

	B1	C	
Deb.hansenii	TIWGOPLYWGHSSSKDLTHWEEHQVALGPQNDDEG----	IFSGSITVIDYNNTSGFFDE--	126
Schw.occidentalis	TAWGOPLYWGHATSNDLVHWDEHEIAIGPEHDNEG----	IFSGSITVDHNNTSGFFNS--	127
Pic.anomala	SIWATPVTWGHSTSKDLLTWDDYHGNALEPENDDG----	IFSGSVVDRNNTSGFFND--	120
Pic.jadinii	TIWGLPLYWGHATSDDLTLWDDHAPAIIGPENDDG----	IYSGSITVIDYDNTSGFFDD--	121
Can.guilliermondii	TVWGTPLYWGHATSKDLSTWKDYGATIGPDRDEDG----	IFSGNITVDHNNTSGFFND--	111
S.cerevisiae	TVWGLPLFWGHATSNDLTHWQDEPVAIAPKRNDSG----	AYSGSMVIDHNNTSGFFND--	119
S.monacensis	TVWGLPLFWGHATSNDLTHWQDEPVAIAPKRNDSG----	AYSGSMVIDHNNTSGFFND--	119
S.pastorianus	TVWGLPLFWGHATSNDLTHWQDEPVAIAPKRNDSG----	AYSGSMVIDHNNTSGFFND--	119
S.bayanus	TVWGLPLFWGHATSNDLTHWQDEPVAIAPKRNDSG----	AYSGSMVIDHNNTSGFFND--	119
S.cariocanus	TVWGTPLFWGHATSDDLTHWQDEPVAIAPKRNDSG----	AFSGSMVVDYNNTSGFFND--	119
Y.lipolytica	TVWGTPLFWGHATSDDLTHWQDEPVAIAPKRNDSG----	AFSGSMVVDYNNTSGFFND--	138
S.paradoxus	TVWGTPLFWGHATSDDLTHWQDEPVAIAPKRNDSG----	AFSGSMVVDYNNTSGFFND--	119
Ash.gossypii	TVWGVPLYWGHLSKDLQSWEDHGVAIREPDRNDG----	AFSGSAVVDYNTNTSGFFND--	141
Vand.polyspora-1	TVWALPIVWGHKTSKNLTIWDDAGIAMAPTDITG----	FYSGSVVDYNNTSGFFNS--	220
Vand.polyspora-2	TVWGLPIVWGHKTSKNLTIWDDAGIAMAPTDNTG----	FYSGSVVDYNNTSGFFNS--	165
Km-DMKU3-1042	TIWGTPLYWGHAVSKDLTSWTDYGASLPGGSDDAG----	AFSGSMVIDYNNTSGFFNS--	130
Km-CBS6556	TIWGTPLYWGHAVSKDLTSWTDYGASLPGGSDDAG----	AFSGSMVIDYNNTSGFFNS--	130
Km-CBS4857	TIWGTPLYWGHAVSKDLTSWTDYGASLPGGSDDAG----	AFSGSMVIDYNNTSGFFNS--	130
Km-ATCC12424	TIWGTPLYWGHAVSKDLTSWTDYGASLPGGSDDAG----	AFSGSMVIDYNNTSGFFNS--	130
Km-Y1	TIWGTPLYWGHAVSKDLTSWTDYGASLPGGSDDAG----	AFSGSMVIDYNNTSGFFNS--	130
Km-CBS834	TIWGTPLYWGHAVSKDLTSWTDYGASLPGGSDDAG----	AFSGSMVIDYNNTSGFFNS--	130
Km-IW9801	TIWGTPLYWGHAVSKDLTSWTDYGASLPGGSDDAG----	AFSGSMVIDYNNTSGFFNS--	108
Kluy.lactis	PHWGLPLTWGHAVSKDLTVWDEQGVAFGEFETAG----	AFSGSMVIDYNNTSGFFNS--	136
Zygo.rouxii	TVWKQPTWGHSSVSKDLTIWYDKGLAIVPPDSGG----	VFSGSVVDNRNTSGLFDE--	99
Schiz.pombe-1	-LTAGEVHWGHTVSKDLTHWENYPIAIYPDEHENGVLSPF	SGSAVVDVHNSSGLFSN--	175
Schiz.pombe-2	-NQAGNQHWGHAVSKNLYKWKLLPTALAPGDDHG----	LMFSGSAVIDKTNSSGFFSEF	94
		D	
Deb.hansenii	----SIDKDQRVVAIY-TNSIPDTQTQDIAYSLDGGGETFTKYKKNPVIDVNSTQ	FRDPKV	181
Schw.occidentalis	----SIDPNQRIVAIY-TNNIPDLQTQDIAFSLDGGYTFTKYENNPVIDVSSNQ	FRDPKV	182
Pic.anomala	----STDPEQRIVAIY-TNN-AQLQTQEIAYSLDKGYSFICYDQNPVINVNSSQ	FRDPKV	174
Pic.jadinii	----STRPEQRIVAIY-TNNLPDVETQDIAYSTDGGYTFEKYENNPVIDVNSTQ	FRDPKV	176
Can.guilliermondii	----SIDPRQRVVAIY-TYNTPESEEQYISYSLDGGYTFEKYENNPVIDVNSTQ	FRDPKV	166
S.cerevisiae	----TVDPRQRCVAIW-TYNTPESEEQYISYSLDGGYTFEYQKNPVLAANSTQ	FRDPKV	174
S.monacensis	----TVDPRQRCVAIW-TYNTPESEEQYISYSLDGGYTFEYQKNPVLAANSTQ	FRDPKV	174
S.pastorianus	----TVDPRQRCVAIW-TYNTPESEEQYISYSLDGGYTFEYQKNPVLAANSTQ	FRDPKV	174
S.bayanus	----TVDPRQRCVAIW-TYNTPESEEQYISYSLDGGYTFEYQKNPVLAANSTQ	FRDPKV	174
S.cariocanus	----TIDPRQRCVAIW-TYNTPESEEQYISYSLDGGYTFEYQKNPVLAANSTQ	FRDPKV	174
Y.lipolytica	----TIDPRQRCVAIW-TYNTPESEEQYISYSLDGGYTFEYQKNPVLAANSTQ	FRDPKV	193
S.paradoxus	----TIDPRQRCVAIW-TYNTPESEEQYISYSLDGGYTFEYQKNPVLAANSTQ	FRDPKV	174
Ash.gossypii	----SIDPAQRVVAIW-TYNTPESETQWISYSLDGGYTFIDYANNPVLDLNSTQ	FRDPKV	196
