

Tyr41

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Saccharolobus solfataricus 98/2 MT-LQIQFKKYELPPLPYKIDALEPYISKDIIDVHYNGHHKGYVNGANSLLERLEKVVKG
Sulfolobus acidocaldarius DSM 639 MT-QVIQLKRYEFPQPLPYKVDALPEYISKDIIDVHYNGHHKGYVNGANSLLDRLEKLIK
Acidianus brierleyi DSM 1651 MS-SSISFKKYELPPLPYKLDALPEYISKDIIDVHYNGHHKGYVNGANSFLDRMQVTKG
Metallosphaera sedula DSM 5348 MS-SSISFKKFELPPLPYKVDALPEYISKDIIDVHYNGHHKGYVTGANTFMERFNKVIKG
Thermoproteus sp. A22 MA---VQFKKYELPPLPYNLDALEPYISRDIVDVHYNGHHKGYVNTANSLLDRLEKIIRG
Caldivirga maquilingensis IC-167 MA-AQTLFKRYELPPLPYNVNALEPYISGQVIDVHYNGHHKGYVNGANAADRLEKIIKN
Vulcanisaeta distributa DSM 14429 MSLPATLFRKYELPPLPYVINALEPHISGQVIDVHYNGHHKGYVNGANATIERLEKIIKG
Thermocladium modestius JCM 10088 MS-SANLFRKYELPPLPYKTSDEPHISAQVIDVHYNGHHKGYVNGANATVDRLEKILKG
Acidilobus saccharovorans 345-15 MV----SLKRYELPPLPYNYDALEPIISAETLRYHHDKHHKGYVNGANAALDKLEKYLNG
Caldisphaera lagunensis DSM 15908 MV----SYKRYELPPLPYSDALEPVLRSRDLTYHDKHHKGYVNGANAAMEKLEKYLNG
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Saccharolobus solfataricus 98/2 DLQTGGYDIQGIIRGLTFNINHGKHLHALYWNMAPSGKGGKPGGALADLINKQYGSFDR
Sulfolobus acidocaldarius DSM 639 DLPGQGYDLQGIIRGLTFNINHGKHLHALYWNMAPSGKGGKPGGALADLINKQYGSFDR
Acidianus brierleyi DSM 1651 ELSSGQYDIQGLLRGLTFNINHGKHLHALYWNMAPSGKGGKPGGSLADLIEKQYGSFDR
Metallosphaera sedula DSM 5348 ELQSGQYDVQGLMRGIVFNINHGKHLHALYWNMAPSGKGGKPGGALADLIVKQYGSYDR
Thermoproteus sp. A22 ELQGGYDIQGIIRGLTFNINHGKHLHDLVWKSMAKSGKGGKPGGRLADLINKQYGSFDR
Caldivirga maquilingensis IC-167 EVTS--YDIQGLLRNLFNINHGKHLHTLYWNSMAPSGKGGTTPGGYLDLVIKQFGSYDK
Vulcanisaeta distributa DSM 14429 DVTS--YDIQGLLRSLFFNVNGKHLHTLYWNSMAPSGKGGTTPGGYLDLVIKQFGSYDK
Thermocladium modestius JCM 10088 DVTS--YDIQGLLRNLFNINHGKHLHALYWNMAPSGKGGKPGGKADLITKQYGGYDK
Acidilobus saccharovorans 345-15 QLTD--IDVRAVSRDFEFNYGGHILHTLYWLNMAPSGKGGTTPGGAIGDAINKFPGSFDR
Caldisphaera lagunensis DSM 15908 QEQS--IDIRAVSRDFEFNYGGHLLHTLYWLNMAPSGKGGTTPGGTIADAINKNFPGSFDR
