair of alkylation damage, e.g. the removal of the alkyl group at the O6-position of guanine by O6-alkylguanine-DNA alkyltransferase (AGT)." [PMID:10946226]
GO:0010213	0.009512598 2 / 4		"A DNA repair process that is involved in repairing UV-induced DNA damage under non-photoreactivating conditions. The mechanism by which this repair process operates has not yet been completely elucid
GO:0036297	0.009512598 2 / 4		"Removal of a DNA interstrand crosslink (a covalent attachment of DNA bases on opposite strands of the DNA) and restoration of the DNA. DNA interstrand crosslinks occur when both strands of duplex DNA i
GO:0043504	0.009512598 2 / 4		"The process of restoring mitochondrial DNA after damage." [PMID:12565799, PMID:15189144, PMID:16050976]

Supplementary Data S3.2.8

GO_Term	P_val	Counts	MolFunc_Description
GO:0005096	0.013232923	3 / 15	"Binds to and increases the activity of a GTPase, an enzyme that catalyzes the hydrolysis of GTP." [GOC:mah]
GO:0016301	0.016710394	2 / 6	"Catalysis of the transfer of a phosphate group, usually from ATP, to a substrate molecule." [ISBN:0198506732]
GO:0016772	0.022594738	2 / 7	"Catalysis of the transfer of a phosphorus-containing group from one compound (donor) to another (acceptor)." [GOC:jl, ISBN:0198506732]
GO:0016773	0.022594738	2 / 7	"Catalysis of the transfer of a phosphorus-containing group from one compound (donor) to an alcohol group (acceptor)." [GOC:jl]
GO:0008047	0.021541176	3 / 21	"Binds to and increases the activity of an enzyme." [GOC:dph, GOC:mah, GOC:tb]
GO:0004673	0.036363636	1 / 1	"Catalysis of the reaction: ATP + protein L-histidine = ADP + protein phospho-L-histidine." [EC:2.7.13.3, GOC:mah]
GO:0004712	0.036363636	1 / 1	"Catalysis of the reactions: ATP + a protein serine = ADP + protein serine phosphate; ATP + a protein threonine = ADP + protein threonine phosphate; and ATP + a protein tyrosine = ADP + protein tyrosine phosphate." [GOC:mah]
GO:0004713	0.036363636	1 / 1	"Catalysis of the reaction: ATP + a protein tyrosine = ADP + protein tyrosine phosphate." [RHEA:10596]
GO:0004740	0.036363636	1 / 1	"Catalysis of the reaction: ATP + pyruvate dehydrogenase (acetyl-transferring) = ADP + pyruvate dehydrogenase (acetyl-transferring) phosphate." [EC:2.7.11.2]
GO:0008413	0.036363636	1 / 1	"Catalysis of the reaction: 8-oxo-7,8-dihydroguanosine triphosphate (8-oxo-GTP) + H2O = 8-oxo-7,8-dihydroguanosine diphosphate (8-oxo-GDP) + phosphate. 8-oxo-7,8-dihydroguanosine triphosphate (8-oxo-GTP) is the
GO_Term	P_val	Counts	BioProc_Description
GO:0071396	0.00233321	3 / 8	"Any process that results in a change in state or activity of a cell (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a lipid stimulus." [GOC:mah]
GO:0006606	0.004658681	3 / 10	"The directed movement of a protein from the cytoplasm to the nucleus." [GOC:jl]
GO:0000378	0.007779679	2 / 4	"The RNA metabolic process that joins two exons, each of which has free ends that were generated by endonucleolytic cleavages, by a ligation reaction." [GOC:krc, ISBN:0879695897]
GO:000959	0.007779679	2 / 4	"The chemical reactions and pathways involving RNA transcribed from the mitochondrial genome and occurring in the mitochondrion." [GOC:krc, GOC:mah]
GO:0010501	0.007779679	2 / 4	"The process in which a secondary structure of RNA are broken or 'melted'." [PMID:17169986]
GO:0034660	0.007779679	2 / 4	"The chemical reactions and pathways involving non-coding RNA transcripts (ncRNAs)." [GOC:mah]
GO:0039703	0.007779679	2 / 4	"The cellular metabolic process in which a cell duplicates one or more molecules of RNA." [GOC:bf, GOC:jl]
GO:0042245	0.007779679	2 / 4	"Any process that results in the repair of damaged RNA." [PMID:11000254, PMID:11070075, UniProtKB-KW:KW-0692]
GO:0110154	0.007779679	2 / 4	"Cleavage of the 5'-cap of an RNA." [GOC:sp, PMID:25533955, PMID:31101919]
GO:0006041	0.024411214	2 / 7	"The chemical reactions and pathways resulting in the breakdown of RNA, ribonucleic acid, one of the two main type of nucleic acid, consisting of a long, unbranched macromolecule formed from ribonucleotides joined
GO_Term	P_val	Counts	CellComp_Description
GO:0008150	0.002549714	1 / 154	"A biological process is the execution of a genetically-encoded biological module or program. It consists of all the steps required to achieve the specific biological objective of the module. A biological process is accomplish
GO:0008152	0.002549714	1 / 154	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromol
GO:0009987	0.00268072	1 / 153	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators, G
GO:0022414	0.003795161	1 / 146	"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or parents." [GOC
GO:0044419	0.003986618	1 / 145	"Any process evolved to enable an interaction with an organism of a different species." [GOC:cc]
GO:0050896	0.003986618	1 / 145	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus. The process begins with detection of
GO:0098754	0.003986618	1 / 145	"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration c
GO:0000003	0.004187261	1 / 144	"The production of new individuals that contain some portion of genetic material inherited from one or more parent organisms." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
GO:0002376	0.004187261	1 / 144	"Any process involved in the development or functioning of the immune system, an organismal system for calibrated responses to potential internal or invasive threats." [GO_REF:00000022, GOC:adp]
GO:0016032	0.004187261	1 / 144	"A multi-organism process in which a virus is a participant. The other participant is the host. Includes infection of a host cell, replication of the viral genome, and assembly of progeny virus particles. In some cases the vir

Supplementary Data S3.2.9

GO_Term	P_val	Counts	MolFunc_Description
GO:0008429	0.002309378	4 / 19	"Binding to a phosphatidylethanolamine, a class of glycerophospholipids in which a phosphatidyl group is esterified to the hydroxyl group of ethanolamine." [ISBN:0198506732]
GO:0035727	0.002309378	4 / 19	"Binding to lysophosphatidic acid (LPA), a phospholipid derivative that acts as a potent mitogen due to its activation of high-affinity G protein-coupled receptors." [GOC:curators]
GO:0070300	0.002309378	4 / 19	"Binding to phosphatidic acid, any of a class of glycerol phosphate in which both the remaining hydroxyl groups of the glycerol moiety are esterified with fatty acids." [CHEBI:16337, GOC:jp, ISBN:0198506732]
GO:1901611	0.002309378	4 / 19	"Binding to phosphatidylglycerol." [GOC:kmv, GOC:TermGenie]
GO:1902387	0.002309378	4 / 19	"Binding to ceramide 1-phosphate." [GOC:TermGenie, PMID:23863933]
GO:0001786	0.002804347	4 / 20	"Binding to phosphatidylserine, a class of glycerophospholipids in which a phosphatidyl group is esterified to the hydroxyl group of L-serine." [ISBN:0198506732, PMID:12000961]
GO:0005544	0.002804347	4 / 20	"Binding to a phospholipid, a class of lipids containing phosphoric acid as a mono- or diester, in the presence of calcium." [GOC:jl]
GO:0031210	0.002804347	4 / 20	"Binding to a phosphatidylcholine, a glycerophospholipid in which a phosphatidyl group is esterified to the hydroxyl group of choline." [GOC:mah, ISBN:0198506732]
GO:0008289	0.003365217	4 / 21	"Binding to a lipid." [GOC:ai]
GO:0005091	0.003995381	4 / 22	"Binding to an inositol-containing glycerophospholipid, i.e. phosphatidylinositol (PtdIns) and its phosphorylated derivatives." [GOC:bf, ISBN:0198506732, PMID:11395417]
GO_Term	P_val	Counts	BioProc_Description
GO:0030026	0.001141264	2 / 2	"A homeostatic process involved in the maintenance of a steady state level of manganese ions within a cell." [GOC:mah]
GO:0055071	0.001141264	2 / 2	"Any process involved in the maintenance of an internal steady state of manganese ions within an organism or cell." [GOC:jid, GOC:mah]
GO:1990659	0.001141264	2 / 2	"The process of binding or confining manganese ions such that they are separated from other components of a biological system." [GOC:bhm, PMID:25417112]
GO:0030003	0.002544711	3 / 9	"A homeostatic process involved in the maintenance of a steady state level of monatomic cations within a cell. Monatomic cations (also called simple cations) are cations consisting of exactly one atom." [GOC
GO:0061389	0.003314002	2 / 3	"Any process that modulates the direction of cell growth." [GOC:mah, GOC:vw]
GO:1903468	0.003314002	2 / 3	"Any process that activates or increases the frequency, rate or extent of DNA replication initiation involved in mitotic DNA replication." [GO_REF:00000058, GOC:mtg_cell_cycle, GOC:TermGenie, PMID:1234]
GO:0001402	0.003498038	5 / 33	"Relaying of environmental signals promoting filamentous growth." [GOC:mcc, PMID:9728395]
GO:0007015	0.006060629	3 / 12	"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of cytoskeletal structures comprising actin filaments. Includes processes that co
GO:0098662	0.006415215	2 / 4	"A process in which an inorganic cation is transported from one side of a membrane to the other by means of some agent such as a transporter or pore." [GOC:mah]
GO:0030036	0.00941029	3 / 14	"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of cytoskeletal structures comprising actin filaments and their associated protei
GO_Term	P_val	Counts	CellComp_Description
GO:0000041	0.03804878	1 / 1	"The directed movement of transition metal ions into, out of or within a cell, or between cells, by means of some agent such as a transporter or pore. A transition metal is an element whose atom has an incom
GO:0001100	0.03804878	1 / 1	"Any process involved in the inhibition of progression from anaphase/telophase (high mitotic CDK activity) to G1 (low mitotic CDK activity)." [GOC:rn]
GO:0005934	0.03804878	1 / 1	"The end of a cellular bud distal to the site of attachment to the mother cell." [GOC:mah]
GO:0005935	0.03804878	1 / 1	"The constriction between the mother cell and daughter cell (bud) in an organism that reproduces by budding." [GOC:mah]
GO:0006337	0.03804878	1 / 1	"The controlled breakdown of nucleosomes, the beadlike structural units of eukaryotic chromatin composed of histones and DNA." [GOC:mah]
GO:0006825	0.03804878	1 / 1	"The directed movement of copper (Cu) ions into, out of or within a cell, or between cells, by means of some agent such as a transporter or pore." [GOC:ai]
GO:0010876	0.03804878	1 / 1	"Any process in which a lipid is transported to, or maintained in, a specific location." [GOC:BHF, GOC:dph, GOC:tb]
GO:0010877	0.03804878	1 / 1	"The directed movement of lipids into cells that is part of their accumulation and maintenance." [GOC:BHF, GOC:dph, GOC:tb]
GO:0010878	0.03804878	1 / 1	"The accumulation and maintenance in cells or tissues of cholesterol, cholest-5-en-3 beta-ol, the principal sterol of vertebrates and the precursor of many steroids, including bile acids and steroid hormones." [I

Supplementary Data S3.2.10

GO_Term	P_val	Counts	MolFunc_Description
GO:0003824		0 44 / 825	"Catalysis of a biochemical reaction at physiological temperatures. In biologically catalyzed reactions, the reactants are known as substrates, and the catalysts are naturally occurring macromolecular substances." [EC:6.1.1.12]
GO:0004815	0.025817397 2 / 5		"Catalysis of the reaction: ATP + L-aspartate + tRNA(Asp) = AMP + diphosphate + L-aspartyl-tRNA(Asp)." [EC:6.1.1.23, MetaCyc:6.1.1.23-RXN]
GO:0005060	0.025817397 2 / 5		"Catalysis of the reaction: tRNA(Asx) + L-aspartate + ATP = aspartyl-tRNA(Asx) + diphosphate + AMP." [EC:6.1.1.23, MetaCyc:6.1.1.23-RXN]
GO:0003674	0.02748941 42 / 802		"A molecular process that can be carried out by the action of a single macromolecular machine, usually via direct physical interactions with other molecular entities. Function in this sense denotes an action, or a process, that is carried out by a single macromolecular machine, usually via direct physical interactions with other molecular entities. Function in this sense denotes an action, or a process, that is carried out by a single macromolecular machine, usually via direct physical interactions with other molecular entities." [GOC:mah]
GO:0005096	0.038698813 3 / 15		"Binds to and increases the activity of a GTPase, an enzyme that catalyzes the hydrolysis of GTP." [GOC:mah]
GO:0004812	0.048550914 2 / 7		"Catalysis of the formation of aminoacyl-tRNA from ATP, amino acid, and tRNA with the release of diphosphate and AMP." [ISBN:0198506732]
GO:0000976	0.055757576 1 / 1		"Binding to a specific sequence of DNA that is part of a regulatory region that controls transcription of that section of the DNA. The transcribed region might be described as a gene, cistron, or operon." [GOC:clt]
GO:0001016	0.055757576 1 / 1		"Binding to a DNA region that controls the transcription of a gene by RNA polymerase III. Binding may occur as a sequence specific interaction or as an interaction observed only once a factor has been recruited to the DNA." [GOC:clt]
GO:0001018	0.055757576 1 / 1		"Binding to a DNA region that controls the transcription of the mitochondrial DNA." [GOC:txnh, GOC:vw, PMID:20056105]
GO:0001019	0.055757576 1 / 1		"Binding to a DNA region that controls transcription by a plastid RNA polymerase. Binding may occur as a sequence specific interaction or as an interaction observed only once a factor has been recruited to the DNA." [GOC:clt]
GO_Term	P_val	Counts	BioProc_Description
GO:0009987		0 43 / 844	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go]
GO:0000281	0.002659201 2 / 2		"A cell cycle process that results in the division of the cytoplasm of a cell after mitosis, resulting in the separation of the original cell into two daughter cells." [GOC:mtg_cell_cycle]
GO:0071396	0.005782034 3 / 8		"Any process that results in a change in state or activity of a cell (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a lipid stimulus." [GOC:mah]
GO:0000378	0.014402273 2 / 4		"The RNA metabolic process that joins two exons, each of which has free ends that were generated by endonucleolytic cleavages, by a ligation reaction." [GOC:krc, ISBN:0879695897]
GO:0000425	0.014402273 2 / 4		"The selective autophagy process in which a peroxisome is degraded by macroautophagy." [GOC:autophagy, PMID:12914914, PMID:16973210]
GO:0000959	0.014402273 2 / 4		"The chemical reactions and pathways involving RNA transcribed from the mitochondrial genome and occurring in the mitochondrion." [GOC:krc, GOC:mah]
GO:0007006	0.014402273 2 / 4		"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of a mitochondrial membrane, either of the lipid bilayer surrounding a mitochondrion or of the inner membrane." [GOC:clt]
GO:0010501	0.014402273 2 / 4		"The process in which a secondary structure of RNA are broken or 'melted'." [PMID:17169986]
GO:0016236	0.014402273 2 / 4		"The autophagic process that proceeds via the formation of an autophagosome." [PMID:24366339]
GO:0003082	0.014402273 2 / 4		"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of sperm mitochondria; the process in which they take on their characteristic structure." [GOC:clt]
GO_Term	P_val	Counts	CellComp_Description
GO:0006554	0.003041159 2 / 2		"The chemical reactions and pathways resulting in the breakdown of lysine, 2,6-diaminohexanoic acid." [GOC:go_curators]
GO:0046440	0.003041159 2 / 2		"The chemical reactions and pathways involving L-lysine, the L-enantiomer of (S)-2,6-diaminohexanoic acid, i.e. (2S)-2,6-diaminohexanoic acid." [GOC:al, GOC:jsg, GOC:mah]
GO:0046394	0.016336748 2 / 4		"The chemical reactions and pathways resulting in the formation of carboxylic acids, any organic acid containing one or more carboxyl (-COOH) groups." [ISBN:0198506732]
GO:1901566	0.036558145 2 / 6		"The chemical reactions and pathways resulting in the formation of organonitrogen compound." [GOC:pr, GOC:TermGenie]
GO:0140513	0.054712258 4 / 140		"A stable assembly of two or more macromolecules, i.e. proteins, nucleic acids, carbohydrates or lipids, in which at least one component is a protein and the constituent parts function together in the nucleus." [GOC:clt]
GO:0000745	0.055609756 1 / 1		"The net movement of nuclei towards one another, leading to the bilateral transfer of genetic material in organisms undergoing conjugation without cellular fusion." [GOC:clt, GOC:mah]
GO:0006226	0.055609756 1 / 1		"The chemical reactions and pathways resulting in the formation of dUMP, deoxyuridine monophosphate (2'-deoxyuridine 5'-phosphate)." [ISBN:0198506732]
GO:0006553	0.055609756 1 / 1		"The chemical reactions and pathways involving lysine, 2,6-diaminohexanoic acid." [GOC:go_curators]
GO:0006558	0.055609756 1 / 1		"The chemical reactions and pathways involving L-phenylalanine, the L-enantiomer of 2-amino-3-phenylpropanoic acid, i.e. (2S)-2-amino-3-phenylpropanoic acid." [GOC:jsg, GOC:mah]
GO:0006568	0.055609756 1 / 1		"The chemical reactions and pathways involving tryptophan, the chiral amino acid 2-amino-3-(1H-indol-3-yl)propanoic acid." [ISBN:0198547684]