Vand.polyspora-1	----STDPRQRAVAIY-TYNTPEAEVQCVAYS LDGGYTFIQYESNPVLSNNSTQ	FRDPKV	275
Vand.polyspora-2	----TTDPRQRAVAIF-TYNTPEAEVQCVAYS LDGGYTFIQYESNPVLSNNSTQ	FRDPKV	220
Km-DMKU3-1042	----SVDPRQRAVAVW-TLSKGPSQAQHSYSLDGGYTFQHYSDNAVLDINSSN	FRDPKV	185
Km-CBS6556	----SVDPRQRAVAVW-TLSKGPSQAQHSYSLDGGYTFQHYSDNAVLDINSSN	FRDPKV	185
Km-CBS4857	----SVDPRQRAVAVW-TLSKGPSQAQHSYSLDGGYTFQHYSDNAVLDINSSN	FRDPKV	185
Km-ATCC12424	----SVDPRQRAVAVW-TLSKGPSQAQHSYSLDGGYTFEHYTDNAVLDINSSN	FRDPKV	185
Km-Y1	----SVDPRQRAVAVW-TLSKGPSQAQHSYSLDGGYTFEHYTDNAVLDINSSN	FRDPKV	185
Km-CBS834	----SVDPRQRAVAVW-TLSKGPSQAQHSYSLDGGYTFEHYTDNAVLDINSSN	FRDPKV	185
Km-IW9801	----SVDPRQRAVAVW-TLSKGPSQAQHSYSLDGGYTFEHYTDNAVLDINSSN	FRDPKV	163
Kluy.lactis	----STDPRQRVVAIW-TLDYSGSETQQLSYSHDGGYTFTEYSNPNVLDIDSDA	FRDPKV	191
Zygo.rouxii	----STDPRQRVVAIW-TQDADGIQRQMISYSDGGYTFKDYAHNPVLDINSSN	FRDPKV	154
Schiz.pombe-1	----DTIPEERIVLIYTDHWTGVAERQAIAYTTDGGYTFKKYSGNPVLDINSLQ	FRDPKV	231
Schiz.pombe-2	FSRKSVDPEERIVLIYTHYD-NRETQNIAYSLDGGITFIKYKKNPILDIKESQ	FRDPKV	153
		E *	
Deb.hansenii	FWHE--ETN---KWIMVVSQSQEYKIQIFGSLDLKTWDLHSNFTS-GYLGNO	OYECPLIK	235
Schw.occidentalis	FWHE--REF---SMDHGCSEIARVKIQIFGSANLKNWVLSNFTS-GYYGNO	OYGMSRLIE	236
Pic.anomala	LWHD--ESN---QWIMVVAKTQEFKVQIYGSPLKKWDLKSNFTSNGYLGFO	OYECPLIFK	229
Pic.jadinii	IWYE--ETE---QWVMTVAKSQEYKIQIYTSNLDKDWLASNFTSKGYVGVO	OYECPLIFE	231
Can.guilliermondii	FWHE--PTN---QWIMVIALSQQFKIQIYGSIDLTNWLSNFTG-GLFGFO	OYECPLIE	220
S.cerevisiae	FWYE--PSQ---KWIMTAAKSQDYKIEIYSSDDLKSWKLESFAFANEGFLGY	OYECPLIE	229
S.monacensis	FWYE--PSQ---KWIMTAAKSQDYKIEIYSSDDLKSWKLESFAFANEGFLGY	OYECPLIE	229
S.pastorianus	FWYE--PSQ---KWIMTAAKSQDYKIEIYSSDDLKSWKLESFAFANEGFLGY	OYECPLIE	229
S.bayanus	FWYE--PSQ---KWIMTAAKSQDYKIEIYSSDDLKSWKLESFAFANEGFLGY	OYECPLIE	229
S.cariocanus	FWYE--PSQ---KWIMTAAKSQDYKIEIYSSDDLKSWKLESFAFANEGFLGY	OYECPLIE	229
Y.lipolytica	FWYE--PSQ---KWIMTAAKSQDYKIEIYSSDDLKSWKLESFAFANEGFLGY	OYECPLIE	248
S.paradoxus	FWYE--PSQ---KWIMTAAKSQEYKIEIFSSDDLKSWKLESFAFANEGFLGY	OYECPLIE	229
Ash.gossypii	IWHE--ESQ---KWIMTVVLSHKYAIQIYSSDNLREWTLSEFEKNHGLLGF	OYECPLAK	251
Vand.polyspora-1	IWHE--ESQ---KWIMTVAKTQYKVKVAYSSDLKDWTLSEVEKVGVLGY	OYECPLAK	330
Vand.polyspora-2	IWHE--ESQ---KWIMTIAKTQYKVKVAYSSDLKDWTLSEVEKVGVLGY	OYECPLAK	275
Km-DMKU3-1042	FWHEGENGE-DGRWIMAVAESQVFSVLFYSSPNLKNWLTLESNFTHHGWTGT	OYECPLVK	244
Km-CBS6556	FWHEGENGE-DGRWIMAVAESQVFSVLFYSSPNLKNWLTLESNFTHHGWTGT	OYECPLVK	244
Km-CBS4857	FWHEGENGE-DGRWIMAVAESQVFSVLFYSSPNLKNWLTLESNFTITVWGTGT	OYECPLVK	244
Km-ATCC12424	FWHEGENGE-DGRWIMAVAESQVFSVLFYSSPNLKNWLTLESNFTHHGWTGT	OYECPLVK	244
Km-Y1	FWHEGENGE-DGRWIMAVAESQVFSVLFYSSPNLKNWLTLESNFTHHGWTGT	OYECPLVK	244
Km-CBS834	FWHEGENGE-DGRWIMAVAESQVFSVLFYSSPNLKNWLTLESNFTHHGWTGT	OYECPLVK	244
Km-IW9801	FWHEGENGE-DGRWIMAVAESQVFSVLFYSSPNLKNWLTLESNFTHHGWTGT	OYECPLVK	222
Kluy.lactis	FWYQGEDSESEGNWVMTVAEADRFVLIYSSPNLKNWLTLESNFTREGYLGNY	OYECPLVK	251
Zygo.rouxii	IWHK--ETG---RWIMVVALSQFEISYSSKDLIHWQYESGFAVRGFKGLIK	OYECPLIK	209
Schiz.pombe-1	IWDF--DAN---RWVMIVAMSQNYGIAFYSSYDLIHWTELSVFTSTSGYLGLO	OYECPLMAR	286
Schiz.pombe-2	FWHE--ESR---AWIMVVVLAQYKVKVLYHSLNLRDWWKLSEFGSAGVLGY	OYECPLFVR	208

