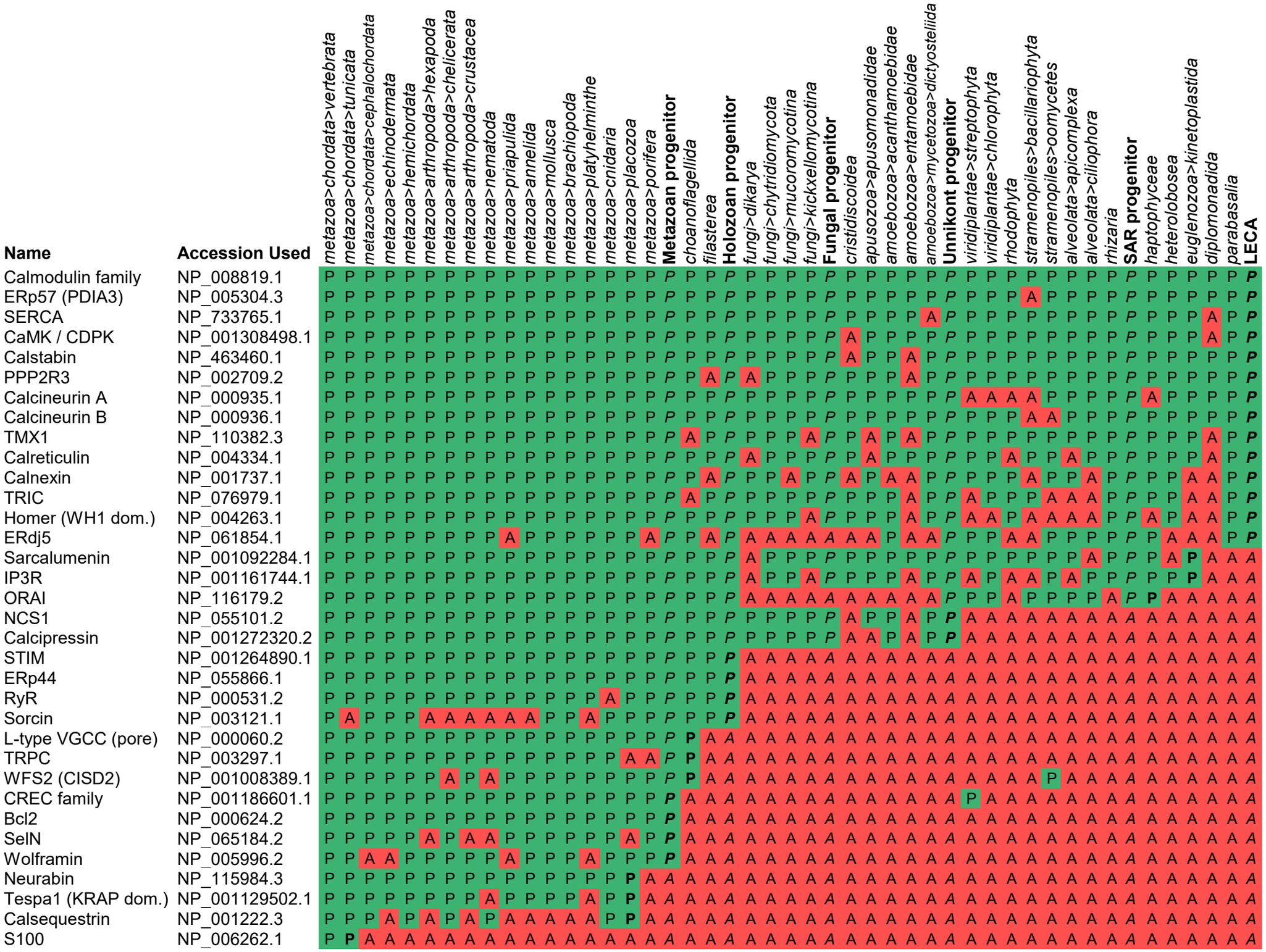
VI. Supplementary Figure S1



VII. Supplementary Figure S2

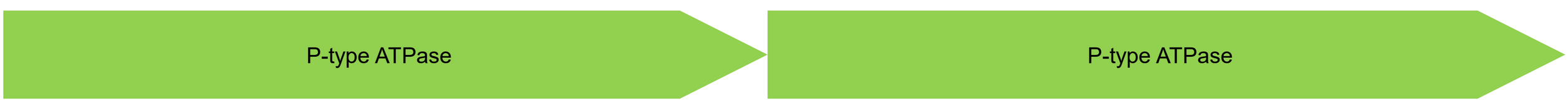
ABQ30334, ABQ30333 from *Acidiphilium cryptum JF-5* (α-proteobacteria)

ADN08417, ADN08416 from *Sulfurimonas autotrophica DSM 16294* (ε-proteobacteria)

AFL87427, AFL87428 from *Terriglobus roseus DSM 18391* (acidobacteria)

AEY94042, AEY94041, AEY94040 from *Streptomyces hygroscopicus subsp. jinggangensis 5008* (actinobacteria)

APC18922, APC18921, APC18920 from *Pseudomonas frederiksbergensis* (γ-proteobacteria)

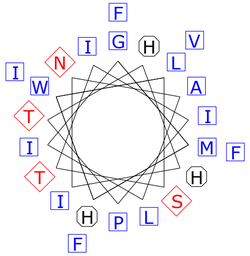


AEN97664, AEN97663 from *Roseburia hominis A2-183* (firmicutes)

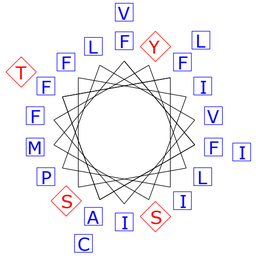
VIII. Supplementary Figure S3

IX. Supplementary Figure S4

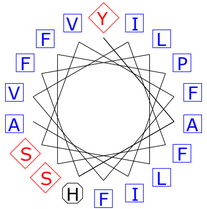
A.TM1 (311..333)



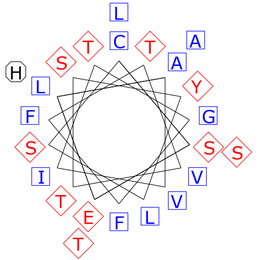
B. TM2 (340..362)



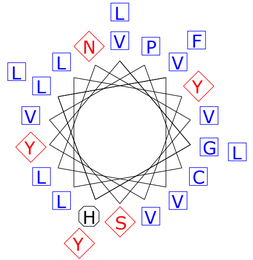
C. TM3 (405..422)



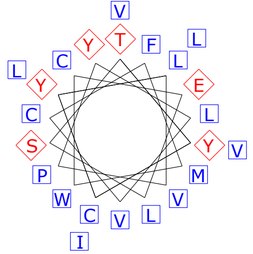
D. TM4 (429..451)



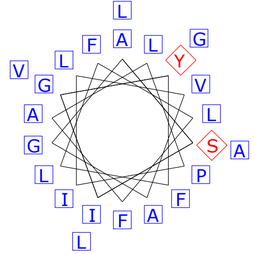
E. TM5 (493..515)



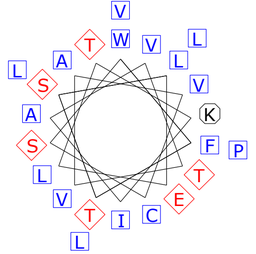
F. TM6 (527..549)



G. TM7 (559..581)



H.TM8 (588..610)



I. TM9 (630..652)