Supplementary Data S3.2.11

GO_Term	P_val	Counts	MolFunc_Description
GO:0003824		0 39 / 825	"Catalysis of a biochemical reaction at physiological temperatures. In biologically catalyzed reactions, the reactants are known as substrates, and the catalysts are naturally occurring macromolecular substances." [EC:6.1.1.12]
GO:0005096	0.003963102 4 / 15		"Binds to and increases the activity of a GTPase, an enzyme that catalyzes the hydrolysis of GTP." [GOC:mah]
GO:0008047	0.013216808 4 / 21		"Binds to and increases the activity of an enzyme." [GOC:dph, GOC:mah, GOC:tb]
GO:0003695	0.01784169 4 / 23		"Binds to and modulates the activity of a GTPase." [GOC:mah]
GO:0004839	0.048484848 1 / 1		"Catalysis of the reaction: E1 + ubiquitin + ATP -> E1-ubiquitin + AMP + PPi, where the E1-ubiquitin linkage is a thioester bond between the C-terminal glycine of Ub and a sulphydryl side group of an E1 cysteine." [GOC:al]
GO:0005046	0.048484848 1 / 1		"Binding to a KDEL sequence, the C terminus tetrapeptide sequence Lys-Asp-Glu-Leu found in proteins that are to be retained in the endoplasmic reticulum." [GOC:al]
GO:0005338	0.048484848 1 / 1		"Enables the transfer of a nucleotide-sugar from one side of a membrane to the other. A nucleotide-sugar is any nucleotide in which the distal phosphoric residue of a nucleoside 5'-diphosphate is in glycosidic linkage with a sugar." [GOC:al, GOC:mtg_transport, ISBN:0815340729]
GO:0005456	0.048484848 1 / 1		"Enables the transfer of a CMP-N-acetylneuraminate from one side of a membrane to the other." [GOC:al, GOC:mtg_transport, ISBN:0815340729]
GO:0005460	0.048484848 1 / 1		"Enables the transfer of a UDP-glucose from one side of a membrane to the other. UDP-glucose is a substance composed of glucose in glycosidic linkage with uridine diphosphate." [GOC:al, GOC:mtg_transport]
GO:0005461	0.048484848 1 / 1		"Enables the transfer of a UDP-glucuronic acid from one side of a membrane to the other. UDP-glucuronic acid is a substance composed of glucuronic acid in glycosidic linkage with uridine diphosphate." [GOC:al, GOC:mtg_transport]
GO_Term	P_val	Counts	BioProc_Description
GO:0007165	0.009547765 4 / 20		"The cellular process in which a signal is conveyed to trigger a change in the activity or state of a cell. Signal transduction begins with reception of a signal (e.g. a ligand binding to a receptor or receptor activation) and results in a change in the activity or state of a cell." [GOC:clt]
GO:0141124	0.010626745 3 / 11		"An intracellular signaling module that is part of larger signaling pathways that can be initiated either intracellularly or by cell surface receptors. Intracellular signaling cassettes are discrete signaling units that are part of larger signaling pathways." [GOC:clt]
GO:0000378	0.011422818 2 / 4		"The RNA metabolic process that joins two exons, each of which has free ends that were generated by endonucleolytic cleavages, by a ligation reaction." [GOC:krc, ISBN:0879695897]
GO:0000959	0.011422818 2 / 4		"The chemical reactions and pathways involving RNA transcribed from the mitochondrial genome and occurring in the mitochondrion." [GOC:krc, GOC:mah]
GO:0010501	0.011422818 2 / 4		"The process in which a secondary structure of RNA are broken or 'melted'." [PMID:17169986]
GO:0034660	0.011422818 2 / 4		"The chemical reactions and pathways involving non-coding RNA transcripts (ncRNAs)." [GOC:mah]
GO:0039703	0.011422818 2 / 4		"The cellular metabolic process in which a cell duplicates one or more molecules of RNA." [GOC:bf, GOC:jl]
GO:0042245	0.011422818 2 / 4		"Any process that results in the repair of damaged RNA." [PMID:11000254, PMID:11070075, UniProtKB-KW:KW-0692]
GO:0110154	0.011422818 2 / 4		"Cleavage of the 5'-cap of an RNA." [GOC:sp, PMID:25533955, PMID:31101919]
GO:0006890	0.018199451 2 / 5		"The directed movement of substances from the Golgi back to the endoplasmic reticulum, mediated by vesicles bearing specific protein coats such as COPI or COG." [ISBN:0716731363, PMID:16510524]
GO_Term	P_val	Counts	CellComp_Description
GO:0061645	0.001202535 4 / 11		"The part of the cell cortex consisting of an aggregation of proteins that will give rise to an endocytic vesicle." [GOC:dph, PMID:22949647]
GO:0030479	0.004844612 3 / 8		"An endocytic patch that consists of an actin-containing structure found at the plasma membrane in cells; formed of networks of branched actin filaments that lie just beneath the plasma membrane and are associated with the plasma membrane." [GOC:mah]
GO:0030864	0.004844612 3 / 8		"The portion of the actin cytoskeleton, comprising filamentous actin and associated proteins, that lies just beneath the plasma membrane." [GOC:mah]
GO:0110131	0.004844612 3 / 8		"A complex that localizes to actin cortical patches at sites of endocytosis and negatively regulates barbed end F-actin assembly, resulting in the generation of free actin pools. The Aim2-Tda2 complex is necessary for the formation of actin cortical patches." [GOC:clt]
GO:0000781	0.048780488 1 / 1		"The end of a linear chromosome, required for the integrity and maintenance of the end. A chromosome telomere usually includes a region of telomerase-encoded repeats the length of which rarely exceeds 2 kb." [GOC:clt]
GO:0001171	0.048780488 1 / 1		"A DNA synthesis process that uses RNA as the initial template for synthesis of DNA, but which also includes an RNase activity to remove the RNA strand of an RNA-DNA heteroduplex produced by the RNA-dependent DNA polymerase." [GOC:clt]
GO:0001666	0.048780488 1 / 1		"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus indicating lowered oxygen levels." [GOC:clt]
GO:0002931	0.048780488 1 / 1		"Any process that results in a change in state or activity of an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of an inadequate blood supply." [GOC:hjd]
GO:0003299	0.048780488 1 / 1		"The enlargement or overgrowth of all or part of a muscle organ or tissue due to an increase in the size of its muscle cells as a result of a disturbance in organismal or cellular homeostasis." [GOC:mtg_heart]
GO:0006044	0.048780488 1 / 1		"The chemical reactions and pathways involving N-acetylglucosamine. The D isomer is a common structural unit of glycoproteins in plants, bacteria and animals; it is often the terminal sugar of an oligosaccharide." [GOC:clt]
GO:0006046	0.048780488 1 / 1		"The chemical reactions and pathways resulting in the breakdown of N-acetylglucosamine. The D isomer is a common structural unit of glycoproteins in plants, bacteria and animals; it is often the terminal sugar of an oligosaccharide." [GOC:clt]

Supplementary Data S3.2.12

GO_Term	P_val	Counts	MolFunc_Description
GO:0005096	0.007533272	4 / 15	"Binds to and increases the activity of a GTPase, an enzyme that catalyzes the hydrolysis of GTP." [GOC:mah]
GO:0005545	0.017746809	2 / 4	"Binding to a phosphatidylinositol, a glycerophospholipid with its sn-glycerol 3-phosphate residue is esterified to the 1-hydroxyl group of 1D-myo-inositol." [ISBN:0198506732]
GO:0034235	0.017746809	2 / 4	"Binding to a glycosylphosphatidylinositol anchor. GPI anchors serve to attach membrane proteins to the lipid bilayer of cell membranes." [GOC:vw]
GO:0008047	0.023600082	4 / 21	"Binds to and increases the activity of an enzyme." [GOC:dph, GOC:mah, GOC:tb]
GO:0035091	0.027265987	4 / 22	"Binding to an inositol-containing glycerophospholipid, i.e. phosphatidylinositol (PtdIns) and its phosphorylated derivatives." [GOC:bf, ISBN:0198506732, PMID:11395417]
GO:0030695	0.031197636	4 / 23	"Binds to and modulates the activity of a GTPase." [GOC:mah]
GO:0001217	0.036204346	3 / 14	"A DNA-binding transcription factor activity that represses or decreases the transcription of specific gene sets." [GOC:txnOH-2018]
GO:0016301	0.03953174	2 / 6	"Catalysis of the transfer of a phosphate group, usually from ATP, to a substrate molecule." [ISBN:0198506732]
GO:0001216	0.042744342	3 / 15	"A DNA-binding transcription factor activity that activates or increases transcription of specific gene sets." [GOC:txnOH-2018]
GO:0005543	0.044459475	4 / 26	"Binding to a phospholipid, a class of lipids containing phosphoric acid as a mono- or diester." [ISBN:0198506732]
GO_Term	P_val	Counts	BioProc_Description
GO:0006984	0.001123911	4 / 9	"The series of molecular signals that conveys information from the endoplasmic reticulum to the nucleus, usually resulting in a change in transcriptional regulation." [GOC:mah]
GO:0006996	0.001123911	4 / 9	"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of an organelle within a cell. An organelle is an organized structure of distinct parts." [GOC:mah]
GO:0097411	0.001767748	4 / 10	"The series of molecular signals mediated by hypoxia-inducible factor (HIF1) in response to lowered oxygen levels (hypoxia). Under hypoxic conditions, the oxygen-sensitive alpha-subunit of hypoxia-inducible factor (HIF1) binds to DNA and initiates transcription of hypoxia-inducible genes." [GOC:mah]
GO:0006914	0.003496405	3 / 6	"The cellular catabolic process in which cells digest cellular materials, such as organelles and other macromolecular constituents, or non-self materials such as intracellular pathogens. Autophagy serves to protect the cell from damage by these materials." [GOC:mah]
GO:0097576	0.003496405	3 / 6	"Merging of two or more vacuoles, or of vacuoles and vesicles within a cell to form a single larger vacuole." [GOC:pr, GOC:vw, Wikipedia:Vacuole]
GO:0072741	0.003584018	2 / 2	"A cellular protein localization process in which a protein is transported to, or maintained at, the site of cell division." [GOC:mah, PMID:19756689]
GO:0030968	0.003710159	4 / 12	"The series of molecular signals generated as a consequence of the presence of unfolded proteins in the endoplasmic reticulum (ER) or other ER-related stress; results in changes in the regulation of transcription and translation." [GOC:mah]
GO:0007165	0.004399866	5 / 20	"The cellular process in which a signal is conveyed to trigger a change in the activity or state of a cell. Signal transduction begins with reception of a signal (e.g. a ligand binding to a receptor or receptor activation) and results in a change in the activity or state of the cell." [GOC:mah]
GO:0007154	0.00505638	4 / 13	"Any process that mediates interactions between a cell and its surroundings. Encompasses interactions such as signaling or attachment between one cell and another cell, between a cell and an extracellular matrix, or between a cell and a microorganism." [GOC:mah]
GO:1905037	0.005768234	3 / 7	"A process that is carried out at the cellular level which results in the assembly, arrangement of constituent parts, or disassembly of an autophagosome." [GOC:bf, GOC:PARL, GOC:TermGenie, PMID:22186024]
GO_Term	P_val	Counts	CellComp_Description
GO:0006554	0.004087271	2 / 2	"The chemical reactions and pathways resulting in the breakdown of lysine, 2,6-diaminohexanoic acid." [GOC:go_curators]
GO:0046440	0.004087271	2 / 2	"The chemical reactions and pathways involving L-lysine, the L-enantiomer of (S)-2,6-diaminohexanoic acid, i.e. (2S)-2,6-diaminohexanoic acid." [GOC:al, GOC:js, GOC:mah]
GO:0046394	0.021549754	2 / 4	"The chemical reactions and pathways resulting in the formation of carboxylic acids, any organic acid containing one or more carboxyl (-COOH) groups." [ISBN:0198506732]
GO:0005727	0.024387104	6 / 39	"Circular DNA structures that are not part of a chromosome." [GOC:al]
GO:0016234	0.024387104	6 / 39	"A discrete intracellular part formed of aggregated molecules such as proteins or other biopolymers." [GOC:mah, PMID:11121744]
GO:0019774	0.024387104	6 / 39	"The proteasome core subcomplex that constitutes the two inner rings of the proteasome core complex. An example of this component is found in <i>Mus musculus</i> ." [GOC:jl, GOC:mtg_sensu, GOC:rb, PMID:10111121]
GO:0030076	0.024387104	6 / 39	"A protein-pigment complex that may be closely or peripherally associated to photosynthetic reaction centers that participate in harvesting and transferring radiant energy to the reaction center." [GOC:lr]
GO:0032300	0.024387104	6 / 39	"Any complex formed of proteins that act in mismatch repair." [GOC:mah]
GO:0034708	0.024387104	6 / 39	"A protein complex that possesses methyltransferase activity." [GOC:mah]
GO:0043229	0.024387104	6 / 39	"Organized structure of distinctive morphology and function, occurring within the cell. Includes the nucleus, mitochondria, plastids, vacuoles, vesicles, ribosomes and the cytoskeleton. Excludes the plasma membrane." [GOC:mah]

Supplementary Data S3.3— Temporal GO Description of DPOp analysis Transcriptomic Data

Each one of the following pictures is an aggregation of outputs of a GO term enrichment analysis on the results of DPOp at each specific point along the transcriptomic time course.

Supplementary Data S3.3.1

Timepoint 1

Molecular Function

356 / 3514	"The action of a molecule that contributes to the structural integrity of a complex or its assembly within or outside a cell." [GOC:mah, GOC:vw]
18 / 510	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GOC:dph, GOC:jl, GOC:tb, GOC:vw]
19 / 515	"Binding to a nucleic acid." [GOC:jl]
362 / 3521	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction." [GOC:ceh, GOC:vw]
121 / 632	"Catalysis of an oxidation-reduction (redox) reaction, a reversible chemical reaction in which the oxidation state of an atom or atoms within a molecule is altered. One substrate is oxidized and another is reduced." [GOC:ceh, GOC:vw]
80 / 358	"Catalysis of an oxidation-reduction (redox) reaction in which an aldehyde or ketone (oxo) group acts as a hydrogen or electron donor and reduces a hydrogen or electron acceptor." [GOC:ceh, GOC:vw]
78 / 349	"Catalysis of an oxidation-reduction (redox) reaction in which a CH-NH group acts as a hydrogen or electron donor and reduces a hydrogen or electron acceptor." [GOC:ai]
77 / 347	"Catalysis of the reaction: 3,5,3'-L-triiodo-L-thyronine + iodide + acceptor + H+ = L-thyronine + donor-H2." [EC:1.21.99.4]
77 / 347	"Catalysis of the hydroxylation of tyramine to form octopamine." [PMID:10745161]
77 / 347	"Catalysis of the reaction: 2 H2O = O2 + 4 H+ + 4 e-. The evolution of oxygen from oxidizing water is carried out by the oxygen evolving complex in photosystem II of plants. P680." [GOC:ceh, GOC:vw]

Biological Process

397 / 3778	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators, GOC:vw]
1 / 150	"The cellular metabolic process in which a protein is formed, using the sequence of a mature mRNA or circRNA molecule to specify the sequence of amino acids in a polypeptide chain. Translation is mediated by ribosomes." [GOC:ceh, GOC:vw]
407 / 3664	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecules." [GOC:ceh, GOC:vw]
0 / 107	"The chemical reactions and pathways resulting in the formation of a protein in the cytoplasm. This is a ribosome-mediated process in which the information in messenger RNA (mRNA) is used to specify the sequence of amino acids in the protein." [GOC:ceh, GOC:vw]
0 / 106	"The synthesis of aminoacyl-tRNA by the formation of an ester bond between the 3'-hydroxyl group of the most 3' adenosine of the tRNA and the alpha carboxylic acid group of an amino acid, to be used in ribosomal protein synthesis." [GOC:ceh, GOC:vw]
73 / 431	"OBSOLETE. A metabolic process that results in the removal or addition of one or more electrons to or from a substance, with or without the concomitant removal or addition of a proton or protons." [GOC:ceh, GOC:vw]
17 / 52	"The chemical reactions and pathways involving an ergot alkaloid, an indole alkaloid." [GOC:yaf]
16 / 47	"The chemical reactions and pathways involving melanins, pigments largely of animal origin. High molecular weight polymers of indole quinone, they are irregular polymeric structures and are divided into three classes: eumelanins, pheomelanins, and neuromelanins." [GOC:ceh, GOC:vw]
16 / 47	"The chemical reactions and pathways involving glycosinolates, substituted thioglycosides found in rapeseed products and related cruciferae." [GOC:mah, http://www.gardeneaters.net/family_characteristics.htm]
16 / 48	"The chemical reactions and pathways resulting in the formation of verruculogen." [GOC:di, GOC:TermGenie, PMID:23649274]

Cellular Compartment

13 / 494	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell growth." [GOC:go_curators, GOC:vw]
14 / 503	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecules." [GOC:ceh, GOC:vw]
14 / 503	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators, GOC:vw]
13 / 476	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
13 / 466	"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or parents." [GOC:ceh, GOC:vw]
13 / 466	"The entirety of a process in which information is transmitted within a biological system. This process begins with an active signal and ends when a cellular response has been triggered." [GOC:mtg_signal, GOC:mtg]
13 / 466	"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration." [GOC:ceh, GOC:vw]
13 / 464	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus. The process begins with detection of the stimulus." [GOC:ceh, GOC:vw]
13 / 463	"The production of new individuals that contain some portion of genetic material inherited from one or more parent organisms." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
13 / 463	"Any process involved in the development or functioning of the immune system, an organismal system for calibrated responses to potential internal or invasive threats." [GO_REF:0000022, GOC:add]

Supplementary Data S3.3.2

Timepoint 2

Molecular Function

352 / 3514	"The action of a molecule that contributes to the structural integrity of a complex or its assembly within or outside a cell." [GOC:mah, GOC:vw]
18 / 510	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GOC:dph, GOC:jl, GOC:tb, GOC:vw]
19 / 515	"Binding to a nucleic acid." [GOC:jl]
358 / 3521	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport across a membrane." [GOC:ceh, GOC:vw]
117 / 632	"Catalysis of an oxidation-reduction (redox) reaction, a reversible chemical reaction in which the oxidation state of an atom or atoms within a molecule is altered. One substrate acts as a hydrogen or electron donor and another is reduced." [GOC:ceh, GOC:vw]
10 / 330	"Binding to an RNA molecule or a portion thereof." [GOC:jl, GOC:mah]
354 / 3464	"The selective, non-covalent, often stoichiometric, interaction of a molecule with one or more specific sites on another molecule." [GOC:ceb, GOC:mah, ISBN:0198506732]
80 / 386	"Catalysis of an oxidation-reduction (redox) reaction in which a CH-OH group acts as a hydrogen or electron donor and reduces a hydrogen or electron acceptor." [GOC:ai]
74 / 349	"Catalysis of an oxidation-reduction (redox) reaction in which a CH-NH group acts as a hydrogen or electron donor and reduces a hydrogen or electron acceptor." [GOC:ai]
22 / 478	"Binding to a zinc ion (Zn)." [GOC:ai]

Biological Process

392 / 3778	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators, GOC:vw]
1 / 150	"The cellular metabolic process in which a protein is formed, using the sequence of a mature mRNA or circRNA molecule to specify the sequence of amino acids in a polypeptide chain. Translation is mediated by ribosomes." [GOC:ceh, GOC:vw]
403 / 3664	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecules." [GOC:ceh, GOC:vw]
0 / 111	"The process preceding formation of the peptide bond between the first two amino acids of a protein. This includes the formation of a complex of the ribosome, mRNA or circRNA, and an initiation complex that assembles the ribosome." [GOC:ceh, GOC:vw]
62 / 342	"The chemical reactions and pathways resulting in many of the chemical changes of compounds that are not necessarily required for growth and maintenance of cells, and are often unique to a taxon. In multicellular organisms, these changes are often related to development." [GOC:ceh, GOC:vw]
0 / 107	"The chemical reactions and pathways resulting in the formation of a protein in the cytoplasm. This is a ribosome-mediated process in which the information in messenger RNA (mRNA) is used to specify the sequence of amino acids in the protein." [GOC:ceh, GOC:vw]
0 / 106	"The synthesis of aminoacyl-tRNA by the formation of an ester bond between the 3'-hydroxyl group of the most 3' adenosine of the tRNA and the alpha carboxylic acid group of an amino acid, to be used in ribosomal protein synthesis." [GOC:ceh, GOC:vw]
0 / 92	"The successive addition of amino acid residues to a nascent polypeptide chain during protein biosynthesis." [GOC:ems]
0 / 92	"The chemical reactions and pathways resulting in the formation of a protein in a mitochondrion. This is a ribosome-mediated process in which the information in messenger RNA (mRNA) is used to specify the sequence of amino acids in the protein." [GOC:ceh, GOC:vw]
16 / 336	"Any process that modulates the frequency, rate or extent of transcription mediated by RNA polymerase II." [GOC:go_curators, GOC:txnOH]