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His155
Saccharolobus solfataricus 98/2 FKQVFTETANSLPGTGWAVLYYDTESGNLQIMTFENHFQNHIAELPIILILDEFEHAYYL
Sulfolobus acidocaldarius DSM 639 FKQVFESANSLPGSGWTVLYYDNESGNLQIMTFENHFQNHIAELPVLIVDEFEHAYYL
Acidianus brierleyi DSM 1651 FKALFTEANSLPGTGWTLVLYYETENGNLQIMTFENHFQNHIAELPIVLILDEFEHAYYL
Metallosphaera sedula DSM 5348 FKQVFTETANSLPGTGWTLVLYYDTENGLEIMTFENHFQNHIAELPILLILDEFEHAYYL
Thermoproteus sp. A22 FKAVFTEANSLPGTGWTLVLYYDTETGNLQIMTFENHFQNHIAELPILLIVDEFEHAYYL
Caldivirga maquilingensis IC-167 FRNLFNEVMRSLPGSGWAVLYYDTETGNLVFTTFENHYNQHIAELPILLIIDEFEHAYYL
Vulcanisaeta distributa DSM 14429 FKALFTEVMRSLPGCGWTVLYYDPETGNLEFTTFENHYNQHIAELPILLIVDEFEHAYYL
Thermocladium modestius JCM 10088 FRKIFDEVMRSLPGSGWATVLYYDPETGNLVFTTFENHYNQHIAELPVLIVDEFEHAYYL
Acidilobus saccharovorans 345-15 FKKLPGDAAKNVEGVGWAIALDPVTGDLRILQVEKHNNVTTNLIPLAVDVFEHAYYI
Caldisphaera lagunensis DSM 15908 FKKVFGDAAKLVEGVGWAIALDPVTGDLKITQVEKHNAVITMNLVPLACDVFEHAYYL
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Saccharolobus solfataricus 98/2 QYKNKRADYVNAWNVNWDAAEKKLQKYLTK-----
Sulfolobus acidocaldarius DSM 639 QYKNKRGDYLNAWNWNVNDWDAEKKLQKYLTK-----
Acidianus brierleyi DSM 1651 QYKNKRADYVNAWNVNWDYANKKLEKYLTK-----
Metallosphaera sedula DSM 5348 QYKNKRADYVNAWNVNWDYAEKKLQKYLK-----
Thermoproteus sp. A22 QYKNKRADYVNAWNVNWDYAEQKLSKLL-----
Caldivirga maquilingensis IC-167 QYKNRNAYLDAIWNVLNWEAEENRLRKYIK-----
Vulcanisaeta distributa DSM 14429 QYRSNRNGYIDAIWNVLNWEAEENRLRKYIK-----
Thermocladium modestius JCM 10088 QYKNRNAYLDAIWNVLNWEAEKRLSKYL-----
Acidilobus saccharovorans 345-15 DYRNDRAKYVDSWWDLINWDDVEARYQKALNTPKLIL
Caldisphaera lagunensis DSM 15908 QYKNDRGSYVDKWDVNVNWDVEKRYQKALTPLKLIL
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Figure S1. Multiple sequence alignment of Crenarchaeota Fe-SOD. In red are emphasized the conserved key amino acids Tyr41 and His155 through the different sequences.

