

Sequence alignment of representatives of GMPs. The sequences of *Mj*GATase and *Mj*ATPase subunits have been fused in the alignment. The sequence alignment has been performed using the program ESPrnt [65].

1 10 20 30

E.coliMTENIHKKHRLILDLFGSQYTQLVARRVRELVGYCELWAW
H.sapiens MALCNGDSKLENAGGDLKDGHHHYEGAVVILDAAGQYGVKVIDRRVRELVVQSEIFPL
P.falci parumMEGEYDKLLVLNFGSQYFHLIVKRLNHIKIFSETKDY
M.jannaschiiMILVILDLNGGQYVHRIHRSLSKYITGVSSKIVPN

40 50 60 70 80 90

E.coli DVTEAQIRLDFNPSGIIILSGGPESTTEENSPRAP...QYVFEAGVPVFGVCGMQT
H.sapiens ETPAFAIKLEQGFRAIIISGGPNSVYAEDA PWFDP...AIFTIGKPVLFCHCMGMQM
P.falci parum GVELKDKIDMNIKGVILSGGPIYSVTEAGSPHLKKEVFYFLEKKIPIFGICMGMOE
M.jannaschii TTPLEELISNKEVKGIIILSGGPDIEKAKNCIDIA.....LNAKIPILGICLGHOL

100 110 120 130

E.coli MAMQLGCHVEASNEREFGYAQVEVVNDS....ALVRGLEDALTAD.....
H.sapiens MNKVFGGTVHKKSVREDDGVFNISVDNTC....SLFRGLQKE.....
P.falci parum IAVQMNGGVKKSKTSIEYCTDVNII LRNDNINNITYCRNFGDSSSSAMDLYSNYKLMNE
M.jannaschii TALAYGCEVGRAEAEIEYALTKVYVDKEN....DLFKNVPR....E.....

140 150 160 170 180

E.coliGKPLLDVWMSHGDKVTIAPSDFITVASIESCFPAIMANEEERFYGVQFH
H.sapiensEVVLLTHGDSVDKVADGFKVVARSG.NIVAGIANESKKLYGAQFH
P.falci parum TCCLFENIKSDITTVMMNRNDEVTKIPENFYLVSSSENCLICSIIYNKEYNIFYGVQYH
M.jannaschiiFNAAWASHKDEVKVPEGFEILAHSDIOVEAMKHKTKPFYGVQFH

190 200 210 220 230

E.coli FEVTHTRCGMRMLERFVRDTCQCEALWTFAKIIDDVARIREQVGDQKVLILSGGV
H.sapiens FEVGLTENGGVILKNFLYDIAGCSGTFTVQNRLECIREDIKERVGTSSKVLVLSSGGV
P.falci parum FEVYESLDGELMFYFNAYNICKCKKQFDPRIYHELELKNLEKYKHHDHYVIAAMSGGV
M.jannaschii FEVAHTEYGNELKNFKCKVCGYKFFEMDPKKFIDEAVERIKQQISDRKAIIALSGGV

240 250 260 270 280 290

E.coli DSSVTAMTLHRAIG.KNLTICVFVDNGLRLNEAEQVLDMFGDHFG.LNIIVHVEAEDR
H.sapiens DSTVCTALLNRLNQEQVIAVHIDNGFMRKRESQSVEEALKKLGL..IQVKVINAHHS
P.falci parum DSTVAAYTHKIFK.ERFFGIFIDNGLLRKNEAENVYTFLKSTFFDMNITKIDASEN
M.jannaschii DSSVAAVLTHKAIIG.DKLTAVFVDICLMRKGREVEVEKTFRDKLG.LNLIVVDKDR

300 310 320

E.coli FLS.....ALAGENDPEAKRKIIIG..RVFVEVFDEEATKLED
H.sapiens FYNGTITLPISEDRTPRKRIKTLNMTTSPERRKIIIGDTFVKIANEVI GEMNLKP
P.falci parum FLS.....NLQGVTDPRITKKENYRGNYLLKNLKKRKYIDIEY
M.jannaschii FELN.....AKGVTDPEBKRKIIIG..KLFIDVFEEIADIKKA

330 340 350 360 370 380

E.coli VK..WLAOCTIYPDVIESAASATG.KAHV.IKSHHNVGGLPKEMKMG..LVEPLKELFK
H.sapiens EEVFLAOCTLRPDIESASLVASGKAEIKITHNDTELIRKLREEGKVIEPLKDFHK
P.falci parum KQTFLLOCTLYPDIESKCSKN..LSDTIKTHHNVGGLPKNLKF..LFEPFKYLFK
M.jannaschii EV..LVQCTIAPDRIETQG.....KIKSHHNV..LPHGMVLE..VVEPLRELYK

390 400 410

E.coli DEVRKIGDELGLPYDMLYRHPPFGPGLGVRVLG.....
H.sapiens DEVRIILGRELGLPEELVSRHPPFGPGLAIRVICAEEPYICKDFPETNNILKIVADFS
P.falci parum DEVKTLRELNLPEEITNRHPPFGPGLAIRVIG.....
M.jannaschii DEVRLLADELGLPDSIVYRPPFGPGLAVRVLG.....