Cellular Compartment

13 / 494	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell growth." [GOC:go_curators, GOC:vw]
14 / 503	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecules." [GOC:ceh, GOC:vw]
14 / 503	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators, GOC:vw]
13 / 476	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
13 / 466	"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or parents." [GOC:ceh, GOC:vw]
13 / 466	"The entirety of a process in which information is transmitted within a biological system. This process begins with an active signal and ends when a cellular response has been triggered." [GOC:mtg_signal, GOC:mtg]
13 / 466	"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration." [GOC:ceh, GOC:vw]
13 / 464	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus. The process begins with detection of the stimulus." [GOC:ceh, GOC:vw]
13 / 463	"The production of new individuals that contain some portion of genetic material inherited from one or more parent organisms." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
13 / 463	"Any process involved in the development or functioning of the immune system, an organismal system for calibrated responses to potential internal or invasive threats." [GO_REF:0000022, GOC:add]

Supplementary Data S3.3.3

Timepoint 3

Molecular Function

18 / 510	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GOC:dph, GOC:jl, GOC:tb, GOC:vw]
19 / 515	"Binding to a nucleic acid." [GOC:jl]
359 / 3514	"The action of a molecule that contributes to the structural integrity of a complex or its assembly within or outside a cell." [GOC:mah, GOC:vw]
10 / 330	"Binding to an RNA molecule or a portion thereof." [GOC:jl, GOC:mah]
366 / 3521	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport against a concentration gradient." [GOC:vw, PMID:31239353]
115 / 632	"Catalysis of an oxidation-reduction (redox) reaction, a reversible chemical reaction in which the oxidation state of an atom or atoms within a molecule is altered. One substrate acts as a hydrogen or electron donor and the other as an acceptor." [GOC:vw]
23 / 478	"Binding to a zinc ion (Zn)." [GOC:al]
23 / 477	"Binding to and responding, e.g. by conformational change, to changes in the cellular level of zinc." [GOC:vw, PMID:31239353]
11 / 315	"Binding to DNA that is assembled into chromatin." [GOC:mah]
0 / 123	"The action of a molecule that contributes to the structural integrity of the ribosome." [GOC:mah]

Biological Process

398 / 3778	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curator]
1 / 150	"The cellular metabolic process in which a protein is formed, using the sequence of a mature mRNA or circRNA molecule to specify the sequence of amino acids in a polypeptide chain. Translation is mediated by transfer RNA (tRNA) and ribosomes." [GOC:go_curator]
409 / 3664	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecules." [GOC:go_curator]
64 / 342	"The chemical reactions and pathways resulting in many of the chemical changes of compounds that are not necessarily required for growth and maintenance of cells, and are often unique to a taxon. In multicellular organisms, these reactions and pathways are often unique to a tissue or organ." [GOC:go_curator]
0 / 111	"The process preceding formation of the peptide bond between the first two amino acids of a protein. This includes the formation of a complex of the ribosome, mRNA or circRNA, and an initiation complex that catalyzes the reaction." [GOC:go_curator]
0 / 107	"The chemical reactions and pathways resulting in the formation of a protein in the cytoplasm. This is a ribosome-mediated process in which the information in messenger RNA (mRNA) is used to specify the sequence of amino acids in the protein." [GOC:go_curator]
0 / 106	"The synthesis of aminoacyl tRNA by the formation of an ester bond between the 3'-hydroxyl group of the most 3' adenosine of the tRNA and the alpha carboxylic acid group of an amino acid, to be used in ribosomal protein synthesis." [GOC:go_curator]
17 / 52	"The chemical reactions and pathways involving an ergot alkaloid, an indole alkaloid." [GOC:ya]
16 / 47	"The chemical reactions and pathways involving melanins, pigments largely of animal origin. High molecular weight polymers of indole quinone, they are irregular polymeric structures and are divided into three groups: eumelanins, pheomelanins, and neuromelanins." [GOC:mah, http://www.gardeneaters.net/familv_characteristics.html]
16 / 47	"The chemical reactions and pathways involving glycosinolates, substituted thioglycosides found in rapeseed products and related cruciferae." [GOC:mah, http://www.gardeneaters.net/familv_characteristics.html]

Cellular Compartment

14 / 503	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecules." [GOC:go_curator]
14 / 494	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell division." [GOC:go_curator]
15 / 503	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curator]
14 / 476	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
21 / 575	"Organized structure of distinctive morphology and function, bounded by a single or double lipid bilayer membrane and occurring within the cell. Includes the nucleus, mitochondria, plastids, vacuoles, and vesicles." [GOC:go_curator]
14 / 466	"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or parents." [GOC:go_curator]
14 / 466	"The entirety of a process in which information is transmitted within a biological system. This process begins with an active signal and ends when a cellular response has been triggered." [GOC:mtg_signal, GOC:mtg]
14 / 466	"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration." [GOC:go_curator]
14 / 464	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus. The process begins with detection of the stimulus." [GOC:go_curator]
14 / 463	"The production of new individuals that contain some portion of genetic material inherited from one or more parent organisms." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]

Supplementary Data S3.3.4

Timepoint 4

Molecular Function

16 / 510	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GOC:dph, GOC:jl, GOC:tb, GOC:vw]
18 / 515	"Binding to a nucleic acid." [GOC:jl]
353 / 3514	"The action of a molecule that contributes to the structural integrity of a complex or its assembly within or outside a cell." [GOC:mah, GOC:vw]
9 / 330	"Binding to an RNA molecule or a portion thereof." [GOC:jl, GOC:mah]
359 / 3521	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport against a concentration gradient." [GOC:vw, PMID:31239353]
116 / 632	"Catalysis of an oxidation-reduction (redox) reaction, a reversible chemical reaction in which the oxidation state of an atom or atoms within a molecule is altered. One substrate acts as a hydrogen or electron donor and the other as an acceptor." [GOC:vw]
23 / 478	"Binding to a zinc ion (Zn)." [GOC:al]
23 / 477	"Binding to and responding, e.g. by conformational change, to changes in the cellular level of zinc." [GOC:vw, PMID:31239353]
360 / 3487	"Enables the directed movement of substances (such as macromolecules, small molecules, ions) into, out of or within a cell, or between cells." [GOC:al, GOC:dgf]
357 / 3464	"The selective, non-covalent, often stoichiometric, interaction of a molecule with one or more specific sites on another molecule." [GOC:ceb, GOC:mah, ISBN:0198506732]

Biological Process

392 / 3778	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curator]
0 / 150	"The cellular metabolic process in which a protein is formed, using the sequence of a mature mRNA or circRNA molecule to specify the sequence of amino acids in a polypeptide chain. Translation is mediated by transfer RNA (tRNA) and ribosomes." [GOC:go_curator]
65 / 342	"The chemical reactions and pathways resulting in many of the chemical changes of compounds that are not necessarily required for growth and maintenance of cells, and are often unique to a taxon. In multicellular organisms, these reactions and pathways are often unique to a tissue or organ." [GOC:go_curator]
405 / 3664	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecules." [GOC:go_curator]
0 / 108	"The chemical reactions and pathways involving a specific protein, rather than of proteins in general, occurring at the level of an individual cell. Includes cellular protein modification." [GOC:jl]
0 / 107	"The chemical reactions and pathways resulting in the formation of a protein in the cytoplasm. This is a ribosome-mediated process in which the information in messenger RNA (mRNA) is used to specify the sequence of amino acids in the protein." [GOC:go_curator]
0 / 106	"The synthesis of aminoacyl tRNA by the formation of an ester bond between the 3'-hydroxyl group of the most 3' adenosine of the tRNA and the alpha carboxylic acid group of an amino acid, to be used in ribosomal protein synthesis." [GOC:go_curator]
17 / 52	"The chemical reactions and pathways involving an ergot alkaloid, an indole alkaloid." [GOC:ya]
16 / 47	"The chemical reactions and pathways involving melanins, pigments largely of animal origin. High molecular weight polymers of indole quinone, they are irregular polymeric structures and are divided into three groups: eumelanins, pheomelanins, and neuromelanins." [GOC:mah, http://www.gardeneaters.net/familv_characteristics.html]
16 / 47	"The chemical reactions and pathways involving glycosinolates, substituted thioglycosides found in rapeseed products and related cruciferae." [GOC:mah, http://www.gardeneaters.net/familv_characteristics.html]

Cellular Compartment

12 / 503	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecules." [GOC:go_curator]
12 / 494	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell division." [GOC:go_curator]
13 / 503	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curator]
12 / 476	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
12 / 466	"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or parents." [GOC:go_curator]
12 / 466	"The entirety of a process in which information is transmitted within a biological system. This process begins with an active signal and ends when a cellular response has been triggered." [GOC:mtg_signal, GOC:mtg]
12 / 466	"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration." [GOC:go_curator]
12 / 464	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus. The process begins with detection of the stimulus." [GOC:go_curator]
12 / 463	"The production of new individuals that contain some portion of genetic material inherited from one or more parent organisms." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
12 / 463	"Any process involved in the development or functioning of the immune system. An organismal system for calibrated responses to potential internal or invasive threats." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]

Supplementary Data S3.3.5

Timepoint 5

Molecular Function

15 / 510	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GOC:dph, GOC:jl, GOC:tb, GOC:vw]
17 / 515	"Binding to a nucleic acid." [GOC:jl]
340 / 3514	"The action of a molecule that contributes to the structural integrity of a complex or its assembly within or outside a cell." [GOC:mah, GOC:vw]
8 / 330	"Binding to an RNA molecule or a portion thereof." [GOC:jl, GOC:mah]
344 / 3521	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport against a concentration gradient." [GOC:jl]
20 / 478	"Binding to a zinc ion (Zn)." [GOC:ai]
20 / 477	"Binding to and responding, e.g. by conformational change, to changes in the cellular level of zinc." [GOC:vw, PMID:31239353]
109 / 632	"Catalysis of an oxidation-reduction (redox) reaction, a reversible chemical reaction in which the oxidation state of an atom or atoms within a molecule is altered. One substrate acts as a hydrogen or electron donor and the other as an acceptor." [GOC:mah]
10 / 315	"Binding to DNA that is assembled into chromatin." [GOC:mah]
10 / 305	"Binding to double-stranded DNA." [GOC:eh, GOC:vw]

Biological Process

384 / 3778	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
0 / 150	"The cellular metabolic process in which a protein is formed, using the sequence of a mature mRNA or circRNA molecule to specify the sequence of amino acids in a polypeptide chain. Translation is mediated by the ribosome." [GOC:go_curators, GOC:txnh]
62 / 342	"The chemical reactions and pathways resulting in many of the chemical changes of compounds that are not necessarily required for growth and maintenance of cells, and are often unique to a taxon. In multicellular organisms, these processes typically transform small molecules, but also include macromolecular synthesis." [GOC:mtg_signal, GOC:mtg_structure]
393 / 3664	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecular synthesis." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
0 / 108	"The chemical reactions and pathways involving a specific protein, rather than of proteins in general, occurring at the level of an individual cell. Includes cellular protein modification." [GOC:jl]
0 / 107	"The chemical reactions and pathways resulting in the formation of a protein in the cytoplasm. This is a ribosome-mediated process in which the information in messenger RNA (mRNA) is used to specify the sequence of amino acids in a polypeptide chain." [GOC:go_curators, GOC:txnh]
0 / 106	"The synthesis of aminoacyl tRNA by the formation of an ester bond between the 3'-hydroxyl group of the most 3' adenosine of the tRNA and the alpha carboxylic acid group of an amino acid, to be used in ribosomal protein synthesis." [GOC:go_curators, GOC:txnh]
14 / 336	"Any process that modulates the frequency, rate or extent of transcription mediated by RNA polymerase II." [GOC:go_curators, GOC:txnh]
12 / 305	"Any process that modulates the frequency, rate or extent of cellular DNA-templated transcription." [GOC:go_curators, GOC:txnh]
50 / 275	"The chemical reactions and pathways involving pigment, any general or particular coloring matter in living organisms, e.g. melanin." [GOC:jl, ISBN:0198506732]

Cellular Compartment

12 / 503	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecular synthesis." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
12 / 494	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell division." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
13 / 503	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
12 / 476	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
12 / 466	"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or parents." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
12 / 466	"The entirety of a process in which information is transmitted within a biological system. This process begins with an active signal and ends when a cellular response has been triggered." [GOC:mtg_signal, GOC:mtg_structure]
12 / 466	"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration, or the degradation of the toxic substance." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
19 / 575	"Organized structure of distinctive morphology and function, bounded by a single or double lipid bilayer membrane and occurring within the cell. Includes the nucleus, mitochondria, plastids, vacuoles, and vesicles. Endomembrane system includes the nucleus, endoplasmic reticulum, Golgi apparatus, lysosomes, and vacuoles." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
12 / 464	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus. The process begins with detection of the stimulus." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
12 / 463	"The production of new individuals that contain some portion of genetic material inherited from one or more parent organisms." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]

Supplementary Data S3.3.6

Timepoint 6

Molecular Function

16 / 510	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GOC:dph, GOC:jl, GOC:tb, GOC:vw]
18 / 515	"Binding to a nucleic acid." [GOC:jl]
340 / 3514	"The action of a molecule that contributes to the structural integrity of a complex or its assembly within or outside a cell." [GOC:mah, GOC:vw]
8 / 330	"Binding to an RNA molecule or a portion thereof." [GOC:jl, GOC:mah]
344 / 3521	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport against a concentration gradient." [GOC:jl]
19 / 478	"Binding to a zinc ion (Zn)." [GOC:ai]
19 / 477	"Binding to and responding, e.g. by conformational change, to changes in the cellular level of zinc." [GOC:vw, PMID:31239353]
108 / 632	"Catalysis of an oxidation-reduction (redox) reaction, a reversible chemical reaction in which the oxidation state of an atom or atoms within a molecule is altered. One substrate acts as a hydrogen or electron donor and the other as an acceptor." [GOC:mah]
344 / 3464	"The selective, non-covalent, often stoichiometric, interaction of a molecule with one or more specific sites on another molecule." [GOC:ceb, GOC:mah, ISBN:0198506732]
11 / 315	"Binding to DNA that is assembled into chromatin." [GOC:mah]

Biological Process

0 / 150	"The cellular metabolic process in which a protein is formed, using the sequence of a mature mRNA or circRNA molecule to specify the sequence of amino acids in a polypeptide chain. Translation is mediated by the ribosome." [GOC:go_curators, GOC:txnh]
13 / 336	"Any process that modulates the frequency, rate or extent of transcription mediated by RNA polymerase II." [GOC:go_curators, GOC:txnh]
11 / 305	"Any process that modulates the frequency, rate or extent of cellular DNA-templated transcription." [GOC:go_curators, GOC:txnh]
0 / 108	"The chemical reactions and pathways involving a specific protein, rather than of proteins in general, occurring at the level of an individual cell. Includes cellular protein modification." [GOC:jl]
0 / 107	"The chemical reactions and pathways resulting in the formation of a protein in the cytoplasm. This is a ribosome-mediated process in which the information in messenger RNA (mRNA) is used to specify the sequence of amino acids in a polypeptide chain." [GOC:go_curators, GOC:txnh]
0 / 106	"The synthesis of aminoacyl tRNA by the formation of an ester bond between the 3'-hydroxyl group of the most 3' adenosine of the tRNA and the alpha carboxylic acid group of an amino acid, to be used in ribosomal protein synthesis." [GOC:go_curators, GOC:txnh]
12 / 302	"Any process that activates or increases the frequency, rate or extent of cellular DNA-templated transcription." [GOC:go_curators, GOC:txnh]
12 / 298	"Any process that stops, prevents, or reduces the frequency, rate or extent of cellular DNA-templated transcription." [GOC:go_curators, GOC:txnh]
58 / 342	"The chemical reactions and pathways resulting in many of the chemical changes of compounds that are not necessarily required for growth and maintenance of cells, and are often unique to a taxon. In multicellular organisms, these processes typically transform small molecules, but also include macromolecular synthesis." [GOC:mtg_signal, GOC:mtg_structure]
11 / 278	"Any process that regulates transcription such that the target genes are involved in the transition between G1 and S phase of the mitotic cell cycle." [GOC:mtg_cell_cycle]

Cellular Compartment

6 / 503	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecular synthesis." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
6 / 494	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell division." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
7 / 503	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
6 / 476	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
6 / 466	"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or parents." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
6 / 466	"The entirety of a process in which information is transmitted within a biological system. This process begins with an active signal and ends when a cellular response has been triggered." [GOC:mtg_signal, GOC:mtg_structure]
6 / 466	"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration, or the degradation of the toxic substance." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
6 / 464	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus. The process begins with detection of the stimulus." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
6 / 463	"The production of new individuals that contain some portion of genetic material inherited from one or more parent organisms." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
6 / 463	"Any process involved in the development or functioning of the immune system: an organismal system for calibrated responses to potential internal or invasive threats." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]

Supplementary Data S3.3.7

Timepoint 7

Molecular Function

16 / 510	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GOC:dph, GOC:jl, GOC:tb, GOC:vw]
347 / 3514	"The action of a molecule that contributes to the structural integrity of a complex or its assembly within or outside a cell." [GOC:mah, GOC:vw]
18 / 515	"Binding to a nucleic acid." [GOC:jl]
351 / 3521	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport across a membrane." [GOC:jl, GOC:mah]
7 / 330	"Binding to an RNA molecule or a portion thereof." [GOC:jl, GOC:mah]
121 / 632	"Catalysis of an oxidation-reduction (redox) reaction, a reversible chemical reaction in which the oxidation state of an atom or atoms within a molecule is altered. One substrate acts as a hydrogen or electron donor." [GOC:jl, GOC:mah]
19 / 478	"Binding to a zinc ion (Zn)." [GOC:ai]
19 / 477	"Binding to and responding, e.g. by conformational change, to changes in the cellular level of zinc." [GOC:vw, PMID:31239353]
350 / 3464	"The selective, non-covalent, often stoichiometric, interaction of a molecule with one or more specific sites on another molecule." [GOC:ceb, GOC:mah, ISBN:0198506732]
348 / 3446	"A molecular function that controls the rate, timing and/or magnitude of gene transcription. The function of transcriptional regulators is to modulate gene expression at the transcription step so that they are expressed at the appropriate time." [GOC:ceb, GOC:mah, ISBN:0198506732]

Biological Process

0 / 150	"The cellular metabolic process in which a protein is formed, using the sequence of a mature mRNA or circRNA molecule to specify the sequence of amino acids in a polypeptide chain. Translation is mediated by the ribosome." [GOC:ceb, GOC:mah, ISBN:0198506732]
69 / 369	"The process in which an organomercurial compound is transported across a membrane. Organomercurial substances are any organic compound containing a mercury atom." [GOC:ai, PMID:18793329]
69 / 369	"The directed movement of bicyclomycin across a lipid bilayer, from one side of a membrane to the other. Bicyclomycin (or bicozamycin) is an antibacterial drug often used as a livestock feed additive." [PMID:2006732]
69 / 369	"The process in which carbon dioxide (CO2) is transported across a membrane." [GOC:yaf]
69 / 369	"The process in which urea, the water-soluble compound H2N-CO-NH2, is transported from one side of a membrane to the other by means of some agent such as a transporter or pore." [GOC:mah]
69 / 369	"The process in which a pyrimidine-containing compound is transported across a membrane. A pyrimidine-containing compound is any compound that contains pyrimidine or a formal derivative thereof." [GOC:mah]
69 / 369	"The directed movement of auxins from endoplasmic reticulum to cytosol." [PMID:19506555]
69 / 369	"The process in which hydrogen peroxide is transported across a membrane." [GOC:tb]
69 / 369	"The directed movement of a substance across the outer membrane in cells with two membranes." [PMID:15968039]
69 / 369	"The directed movement of benomyl across a membrane." [GOC:TermGenie]

