

**CELL WALL AND CELL WALL
PROCESSES (57)**

CysT (Rv2399c), CysW (Rv2398c), DrrB (Rv2937), DrrC (Rv2938), EmbA (Rv3794), EmbC (Rv3793), EsxG (Rv0287), FtsK (Rv2748c), GlfT (Rv3808c), GlnH (Rv0411c), LepB (Rv2903c), LppL (Rv2138), LpqI (Rv0237), LpqK (Rv0399c), MmpL8 (Rv3823c), ModA (Rv1857), MurE (Rv2158c), MurF (Rv2157c), MurG (Rv2153c), MurX (Rv2156c), NagA (Rv3332), ParB (Rv3917c), PitA (Rv0545c), PitB (Rv2281), Rip (Rv2869c), RpfB (Rv1009), Rv0102, Rv0284, Rv0290, Rv0479c, Rv0585c, Rv1303, Rv1435c, Rv1456c, Rv1459c, Rv1473, Rv1565c, Rv1795, Rv2113, Rv2136c, Rv2969c, Rv3238c, Rv3448, Rv3604c, Rv3635, Rv3679, Rv3737, GlfT1 (Rv3782), Rv3802c, AftB (Rv3805c), Rv3882c, Rv3887c, SecY (Rv0732), SppA (Rv0724), SugB (Rv1237), Wag31 (Rv2145c), WbbL1 (Rv3265c)

CONSERVED HYPOTHETICALS (77)

ArgA (Rv2747), Pra (Rv1078), Rv0060, Rv0163, Rv0269c, Rv0295c, Rv0525, Rv0540, Rv0552, Rv0635, Rv0811c, Rv0813c, Rv0926c, Rv1186c, Rv1204c, Rv1208, Rv1215c, Rv1232c, Rv1247c, Rv1277, Rv1287, Rv1339, Rv1421, Rv1461, Rv1462, Rv1466, Rv1505c, Rv1558, Rv1592c, Rv1711, Rv1732c, Rv1738, Rv1828, Rv1836c, Rv1847, Rv1870c, Rv1873, Rv1885c, Rv1897c, Rv2026c, Rv2117, Rv2165c, Rv2166c, Rv2170, Rv2372c, Rv2510c, Rv2515c, Rv2554c, Rv2573, Rv2681, Rv2683, Rv2689c, Rv2787, Rv2837c, Rv2842c, Rv2897c, Rv2910c, Rv2949c, Rv3015c, Rv3031, Rv3037c, Rv3131, Rv3282, Rv3284, Rv3338, Rv3404c, Rv3471c, Rv3627c, Rv3722c, Rv3740c, Rv3755c, Rv3796, Rv3868, Rv3871, Rv3909, Rv2140c, Rv2623

LIPID METABOLISM (48)

AccD3 (Rv0904c), AcpM (Rv2244), AcpS (Rv2523c), CmaA2 (Rv0503c), DesA1 (Rv0824c), DesA2 (Rv1094), FabD (Rv2243), FabH (Rv0533c), FadA2 (Rv0243), FadD11 (Rv1550), FadD16 (Rv0852), FadD28 (Rv2941), FadD30 (Rv0404), FadD32 (Rv3801c), FadD36 (Rv1193), FadE24 (Rv3139), FadE33 (Rv3564), FadH (Rv1175c), Fas (Rv2524c), FbpA (Rv3804c), FbpB (Rv1886c), FbpC (Rv0129c), InhA (Rv1484), MbtC (Rv2382c), MmaA1 (Rv0645c), MmaA2 (Rv0644c), MmaA3 (Rv0643c), MmaA4 (Rv0642c), MutA (Rv1492), PapA3 (Rv1182), PapA5 (Rv2939), PcaA (Rv0470c), Php (Rv0230c), PimA (Rv2610c), PimB (Rv0557), Pks1 (Rv2946c), Pks13 (Rv3800c), Pks17 (Rv1663), Pks2 (Rv3825c), Pks4 (Rv1181), PlsB1 (Rv1551), PlsB2 (Rv2482c), PpsA (Rv2931), PpsC (Rv2933), PpsE (Rv2935), Rv0914c, Rv1722, Rv2613c