★★

Additional file 1 (continued)

Deb.hansenii	VPIEN-----TNDYK-----	245
Schw.occidentalis	VPIEN-----SDKSK-----	246
Pic.anomala	LPIENPL-----NDTVTSK-----	243
Pic.jadinii	ATIENPK-----SGDPKK-----	245
Can.guilliermondii	VPVEG-----TDELK-----	230
S.cerevisiae	VPT-----EQDP-----	236
S.monacensis	VPT-----EQDP-----	236
S.pastorianus	VPT-----EQDP-----	236
S.bayanus	VPT-----EQDP-----	236
S.cariocanus	VPT-----EQDP-----	236
Y.lipolytica	VPT-----EQDP-----	255
S.paradoxus	VPT-----EQDA-----	236
Ash.gossypii	IPV-----SKPANCE-----MQLKDVSYPVKN-----	273
Vand.polyspora-1	ISL-----PDVVLESGSNKTI PNSSSSK-----	354
Vand.polyspora-2	ISL-----PNVTLASGSSNMTVPYPSTYSNGTA-----	303
Km-DMKU3-1042	VPY-----DSVADSSS-----NSSDSKPKDS-----	264
Km-CBS6556	VPY-----DSVADSSS-----NSSDSKPKDS-----	264
Km-CBS4857	VPY-----DSVADSSS-----NSSDSKPKDS-----	263
Km-ATCC12424	VPY-----DSVVDSS-----NSSDSKPKDS-----	263
Km-Y1	VPY-----DSVVDSS-----NSSDSKPKDS-----	263
Km-CBS834	VPY-----DSVVDSS-----NSSDSKPKDS-----	263
Km-IW9801	VPY-----DSVVDSS-----NSSDSKPKDS-----	241
Kluy.lactis	VPYVKNTTYASAPGSNITSSGPLHPNSTVFSNSSSI AWNASSVPLNITLSNSTLVDETS	311
Zygo.rouxii	VLDDAN-----GQEVKDT-----	223
Schiz.pombe-1	VPVEG-----TDEYK-----	296
Schiz.pombe-2	LPIEG-----TDEFR-----	218