Cellular Compartment

7 / 503	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecular synthesis." [GOC:ceb, GOC:mah, ISBN:0198506732]
7 / 494	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell division." [GOC:ceb, GOC:mah, ISBN:0198506732]
8 / 503	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators]
7 / 476	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
7 / 466	"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or parents." [GOC:ceb, GOC:mah, ISBN:0198506732]
7 / 466	"The entirety of a process in which information is transmitted within a biological system. This process begins with an active signal and ends when a cellular response has been triggered." [GOC:mtg_signal, GOC:mtg_signal]
7 / 466	"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration." [GOC:ceb, GOC:mah, ISBN:0198506732]
7 / 464	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus. The process begins with detection of a stimulus." [GOC:ceb, GOC:mah, ISBN:0198506732]
7 / 463	"The production of new individuals that contain some portion of genetic material inherited from one or more parent organisms." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
7 / 463	"Any process involved in the development or functioning of the immune system, an organismal system for calibrated responses to potential internal or invasive threats." [GOC_REF:0000022, GOC:add]

Supplementary Data S3.3.8

Timepoint 8

Molecular Function

346 / 3521	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport across a membrane." [GOC:jl, GOC:mah]
345 / 3514	"The action of a molecule that contributes to the structural integrity of a complex or its assembly within or outside a cell." [GOC:mah, GOC:vw]
5 / 330	"Binding to an RNA molecule or a portion thereof." [GOC:jl, GOC:mah]
18 / 510	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GOC:dph, GOC:jl, GOC:tb, GOC:vw]
19 / 515	"Binding to a nucleic acid." [GOC:jl]
5 / 294	"Binding to a purine ribonucleoside triphosphate, a compound consisting of a purine base linked to a ribose sugar esterified with triphosphate on the sugar." [GOC:BHF, GOC:ebc, ISBN:0198506732]
3 / 255	"Binding to an adenylyl ribonucleotide, any compound consisting of adenosine esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose moiety." [GOC:mah]
120 / 632	"Catalysis of an oxidation-reduction (redox) reaction, a reversible chemical reaction in which the oxidation state of an atom or atoms within a molecule is altered. One substrate acts as a hydrogen or electron donor." [GOC:jl, GOC:mah]
3 / 247	"Binding to ATP, adenosine 5'-triphosphate, a universally important coenzyme and enzyme regulator." [ISBN:0198506732]
348 / 3464	"The selective, non-covalent, often stoichiometric, interaction of a molecule with one or more specific sites on another molecule." [GOC:ceb, GOC:mah, ISBN:0198506732]

Biological Process

72 / 372	"A process in which an ion is transported across a membrane." [GOC:mah]
71 / 369	"The process in which an organomercurial compound is transported across a membrane. Organomercurial substances are any organic compound containing a mercury atom." [GOC:ai, PMID:18793329]
71 / 369	"The directed movement of bicyclomycin across a lipid bilayer, from one side of a membrane to the other. Bicyclomycin (or bicozamycin) is an antibacterial drug often used as a livestock feed additive." [PMID:2006732]
71 / 369	"The process in which carbon dioxide (CO2) is transported across a membrane." [GOC:yaf]
71 / 369	"The process in which urea, the water-soluble compound H2N-CO-NH2, is transported from one side of a membrane to the other by means of some agent such as a transporter or pore." [GOC:mah]
71 / 369	"The process in which a pyrimidine-containing compound is transported across a membrane. A pyrimidine-containing compound is any compound that contains pyrimidine or a formal derivative thereof." [GOC:mah]
71 / 369	"The directed movement of auxins from endoplasmic reticulum to cytosol." [PMID:19506555]
71 / 369	"The process in which hydrogen peroxide is transported across a membrane." [GOC:tb]
71 / 369	"The directed movement of a substance across the outer membrane in cells with two membranes." [PMID:15968039]
71 / 369	"The directed movement of benomyl across a membrane." [GOC:TermGenie]

Cellular Compartment

9 / 503	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecular synthesis." [GOC:ceb, GOC:mah, ISBN:0198506732]
9 / 494	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell division." [GOC:ceb, GOC:mah, ISBN:0198506732]
10 / 503	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators]
9 / 476	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
9 / 466	"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or parents." [GOC:ceb, GOC:mah, ISBN:0198506732]
9 / 466	"The entirety of a process in which information is transmitted within a biological system. This process begins with an active signal and ends when a cellular response has been triggered." [GOC:mtg_signal, GOC:mtg_signal]
9 / 466	"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration." [GOC:ceb, GOC:mah, ISBN:0198506732]
9 / 464	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus. The process begins with detection of a stimulus." [GOC:ceb, GOC:mah, ISBN:0198506732]
9 / 463	"The production of new individuals that contain some portion of genetic material inherited from one or more parent organisms." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
9 / 463	"Any process involved in the development or functioning of the immune system, an organismal system for calibrated responses to potential internal or invasive threats." [GOC_REF:0000022, GOC:add]

Supplementary Data S3.3.9

Timepoint 9

Molecular Function

363 / 3521	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport against a concentration gradient." [GOC:ma, GOC:vw]
363 / 3514	"The action of a molecule that contributes to the structural integrity of a complex or its assembly within or outside a cell." [GOC:mah, GOC:vw]
17 / 515	"Binding to a nucleic acid." [GOC:jl]
17 / 510	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GOC:dph, GOC:jl, GOC:tb, GOC:vw]
4 / 294	"Binding to a purine ribonucleoside triphosphate, a compound consisting of a purine base linked to a ribose sugar esterified with triphosphate on the sugar." [GOC:BHF, GOC:ebc, ISBN:0198506732]
2 / 255	"Binding to an adenyl ribonucleotide, any compound consisting of adenosine esterified with (ortho)phosphate or an oligophosphate at any hydroxyl group on the ribose moiety." [GOC:mah]
2 / 247	"Binding to ATP, adenosine 5'-triphosphate, a universally important coenzyme and enzyme regulator." [ISBN:0198506732]
130 / 632	"Catalysis of an oxidation-reduction (redox) reaction, a reversible chemical reaction in which the oxidation state of an atom or atoms within a molecule is altered. One substrate acts as a hydrogen or electron donor and the other acts as a hydrogen or electron acceptor." [GOC:ma, GOC:vw]
365 / 3464	"The selective, non-covalent, often stoichiometric, interaction of a molecule with one or more specific sites on another molecule." [GOC:ceb, GOC:mah, ISBN:0198506732]
8 / 330	"Binding to an RNA molecule or a portion thereof." [GOC:jl, GOC:mah]

Biological Process

0 / 150	"The cellular metabolic process in which a protein is formed, using the sequence of a mature mRNA or circRNA molecule to specify the sequence of amino acids in a polypeptide chain. Translation is mediated by the ribosome." [GOC:ma]
74 / 372	"A process in which an ion is transported across a membrane." [GOC:mah]
73 / 369	"The process in which an organomercurial compound is transported across a membrane. Organomercurial substances are any organic compound containing a mercury atom." [GOC:al, PMID:18793329]
73 / 369	"The directed movement of bicyclomycin across a lipid bilayer, from one side of a membrane to the other. Bicyclomycin (or bicozamycin) is an antibacterial drug often used as a livestock feed additive." [PMID:2006732]
73 / 369	"The process in which carbon dioxide (CO ₂) is transported across a membrane." [GOC:yaf]
73 / 369	"The process in which urea, the water-soluble compound H ₂ N-CO-NH ₂ , is transported from one side of a membrane to the other by means of some agent such as a transporter or pore." [GOC:mah]
73 / 369	"The process in which a pyrimidine-containing compound is transported across a membrane. A pyrimidine-containing compound is any compound that contains pyrimidine or a formal derivative thereof." [GOC:mah]
73 / 369	"The directed movement of auxins from endoplasmic reticulum to cytosol." [PMID:19506555]
73 / 369	"The process in which hydrogen peroxide is transported across a membrane." [GOC:tb]
73 / 369	"The directed movement of a substance across the outer membrane in cells with two membranes." [PMID:15968039]

Cellular Compartment

11 / 503	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecular synthesis." [GOC:ma]
11 / 494	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell division." [GOC:ma]
12 / 503	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curator]
11 / 476	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
11 / 466	"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or parents." [GOC:ma]
11 / 466	"The entirety of a process in which information is transmitted within a biological system. This process begins with an active signal and ends when a cellular response has been triggered." [GOC:mtg_signal, GOC:mtg_target]
11 / 466	"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration." [GOC:ma]
11 / 464	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus. The process begins with detection of a stimulus." [GOC:ma]
11 / 463	"The production of new individuals that contain some portion of genetic material inherited from one or more parent organisms." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]

Supplementary Data S3.3.10

Timepoint 10

Molecular Function

12 / 510	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GOC:dph, GOC:jl, GOC:tb, GOC:vw]
13 / 515	"Binding to a nucleic acid." [GOC:jl]
385 / 3521	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport against a concentration gradient." [GOC:ma, GOC:vw]
385 / 3514	"The action of a molecule that contributes to the structural integrity of a complex or its assembly within or outside a cell." [GOC:mah, GOC:vw]
100 / 386	"Catalysis of an oxidation-reduction (redox) reaction in which a CH-OH group act as a hydrogen or electron donor and reduces a hydrogen or electron acceptor." [GOC:al]
139 / 632	"Catalysis of an oxidation-reduction (redox) reaction, a reversible chemical reaction in which the oxidation state of an atom or atoms within a molecule is altered. One substrate acts as a hydrogen or electron donor and the other acts as a hydrogen or electron acceptor." [GOC:ma, GOC:vw]
92 / 355	"Catalysis of the incorporation of one atom from molecular oxygen into a compound and the reduction of the other atom of oxygen to water." [ISBN:0198506732]
7 / 330	"Binding to an RNA molecule or a portion thereof." [GOC:jl, GOC:mah]
94 / 367	"Catalysis of an oxidation-reduction (redox) reaction in which hydrogen or electrons are transferred from each of two donors, and molecular oxygen is reduced or incorporated into a donor." [GOC:mah]
92 / 358	"Catalysis of an oxidation-reduction (redox) reaction in which an aldehyde or ketone (oxo) group acts as a hydrogen or electron donor and reduces a hydrogen or electron acceptor." [GOC:al]

Biological Process

90 / 431	"OBSOLETE. A metabolic process that results in the removal or addition of one or more electrons to or from a substance, with or without the concomitant removal or addition of a proton or protons." [GOC:dhl, GOC:ma]
0 / 150	"The cellular metabolic process in which a protein is formed, using the sequence of a mature mRNA or circRNA molecule to specify the sequence of amino acids in a polypeptide chain. Translation is mediated by the ribosome." [GOC:ma]
12 / 336	"Any process that modulates the frequency, rate or extent of transcription mediated by RNA polymerase II." [GOC:go_curators, GOC:txnOH]
70 / 342	"The chemical reactions and pathways resulting in many of the chemical changes of compounds that are not necessarily required for growth and maintenance of cells, and are often unique to a taxon. In multicellular organisms, these changes are often coordinated." [GOC:ma]
74 / 372	"A process in which an ion is transported across a membrane." [GOC:mah]
74 / 373	"The process in which an oligopeptide is transported across a membrane. Oligopeptides are molecules that contain a small number (2 to 20) of amino-acid residues connected by peptide linkages." [GOC:vw, ISBN:0198506732]
73 / 369	"The process in which an organomercurial compound is transported across a membrane. Organomercurial substances are any organic compound containing a mercury atom." [GOC:al, PMID:18793329]
73 / 369	"The directed movement of bicyclomycin across a lipid bilayer, from one side of a membrane to the other. Bicyclomycin (or bicozamycin) is an antibacterial drug often used as a livestock feed additive." [PMID:2006732]
73 / 369	"The process in which carbon dioxide (CO ₂) is transported across a membrane." [GOC:yaf]
73 / 369	"The process in which urea, the water-soluble compound H ₂ N-CO-NH ₂ , is transported from one side of a membrane to the other by means of some agent such as a transporter or pore." [GOC:mah]

Cellular Compartment

18 / 575	"Organized structure of distinctive morphology and function, bounded by a single or double lipid bilayer membrane and occurring within the cell. Includes the nucleus, mitochondria, plastids, vacuoles, and vesicles. Enzymes and other molecules are often concentrated in specific compartments." [GOC:ma]
13 / 494	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell division." [GOC:ma]
14 / 503	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecular synthesis." [GOC:ma]
15 / 507	"A stable assembly of two or more macromolecules, i.e. proteins, nucleic acids, carbohydrates or lipids, in which at least one component is a protein and the constituent parts function together in the nucleus." [GOC:ma]
13 / 476	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
15 / 503	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curator]
15 / 497	"The volume enclosed by the nuclear inner membrane." [GOC:mah, GOC:pz]
13 / 466	"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or parents." [GOC:ma]
13 / 466	"The entirety of a process in which information is transmitted within a biological system. This process begins with an active signal and ends when a cellular response has been triggered." [GOC:mtg_signal, GOC:mtg_target]
13 / 466	"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration." [GOC:ma]

Supplementary Data S3.3.11

Timepoint 11

Molecular Function

13 / 510	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GOC:dph, GOC:jl, GOC:tb, GOC:vw]
14 / 515	"Binding to a nucleic acid." [GOC:jl]
385 / 3521	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport across a membrane." [GOC:ma, GOC:vw]
384 / 3514	"The action of a molecule that contributes to the structural integrity of a complex or its assembly within or outside a cell." [GOC:ma, GOC:vw]
92 / 355	"Catalysis of the incorporation of one atom from molecular oxygen into a compound and the reduction of the other atom of oxygen to water." [ISBN:0198506732]
94 / 367	"Catalysis of an oxidation-reduction (redox) reaction in which hydrogen or electrons are transferred from each of two donors, and molecular oxygen is reduced or incorporated into a donor." [GOC:ma]
92 / 358	"Catalysis of an oxidation-reduction (redox) reaction in which an aldehyde or ketone (oxo) group acts as a hydrogen or electron donor and reduces a hydrogen or electron acceptor." [GOC:ai]
90 / 348	"Catalysis of the hydroxylation of sphingolipid long chain bases." [PMID:9556590]
90 / 348	"Catalysis of the conversion of a fatty acid to an alpha-hydroxylated fatty acid. A hydroxyl group is added to the second carbon, counted from the carboxyl end, of a fatty acid chain." [PMID:19054355]
91 / 354	"Catalysis of an oxidation-reduction (redox) reaction in which NADH or NADPH acts as a hydrogen or electron donor and reduces a hydrogen or electron acceptor." [GOC:ai]

Biological Process

0 / 150	"The cellular metabolic process in which a protein is formed, using the sequence of a mature mRNA or circRNA molecule to specify the sequence of amino acids in a polypeptide chain. Translation is mediated by the ribosome." [GOC:ma, GOC:vw]
12 / 336	"Any process that modulates the frequency, rate or extent of transcription mediated by RNA polymerase II." [GOC:go_curators, GOC:txnOH]
86 / 431	"OBSOLETE. A metabolic process that results in the removal or addition of one or more electrons to or from a substance, with or without the concomitant removal or addition of a proton or protons." [GOC:dhl, GOC:ma]
10 / 305	"Any process that modulates the frequency, rate or extent of cellular DNA-templated transcription." [GOC:go_curators, GOC:txnOH]
76 / 372	"A process in which an ion is transported across a membrane." [GOC:ma]
76 / 373	"The process in which an oligopeptide is transported across a membrane. Oligopeptides are molecules that contain a small number (2 to 20) of amino-acid residues connected by peptide linkages." [GOC:vw, ISBN:0198506732]
75 / 369	"The process in which an organomercurial compound is transported across a membrane. Organomercurial substances are any organic compound containing a mercury atom." [GOC:ai, PMID:18793329]
75 / 369	"The directed movement of bicyclomycin across a lipid bilayer, from one side of a membrane to the other. Bicyclomycin (or bicozamycin) is an antibacterial drug often used as a livestock feed additive." [PMID:20067332]
75 / 369	"The process in which carbon dioxide (CO2) is transported across a membrane." [GOC:yaf]
75 / 369	"The process in which urea, the water-soluble compound H2N-CO-NH2, is transported from one side of a membrane to the other by means of some agent such as a transporter or pore." [GOC:ma]

Cellular Compartment

12 / 494	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell growth." [GOC:ma, GOC:vw]
13 / 503	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecular synthesis." [GOC:ma, GOC:vw]
18 / 575	"Organized structure of distinctive morphology and function, bounded by a single or double lipid bilayer membrane and occurring within the cell. Includes the nucleus, mitochondria, plastids, vacuoles, and vesicles." [GOC:ma, GOC:vw]
12 / 476	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
14 / 503	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators, GOC:ma]
12 / 466	"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or parents." [GOC:ma, GOC:vw]
12 / 466	"The entirety of a process in which information is transmitted within a biological system. This process begins with an active signal and ends when a cellular response has been triggered." [GOC:mtg_signal, GOC:mtg_target]
12 / 466	"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration." [GOC:ma, GOC:vw]
12 / 464	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus. The process begins with detection of the stimulus." [GOC:ma, GOC:vw]
12 / 463	"The production of new individuals that contain some portion of genetic material inherited from one or more parent organisms." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]

Supplementary Data S3.3.12

Timepoint 12

Molecular Function

385 / 3521	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport across a membrane." [GOC:ma, GOC:vw]
384 / 3514	"The action of a molecule that contributes to the structural integrity of a complex or its assembly within or outside a cell." [GOC:ma, GOC:vw]
16 / 510	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GOC:dph, GOC:jl, GOC:tb, GOC:vw]
18 / 515	"Binding to a nucleic acid." [GOC:jl]
96 / 358	"Catalysis of an oxidation-reduction (redox) reaction in which an aldehyde or ketone (oxo) group acts as a hydrogen or electron donor and reduces a hydrogen or electron acceptor." [GOC:ai]
94 / 348	"Catalysis of the hydroxylation of sphingolipid long chain bases." [PMID:9556590]
94 / 348	"Catalysis of the conversion of a fatty acid to an alpha-hydroxylated fatty acid. A hydroxyl group is added to the second carbon, counted from the carboxyl end, of a fatty acid chain." [PMID:19054355]
95 / 354	"Catalysis of an oxidation-reduction (redox) reaction in which NADH or NADPH acts as a hydrogen or electron donor and reduces a hydrogen or electron acceptor." [GOC:ai]
94 / 349	"Catalysis of an oxidation-reduction (redox) reaction in which a CH-NH group acts as a hydrogen or electron donor and reduces a hydrogen or electron acceptor." [GOC:ai]
95 / 355	"Catalysis of the incorporation of one atom from molecular oxygen into a compound and the reduction of the other atom of oxygen to water." [ISBN:0198506732]

Biological Process

89 / 431	"OBSOLETE. A metabolic process that results in the removal or addition of one or more electrons to or from a substance, with or without the concomitant removal or addition of a proton or protons." [GOC:dhl, GOC:ma]
0 / 150	"The cellular metabolic process in which a protein is formed, using the sequence of a mature mRNA or circRNA molecule to specify the sequence of amino acids in a polypeptide chain. Translation is mediated by the ribosome." [GOC:ma, GOC:vw]
74 / 372	"A process in which an ion is transported across a membrane." [GOC:ma]
74 / 373	"The process in which an oligopeptide is transported across a membrane. Oligopeptides are molecules that contain a small number (2 to 20) of amino-acid residues connected by peptide linkages." [GOC:vw, ISBN:0198506732]
14 / 336	"Any process that modulates the frequency, rate or extent of transcription mediated by RNA polymerase II." [GOC:go_curators, GOC:txnOH]
73 / 369	"The process in which an organomercurial compound is transported across a membrane. Organomercurial substances are any organic compound containing a mercury atom." [GOC:ai, PMID:18793329]
73 / 369	"The directed movement of bicyclomycin across a lipid bilayer, from one side of a membrane to the other. Bicyclomycin (or bicozamycin) is an antibacterial drug often used as a livestock feed additive." [PMID:20067332]
73 / 369	"The process in which carbon dioxide (CO2) is transported across a membrane." [GOC:yaf]
73 / 369	"The process in which urea, the water-soluble compound H2N-CO-NH2, is transported from one side of a membrane to the other by means of some agent such as a transporter or pore." [GOC:ma]
73 / 369	"The process in which a pyrimidine-containing compound is transported across a membrane. A pyrimidine-containing compound is any compound that contains pyrimidine or a formal derivative thereof." [GOC:ma]

Cellular Compartment

12 / 494	"A biological process represents a specific objective that the organism is genetically programmed to achieve. Biological processes are often described by their outcome or ending state, e.g., the biological process of cell growth." [GOC:ma, GOC:vw]
13 / 503	"The chemical reactions and pathways, including anabolism and catabolism, by which living organisms transform chemical substances. Metabolic processes typically transform small molecules, but also include macromolecular synthesis." [GOC:ma, GOC:vw]
13 / 503	"Any process that is carried out at the cellular level, but not necessarily restricted to a single cell. For example, cell communication occurs among more than one cell, but occurs at the cellular level." [GOC:go_curators, GOC:ma]
12 / 476	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOC:bf, GOC:ma]
12 / 466	"A biological process that directly contributes to the process of producing new individuals by one or two organisms. The new individuals inherit some proportion of their genetic material from the parent or parents." [GOC:ma, GOC:vw]
12 / 466	"The entirety of a process in which information is transmitted within a biological system. This process begins with an active signal and ends when a cellular response has been triggered." [GOC:mtg_signal, GOC:mtg_target]
12 / 466	"Any process that reduces or removes the toxicity of a toxic substance. These may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration." [GOC:ma, GOC:vw]
12 / 464	"Any process that results in a change in state or activity of a cell or an organism (in terms of movement, secretion, enzyme production, gene expression, etc.) as a result of a stimulus. The process begins with detection of the stimulus." [GOC:ma, GOC:vw]
12 / 463	"The production of new individuals that contain some portion of genetic material inherited from one or more parent organisms." [GOC:go_curators, GOC:isa_complete, GOC:jl, ISBN:0198506732]
12 / 463	"Any process involved in the development or functioning of the immune system, an organismal system for calibrated responses to potential internal or invasive threats." [GO_REF:0000022, GOC:add]

Each one of the following pictures is an aggregation of outputs of a GO term enrichment analysis on the results of DEseq2 at each specific point along the transcriptomic time course.