420 430 440 450 460 470

E.coli .EVKKEYCDLRRADAFIFI EELRKADLYDKVSQAFTVFLPVRSVGVMGDGGRKYDWV
H.sapiens ASVKKPHITLQRVKACTTEEDQEKLMQITSLSLNAFLLPKIKTVGVQGDGRSYSYVC
P.falci parum .EINKHKLNLILREVDIFINDLKQYGLYNQISQAFVILSSKSVGVGRDARSYDYVC
M.jannaschii .EVTEEKLNICREANALIVEEVKKANLDKDLWQYFAVVLDCATGVKGDREYVNIIV

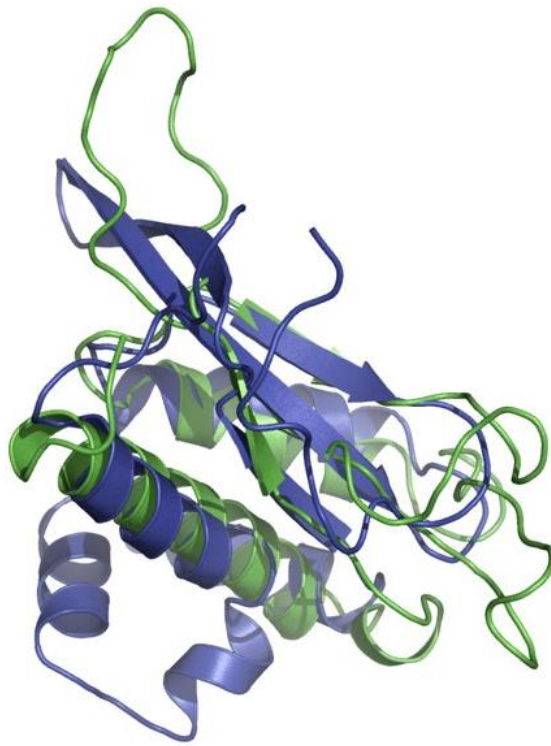
E.coli
H.sapiens GISSKDEPDWESLIFLARLIPRMCHNVNRVVYIFGPPVKEPPTDVPFTFLTGVLSL
P.falci parum
M.jannaschii

E.coliSLRAVETID
H.sapiens LRQADFEAHNILRESGYAGKISQMPVILTPLHFDRDPLQKQPSQCRSVVIRTFITSD
P.falci parumVLRAVKTSS
M.jannaschiiALRMVKSLSL

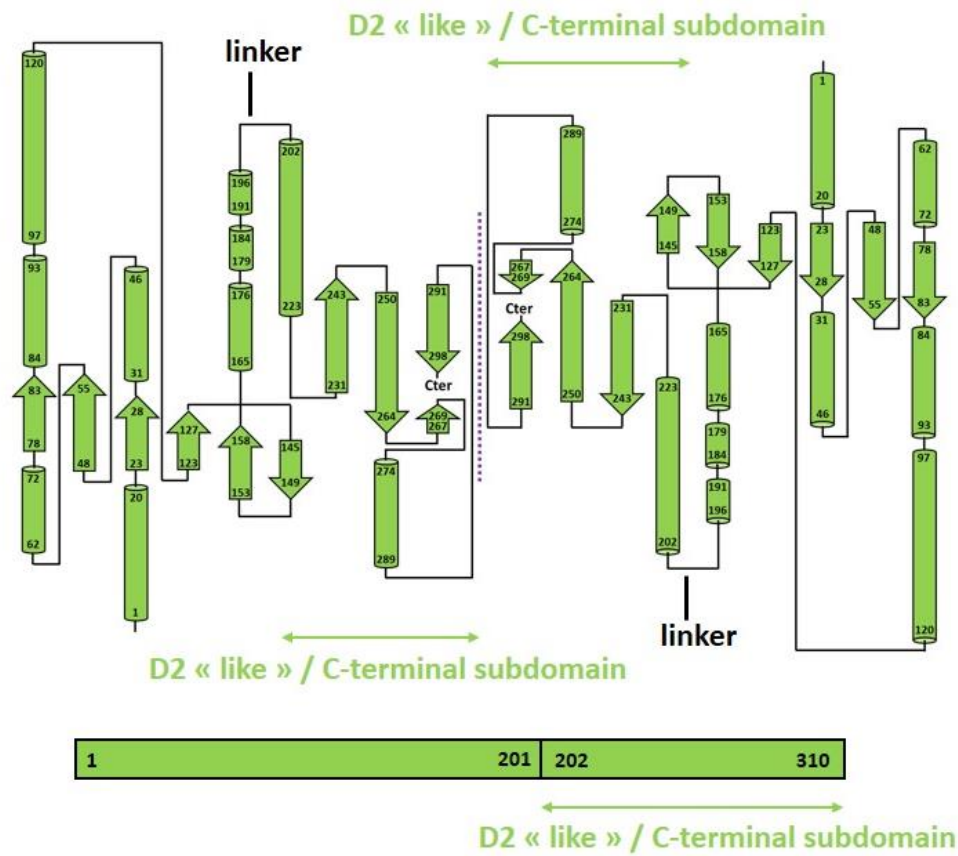
480 490 500 510 520

E.coli FMTAHHWAHLPYDFLGRVSNRIINEVN...GISRVVYDISCKPPATIEWE
H.sapiens FMTGIPATPGNEIPEVVLKMTVEIKKIPGISRIMYDLTSKPPGTIEWE
P.falci parum FMTANWYQIPYDILDKITIRILSEVK...GVNRILYDVSSKPPATIEFE
M.jannaschii AMTAHVPEIPFDLLKRISKRITSEIP...NVARVVFDTIDKPPATIEFE

Supplementary Figure S1. Sequence alignment of representatives of GMPs. The sequences of *Mj*GATase and *Mj*ATPase subunits have been fused in the alignment. The sequence alignment has been performed using the program ESPrnt [65].



Supplementary Figure S2. Subdomains D1 (blue) and D2 (green) in *HsGMPS* display very similar fold with a rmsd of 2.2 Å.



Supplementary Figure S3. Topology diagram of the *MjATPPase* subunit structure. The structure of the dimerization subdomain and the inter-subunit contacts in the dimer of the *MjATPPase* subunit is similar to the counterparts in the two domain GMPS structures.