INFORMATION PATHWAYS (37)

AlaS (Rv2555c), Def (Rv0429c), DnaB (Rv0058), DnaG (Rv2343c), DnaZX (Rv3721c), FusA2 (Rv0120c), GltS (Rv2992c), HelZ (Rv2101), HupB (Rv2986c), LigC (Rv3731), NrdZ (Rv0570), NusB (Rv2533c), PheT (Rv1650), PolA (Rv1629), PpiB (Rv2582), PrfB (Rv3105c), RadA (Rv3585), Rho (Rv1297), Rnc (Rv2925c), RnhB (Rv2902c), RnpA (Rv3923c), RplL (Rv0652), RplV (Rv0706), RplW (Rv0703), RpsD (Rv3458c), RpsQ (Rv0710), RpsT (Rv2412), SigA (Rv2703), SigC (Rv2069), SigE (Rv1221), SigF (Rv3286c), SigH (Rv3223c), SigM (Rv3911), TopA (Rv3646c), TrmD (Rv2906c), Tsf (Rv2889c), TyrS (Rv1689)

REGULATORY PROTEINS (21)

DevS (Rv3132c), KdpE (Rv1027c), MprB (Rv0982), MtrB (Rv3245c), NadR (Rv0212c), NarL (Rv0844c), PknB (Rv0014c), PknH (Rv1266c), PknL (Rv2176), PstP (Rv0018c), RraA (Rv3853), Rv0196, Rv0465c, Rv0472c, Rv0474, Rv0586, Rv0894, Rv1846c, Rv3220c, Rv3405c, TcrA (Rv0602c)

INTERMEDIARY METABOLISM AND RESPIRATION (187)