[illegible][illegible][illegible]

GO_Term	P_val	Counts	MolFunc_Description
GO:0004053	0.003027345	2 / 5	"Catalysis of the reaction: L-arginine + H ₂ O = L-ornithine + urea"
GO:0004668	0.003027345	2 / 5	"Catalysis of the reaction: H ₂ O + L-arginyl-[protein] = L-citrulyl-[protein] + urea"

111

112

[illegible]

113

Supplementary Data S3.4.5

GO Term	P_val	Counts	BiolComp_Description
GO:000318	1.59E-026	108 / 1374	"The action of a molecule that contributes to the structural integrity of a complex." [GOC:mah, GOC:vcw]
GO:0003215	1.57E-005	159 / 372	"Enables the directed movement of substances [such as macromolecules, small molecules, ions] into, out of, or within a cell, or between cells." [GOC:ca, GOC:glg]
GO:001691	7.07E-056	45 / 624	"Catalysis of an oxidation-reduction [redox] reaction, a reversible chemical reaction in which the oxidation state of an atom or atoms within a molecule is altered. One substrate acts as a hydrogen or electron donor and becomes oxidized, while the other acts as hydrogen or e
GO:000410	8.86E-056	109 / 3674	"Any molecular function that controls the rate, timing and/or magnitude of gene transcription. The function of transcriptional regulators is to modulate gene expression at the transcription step so that they are expressed in the right cell at the right time and in the right amount
GO:0005488	0.0001382	139 / 380	"The selective, non-covalent, often stoichiometric, interaction of a molecule with one or more specific sites on another molecule." [GOC:ca, GOC:mah, ISBN:0195850073]
GO:000609	0.0001603	126 / 3674	"The binding activity of a molecule that brings together two or more molecules through a selective, non-covalent, often stoichiometric interaction, permitting those molecules to function in a coordinated way." [GOC:mg, MIT_136a07, GOC:vcw]
GO:000695	0.0001938	109 / 3674	"A molecular function representing the directed movement of electrons from one molecular entity to another, typically mediated by electron carriers or acceptors, resulting in the transfer of energy and/or the reduction-oxidation [redox] transformation of chemical species. Th
GO:0014023	0.0002022	149 / 3674	"A molecular function required for core promoter activity that mediates the assembly of the RNA polymerase holoenzyme at promoter DNA to form the pre-initiation complex (PIC). General transcription factors (GTFs) bind to end and core promoter DNA, initiate RNA synthesis an
GO:0002018	0.0002144	169 / 362	"Inhibition of the reactions brought about by diagenesis (D) or prokaryotes. Usually the molecular activity is effective because it can itself be more easily oxidized than the substances protected. The term is often applied to components that can trap free radicals, thereby breaking the c
GO:008712	0.0002249	168 / 362	"A molecular function that regulates the activity of its target via non-covalent binding that does not result in covalent modification to the target. Examples of molecular function regulators include regulatory subunits of multimeric enzymes and channels. Mechanisms of t
GO:004535	0.0002644	169 / 363	"Functions in the storage of substances [targets]." [GOC:ca]
GO:008024	0.0002788	169 / 363	"Binding specifically to a substrate [target] to deliver it to a transport vesicle. Cargo receptors span a membrane [either the plasma membrane or a vesicle membrane], binding simultaneously to cargo molecules and coat adaptors, to efficiently recruit soluble proteins to nasce
GO:0041483	0.0002841	139 / 363	"Binding to a protein or a protein-containing complex to assist the protein folding process." [GOC:mg, cambridge, 2000]
GO:0045182	0.0002841	169 / 363	"Any molecular function involved in the initiation, activation, perpetuation, repression or termination of polypeptide synthesis at the ribosome." [GOC:ca]
GO:0014034	0.0002845	169 / 363	"Directly binding to a specific ion or molecule and delivering it either to an acceptor molecule or to a specific location." [GOC:molecule, function, reflecting, GOC:pb]
GO:0006089	0.0002673	168 / 3674	"A compound molecular function in which an effector function is controlled by one or more regulatory components." [GOC:doe, GOC:pb]
GO:0007079	0.0002673	168 / 3674	"Interacting selectively with one or more biological molecules in another [target] organism, initiating pathogenesis [leading to an abnormal, generally detrimental state] in the target organism. The activity should refer to an evolved function of the active gene product, i.e. one
GO:0014029	0.0002673	168 / 3674	"Binding to a small molecule and eliciting a change in the protein's activity in response to the small molecule." [PMID:6338879]
GO:0014013	0.0002673	168 / 3674	"Binding to a specific molecule to prevent it from interacting with other partners or to inhibit its localization to the area of the cell or complex where it is active." [PMID:1331007]
GO:0014049	0.0002673	168 / 3674	"The action of a molecule that provides a shape or a sequence mimicking or complementary to the final product, providing template for copying the original molecule's shape or sequence." [GOC:pg]
GO:0014022	0.0002673	168 / 3674	"The activity of joining two lipid bilayers to form a single membrane." [PMID:1033732, PMID:11493675, PMID:12609315, PMID:13200701, PMID:13641474]
GO:0046091	0.0002673	168 / 3674	"Binding to an RNA in an RNA-containing complex to assist the folding process." [PMID:13160715]
GO:0014078	0.0002673	168 / 3674	"A molecular function that involves direct binding to one of the subunits of a protein-containing complex and promoting the dissociation of one or more subunits. This often happens by changing the conformation of the protein being bound, which decreases its affinity for th
GO:0014077	0.0002673	168 / 3674	"A molecular function that involves direct binding to one of the subunits of a protein-containing complex, thus preventing an interaction with a factor that would promote dissociation of the complex." [PMID:3404023]
GO:0014091	0.0002673	168 / 3674	"Any activity in which a protein is inserted into the membrane of another cell where it forms transmembrane pores. Pore disrupts the integrity of the cell membrane, resulting in depolarized ion homeostasis, cellular dysfunction, and can result in cell death." [PMID:1804693, P
GO:0014012	0.0002673	168 / 3674	"Binding to a membrane and increasing its permeability. This may lead to cell membrane lysis and cell content release." [PMID:3486067]
GO:0014107	0.0002673	168 / 3674	"Any molecular function exhibited by a protein that is covalently attached [ASA tagged or conjugated] to another molecule [for example a protein or a lipid] where it acts as a marker, recognized by the cellular apparatus to target the tagged protein for some cellular process suc
GO:0018020	0.0002673	168 / 3674	"Any activity of inserting a membrane." [PMID:13160715]
GO:0018024	0.0002673	168 / 3674	"Any activity in which a protein, or group of proteins, acts to restrict the size of a fenestration in a membrane or membrane system (i.e. restrict the diameter of a hole in a membrane). An example of this is the molecular function is performed by ESCRT-III proteins at the nucleus
GO:0014057	0.0002673	168 / 3674	"A molecular function characterized by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport against a concentration gradient." [PMID:24878163, PMID:25707373]
GO:0014090	0.0002763	150 / 362	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0003848	27 / 334	"Binding to double-stranded DNA." [GOC:ch, GOC:vcw, PMID:27974124]
GO:0003676	0.0003848	27 / 333	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0003848	27 / 334	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0003848	27 / 334	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0003912	127 / 334	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0007263	150 / 362	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0008487	27 / 334	"Binding to double-stranded DNA." [GOC:ch, GOC:vcw, PMID:27974124]
GO:0003676	0.0008487	27 / 333	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0008487	27 / 334	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0008487	27 / 334	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0009012	127 / 334	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0009273	150 / 362	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
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GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
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GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch]
GO:0003677	0.0010507	97 / 84	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GOC:pb, GOC:ch, GOC:ch, GOC:ch, GOC:ch]
GO:0003684	0.0010507	97 / 84	"Binding to damaged DNA." [GOC:ch]
GO:0014060	0.0010507	97 / 84	"Binding to DNA that is assembled into chromatin." [GOC:mah]
GO:0003674	0.0010507	97 / 84	"Generation of force resulting in movement, for example along a microfilament or microtubule, or a torque resulting in membrane scission or rotation of a flagellum. The energy required is obtained either from the hydrolysis of a nucleoside triphosphate or by an electroche
GO:0003698	0.0010507	97 / 84	"Catalysis of the reaction: dTPP + H2O -> dTP + H+ + phosphate. May or may not be coupled to another reaction." [REA:29387]
GO:0003676	0.0010507	97 / 84	"Binding to a nucleic acid." [GOC:ch

115

[illegible]

GO_Term	P_val	Counts	MolFunc_Description
GO:0016491	5.7711E-10	72 / 658	*Catalysis of an oxidation-reduction (redox) reaction, a reversible chemical reaction in which the oxidation state of an atom or atoms within a molecule is altered. One substrate acts as a hydrogen or electron donor and becomes oxidized, while the other acts as hydrogen or electron acceptor and becomes reduced. Includes the directed movement of substances (such as macromolecules, small molecules, ions) into, out of or within a cell, or between cells. [GOC:val, GOC:del]
GO:0005215	8.56075E-09	172 / 372	*Enables the directed movement of substances (such as macromolecules, small molecules, ions) into, out of or within a cell, or between cells. [GOC:val, GOC:del]

116

117

GO_Term	P_val	Counts	MolFunc_Description
GO:0005198	9.81447E-07	369 / 3741	"The action of a molecule that contributes to the str

118

GO Term	Counts	MolFunc Description
GO:0003676	9,257,911 of 37 / 531	"Binding to a nucleic acid." [GO:01]
GO:0003677	8,642,046 of 39 / 527	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA (deoxyribonucleic acid)." [GO:003, GO:3, GO:3b, GO:3c]
GO:0014892	3,070,092 of 39 / 324	"Binding to DNA that is assembled into chromatin." [GO:003a]
GO:0008270	4,257,964 of 37 / 489	"Binding to a zinc ion [GO:01]
GO:0005138	1,200,996 of 40 / 1741	"The action of a molecule that contributes to the structural integrity of a complex." [GO:003a, GO:3c]
GO:0005139	2,502,056 of 40 / 131	"Catalysis of an oxidation-reduction (redox) reaction in which hydrogen or electrons are transferred from NADH or NADPH and one other donor, and one atom of oxygen is incorporated into one donor." [GO:003a]
GO:000081	3,650,812 of 36 / 270	"A DNA-binding transcription factor activity that modulates the transcription of specific genes transcribed by RNA polymerase II." [GO:0003b, GO:018]
GO:0005140	5,492,446 of 36 / 270	"Binding to single-stranded DNA." [GO:003, GO:003b, GO:003b.1, GO:003b.2, GO:003b.3, GO:003b.4, GO:003b.5, GO:003b.6, GO:003b.7, GO:003b.8, GO:003b.9, GO:003b.10, GO:003b.11, GO:003b.12, GO:003b.13, GO:003b.14, GO:003b.15, GO:003b.16, GO:003b.17, GO:003b.18, GO:003b.19, GO:003b.20, GO:003b.21, GO:003b.22, GO:003b.23, GO:003b.24, GO:003b.25, GO:003b.26, GO:003b.27, GO:003b.28, GO:003b.29, GO:003b.30, GO:003b.31, GO:003b.32, GO:003b.33, GO:003b.34, GO:003b.35, GO:003b.36, GO:003b.37, GO:003b.38, GO:003b.39, GO:003b.40, GO:003b.41, GO:003b.42, GO:003b.43, GO:003b.44, GO:003b.45, GO:003b.46, GO:003b.47, GO:003b.48, GO:003b.49, GO:003b.50, GO:003b.51, GO:003b.52, GO:003b.53, GO:003b.54, GO:003b.55, GO:003b.56, GO:003b.57, GO:003b.58, GO:003b.59, GO:003b.60, GO:003b.61, GO:003b.62, GO:003b.63, GO:003b.64, GO:003b.65, GO:003b.66, GO:003b.67, GO:003b.68, GO:003b.69, GO:003b.70, GO:003b.71, GO:003b.72, GO:003b.73, GO:003b.74, GO:003b.75, GO:003b.76, GO:003b.77, GO:003b.78, GO:003b.79, GO:003b.80, GO:003b.81, GO:003b.82, GO:003b.83, GO:003b.84, GO:003b.85, GO:003b.86, GO:003b.87, GO:003b.88, GO:003b.89, GO:003b.90, GO:003b.91, GO:003b.92, GO:003b.93, GO:003b.94, GO:003b.95, GO:003b.96, GO:003b.97, GO:003b.98, GO:003b.99, GO:003b.100, GO:003b.101, GO:003b.102, GO:003b.103, GO:003b.104, GO:003b.105, GO:003b.106, GO:003b.107, GO:003b.108, GO:003b.109, GO:003b.110, GO:003b.111, GO:003b.112, GO:003b.113, GO:003b.114, GO:003b.115, GO:003b.116, GO:003b.117, GO:003b.118, GO:003b.119, GO:003b.120, GO:003b.121, GO:003b.122, GO:003b.123, GO:003b.124, GO:003b.125, GO:003b.126, GO:003b.127, GO:003b.128, GO:003b.129, GO:003b.130, GO:003b.131, GO:003b.132, GO:003b.133, GO:003b.134, GO:003b.135, GO:003b.136, GO:003b.137, GO:003b.138, GO:003b.139, GO:003b.140, GO:003b.141, GO:003b.142, GO:003b.143, GO:003b.144, GO:003b.145, GO:003b.146, GO:003b.147, GO:003b.148, GO:003b.149, GO:003b.150, GO:003b.151, GO:003b.152, GO:003b.153, GO:003b.154, GO:003b.155, GO:003b.156, GO:003b.157, GO:003b.158, GO:003b.159, GO:003b.160, GO:003b.161, GO:003b.162, GO:003b.163, GO:003b.164, GO:003b.165, GO:003b.166, GO:003b.167, GO:003b.168, GO:003b.169, GO:003b.170, GO:003b.171, GO:003b.172, GO:003b.173, GO:003b.174, GO:003b.175, GO:003b.176, GO:003b.177, GO:003b.178, GO:003b.179, GO:003b.180, GO:003b.181, GO:003b.182, GO:003b.183, GO:003b.184, GO:003b.185, GO:003b.186, GO:003b.187, GO:003b.188, GO:003b.189, GO:003b.190, GO:003b.191, GO:003b.192, GO:003b.193, GO:003b.194, GO:003b.195, GO:003b.196, GO:003b.197, GO:003b.198, GO:003b.199, GO:003b.200, GO:003b.201, GO:003b.202, GO:003b.203, GO:003b.204, GO:003b.205, GO:003b.206, GO:003b.207, GO:003b.208, GO:003b.209, GO:003b.210, GO:003b.211, GO:003b.212, GO:003b.213, GO:003b.214, GO:003b.215, GO:003b.216, GO:003b.217, GO:003b.218, GO:003b.219, GO:003b.220, GO:003b.221, GO:003b.222, GO:003b.223, GO:003b.224, GO:003b.225, GO:003b.226, GO:003b.227, GO:003b.228, GO:003b.229, GO:003b.230, GO:003b.231, GO:003b.232, GO:003b.233, GO:003b.234, GO:003b.235, GO:003b.236, GO:003b.237, GO:003b.238, GO:003b.239, GO:003b.240, GO:003b.241, GO:003b.242, GO:003b.243, GO:003b.244, GO:003b.245, GO:003b.246, GO:003b.247, GO:003b.248, GO:003b.249, GO:003b.250, GO:003b.251, GO:003b.252, GO:003b.253, GO:003b.254, GO:003b.255, GO:003b.256, GO:003b.257, GO:003b.258, GO:003b.259, GO:003b.260, GO:003b.261, GO:003b.262, GO:003b.263, GO:003b.264, GO:003b.265, GO:003b.266, GO:003b.267, GO:003b.268, GO:003b.269, GO:003b.270, GO:003b.271, GO:003b.272, GO:003b.273, GO:003b.274, GO:003b.275, GO:003b.276, GO:003b.277, GO:003b.278, GO:003b.279, GO:003b.280, GO:003b.281, GO:003b.282, GO:003b.283, GO:003b.284, GO:003b.285, GO:003b.286, GO:003b.287, GO:003b.288, GO:003b.289, GO:003b.290, GO:003b.291, GO:003b.292, GO:003b.293, GO:003b.294, GO:003b.295, GO:003b.296, GO:003b.297, GO:003b.298, GO:003b.299, GO:003b.300, GO:003b.301, GO:003b.302, GO:003b.303, GO:003b.304, GO:003b.305, GO:003b.306, GO:003b.307, GO:003b.308, GO:003b.309, GO:003b.310, GO:003b.311, GO:003b.312, GO:003b.313, GO:003b.314, GO:003b.315, GO:003b.316, GO:003b.317, GO:003b.318, GO:003b.319, GO:003b.320, GO:003b.321, GO:003b.322, GO:003b.