F

Deb.hansenii	-----WVMFLAINPGSPA-GGSSNQYFIGEFDGFEFKQDDSI TRVMACGDFYAFQT	296
Schw.occidentalis	-----WVMFLAINPGSPL-GGSINQYFVGDFDGFQFVPDDSQTRFVDIGKDFYAFQT	297
Pic.anomala	-----WVLLLAINPGSPL-GGSINQYFIGDFDGTTFHPDDGATRFMDIGKDFYAFQS	294
Pic.jadinii	-----WVMVLAINPGSPL-GGSINQYFVGDFNGTEFIPDDDATRFMDTGKDFYAFQA	296
Can.guilliermondii	-----WVMFLAINPGLPL-GGSSNQYFIGSFDGFEFVPDDSQARLMDYKDFYAFQT	281
S.cerevisiae	----SKSHWVMFISINPGAPA-GGSFNQYFVGDFNGTHFEAFDNQSRVVDGKDFYALQT	291
S.monacensis	----SKSHWVMFISINPGAPA-GGSFNQYFVGDFNGTHFEAFDNQSRVVDGKDFYALQT	291
S.pastorianus	----SKSHWVMFISINPGAPA-GGSFNQYFVGDFNGTHFEAFDNQSRVVDGKDFYALQT	291
S.bayanus	----SKSHWVMFISINPGAPA-GGSFNQYFVGDFNGTHFEAFDNQSRVVDGKDFYALQT	291
S.cariocanus	----SKSYWVMFISINPGAPA-GGSFNQYFVGDFNGTHFEAFDNQSRVVDGKDFYALQT	291
Y.lipolytica	----SKSYWVMFISINPGAPA-GGSFNQYFVGDFNGTHFEAFDNQSRVVDGKDFYALQT	310
S.paradoxus	----SKSYWVMFISINPGAPA-GGSFNQYFVGDFNGTHFEAFDNQSRVVDGKDFYALQT	291
Ash.gossypii	----NTDYVWVMFLAINPGGPQ-GGNFNQYFIGDFDGKKFTPFSEQTRFLDHGKDFYAFQG	329
Vand.polyspora-1	-----DAWVLFISINPGAPQ-GGSYVEYFIGDFNGTVTFPFRETQALDDGKDFYAFQT	407
Vand.polyspora-2	-----TPTDAWVMFISVNPAPN-GGSFVQYFIGDFNGTTFPTFTEQTQTLDGKDFYALQT	359
Km-DMKU3-1042	-----AWVLFVSNPGGPL-GGSVTQYFVGDFNGTHFTPIDDQTRFLDMGKDFYALQT	316
Km-CBS6556	-----AWVLFVSNPGGPL-GGSVTQYFVGDFNGTHFTPIDDQTRFLDMGKDFYALQT	316
Km-CBS4857	-----AWVLFVSNPGGPL-GGSVTQYFVGDFNGTHFTPIDDQTRFLDMGKDFYALQT	315
Km-ATCC12424	-----AWVLFVSNPGGPL-GGSVTQYFVGDFNGTHFTPIDGQTRFLDMGKDFYALQT	315
Km-Y1	-----AWVLFVSNPGGPL-GGSVTQYFVGDFNGTHFTPIDGQTRFLDMGKDFYALQT	315
Km-CBS834	-----AWVLFVSNPGGPL-GGSVTQYFVGDFNGTHFTPIDGQTRFLDMGKDFYALQT	315
Km-IW9801	-----AWVLFVSNPGGPL-GGSVTQYFVGDFNGTHFTPIDGQTRFLDMGKDFYALQT	293
Kluy.lactis	QLEEVGYAWVMIVSFNPGSIL-GGSGTEYFIGDFNGTHFEPLDKQTRFLDLGKDFYALQT	370
Zygo.rouxii	-----KDNWVLYISINPGAPQ-GGSATEYFIGEFDGKVFQPRDNQVRLMDLGKDFYAFQT	277
Schiz.pombe-1	-----WVLFISINPGAPL-GGSVVQYFVGDFWNGTNFVPDDGQTRFLDLGKDFYASAL	347
Schiz.pombe-2	-----WVLIVSNPSSSINGGSMVQYFIGDFDGTFTPIDSASRIIDCGHPCYATQT	270