Aao (Rv1905c), Adh (Rv1530), AdhA (Rv1862), AdoK (Rv2202c), AmiB2 (Rv1263), ArcA (Rv1001), ArgC (Rv1652), ArgD (Rv1655), ArgJ (Rv1653), AroB (Rv2538c), AroD (Rv2537c), AroE (Rv2552c), AroF (Rv2540c), AroG (Rv2178c), AroK (Rv2539c), AtpB (Rv1304), AtpC (Rv1311), AtpE (Rv1305), AtpH (Rv1307), BioB (Rv1589), BioF2 (Rv0032), CanA (Rv1284), Cbs (Rv1077), CcdA (Rv0527), CoaA (Rv1092c), CoaE (Rv1631), CobC (Rv2231c), Csd (Rv1464), CtaC (Rv2200c), Cyp121 (Rv2276), Cyp128 (Rv2268c), Cyp132 (Rv1394c), CysD (Rv1285), CysE (Rv2335), CysH (Rv2392), CysK2 (Rv0848), DapA (Rv2753c), DapF (Rv2726c), DeoC (Rv0478), Dfp (Rv1391), Fba (Rv0363c), FbiA (Rv3261), FdhF (Rv2900c), FolB (Rv3607c), GalK (Rv0620), GalTb (Rv0619), GcvT (Rv2211c), GlbN (Rv1542c), GlpP (Rv1328), GlnA3 (Rv1878), GlnA4 (Rv2860c), GlnE (Rv2221c), GlpQ1 (Rv3842c), GltA1 (Rv1131), GltB (Rv3859c), GltD (Rv3858c), GshA (Rv3704c), GuaB1 (Rv1843c), GuaB3 (Rv3410c), HemA (Rv0509), HemD (Rv0511), HemE (Rv2678c), HemK (Rv1300), HemN (Rv2388c), HemZ (Rv1485), HisC1 (Rv1600), HycP (Rv0085), IlvX (Rv3509c), IspD (Rv3582c), IspE (Rv1011), IspF (Rv3581c), Lat (Rv3290c), LeuA (Rv3710), LipC (Rv0220), LipT (Rv2045c), LldD2 (Rv1872c), LpdA (Rv3303c), LysA (Rv1293), ManA (Rv3255c), MenC (Rv0553), MenD (Rv0555), MenE (Rv0542c), MenH (Rv0558), MetH (Rv2124c), MiaA (Rv2727c), MoeA2 (Rv0438c), Mrp (Rv1229c), MrsA (Rv3441c), MscR (Rv2259), MshB (Rv1170), MshD (Rv0819), Mtn (Rv0091), MycP1 (Rv3883c), MycP2 (Rv3886c), MycP3 (Rv0291), NadA (Rv1594), Nat (Rv3566c), NirA (Rv2391), PabB (Rv1005c), PanB (Rv2225), PanC (Rv3602c), Pcp (Rv0319), Pdc (Rv0853c), PepQ (Rv2535c), PfkB (Rv2029c), PheA (Rv3838c), PpdK (Rv1127c), PpgK (Rv2702), PpnK (Rv1695), PrcA (Rv2109c), PrcB (Rv2110c), ProB (Rv2439c), PtrBa (Rv0781), PurE (Rv3275c), PurK (Rv3276c), PyrB (Rv1380), PyrD (Rv2139), PyrE (Rv0382c), PyrF (Rv1385), QcrA (Rv2195), QcrB (Rv2196), QcrC (Rv2194), RibA1 (Rv1940), RibG (Rv1409), RibH (Rv1416), RmlC (Rv3465), RmlD (Rv3266c), Rv0208c, Rv0224c, Rv0228, Rv0296c, Rv0315, Rv0316, Rv0338c, Rv0526, Rv0636, Rv0648, Rv0697, Rv0843, DapC (Rv0858c), Rv1096, Rv1178, Rv1201c, Rv1220c, Rv1257c, Rv1264, Rv1360, Rv1465, Rv1500, Rv1692, Rv1714, Rv1856c, Rv2296, Rv2435c, Rv2715, Rv2952, Rv2957, Rv2959c, Rv2962c, Rv3137, Rv3175, Rv3406, Rv3579c, Rv3712, Rv3752c, Rv3778c, Rv3790, Rv3791, Rv3915, SerA1 (Rv2996c), SerB2 (Rv3042c), SpeE (Rv2601), SseA (Rv3283), SseB (Rv2291), ThiD (Rv0422c), ThiL (Rv2977c), ThiO (Rv0415), ThrA (Rv1294), ThrB (Rv1296), ThrC (Rv1295), ThyX (Rv2754c), Tmk (Rv3247c), TrpA (Rv1613), TrpC (Rv1611), TrpG (Rv0013), TrxB2 (Rv3913), UreC (Rv1850)

PE/PPE (14)

PE_PGRS63 (Rv3097c), PE11 (Rv1169c), PE5 (Rv0285), PE6 (Rv0335c), PPE12 (Rv0755c), PPE2 (Rv0256c), PPE22 (Rv1705c), PPE23 (Rv1706c), PPE24 (Rv1753c), PPE3 (Rv0280), PPE4 (Rv0286), PPE46 (Rv3018c), PPE50 (Rv3135), PPE54 (Rv3343c)

**VIRULENCE, DETOXIFICATION,
ADAPTATION (12)**

BpoC (Rv0554), DnaJ1 (Rv0352), DnaJ2 (Rv2373c), GrpE (Rv0351), HrcA (Rv2374c), KatG (Rv1908c), OtsB2 (Rv3372), Rv0627, Rv1477, Rv3177, Rv3660c, TreS (Rv0126)

**CONSERVED HYPOTHETICALS
WITH ORTHOLOGUE IN *M. bovis* (4)**

Rv2319c, Rv3611, Rv3818, Rv3849

**INSERTION SEQUENCES
AND PHAGES (2)**

Rv1701, Rv3427c