GO Term	Count	BiOfnc Process
GO:0004007	1,753,378 to 102,417,597	"The increase in size or mass of an entire organism, a part of an organism or a cell." [GOCCb, GOCCm]
GO:0007080	2,894,318 to 102,401,421	"The directed movement of inorganic substance (H ₂ O) to a cell across a plasma membrane." [GOCCm, PMID:20863101]
GO:0005505	1,121,636 to 102,401,421	"The process in which a solute is transported across a lipid bilayer, from one side of a membrane to the other." [GOCCb, GOCCd]
GO:0008055	3,666,668 to 102,401,421	"The process in which a xenobiotic, a compound foreign to the organism exposed to it, is transported across a membrane. It may be synthesized by another organism (like ampicillin) or it can be a synthetic chemical." [GOCC, GOCCm, GOCCn]
GO:0008056	3,666,668 to 102,401,421	"The process in which a xenobiotic, a compound foreign to the organism exposed to it, is transported across a membrane. It may be synthesized by another organism (like ampicillin) or it can be a synthetic chemical." [GOCC, GOCCm, GOCCn]
GO:0034220	9,915,518 to 102,401,421	"The directed movement of nucleic acids, or of one or within a cell, or between cells, by means of some agent such as a transport protein. Nucleic acids may be any nucleotide in which the distal phosphate residue of a nucleoside 5'-phosphate is in glycosidic linkage with a monosaccharide." [GOCCb, GOCCm, GOCCn]
GO:0046067	9,915,518 to 102,401,421	"The directed movement of substances from the cytosol to the endoplasmic reticulum of a cell." [GOCCm]
GO:1000042	9,915,518 to 102,401,421	"The process in which a polymeric macromolecule is transported across a membrane." [GOCC-TermGenie, GOCCm]
GO:0006810	5,248,518 to 102,401,421	"The directed movement of substances [such as macromolecules, small molecules, ions, or cellular components (such as complexes and organelles)] into or out of within a cell, or between cells, or within a multicellular organism by means of some agent such as a transporter or a transport complex." [GOCCb, GOCCm, GOCCn]
GO:0001407	5,569,628 to 102,401,421	"The process in which a glycerophospholipid is transported across a membrane. Glycerophospholipids are small molecules composed of glycerol 3-phosphate and an alcohol, for example, glycerophosphoinositol." [GOCCm, PMID:2512892]
GO:0001408	5,569,628 to 102,401,421	"The process in which glycerol 3-phosphate is transported across a membrane. Glycerol 3-phosphate is a phospholipid precursor." [GOCCm, PMID:2512892]
GO:0001587	5,569,628 to 102,401,421	"The process in which an organometallic compound is transported across a membrane. Organometallic substances are any organic compound containing a mercury atom." [GOCCm, PMID:1873329]
GO:0001904	5,569,628 to 102,401,421	"The directed movement of tetracycline from one side of a membrane to the other. Tetracycline is a broad spectrum antibiotic that blocks binding of aminoacyl tRNA to the ribosomes of both Gram-positive and Gram-negative organisms (and those of organelles)." [GOCCurators]
GO:0001905	5,569,628 to 102,401,421	"The directed movement of bicyclopentan or lipid bicyclopentan from one side of a membrane to the other. Bicyclopentan (or bicyclopentan) is an antibacterial drug often used as a livestock feed additive." [GOCCm]
GO:0003538	5,569,628 to 102,401,421	"The process in which carbon dioxide (CO ₂) is transported across a membrane." [GOCCyaf]
GO:0003546	5,569,628 to 102,401,421	"The process in which those phosphate (glycerol dihydroxy 5-phosphate) is transported across a membrane. Glycerol dihydroxy 5-phosphate is an organic three carbon compound used in research." [GOCCm, ISBN:019506732]
GO:0003547	5,569,628 to 102,401,421	"The process in which glycerol 2-phosphate is transported across a membrane. Glycerol 2-phosphate is a phospholipid precursor of glycerol." [GOCCm]
GO:0007198	5,569,628 to 102,401,421	"The process in which urea, the water-soluble compound H ₂ N CO NH ₂ , is transported from one side of a membrane to the other by means of some agent such as a transporter or pore." [GOCCm]
GO:0072489	5,569,628 to 102,401,421	"The process in which methylmethanion is transported across a membrane." [GOCCm]
GO:0072531	5,569,628 to 102,401,421	"The process in which a pyrimidine-containing compound is transported across a membrane. A pyrimidine-containing compound is any compound that contains pyrimidine or a formal derivative thereof." [GOCCm]
GO:0080162	5,569,628 to 102,401,421	"The directed movement of axons from endoplasmic reticulum to cytosol." [GOCCm, PMID:19506555]
GO:0080170	5,569,628 to 102,401,421	"The process in which hydrogen peroxide is transported across a membrane." [GOCCb]
GO:0080640	5,569,628 to 102,401,421	"The process in which an inorganic ion is transported across a membrane." [GOCCm]
GO:00140317	5,569,628 to 102,401,421	"The directed movement of a substance across the outer membrane in cells with two membranes." [GOCCm, PMID:19568039]
GO:0170006	5,569,628 to 102,401,421	"The process in which lipote is transported across a membrane." [GOCC, PMID:2098265, PMID:2591296]
GO:0019342	5,569,628 to 102,401,421	"The directed movement of nucleoside across a membrane." [GOCCy, GOCC-TermGenie]
GO:0019348	5,569,628 to 102,401,421	"The process in which arsenate is transported across a membrane." [GOCC-TermGenie]
GO:0019362	5,569,628 to 102,401,421	"The directed movement of 5-adenosyl L-methionine across a membrane." [GOCC-TermGenie, PMID:20497160]
GO:00192418	5,569,628 to 102,401,421	"The process in which (1)-alcoholic 3-thioglyceranediol is transported across a membrane." [GOCC-TermGenie, PMID:24028845]
GO:0019263	5,569,628 to 102,401,421	"The directed movement of carline across a membrane." [GOCC, PMID:000006, GOCCy, GOCC-TermGenie]
GO:0019264	5,569,628 to 102,401,421	"The process in which acyl carline is transported across a membrane." [GOCC, PMID:000006, GOCCy, GOCC-TermGenie]
GO:0019265	5,569,628 to 102,401,421	"The process in which an organic acid is transported across a membrane." [GOCC, PMID:000006, GOCC-TermGenie]
GO:0045117	4,406,058 to 102,401,421	"The directed movement of azoles, heterocyclic compounds found in many biologically important substances, such as lipid metabolites, across a membrane." [GOCC-TermGenie, PMID:25730726, Wikipedia:Azole]
GO:0007194	4,406,058 to 102,401,421	"The process in which phytochrome is transported across a membrane. Phytochromes are a group of pigments that bind metal ions (e.g., Cu, Fe, Mg) in holate coordination complexes." [GOCCm, PMID:19506732]
GO:0007195	4,406,058 to 102,401,421	"The directed movement of substances from the cytosol into the Golgi apparatus of a cell." [GOCCm]
GO:0015791	4,487,508 to 102,401,421	"The directed movement of polyols, any polyalcohol, across a membrane." [GOCC-TermGenie, PMID:28733546]
GO:0001578	7,705,058 to 102,401,421	"The process in which a carboxylate is transported across a membrane." [GOCCm]
GO:0001579	7,705,058 to 102,401,421	"The process in which a steroid is transported across a membrane. Steroid steroids with one or more hydroxyl groups and a hydrocarbon side-chain in the molecule." [GOCCm]
GO:0034461	4,487,508 to 102,401,421	"The process in which a vitamin is transported across a membrane. A vitamin is one of a number of unrelated organic compounds that occur in many small amounts and that are necessary in trace amounts for the normal metabolic functioning of the body." [GOCCm]
GO:0001580	4,487,508 to 102,401,421	"The process in which a purine-containing compound is transported across a membrane. A purine-containing compound is any compound that contains purine or a formal derivative thereof." [GOCCm]
GO:0019179	4,487,508 to 102,401,421	"The directed movement of nucleoside across a membrane." [GOCC-TermGenie]
GO:0034466	4,487,508 to 102,401,421	"The process in which a solute is transported from one side of the vacuolar membrane to the other." [GOCCm]
GO:0001581	4,487,508 to 102,401,421	"The process

[illegible]

ID	Count	Molecular Description
00000036	1.036156E-09 / 531	"Binding to a nucleic acid" [GO:0030216]
00000037	4.551725E-09 / 5214	"Any molecular function from both a gene product interact selectively and non-covalently with DNA (deoxyribonucleic acid)" [GO:0043034, GO:0030216, GO:0030217]
00000038	5.826866E-09 / 1274	"The action of a molecule that contributes to the structural integrity of a complex." [GO:0043034, GO:0030216]
00000039	1.467020E-04 / 5323	"The action of a molecule that contributes to the structural integrity of the ribosome." [GO:0030216]
00000040	1.562705E-02 / 7124	"Binding to DNA that is assembled into chromatin." [GO:0030216]
00000041	9.879646E-06 / 314	"Binding to single-stranded DNA" [GO:0043034, GO:0030216, PMID:2297514]
00000042	1.812355E-05 / 489	"Binding to a zinc ion (Zn)" [GO:0043034]
00000043	1.473486E-05 / 278	"Any molecular function from both a gene product interact selectively and non-covalently with the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport against a concentration gradient." [PMID:2487834, PMID:2570732, PMID:3293037, PMID:3293038]
00000044	3.689205E-05 / 112	"Binding to a ribosomal RNA" [GO:0030216]
00000045	3.689462E-05 / 122	"Binding to a DNA secondary structure element such as a four-way junction, a bubble, a loop, a Y-form DNA, or a double-strand/single-strand junction." [GO:0030216]
00000046	1.951407E-05 / 1018	"Any DNA binding transcription factor activity that modulates the transcription of specific gene sets transcribed by RNA polymerase α " [GO:0030216]
00000047	3.831645E-05 / 13	"Enables the transfer of sulfur amino acids from one side of a membrane to the other. Sulfur amino acids contain sulfur in the form of cysteine, methionine or their derivatives." [GO:0043034, GO:0030216, PMID:83047029]
00000048	4.20712E-06 / 3014	"Binding to double-stranded DNA" [GO:0030216, GO:0030217]
00000049	1.944645E-05 / 278	"Any molecular function from both a gene product interact selectively and non-covalently to determine the original structure of DNA, typically a straight helix, into a bend, or increasing the bend if the original structure was intrinsically bent due to its sequence." [GO:0030216, PMID:1071071, PMID:1937758]
00000050	4.684854E-05 / 2781	"Binding to DNA ends exposed by the creation of double strand breaks (DSBs)" [GO:0030216]
00000051	4.684854E-05 / 2781	"Any molecular function from both a gene product interact selectively and non-covalently to determine the original structure of DNA, typically a straight helix, into a bend, or increasing the bend if the original structure was intrinsically bent due to its sequence." [GO:0030216, PMID:1071071, PMID:1937758]
00000052	1.944645E-05 / 278	"Binding to nucleic acid via hydrogen bonds between the bases of a target DNA molecule and the bases of a target DNA molecule." [GO:0030216]
00000053	1.944645E-07 / 2780	"Binding to DNA in a bent conformation." [GO:0030216, PMID:1262797]
00000054	1.944645E-07 / 2780	"Binding to a genomic region which promotes recombination." [GO:0030216]
00000055	1.944645E-07 / 2780	"Binding to a DNA triple helix. The formation of triple helix DNA has been evoked in several cellular processes including transcription, replication, and recombination." [PMID:10485138]
00000056	1.944645E-07 / 2780	"Binding to G-quadruplex DNA structures, in which groups of four guanines adopt a flat, cyclic Hoogsteen hydrogen bonding arrangement known as a quartet repeat. The stacking of quartet tetrads results in G-quadruplex DNA structures. G-quadruplex DNA can form under physiological conditions from a single-stranded DNA molecule." [GO:0030216, PMID:1161895]
00000057	1.944645E-07 / 2780	"DNA-binding activity that is dependent on binding to a histone." [PMID:1161895]
00000058	4.05428E-06 / 3014	"Binding to DNA of a specific nucleotide composition, e.g. with a GC-rich DNA binding, or with a GC-rich DNA binding, or with a GC-rich DNA binding." [GO:0030216]
00000059	6.206434E-04 / 265	"A transcriptional regulator activity that modulates transcription of gene sets selective and non-covalent binding to a specific double-stranded genomic DNA sequence [sometimes referred to as a motif] within a cis-regulatory region. Regulatory regions include promoters (proximal and distal) and enhancers." [GO:0030216]
00000060	7.538688E-06 / 3014	"Binding to a RNA molecule or a portion thereof." [GO:0030216]
00000061	0.000000215 / 109	"Binding to a small molecular RNA" [GO:0030216]
00000062	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000063	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000064	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000065	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000066	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000067	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000068	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000069	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000070	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000071	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000072	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000073	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000074	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000075	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000076	0.00000018 / 107	"Enables the transfer of an amino acid from one side of a membrane to the other. L-amino acids are the enantiomers of amino acids." [GO:0043034, GO:0030216, GO:0030217, PMID:83047029]
00000077	0.0000	

GO ID	Term	Counts	BiProc_Description
GO:0000001	1.75592E-055 / 359	"The increase in size of mass of an entire organism, part of an organism or a cell." [GO:CM, GO:CM]	
GO:0000014	3.65696E-06 / 107	"The successive addition of amino acid residues to a nascent polypeptide chain during protein biosynthesis." [GO:CM]	
GO:0001254	4.80606E-08 / 52	"The chemical reaction and pathways resulting in the formation of a protein in a ribonucleoside." [GO:CM]	
GO:0002081	1.88792E-08 / 110	"The chemical reactions and pathways resulting in the formation of a protein in the cytoplasm. This is a ribosome-mediated process in which the information in messenger RNA (mRNA) is used to specify the sequence of amino acids in the protein." [GO:CM]	
GO:0003090	1.09277E-07 / 12 / 15	"Any cellular process that results in the specification, formation or maintenance of polarized actin-based cytoskeletal structures." [GO:CM]	
GO:0003091	1.09277E-07 / 81	"The chemical reactions and pathways resulting in the formation of a protein in a cell. This is a ribosome-mediated process in which the information in messenger RNA (mRNA) is used to specify the sequence of amino acids in the protein; the plastid has its own ribosomes and transfer RNAs, and uses a	
GO:0003091	1.41532E-07 / 81	"An internal terminal pyridine demethylation process that contributes to translation." [GO:CM]	
GO:0014041	3.41532E-07 / 81	"Translation that occurs at the synapse." [GO:CM] [PMID:2308742]	
GO:0017000	1.52078E-07 / 403	"The directed movement of inorganic solutes (inorganic 3+ physiological pH) across a plasma membrane." [GO:CM, PMID:2086130]	
GO:0004085	3.99123E-07 / 402	"The process in which a xenobiotic, a compound foreign to the organism exposed to it, is transported across a membrane. It may be synthesized by another organism (like ampicillin) or it can be a synthetic chemical." [GO:CM, GO:CM, GO:CM]	
GO:0005079	3.99123E-07 / 402	"The directed movement of nucleotide sugars, such as d- or L-sorbitol, or, between cells, by means of some agent such as a transporter or pore. Nucleotide sugars are nucleotides in which the distal phosphate of a nucleoside-5' diphosphate is in glycosidic linkage with a monosaccharide or disaccharide." [GO:CM]	
GO:0001282	1.11539E-07 / 04	"Any cellular metabolic process involving deoxyribonucleic acid. This is one of the two main types of nucleic acid, consisting of a long, unbranched macromolecule formed from one, or more, commonly two, strands of linked deoxyribose nucleotides." [GO:CM] [PMID:119506732]	
GO:0001476	4.13150E-07 / 186	"The chemical reactions and pathways resulting in the formation of a macromolecule, any molecule of high relative molecular mass, the structure of which requires a complex sequence of events, the multiplication of units derived, actually or conceptually, from molecules of low relative molecular mass." [GO:CM]	
GO:0003420	4.52525E-07 / 402	"The process in which a monomer is transported across a membrane." [GO:CM]	
GO:0003420	4.52525E-07 / 402	"The process in which a solute is transported from one side of the vacuolar membrane to the other." [GO:CM]	
GO:0003420	4.52525E-07 / 402	"The process in which a solute is transported from one side of the endoplasmic reticulum to the other." [GO:CM]	
GO:0003420	4.52525E-07 / 402	"The process in which a polymer macromolecule is transported across a membrane." [GO:CM, GO:CM, GO:CM]	
GO:0005085	4.5746E-07 / 143	"The process in which a solute is transported across a lipid bilayer, from one side of a membrane to the other." [GO:CM, GO:CM]	
GO:0005085	4.5746E-07 / 143	"The process in which a glycerophospholipid is transported across a membrane. Glycerophospholipids are compounds composed of glycerol-3-phosphate and an alcohol, for example, glycerophosphatidylcholine." [GO:CM, PMID:12912892]	
GO:0005074	5.77632E-07 / 102	"The process in which glycerol-3-phosphate is transported across a membrane. Glycerol-3-phosphate is a phosphoric monomer of glycerol." [GO:CM]	
GO:0001897	5.77632E-07 / 102	"The process in which an organosulphur compound is transported across a membrane. Organosulphur compounds are any organic compound containing a mercury atom." [GO:CM, PMID:18199329]	
GO:0005074	5.77632E-07 / 102	"The process in which glycerol-3-phosphate is transported across a membrane. Glycerol-3-phosphate is a phosphoric monomer of glycerol." [GO:CM]	
GO:0005095	5.77632E-07 / 102	"The directed movement of bicyclic nucleoside across a lipid bilayer, from one side of a membrane to the other. Bicyclic nucleoside (or bicyclic) is an antitubercular drug often used as a biosensit feed." [GO:CM] [PMID:23067529]	
GO:0005378	5.77632E-07 / 102	"The process in which carbon dioxide (CO2) is transported across a membrane." [GO:CM]	
GO:0005378	5.77632E-07 / 102	"The process in which triose phosphate (glyceraldehyde-3-phosphate) is transported across a membrane. Glyceraldehyde-3-phosphate is any organic, three carbon compound whose ester." [GO:CM, PMID:119506732]	
GO:0007011	5.77632E-07 / 102	"The process in which glycerol-2-phosphate is transported across a membrane. Glycerol-2-phosphate is a phosphoric monomer of glycerol." [GO:CM]	
GO:0001918	5.77632E-07 / 102	"The process in which urea, the water soluble compound H2N-CO-NH2, is transported from one side of a membrane to the other by means of some agent such as a transporter or pore." [GO:CM]	
GO:0002489	5.77632E-07 / 102	"The process in which methanethiolamine is transported across a membrane." [GO:CM]	
GO:0007251	5.77632E-07 / 102	"The process in which a pyrimidine-containing compound is transported across a membrane. A pyrimidine-containing compound is any compound that contains pyrimidine or a formal derivative thereof." [GO:CM]	
GO:0001762	5.77632E-07 / 102	"The directed movement of azides from endoplasmic reticulum to cytoplasm." [GO:CM] [PMID:1956555]	
GO:0001762	5.77632E-07 / 102	"The process in which hydrogen peroxide is transported across a membrane." [GO:CM]	
GO:0008660	5.77632E-07 / 102	"The process in which an inorganic ion is transported across a membrane." [GO:CM, GO:CM]	
GO:0001417	5.77632E-07 / 102	"The directed movement of a substance across the outer membrane in cells with two membranes." [PMID:15964039]	
GO:0001762	5.77632E-07 / 102	"The process in which lipids is transported across a membrane." [PMID:2008263, PMID:2017186]	
GO:0001642	5.77632E-07 / 102	"The directed movement of nucleoside across a membrane." [GO:CM, GO:CM]	
GO:0001648	5.77632E-07 / 102	"The process in which arsenate is transported across a membrane." [GO:CM]	
GO:0001648	5.77632E-07 / 102	"The directed movement of 4-sideroxyl-5-methylthioacetic acid across a membrane." [GO:CM, PMID:10897160]	
GO:0004218	5.77632E-07 / 102	"The process in which (4)-abscisic acid D-glucuronoyl ester is transported across a membrane." [GO:CM, PMID:20248845]	
GO:0001603	5.77632E-07 / 102	"The directed movement of carotene across a membrane." [GO:RE, GO:000006, GO:CM, GO:CM]	
GO:0002620	5.77632E-07 / 102	"The process in which acid carotene is transported across a membrane." [GO:RE, GO:000006, GO:CM, GO:CM]	
GO:0001825	5.77632E-07 / 102	"The process in which an organic acid is transported across a membrane." [GO:RE, GO:000006, GO:CM]	
GO:0008754	6.18011E-07 / 547 / 552	"Any process which reduces or removes the toxicity of a toxic substance. This may include transport of the toxic substance away from sensitive areas and to compartments or complexes whose purpose is sequestration of the toxic substance." [GO:CM]	
GO:0004517	6.53414E-07 / 102	"Biological processes that directly contribute to the production of new individuals by one or more organisms." [GO:CM, GO:CM, GO:CM]	
GO:0001994	6.53414E-07 / 102	"The directed movement of azides, heterocyclic compounds found in many biologically important molecules, across a lipid bilayer, across a membrane." [GO:CM, GO:CM, GO:CM]	
GO:0001994	6.53414E-07 / 102	"The process in which a phytochelatin is transported across a membrane. Phytochelatin is a group of peptides that bind metals (Cd, Zn, Cu, Pb) in chelate coordination." [GO:CM, PMID:119506732]	
GO:0001994	6.53414E-07 / 102	"The directed movement of substances from the cytoplasm into the vacuolar space." [GO:CM]	
GO:0001994	6.53414E-07 / 102	"The directed movement of polyols, any polyhydroxy alcohol, across a membrane." [GO:CM]	
GO:0001994	6.53414E-07 / 102	"The process in which a steroid is transported across a membrane." [GO:CM]	
GO:0003582	6.78447E-07 / 402	"The process in which a steroid is transported across a membrane. Steroids are steroids which are or more hydroxyl groups and a hydrocarbon side-chain in the molecule." [GO:CM]	