Deb.hansenii	FS---DNEQDVIGLAWASNWQYANVVP-TNPWRSSMSLARKYTLG-YVNQNVETKIMTLI	351
Schw.occidentalis	FS---EVEHGVGLAWASNWQYADQVP-TNPWRSSSTSLARNYTLR-YVIQ---MLKLTANI	350
Pic.anomala	FDNT-EPEDGALGLAWASNWQYANTVP-TENWRSMSLVRNYTLK-YVDVNPENYGLTLI	351
Pic.jadinii	FFN---APENRSIGVAWSSNWQYSNQVPDPDGYRSSMSSIREYTLR-YVSTNPESQILILC	353
Can.guilliermondii	FDNA-PKELGVVGLAWASNWQYANLAP-TKEWRSSMTLARQMTLA-SRNMPETKVLSLL	338
S.cerevisiae	FFNTDPTYGSALGIAWASNWEYSAFVP-TNPWRSSMSLVRKFSLNTEYQANPETELINLK	350
S.monacensis	FFNTDPTYGSALGIAWASNWEYSAFVP-TNPWRSSMSLVRKFSLNTEYQANPETELINLK	350
S.pastorianus	FFNTDPTYGSALGIAWASNWEYSAFVP-TNPWRSSMSLVRKFSLNTEYQANPETELINLK	350
S.bayanus	FFNTDPTYGSALGIAWASNWEYSAFVP-TNPWRSSMSLVRKFSLNTEYQANPETELINLK	350
S.cariocanus	FFNTDPTYGSALGIAWASNWEYSAFVP-TNPWRSSMSLVRKFSLNTEYQANPETELINLK	350
Y.lipolytica	FFNTDPTYGSALGIAWASNWEYSAFVP-TNPWRSSMSLVRKFSLNTEYQANPETELINLK	369
S.paradoxus	FFNTDPTYGSALGIAWASNWEYSAFVP-TNPWRSSMSLVRKFSLNTEYQANPETELINLK	350
Ash.gossypii	FYNSQFKD-SFLGIAWASNWQYSAYVP-TNPWRSSMSLARKLTVR-PYNPTPESVQLVLN	386
Vand.polyspora-1	FFNS--PDNSTLGVAWASNWQYQYVVP-TYPWRSSMSLVRNLTLE-YFQANPESKILKLK	463
Vand.polyspora-2	FFNS--ADNSTLGVAWASNWKYQSVDP-TYPWKSSMSLVRKFTLD-YFQANPESKILSLK	415
Km-DMKU3-1042	FFNTP-NEKDVYGIAWASNWQYQQAP-TDPWRSSMSLVRQFTLK-DFSTNPNSADVVLN	373
Km-CBS6556	FFNTP-NEKDVYGIAWASNWQYQQAP-TDPWRSSMSLVRQFTLK-DFSTNPNSADVVLN	373
Km-CBS4857	FFNTP-NEKDVYGIAWASNWQYQQAP-TDPWRSSMSLVRQFTLK-DFSTNPNSADVVLN	372
Km-ATCC12424	FFNTP-NEKDVYGIAWASNWQYQQAP-TDPWRSSMSLVRQFTLK-DFSTNPNSADVVLN	372
Km-Y1	FFNTP-NEKDVYGIAWASNWQYQQAP-TDPWRSSMSLVRQFTLK-DFSTNPNSADVVLN	372
Km-CBS834	FFNTP-NEKDVYGIAWASNWQYQQAP-TDPWRSSMSLVRQFTLK-DFSTNPNSADVVLN	372
Km-IW9801	FFNTP-NEKDVYGIAWASNWQYQQAP-TDPWRSSMSLVRQFTLK-DFSTNPNSADVVLN	350
Kluy.lactis	FFNTP-NEVDVLGIAWASNWQYANQVP-TDPWRSSMSLVRNFTIT-EYNINSNTALVLN	427
Zygo.rouxii	FYNTN-NDKDVIGMAWASNWQYTNQTP-TSQYRSCLTMLRKLHLQ-KLQITPEYSEINLF	334
Schiz.pombe-1	YHS--SSANADVIGVWASNWQYTNQAPT-QVFRSAMTVARKFTLR-DVPQNPMTNLTSLI	404
Schiz.pombe-2	FG--NAPDGRVIGISWASNWNQYTNQAPT-QVFRSAMTVARKFTLR-DVPQNPMTNLTSLI	327

Additional file 1 (continued)