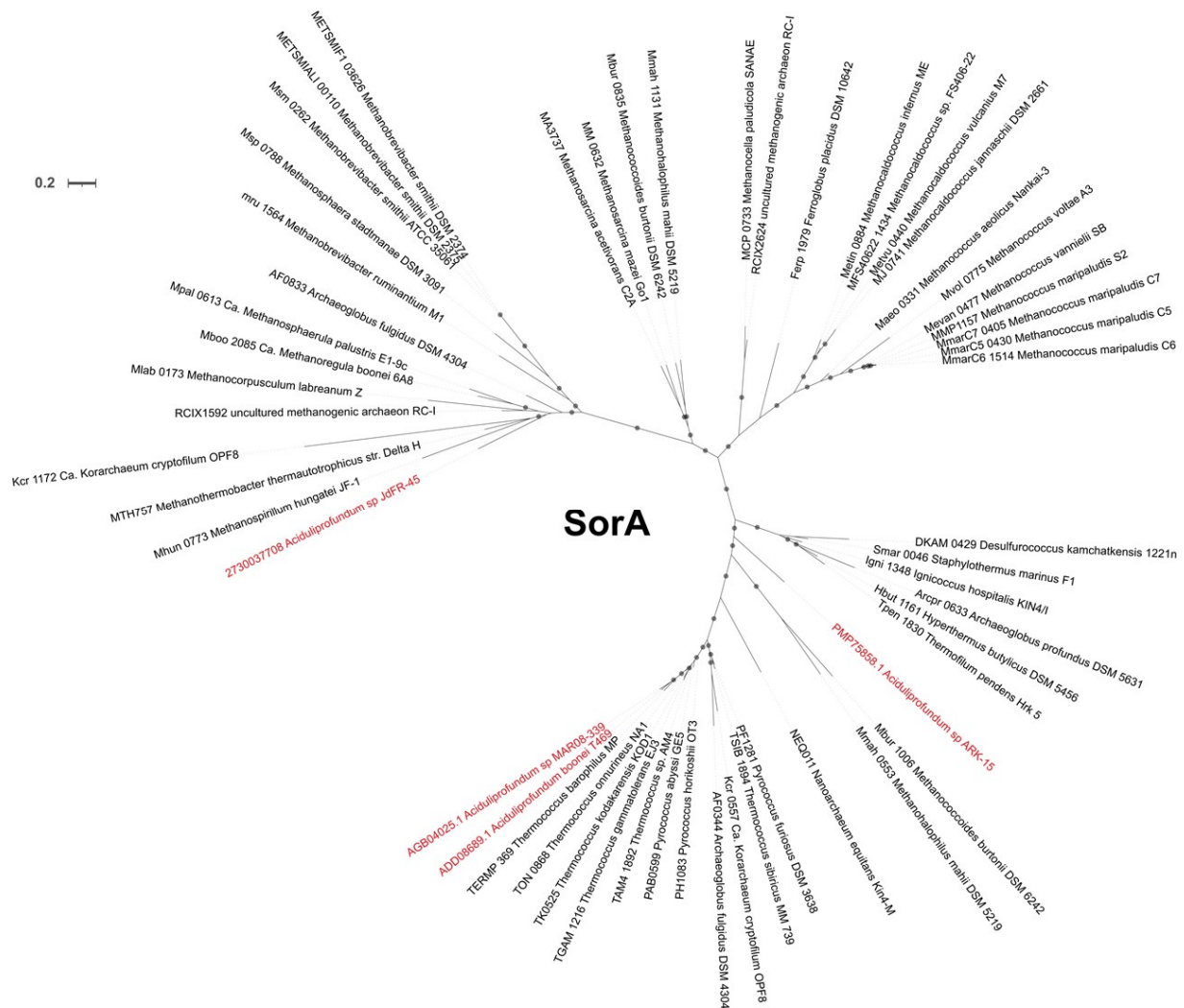


Figure S2. Unrooted phylogenetic tree constructed from the predicted amino acid sequences of SorA in *Aciduliprofundum* and Archaeal sequences from sorGOdb. In red color are sequences from *Aciduliprofundum*. Bootstrap values over 60 are represented with gray circles in the respective branches. Scale bar represent 0.2 amino acid substitutions per site.