[illegible]

GO Term	P_val	Counts	MolFem. Description
GO:0000006	3.00008E-11	75 / 51	"Binding to a nucleic acid." [GO:01]
GO:0000076	1.80051E-10	76 / 54	"Any molecular function by which a gene product interacts selectively and non-covalently with DNA [deoxyribonucleic acid]." [GO:04ph, GO:01, GO:02b, GO:04w]
GO:0001190	7.03039E-08	44 / 124	"Binding to DNA that is assembled into chromatin." [GO:04mh]
GO:0000060	6.68744E-07	45 / 134	"Binding to double-stranded DNA." [GO:04ch, GO:01]
GO:0000067	6.68744E-07	45 / 134	"Binding to single-stranded DNA." [GO:04ch, GO:01, GO:02b, GO:22761374]
GO:0001565	8.18496E-07	45 / 112	"Binding to DNA of a specific nucleotide composition, e.g. GC-rich DNA binding, or with a specific sequence motif or type of DNA e.g. promoter binding or rDNA binding." [GO:01]
GO:0000084	1.36906E-06	44 / 304	"Binding to damaged DNA." [GO:01]
GO:0000027	1.57686E-06	42 / 293	"Binding to a DNA secondary structure element such as a four way junction, a bubble, a loop, a Y form, DNA, or a double-strand/single-strand junction." [GO:01c]
GO:0000077	1.6995E-06	42 / 293	"The activity of binding selectively and non-covalently to and distorting the original structure of DNA, typically a straight helix, into a bend, or increasing the bend if the original structure was intrinsically bent due to its sequence." [GO:04ch, GO:04w, PMID:10710711, PMID:10710712]
GO:0000027	2.099E-06	42 / 293	"Binding to DNA ends exposed by the creation of double-strand breaks [DSBs]." [GO:01]
GO:0007036	2.099E-06	42 / 293	"Binding to a flap structure in DNA. A DNA flap structure is one in which a single-stranded length of DNA protrudes from a double-stranded DNA molecule." [GO:04mh, PMID:15189154]
GO:0000087	2.19444E-06	42 / 290	"Binding to nucleic acid via hydrogen bonds between the bases of a gene product molecule and the bases of a target DNA molecule." [GO:01c]
GO:0000081	2.19444E-06	42 / 290	"Binding to DNA in a bent conformation." [GO:01, PMID:14677797]
GO:0001084	2.19444E-06	42 / 290	"Binding to a genomic region which promotes recombination." [GO:04ph, GO:01b]
GO:0004512	2.19444E-06	42 / 290	"Binding to a DNA triple helix. The formation of triple helical DNA has been observed in several prokaryotic processes including transcription, replication, and recombination." [PMID:10881538]
GO:0001380	2.19444E-06	42 / 290	"Binding to C-quadruplex DNA structures, in which groups of four guanines adopt a flat, cyclic Hoogsteen hydrogen-bonding arrangement known as a guanine tetrad. The stacking of guanine tetrads results in G-quadruplex DNA structures. G-quadruplex DNA can form under pH
GO:0009077	2.19444E-06	42 / 290	"DNA binding activity that is dependent on binding to a histone." [PMID:11019153]
GO:0000723	4.60555E-05	54 / 184	"Binding to an RNA molecule or a portion thereof." [GO:01c, GO:04mh]
GO:0000528	9.4578E-05	895 / 337	"The action of a molecule that contributes to the structural integrity of a complex." [GO:04mh, GO:04w]
GO:0003015	9.6221E-06	9 / 305	"Binding to a small nuclear RNA." [GO:04mh]
GO:0001983	2.50262E-05	11 / 112	"Binding to a ribosomal RNA." [GO:01]
GO:0001984	2.50262E-05	11 / 112	"Binding to a transfer RNA." [GO:01]
GO:0003602	3.90904E-05	9 / 97	"Binding to a pre-messenger RNA [pre-mRNA], an intermediate molecule between DNA and protein that may contain introns and, at least in part, encodes one or more proteins. Introns are removed from pre-mRNA to form a mRNA molecule." [GO:01, GO:04w, PMID:219011]
GO:0001709	4.76955E-05	9 / 98	"Binding to a small nuclear RNA [snRNA]." [GO:04mh]
GO:0001324	4.76955E-05	9 / 97	"Binding to RNA subunit of ribonuclease P." [GO:01]
GO:0001430	4.76955E-05	9 / 97	"Binding to an RNA molecule that has assumed an incorrect conformation." [GO:01, PMID:10391591]
GO:0001467	5.61994E-05	903 / 37	"A molecular function facilitated by the coupling of ATP hydrolysis to other steps of a reaction mechanism to make the reaction energetically favorable, for example to catalyze a reaction or drive transport against a concentration gradient." [PMID:2487834, PMID:25705732]
GO:0001069	5.78282E-05	9 / 96	"Binding to a RNA region that regulates a nucleic acid-based process. Such processes include transcription, DNA replication, and DNA repair." [GO:01c]
GO:0001069	5.78282E-05	9 / 96	"Binding to C-quadruplex RNA tetrads, in which groups of four guanines adopt a flat, cyclic Hoogsteen hydrogen-bonding arrangement known as a guanine tetrad. The stacking of guanine tetrads results in C-quadruplex RNA structures. C-quadruplex RNA can form under pH
GO:0003055	5.78282E-05	9 / 96	"Specifies the site of a posttranscriptional modification in an RNA molecule by base pairing with a short sequence around the target residue." [GO:01, PMID:12457565]
GO:0004583	5.78282E-05	9 / 96	"Binding to a 21U RNA, a 21-nucleotide RNA characterized by a uridine 5' monophosphate and a modified 3' end resistant to periodate degradation. 21U RNAs are derived from distantly related organisms, but autonomously expressed loci within the genome." [GO:04w]
GO:0001069	5.78282E-05	9 / 96	"Binding to a small nuclear RNA [snRNA], an RNA molecule that is a component of a small nuclear ribonucleoprotein (snRNP) structure consisting of a small nuclear RNA (snRNA) stem and a terminal loop." [GO:01, PMID:16584286, PMID:20055442]
GO:0004285	5.78282E-05	9 / 96	"Binding to a BTE RNA element (Bruno response element)." [PMID:10912311]
GO:0006172	5.78282E-05	9 / 96	"Binding to long non-coding RNA molecules transcribed from subtelomeric regions in most eukaryotes. Telomeric repeat containing RNA [TERRA] molecules consist of subtelomeric-derived sequences and a 3' C-rich telomeric repeat." [GO:04w, GO:04b, telomeres, GO:04ph, GO:01]
GO:0006180	5.78282E-05	9 / 96	"Binding to a small regulatory RNA, a short RNA usually 30-200 nt long that is either independently transcribed or processed from a longer RNA by an RNase enzyme." [PMID:14627401, PMID:13475961]
GO:0006180	5.78282E-05	9 / 96	"Binding to a region of an RNA containing a hairpin-loop structural element. The consensus sequence for the element is UUUUUUUU." [PMID:3061114]
GO:0007034	5.78282E-05	9 / 96	"Binding to the telomerase RNA template." [GO:01, PMID:16844717]
GO:0007078	5.78282E-05	9 / 96	"Binding to a primary microRNA (pri-miRNA) transcript, an RNA molecule that is processed into a short hairpin-shaped structure called a pre-miRNA and finally into a functional miRNA. Both double-stranded and single-stranded regions of a pri-miRNA are required for binding
GO:0007078	5.78282E-05	9 / 96	"Binding to a pre-microRNA transcript (pre-miRNA) transcript, a stem-loop structure intermediate of mature miRNA." [PMID:16844717]
GO:0007128	5.78282E-05	9 / 96	"Binding to the downstream cleavage product (DCP) generated by histone pre-mRNA 3' end processing." [PMID:19470572]
GO:0106222	5.78282E-05	9 / 96	"Binding to a long noncoding RNA (lncRNA)." [PMID:25578758]
GO:1001004	5.78282E-05	9 / 96	"Binding to an alpha-amyloid cRNA." [GO:01, K0100002, GO:TermGenie, 58N:155381013X]
GO:1990605	5.78282E-05	9 / 96	"

Cellular_Description

4.6818E-09 1/78 "Each cybolic metabolic process involving deoxyribonucleic acid. This is one of the two main types of nucleic acid, consisting of a long, unbranched macromolecule formed from one, or more commonly, two strands of linked deoxyribosephosphates." [SNHG01856674] [GOC:001046]

4.6819E-09 1/78 "The process in which a gene's sequence of DNA is transcribed into RNA. This includes the production of an RNA transcript and its processing, as well as translation and maturation for protein coding genes." [GOC:000104] [GOC:001046] [GOC:00234043] [PMID:10070194]

2.14949E-06 1/4 "A DNA repair process that is initiated by an endonuclease that introduces a single-strand incision immediately 5' of a UV-induced excision repair scar. UV damage excision repair acts on both cytosubstrate pyrimidine dimers [CPD] and pyrimidine photoproducts 6-4 photoproducts [6-4P] [GOC:005086]

4.6830E-06 1/42 "The process in which a solute is transported across a lipid bilayer, from one side of a membrane to the other." [GOC:00G, GOC:04]

4.6831E-06 1/42 "The process in which an oligopeptide is transported across a membrane. Oligopeptides are molecules that contain a small number (2 to 20) of amino acids residues connected by peptide linkages." [GOC:00G, GOC:00105672] [GOC:0010780]

2.21549E-05 1/34 "The directed movement of inorganic sulfate from the lumen of a single-strand DNA across a plasma membrane." [GOC:00G, PMID:2086130]

4.6832E-06 1/49 "Synthesis of DNA that proceeds from the broken 3'-single-strand DNA end and uses the homologous intact duplex as the template." [PMID:10075785]

4.6833E-06 1/188 "The synthesis of an RNA transcript from a DNA template." [GOC:00G, GOC:00G:00C] [GOC:0015780]

3.18702E-05 1/34 "The directed movement of nucleotide sugars into, out of or within a cell, or between cells, by means of some agent such as a transporter or pore. Nucleotide sugars are any nucleoside in which the distal phosphoric residue of a nucleoside 5'-phosphate is in glycosidic link." [GOC:00G]

3.18702E-05 1/34 "The process in which a vitamin is transported across a membrane. A vitamin is one of a number of essential organic substances that occur in many foods in small amounts and that are necessary to various processes for the normal metabolic functioning of the body." [GOC:00G]

4.6834E-06 1/34 "The process in which a lipid is transported across a membrane." [GOC:00G]

4.68461E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68462E-06 1.58661E-04 1/49 "The process of restoring DNA after damage. Genomes are subject to damage by chemical and physical agents in the environment (e.g. UV and ionizing radiation), chemical mutagens, fungal and bacterial toxins, and even free radicals of ablyating agents endogenously gme the genome." [GOC:00G]

4.68463E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68464E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68465E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68466E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68467E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68468E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68469E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68470E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68471E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68472E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68473E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68474E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68475E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68476E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68477E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68478E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68479E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68480E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68481E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68482E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68483E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68484E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68485E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68486E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68487E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68488E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68489E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:04, GOC:04C]

4.68490E-06 1.58661E-04 1/42 "The directed movement of a xenobiotic from a cell, into the extracellular region. A xenobiotic is a compound foreign to the organism exposed to it. It may be synthesized by chemical agents (like ampicillin) or it can be a synthetic chemical." [GOC:00G, GOC:0

GO term	P_val	Count	Organism	GO term	Description
GO:0043121	1.65097e-07	129	Cy	GO:0031358	Organization of distinctive morphology, bounded by a single or double lipid bilayer membrane and occurring within the cell. Includes the nucleus, mitochondria, plastids, vacuoles, and vesicles. Excludes the plasma membrane. [GO:ccp_cursors]
GO:0005818	1.65097e-07	129	Cy	GO:0031358	Organization of distinctive morphology, bounded by a single or double lipid bilayer membrane and occurring within the cell. Includes the nucleus, mitochondria, plastids, vacuoles, and vesicles. Excludes the plasma membrane. [GO:ccp_cursors]
GO:0005761	8.79075e-07	17	Cy	GO:0005761	"A ribosome found in the mitochondrion of a eukaryotic cell; contains a characteristic set of proteins distinct from those of cytosolic ribosomes." [GO:ccm, RSN0180672]
GO:0003874	2.13498e-06	61	Cy	GO:0003874	"The portion of nuclear chromosome associated with the nucleolus; includes the DNA encoding the ribosomal RNA." [GO:ccm]
GO:0005818	2.13498e-06	61	Cy	GO:0005818	"The portion of nuclear chromosome associated with the nucleolus; includes the DNA encoding the ribosomal RNA." [GO:ccm]
GO:0005765	2.13498e-06	61	Cy	GO:0005765	"A protein complex of the 90S preribosome. In <i>S. cerevisiae</i> , it is composed of Pab1, Dab1, and Dab2; in <i>Saccharomyces</i> the proteins are known as Pab1, Eht1 and Ytm1 respectively." [GO:ccp, GO:ccm, PMID:3684354]
GO:0004456	2.85762e-06	44	Cy	GO:0004456	"A protein complex that forms a subdomain of the 90S preribosome. In <i>S. cerevisiae</i> , it is composed of Pab1, Dab1, Dab2, and Ckap2." [GO:ccp, PMID:7515605]
GO:0005818	2.85762e-06	44	Cy	GO:0005818	"A protein complex that forms a subdomain of the 90S preribosome. In <i>S. cerevisiae</i> , it is composed of Pab1, Dab1, Dab2, and Ckap2." [GO:ccp, PMID:7515605]
GO:0005759	2.88046e-06	16	Cy	GO:0005759	"A small, dense body material, with considerable fine structure, that lies in the matrix or, in some, of a mitochondrion. It contains the enzymes of the tricarboxylic acid cycle, and, in some organisms, the enzymes concerned with fatty acid oxidation." [GO:ccm, RSN0180672]
GO:0005710	3.51748e-06	41	Cy	GO:0005710	"A small, dense body material, with considerable fine structure, that lies in the matrix or, in some, of a mitochondrion. It contains the enzymes of the tricarboxylic acid cycle, and, in some organisms, the enzymes concerned with fatty acid oxidation." [GO:ccm, RSN0180672]
GO:0005710	3.51748e-06	41	Cy	GO:0005710	"A small, dense body material, with considerable fine structure, that lies in the matrix or, in some, of a mitochondrion. It contains the enzymes of the tricarboxylic acid cycle, and, in some organisms, the enzymes concerned with fatty acid oxidation." [GO:ccm, RSN0180672]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The larger of two subunits of a mitochondrial ribosome. Two sites on the ribosomal large subunit are involved in translation: the aminoacyl site (A site) and peptidyl site (P site)." [GO:ccm]
GO:0005762	3.61891e-06	40	Cy	GO:0005762	"The

S4 - Comparison of DPoP Results With Published Findings From *S. cerevisiae*.

Following lists of phosphosites were identified as differentially phosphorylated during high osmolarity conditions in *S. cerevisiae*, via analysis by either DPoP, or by published literature (Kanshin et al, 2015).