Deb.hansenii	QTPILNN-----LDVINKVEKNHLLTKNDSVITNFSSS---TGLLDFNTTTFKV	397
Schw.occidentalis	DKSVLPDS-----INVVDKLLKKNVKLTNKKPIKTNFKGS---TGLFDFNITTFKV	397
Pic.anomala	QKPVYDTKETRLNETLKTLETINEYEVDLKLKSSFVATDFNTERNATGVFEFDLKFTQ	411
Pic.jadinii	QKPFVNET-----DLKVVEYKVSNSSLTVDHTEGSSSFANSN-TTGLLDFNMFTTV	404
Can.guilliermondii	QKPIFGES-----VVAANKISKRNITGQDEQAVKIHKNS--TGTFLLDITFSV	384
S.cerevisiae	AEPILNISN-----AGPWLHFAS---NSTLTKANSFSVDLSNS-TGTLEFELVYAV	397
S.monacensis	AEPILNISN-----AGPWLHFAS---NSTLTKANSFSVDLSNS-TGTLEFELVYAV	397
S.pastorianus	AEPILNISN-----AGPWLHFAS---NSTLTKANSFSVDLSNS-TGTLEFELVYAV	397
S.bayanus	AEPILNISN-----AGPWLHFAS---NSTLTKANSFSVDLSNS-TGTLEFELVYAV	397
S.cariocanus	AEPILNISN-----AGPWLHFAS---NSTLTKANSFSVDLSNS-TGTLEFELVYAV	397
Y.lipolytica	AEPILNISN-----AGPWLHFAS---NSTLTKANSFSVDLSNS-TGTLEFELVYAV	397
Ash.gossypii	SEPVFVPED-----MEFNSNFSSWK-DLKLTSKGEEVFEFGSTPLGAFENLTTFA	436
Vand.polyspora-1	SQPVIDYDC-----FTSNSDVIKFS-NLSSLSTLDSIYFSNSSEGLEFNLTWSV	513
Vand.polyspora-2	SEPCVDYDV-----FDLNAAGTLYTL-NNATDDFMHAKITT-NSSQGLLEFNMTWSV	464
Km-DMKU3-1042	SQPVLNYDA-----LRKNGTTSYIT-NYTVTSENGKKIKLDNP-SGSLEFHLEYVF	422
Km-CBS6556	SQPVLNYDA-----LRKNGTTSYIT-NYTVTSENGKKIKLDNP-SGSLEFHLEYVF	422
Km-CBS4857	SQPVLNYDA-----LRKNGTTSYIT-NYTVTSENGKKIKLDNP-SGSLEFHLEYVF	421
Km-ATCC12424	SQPVLNYDA-----LRKNGTTSYIT-NYTVTSENGKKIKLDNP-SGSLEFHLEYVF	421
Km-Y1	SQPVLNYDA-----LRKNGTTSYIT-NYTVTSENGKKIKLDNP-SGSLEFHLEYVF	421
Km-CBS834	SQPVLNYDA-----LRKNGTTSYIT-NYTVTSENGKKIKLDNP-SGSLEFHLEYVF	421
Km-IW9801	SQPVLNYDA-----LRKNGTTSYIT-NYTVTSENGKKIKLDNP-SGSLEFHLEYVF	399
Kluy.lactis	SQPVLDFTS-----LRKNGTTSYIT-NYTVTSENGKKIKLDNP-SGSLEFHLEYVF	476
Zygo.rouxii	SAPLWDQDS-----LVNLAPPKSLTPDAPLLPNHGLNINLDQGG-EGLLFETWEWSV	384
Schiz.pombe-1	QTPILNVSLLR-----DETLEFAPVINSSSLSGSPITLPSNTAFENVTLSI	451
Schiz.pombe-2	QRPVNLHHLHY-----YPDSLPAPELLLN--RVCEFPVTWTSATVFYLAVSIPK	372

Deb.hansenii	VGESIDSN-SLSNIEILIHQSMSNSTESIKVGFDRSVSAFYFNRD-IPNVEFNNNPYFT	455
Schw.occidentalis	LNLNVSP--GKTHFDILINSQELNSSVDSIKIGFDSSQSLFYIDRH-IPNVEFPRKQFFT	454
Pic.anomala	TDLKMGYSNMTTQFGLYIHSQTVKGSQETLQLVFDTLSTTWYIDRT-TQHSFQRNSPVFT	470
Pic.jadinii	NGTTDVTKQDSVTFELRIS---NQSDAIALGYDYNNEQFYINRA-TESYFQRTNPFQ	460
Can.guilliermondii	DLLKNQTG-----QLQVIS---GQNGESIRAGFDPTAGQFVDRG-NTSGLK-ENPFFT	433
S.cerevisiae	NTTQSVSKSVFSDLSLWFKGL--EDPEEYLRMGFEASASSFFLDRGNSKVKFVKENPYFT	455
S.monacensis	NTTQSVSKSVFSDLSLWFKGL--EDPEEYLRMGFEASASSFFLDRGNSKVKFVKENPYFT	455
S.pastorianus	NTTQSVSKSVFSDLSLWFKGL--EDPEEYLRMGFEASASSFFLDRGNSKVKFVKENPYFT	455
S.bayanus	NTTQSVSKSVFSDLSLWFKGL--EDPEEYLRMGFEASASSFFLDRGNSKVKFVKESPYFT	455
S.cariocanus	NTTQTSISKSVFADLSLWFKGL--EDPEEYLRMGFEVSASSFFLDRGNSKVKFVKENPYFT	455
Y.lipolytica	NTTQTSISKSVFADLSLWFKGL--EDPEEYLRMGFEVSASSFFLDRGNSKVKFVKENPYFT	474
S.paradoxus	NSTKTVSKSVFADLSLWFKGL--EDPEEYLRMGFEVSASSFFLDRGNSKVKFVKENPYFT	455
Ash.gossypii	NDTG-LSKHS LGDFS IYLEGA--KDPDEYLRLGYSTQAADFFDRGNSKVSFVRENPF	493
Vand.polyspora-1	NSSS-YDNHDFADLSLKLKRG--LNPFYLRRLGYLANVNSFFIDRGHSNNNNWNNPF	570
Vand.polyspora-2	NASA-PDINSEAADLSLYLRGN--QFDDEYLWLGYIANAGAFYLRGNTGSPFTATCPLFN	521
Km-DMKU3-1042	NGSPDIKSNVFADLSLYFKGN--NDDNEYLRLGYETNGGAFFLDRGHTKIPFVKENLFFN	480
Km-CBS6556	NGSPDIKSNVFADLSLYFKGN--NDDNEYLRLGYETNGGAFFLDRGHTKIPFVKENLFFN	480
Km-CBS4857	NGSPDIKSNVFADLSLYFKGN--NDDNEYLRLGYETNGGAFFLDRGHTKIPFVKENLFFN	479
Km-ATCC12424	NGSPDIKSNVFADLSLYFKGN--NDDNEYLRLGYETNGGAFFLDRGHTKIPFVKENLFF	479
Km-Y1	NGSPDIKSNVFADLSLYFKGN--NDDNEYLRLGYETNGGAFFLDRGHTKIPFVKENLFF	479
Km-CBS834	NGSPDIKSNVFADLSLYFKGN--NDDNEYLRLGYETNGGAFFLDRGHTKIPFVKENLFF	479
Km-IW9801	NGSPDIKSNVFADLSLYFKGN--NDDNEYLRLGYETNGGAFFLDRGHTKIPFVKENLFF	457
Kluy.lactis	N-FTGIHNWVFTDLSLYFGQD--KDSDEYLRLGYEANSKQFFLDRGHSNIPFVQENPF	533
Zygo.rouxii	QDKL-VPKADFCGITMFLKQD--ETSNQFSLSGFEANSASSFFLDRGNTGSHFETNPFLT	441
Schiz.pombe-1	NYTEGCTTGYCLGRIIDSD--PYRLQSI SVDVDFAASTLVINRAKAMQMF--NSLFT	507
Schiz.pombe-2	SIVLESPMEFLCLTWSTTPDV--ETSKEYFELGYRFHDGAVYVERGVCSSSWK--YPLYP	428