Method of Analysis →	DPoP 803 Differential	Kanshin et al., 2015 596 Differential
List of Significant Signals ↓ (Uniprot ID, P-site)	P31376 S331/T335 P31376 T366 P31383 T23 P31380 S129 P31380 T131 P31381 S27 P31381 S58/S60 P07866 S200/S203 P07866 S559 P07866 T1125 P39732 S594/S604/S609 P00549 S53 Q01329 S579 P39723 S48 P39717 S633 P39705 S246 P27637 S507 P27637 S655 P35845 S691/T694 P35845 T694 P32790 S454 P38199 S358/S362 P38193 S413 P34216 S1012 P34216 S628 P34216 T251 P34216 T948 P34217 S191/S194 P34217 S389/T390/S393 P34217 S653/S655 P34219 S318 P34219 S318/S329 P34219 S333 P34225 S306/S308 P34225 T290/S293 P38187 T730 P38041 S348 P38041 S359 P38041 S626 P38041 S655/S659 P38041 S86 P38041 T158 P38041 T670 P38177 S433/S439 P38174 T2/S9 P38167 T1028/S1030 P38165 T379 P05316 S6 P29465 S32 P29465 S600 P10664 T287 P10664 T60 P38079 S293 P38080 S531/S541 P38084 S24/S26	P47082 S50 P33748 S304 P47082 S115 Q03656 S449 P34219 S280 Q12427 S254 P40986 S9 Q06108 S966 P38970 S233 P33748 S633 P39732 S536 P32793 S374 P53191 S6 P50944 S34 P47082 T181 P12688 S653 P38691 S845 P38970 S19 P38691 S591 P53191 S113 P25339 T205 P33749 S279 Q08206 T353 P40059 S313 P32568 T53 P47082 T117 P11792 T723/S726 P47013 T16/S18 P27692 S1009/S1015 P53273 S842/T847 P38691 S624/S631 P40059 S313/S318 P40528 S859/S860 P43638 S81/S85 P04821 S629/S632 P38970 S229/S233 Q12256 T606/T608 P40059 S313/S318 P34219 S317/S318/S329 P26570 T171 P43633 S258 P38329 S870 P32790 S449 P47035 S1082 P39016 S834 P32798 S407 P33401 S120 P47082 S187 P40021 S670 P53950 S689 P32862 T279 P20107 S387 P34219 S298 Q12043 S645 Q02208 S527

P38085 S13	P39962 S403
P38249 T938	P50942 S1082
P18412 T273/T276	P40061 S19
P38257 S222	P18494 S267
P38261 S523	P46970 S1024
P38266 S843/S847	P43574 S399
P14922 S790	P40463 S325
P14922 S815/S817	P40210 S436
P14922 T938	P32578 S397
P02994 S289	Q12494 S664
P02994 S6	P50089 S642
P38272 S343/S348	P38814 S242
P38283 S73	P37012 S119
P38284 S120	P36003 T161
P38284 S217	Q99252 T381
P38302 S139	P42845 T419
P05755 S162	P24279 T791
P29366 S137	Q12697 S161
P38310 S449/S452	Q12296 S688
P38313 S41/S45	P22211 S317/S320
P32327 S513	P47013 T16/S18
P38321 S156	P38903 S263/S264
P38329 S1028	Q12427 S345/S350
P38329 S26/S29	P40210 T433/S434
P38140 S126	Q12221 S902/S905
P38346 S137	Q99271 T874/T876
P29539 S133/S134/S138	P36169 S276/S280
P29539 S1601	Q08206 T101/S104
P27344 S186/S188	P18888 S122/T125
P38356 S47	P34219 S308/S314
P25587 T180/T184	P32864 S3/S9
P25555 S13	Q12407 S64/S65
P25558 S904	P20107 S387/S393/S395
P25558 T1157/S1160	P38691 S591/S592/S599
P25389 S666	Q12256 T606/T608/S614
P25389 S729/S732	P53273 S149/S152/S153
P25579 T110/S112	P38970 S217
P25588 S215	P32793 S274
P25588 S605/S607	P41911 S72
P25588 S605/S607/T609	P39998 S257
P25591 S269	P37262 S42
P25342 S316	P27692 S1032
P25621 S17/S19	Q00055 S24
P25621 S7	P38691 S827
P25623 S405	P39705 S10
P25635 S912/S913	Q05785 S167
P25364 T428	P38968 S988
P25644 S456/S457	P40956 S240
P15891 T181	Q06315 S580
P24279 T791	P22211 S249
P24279 T798/S801	P06634 S539
P32618 S520	P33399 S19
P32618 S885	P27692 S1043
P32618 T926/S930	P40013 S165
P37303 S369	Q05518 S202
P33332 S32	P53094 S781
P33332 S6	Q12433 S505
P40013 S131	Q12321 S404
P40013 S165/S166/S172	P20484 S434
P40013 T249	P15436 S30
P08456 S4/S34	Q08816 S131
P40021 S152	P27705 T371/S377
P40021 S343/S352	P41913 S359/T363
P40021 S670	P32578 S181/S182
P40021 T151	P06102 S442/S446
P18494 S552/S562	P53939 S123/S125

P18494 S619	P40528 S868
P10869 T333	Q07655 S274
P40048 S248	Q03208 S72
P40052 S189/S192	P32864 S9
P40059 S318	P32618 T154
P40059 S491	P32356 S60
P39966 T380	P46958 S148
P39969 S519/S523/S528	Q04991 S249
P38682 S170	Q08206 S371
P38682 S398	P34761 S225
P38990 S36	P53735 S498
P32634 S1355/S1356	P34216 S241
P32634 S1521	P38070 S90
P32634 S877/S881	P22211 S353
P40091 S226/S230	P22211 S51
Q01477 S339/S341	P41696 S227
Q01477 S404	P38167 S775
P39960 S1012	P12688 T57
P06843 S126	P38970 S275
P32657 S989	P53191 S174
P32660 S1552	P32873 S488
P39956 S590	P11792 T737
P29311 S212	P46678 S178
Q03497 S169/T172	P47035 S439
P38741 S320	Q12523 S12
P18888 S122/T125	P46678 S164
P38739 S498/S502	P32578 S33
P38767 S15	P40917 S99
P38779 T11	P33749 S263
P38788 S477/S480	P39962 S431
P38713 S206	P32432 S170
P38713 S605/S608	P24870 S33
P38691 S815	P39520 S1041
P38691 T501/T504	P53916 T149
P38692 S735	Q02725 T183
P38692 T1073	Q06628 S280
P38692 T625	P53599 S118
P38692 T645	P32634 S1307
P38835 T382	P35724 S104
P23291 S523	Q06673 S1053
P38845 S332/S335	P43560 S140
P38845 T182/S191	P38165 S246
P32900 S126	Q12221 S902
P32900 S167/T169	Q06251 T235
P32900 S219/T221/T232	P40501 T375
P38853 S494/S503	P38167 S527
P38854 S282	Q04749 S273
P38854 S371	P34216 T251
P38870 S771	P38854 S92
P11792 T737	P25351 S313
P40318 S339/S342	P53191 S82
P07278 S84	P40460 S37
P40535 S557	P38314 S524
P40535 T401	Q12416 S88
P06102 S111	P25371 S702
P06102 S322	P18494 S619
P06102 S322/S324	P34219 S333
P40529 S207	Q04749 S305
P40187 S196	P53258 S862
P40528 S868	P46974 S231
P40528 T834	P50089 S667
P40527 T90	P43565 S1337
P04801 S195	Q08930 S343
P40498 S155	Q06479 S627
P40484 S80/T85	P50111 S229
P40433 T157	Q06833 S714

P40433 T158	P13382 S298
P40480 T688/S690	P16649 T275
P40477 S1073	P25357 S318
P40477 S940/S945	P53120 S1167
P40477 T870/S874	P43638 S81
P40476 S276	P48415 S759
P23250 T274	P22211 S125
P40474 S6/S7	P38931 S608
P26784 S163	Q08269 S185
P40463 S159	P47082 S50/S58
P40463 T160	P53273 S37/S42
P40460 S95/S100	P53191 S8/T10
P39928 T274/S278	Q12296 S614/T617
P32351 S60	P40210 T433/S436
P40563 S167	Q12256 T606/T608
P36101 S420	P34219 S300/S303
P32861 Y13	P47082 T181/S187
P32862 S1130	P53094 S1202/T1203
P32862 S492	Q06820 S18/S21
P32862 T214/S229	P23900 S181/S185
P32857 T498/S518	P12688 S644/S653
P32801 S516/S519	Q12494 S664/S670
P32801 S581	P23900 T168/S172/S175
P35735 Y108	Q03497 S169
P14540 Y310	Q12296 S637
P33749 S263	P53943 T28
P33749 S319	Q04991 S269
P33749 S531/S532	P25351 S321
P32364 S566/S570	P47082 S37
P36076 S233	Q9P305 S119
P35201 S325	Q06324 S37
P34244 S1045	Q06836 S356
P34244 S396/S407	Q03210 S62
P34244 S866	P38970 T157
P34250 T503/S507	P40091 T150
P14164 S215	P35724 S472
P32330 S93/S96	P38835 S511
P34163 S466	P53968 S385
P36003 T161	P50089 S234
P36049 S162/S177/S183	Q03361 T662
P36049 S177	P50896 S238
P36048 S85/T88	P19659 S783
P05740 S142	P32047 S228
P34233 S253	P04821 S629
P34233 T450/S452	Q07653 S793
P36015 S178	P53273 S84
P36002 S75	P12688 S644
Q02208 S653	P38227 T425
P36114 S380	P38767 S15
P36115 S157	P51862 S396
P36117 S569/S573	P33122 T237
P36126 S265	P38287 S354
P36022 T2202/T2206/T2208	P39962 S408
P36150 S281	Q03465 S326
P36024 S54/S56	P32047 S322
P36165 S55	P40433 S644
P36165 S737	P40361 S9
P36166 S106/T108	Q04749 S297
P36166 S128	P53273 S842
P36166 S43/S46	P36000 T73
P32901 S594	P38346 S137
P36169 S250	P50089 S232
P36169 S276	P24583 S623
P43563 S56/S59	P34161 S302
P43564 S24/T28	P32583 S394
P43564 T429	P07278 S84

P43565 S1542	P40013 T249
P43574 S270	P50896 T334
P22943 S21/S24	Q04991 S259
P43583 S62/T64	P38835 T382
P07560 S201/S204	P53274 T93
P43587 S131/S133	P38284 S217
P43598 S64/T65	P38703 S23/S24
Q12451 S7	P40463 S159/T160
Q12451 T723	Q03656 S449/S453
Q07395 S23	P38691 S1006/S1014
Q07442 S50/S54	Q04991 S238/S249
P05318 S96	P07278 S83/S84
Q12066 S439	P32330 S93/S96
Q12066 S441	P18494 S552/S562
Q07533 S117/S122	Q03210 T74
Q07533 S354	P08018 S68
P25694 S599	P40059 S423
P04050 S1293	Q05518 S416
P04050 T1471	Q03088 S662
Q12342 S463/S466	P46675 S813
Q12136 S336/S339	Q07807 S86
Q12136 S53/S72	Q02831 S95
Q12518 T346/S350	P47068 S565
P04819 S119	P36076 S42
Q12515 S141	P37304 S659/S664
Q12515 S36	P06102 S450/T454
Q12515 S39/S47	P43564 S1037/S1045
P23595 S64	P40494 T553
P38968 S974	P00549 S22
P38968 S980/S988	P36062 S119
P38968 T996	P39016 S838
Q12424 S476/S479	P40463 S159
Q07655 S236	Q12494 S55
Q07657 S408/S416	P47029 S838
P35197 S168/T170	P47068 S631
P35197 T217	P48415 S1611
Q07684 S417	P25623 S347
P40317 S191/S193	Q07825 S56
P32568 S80/S86	P38590 T170
Q00816 S572	P33202 T135
Q00816 S922	P33749 S531/S532
Q12117 T295	P34072 T553/S554
P38966 T663/S668	Q99271 T874/T876
Q12675 S1542/T1545	P40095 S28
Q12675 S396/S403	Q12476 S256
Q03833 S690	Q12424 S364
Q03834 T42	P38928 S676
O13329 Y460/S467	P32944 S379
Q04602 S142	P32790 T993
P13185 S951	Q99271 S568
Q03897 S922	P33314 S1071
P16664 S351	P32900 S369
Q00402 S1464	P53274 T152
Q12427 S138/S141	P30605 S55
Q12427 S345/S350	P34244 S1045
P11075 S434/S437	P34237 S453
P11075 S779/S782	P38261 S313
P05453 S148	P39109 S873
P32494 S134	P53064 S435
P40986 S9	P38692 T645
Q04004 S222/S224/S226	P38854 S55
Q04007 S334	P36115 S195
Q04007 S399	P08678 S234
P49686 S137	Q08157 S255
P42073 S245	P40433 T157
P38994 S267	P32599 T111

P38994 T222	P29465 S40
P32501 S538	P38835 S616/T620
P07248 S230	P38284 S141/S145
P07248 S299/S302	Q12071 S66/S69
P14737 S83	Q12427 S285/S286
P11978 S1134	P47035 S615/S619
P11978 S516	P26570 Y221/T235
P11978 T62/S63	Q92317 S135
Q04934 S419	P38165 T56
Q04934 S59	P48415 S1515
Q04947 S206	P43585 S187
Q03780 S342/S345/S348	Q04602 S106
P37304 T755	P38329 S34
Q05543 S294/S297	P33300 S349
P24276 S154/S155	P32833 T187/S188
P24276 S319/S322/S325	P40468 S2352/S2355
P24276 S578	P32047 S257
P24276 T261	P34217 T512
Q06631 S10	Q06146 S197
Q06631 S41/S44	P53244 S158
Q05518 T57	Q04947 S206
P29509 T251	P08678 S241
Q06340 S125/S126/S128	P32909 S96
Q06340 S71	P06634 S37
P33301 S533/S534	P40048 T75
Q06407 S375	P05453 S148
Q06407 S523	P20485 S14
Q06407 S524/S527	P38713 T210
Q06407 S702/S707	P25587 S241
P17121 S99	P40468 S300
Q92317 S137	Q03833 S425
Q04177 S365	Q04279 S217
Q04183 S364	P40474 S40
Q04031 S113/S116/S122	P20485 S12
P32578 S181/S182	Q02866 S475
P32578 S299/S302	Q02100 T215
P32578 S81	P53950 S260
P33329 S203	P39104 S396
P33329 T93	Q03769 S394
Q04087 S307	P48361 S948
P14127 S96	P38080 S985
Q03281 S141	Q06636 S16
Q03306 T760	Q07825 S69
Q03361 S145	P53950 T258
Q03361 S552/S568	P47061 S790
Q03361 S851	P53739 S414
P11491 S123	Q12753 S439
P50896 T523	Q03361 S510
Q12263 S382/S385/S389	P36041 S387
Q12263 S750	P36004 S131
P48813 S111/S112	P38590 S98
Q04412 S450	Q12494 S27
P05030 S911/T912	Q12502 S798
P07264 S488	P25623 S405
P43633 S258	P53739 S414/S426
P43633 S440/S443	Q06146 S197/S200
P43633 S76	Q07824 S72/S76
P53191 S6	P39962 S404/S408
P53191 S8/T10	Q02100 S108/T113
P53191 S82	P53599 S54/S57
P05737 S228	Q06108 S1048/S1059
P53148 T135	P08678 T389
P53131 S38	Q08269 S383
P53129 S130	P35209 S627
P0CX44 S6	Q02100 S54
P0CX44 S7	P38968 S974

P22147 S1510	P25341 S269
P53104 S647	Q02875 S651
P53094 S618/S621	P38623 S61
P53094 S702	P48361 S973
P53094 S781/T785	Q02875 S644
P53094 S900/S904	Q06108 T1046
P53094 S919	Q08831 S311
P53090 S272	P39730 S257
P53090 T311	Q9P305 S107
P06774 S19	Q03533 S449
P06774 S31	P47072 T25
P04807 S15	P32909 S84
P53201 S354	P38692 T625
P16965 S69	P43565 S1502
P40357 S186	P53115 S65
P40357 S220	Q12515 S47
P32334 S1300	P33332 S43
P53238 S83	Q12236 T74
P53241 T53/T56	P34761 T479
P53244 S158	P40563 S476
P53250 S308	P41697 T12
P53252 T233	Q99247 S668
P48361 S948	P48562 S367
P48361 S969	P53076 S248
P53267 S20/S23	Q02785 S56
P53267 S31	P43565 T1360
P23615 S94	P19659 T793
P48837 S479	P06786 S629
P49090 T346/S352	Q02875 S657
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P33336 S200	Q03088 S542/S545
P27476 S405	P43598 S64/T65
P32893 S183/S187	P50942 S1081/S1082
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P00359 S201	Q05518 T23/S26
P32566 S381/S394	P48415 S762/S765/S768
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P32566 S488	P38968 T1050
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P16861 S189/S192	P38427 S161
P53049 S18/S24	P38853 S503
O13535 S1093	P06101 S17
P08678 S241	P32909 S125
P08678 S75/S78	P32770 S455
P47072 T25	P38080 S458
P47068 S631/S634	P53191 S300
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P20448 S710/S714	P38426 S181
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P43638 S174	Q08732 S139
P43638 S85	Q12071 S69/S72
P47047 T38	P53890 S270/T274
P47041 S71	P48524 S54/S56/S58
P40361 S34/S41	P53894 T559
P47035 S1082	P32485 T174

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P47035 T357	P39960 S303
P06105 T50	P32485 Y176
P80428 S349	P38080 T1012
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P32447 T265	P53309 S451
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P10081 S129	P15891 S357
P10081 T146	Q04279 S685
P21268 S361	Q05812 S57
P38970 S336	P34250 S45
P38970 S66/S68	P25623 S297
P38970 S68	Q04279 S645
P38970 T157	P34250 S236
P32525 S436	Q06407 S277
P47082 S37	P47116 T160
P47082 T117	P47113 S180
P47098 S38	P47041 S139
P21373 S67	P47068 T88
P47113 T216/T219	P43638 S85
P47116 S752/S755	P39524 S102
P47116 S781/S784	Q06407 S375
P47116 S784	P43597 S201
P17106 S156	P32568 S80
P17106 S45/S48	P38080 T857
P47134 S383	P38041 S525
P47134 T604	P38814 S305
P47135 S951/S954	P39101 S266
P47136 S367	P47136 S367
P47136 S538/S539	P47068 T514
P47136 S545	Q02866 S173/S176
P47139 S60/S69	Q08229 S117/S120
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P14772 S885	P24276 S154/S155
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P04802 S214	P32895 T40/S47
P23201 S646	Q04279 S235/S238
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Q07824 T89/S91	P40494 S484/T488
Q07872 S213	P53191 S381
P23900 S212	Q04279 S48
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Q04673 S7/S9	P47136 S167
Q07950 S73/S76	P38970 S391/S395
P46675 S280	P40072 T66/S67
P46675 S812/S813/S815	P38041 S525/S528
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Q12019 S4353	P08018 S514
P32485 T174/Y176	P38691 S599
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Q12436 S236/S245	P38623 T379
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P21192 S709/S714	P32909 T70
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Q99271 T765/S768	P48361 T808
Q99271 T874/T876	P53274 S155
Q99296 S651	Q03758 T22
P33322 S416	P23900 T168
P21304 S131	P38080 S10
Q05785 T450	P40986 S12
Q05785 T472/T479	P33749 S319
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P47818 S83	Q06108 T21

P39520 S41	P40059 S318
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Q05958 S451/S464	P38835 S365
P38623 S46/S50	Q05518 T153
P38623 S520	Q04279 S217/S220
P38623 S61	P19882 S22/S23
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P19882 S22/S23	P34217 S653/S655
P04821 S629/S632	P40494 T553/S556
P32457 S41/T44/T47	P32790 S785
P32457 S503/S509	P11792 S726
P41697 T352	Q06407 S707
P32499 S399	P17121 S70
P32499 S540	Q03780 S363
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Q06144 S9	P19659 S746
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Q06685 S77	Q06108 S975
Q06440 S443	Q03656 S393
Q06440 S463	P48524 T111
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Q06205 S82	P47113 S150
P52919 S260/S265	P22137 T1651
Q04233 S718	Q08732 S37
P25087 S375	P23201 T1065
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P50109 S238	P22211 S316
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P50109 T298	P22211 S357
Q03718 S159	P23255 T158
Q03714 S376/S379	P27705 S179
Q03707 S231	P33748 S629
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Q04711 S1095	P38249 T938
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P54003 S293/S301	P39732 S609
P23248 S80	Q04007 S392
Q03640 S1371/S1373/T1379	P43565 S1557
Q03640 S1400/S1403/S1404	Q06451 S55
P38911 S80/S81	P43560 S149
Q04511 T514	Q05785 T450
Q04500 S142	Q05775 T75
Q04500 S34/S35	P48524 S58
Q04500 T628	P50944 S71
P54786 S575/S577	P08018 S9
Q03758 T22	P40048 S445
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Q03208 S180	P27637 S655/S658
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P40210 T433/S434	Q12515 S246

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P38426 T265/S267/S273	
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Q03559 S14/S23	
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P50944 S71	
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P13382 S298	
P32389 T206	
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P53550 S747/S751	
P53917 S524/S527	
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P53890 S270/T274	
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P22211 S353/S356	
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P22211 S357	
P22211 T247	
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P53858 S278/S281	
P53858 S746	
P33338 T294/T296/S308	
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