G

Deb.hansenii	NKFSTYVEPSHYDEDDMPVYKIYGIVDKNILELYFNDGTQMTNTFFMSEDKYPHQIEIA	515
Schw.occidentalis	DKLAAYLEPLDYDQD-LRVFSLYGVDKNILELYFNDGTVMAMNTFFMGEGKYPHDIQIV	513
Pic.anomala	ERISTYVEKIDTTDQ-GNVYTLYGVDVDRNILELYFNDGSIAMTNTFFMFREGKIPTSFEV	529
Pic.jadinii	ERWSTYVQPLTITESGDKQYQLYGLVDNNILELYFNDGAFTSTNTFFLEKKGK-PSNVDIV	519
Can.guilliermondii	DKTSAYVEPWKHQND-LPVYKMGFVIDGNLIEVFLNDGIATLTNTFFIPGTEGLEYLEIE	492
S.cerevisiae	NRMSVNNQPFKSEND-LSYKVVYGLLDQNILELYFNDGDVVSTNTYFMTGTGNALGSVNM	514
S.monacensis	NRMSVNNQPFKSEND-LSYKVVYGLLDQNILELYFNDGDVVSTNTYFMTGTGNALGSVNM	514
S.pastorianus	NRMSVNNQPFKSEND-LSYKVVYGLLDQNILELYFNDGDVVSTNTYFMTGTGNALGSVNM	514
S.bayanus	NRMSVNNQPFKSEND-LSYKVVYGLLDQNILELYFNDGDVVSTNTYFMTGTGNALGSVNM	514
S.cariocanus	NRMSVNNQPFKTEDD-LSYKVVYGLLDQNILELYFNDGDVVSTNTYFMTGTGNSLGSVNM	514
Y.lipolytica	NRMSVNNQPFKSEND-LSYKVVYGLLDQNILELYFNDGDVVSTNTYFMTGTGNALGSVNM	533
S.paradoxus	NRMSLNNQPFKTEDD-LSYKVVYGLLDQNILELYFNDGDVVSTNTYFMTGTGNSLGSVNM	514
Ash.gossypii	NKMAINMEPWEILAPGVKVKFVRAIFDVDTILELFNEGTAASTNTYFLTEENHPASLKFK	553
Vand.polyspora-1	NKLSVNLQPFDDYVNDIEITYKYVGIIDRNILELYFNDGFQVSTNTFFFGDYNYSSELS	630
Vand.polyspora-2	TRTAVNVQPCYVSDEITYKYVGIIDRNILELYFNDGQVSTNTFFFMGDGYIETCELC	581
Km-DMKU3-1042	HQLAVTNPVSNYTTN---VFDVYGVIDKNILELYFDNGNVVSTNTFFFSTNNVIGEIDIK	537
Km-CBS6556	HQLAVTNPVSNYTTN---VFDVYGVIDKNILELYFDNGNVVSTNTFFFSTNNVIGEIDIK	537
Km-CBS4857	HQLAVTNPVSNYTTN---VFDVYGVIDKNILELYFDNGNVVSTNTFFFSTNNVIGEIDIK	536
Km-ATCC12424	HQLAVTNPVSNYTTN---VFDVYGVIDKNILELYFDNGNVVSTNTFFFSTNNVIGEIDIK	536
Km-Y1	HQLAVTNPVSNYTTN---VFDVYGVIDKNILELYFDNGNVVSTNTFFFSTNNVIGEIDIK	536
Km-CBS834	HQLAVTNPVSNYTTN---VFDVYGVIDKNILELYFDNGNVVSTNTFFFSTNNVIGEIDIK	536
Km-IW9801	HQLAVTNPVSNYTTN---VFDVYGVIDKNILELYFDNGNVVSTNTFFFSTNNVIGEIDIK	514
Kluy.lactis	QRLSVSNPPSSNSS---TFDVGIVDRNILELYFNNGTVTSTNTFFFSTGNNIGSIIVK	589
Zygo.rouxii	RNLSADLTPYRTFQG-TSIIYKVGILDRNILELYFNDGALAATYTFYFLENRPRIRWVME	500
Schiz.pombe-1	PSFANDIY--IYGN-----VTLYGIVDNGLILELYVNNNGEKTYNDFFFLQGATPGQISFA	560
Schiz.pombe-2	ERTSSVPPSSYEDN--YILEIEAVVDHSTIEVYLLQGGIMCLTNAYYFKGDEPLQYYILR	486

Additional file 1 (continued)

Deb.hansenii	SNVDG-QFELQSLILIRELNN-----	534
Schw.occidentalis	TDTEEPLFELESVIIIRELNK-----	533
Pic.anomala	CDSEKSFITIDELSVRELARK-----	550
Pic.jadinii	ASSSK-----EAYHRGPAD-----	533
Can.guilliermondii	SSSDAIHIVELEVKELKLRLATS-----	514
S.cerevisiae	TGVDN-LFYIDKFQVREVK-----	532
S.monacensis	TGVDN-LFYIDKFQVREVK-----	532
S.pastorianus	TGVDN-LFYIDKFQVREVK-----	532
S.bayanus	TGVDN-LFYIDKFQVREVK-----	532
S.cariocanus	-----	
Y.lipolytica	TGVDN-LFYIDKFQVREVK-----	551
S.paradoxus	TGVDD-LFYIDKFQVREVK-----	532
Ash.gossypii	TSVDN-VFTVNELSLRQLTF-----	572
Vand.polyspora-1	VGKDG-VFDIQEFSVRQLHLK-----	650
Vand.polyspora-2	VNKMG-VFSIDEFSFRQLALKK-----	602
Km-DMKU3-1042	SPYDK-AYTINSFNVTQFNV-----	556
Km-CBS6556	SPYDK-AYTINSFNVTQFNV-----	556
Km-CBS4857	SPYDK-AYTINSFNVTQFNL-----	555
Km-ATCC12424	SPYDK-AYTINSFNVTQFNV-----	555
Km-Y1	SPYDK-AYTINSFNVTQFNV-----	555
Km-CBS834	SPYDK-AYTINSFNVTQFNV-----	555
Km-IW9801	SPYDN-PYTINSFNVTQFNV-----	533
Kluy.lactis	SGVDD-VYEIESLKVNFYVD-----	609
Zygo.rouxii	SSVND-VFKIKELRFTELAIKSPSKTY	526
Schiz.pombe-1	AFQGVSFNNVTVTPLKTIWNC-----	581
Schiz.pombe-2	VPTGASLAKSGMQPLLNNRPHS-----	508

Additional file 1 (continued)