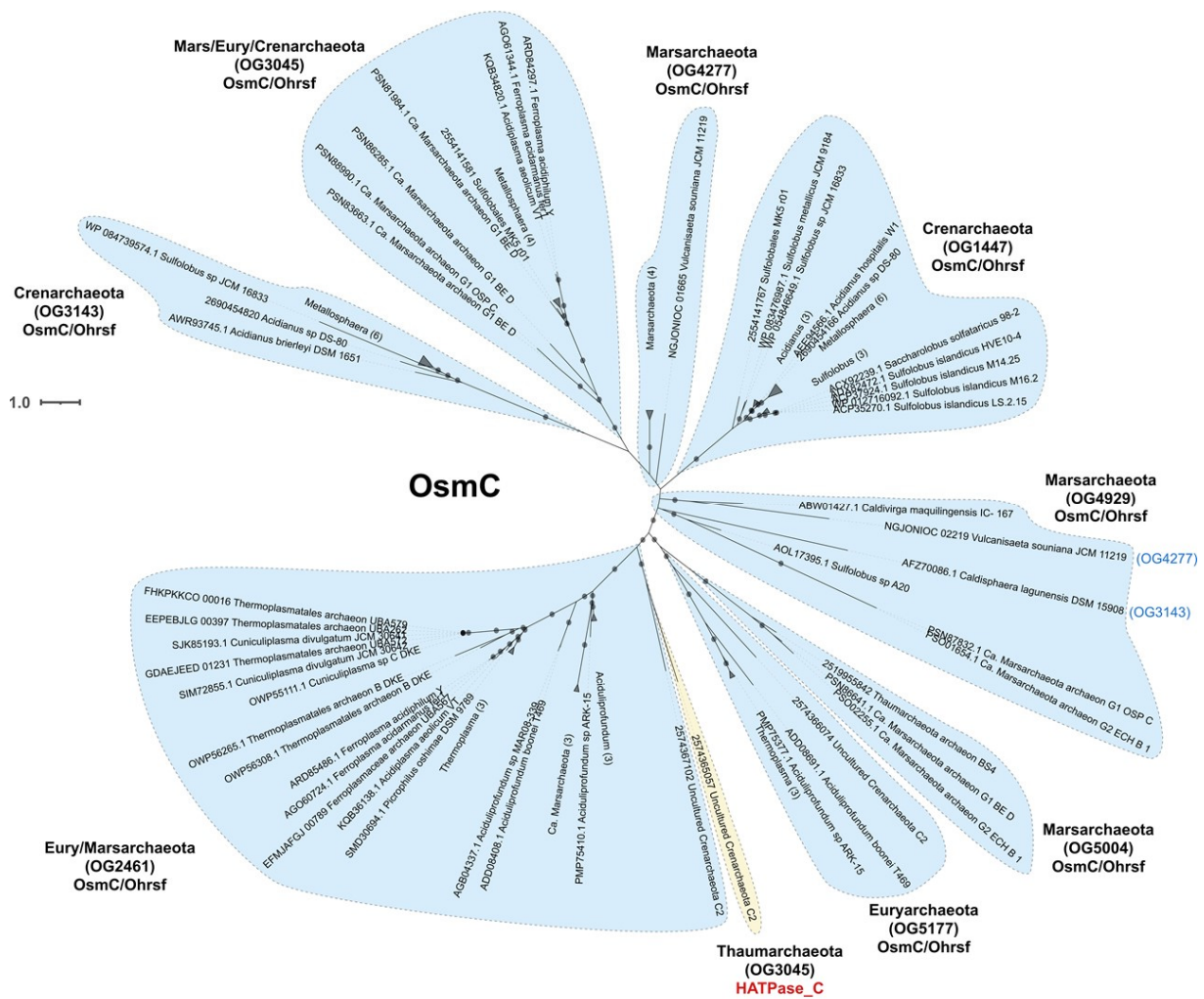


Figure S4 Unrooted phylogenetic tree constructed from the predicted amino acid sequences of OsmC in the different acidophilic Archaea. Each clade is delimited by a blue background. The specific phyla with sequences in each clade are annotated with the corresponding orthogroup. In yellow is shown the sequence of Thaumarchaeota that doesn't share the main functional annotation of OsmC of the other sequences. Bootstrap values over 60 are represented with gray circles in the respective branches. Scale bar represent 0.1 amino acid substitutions per site.

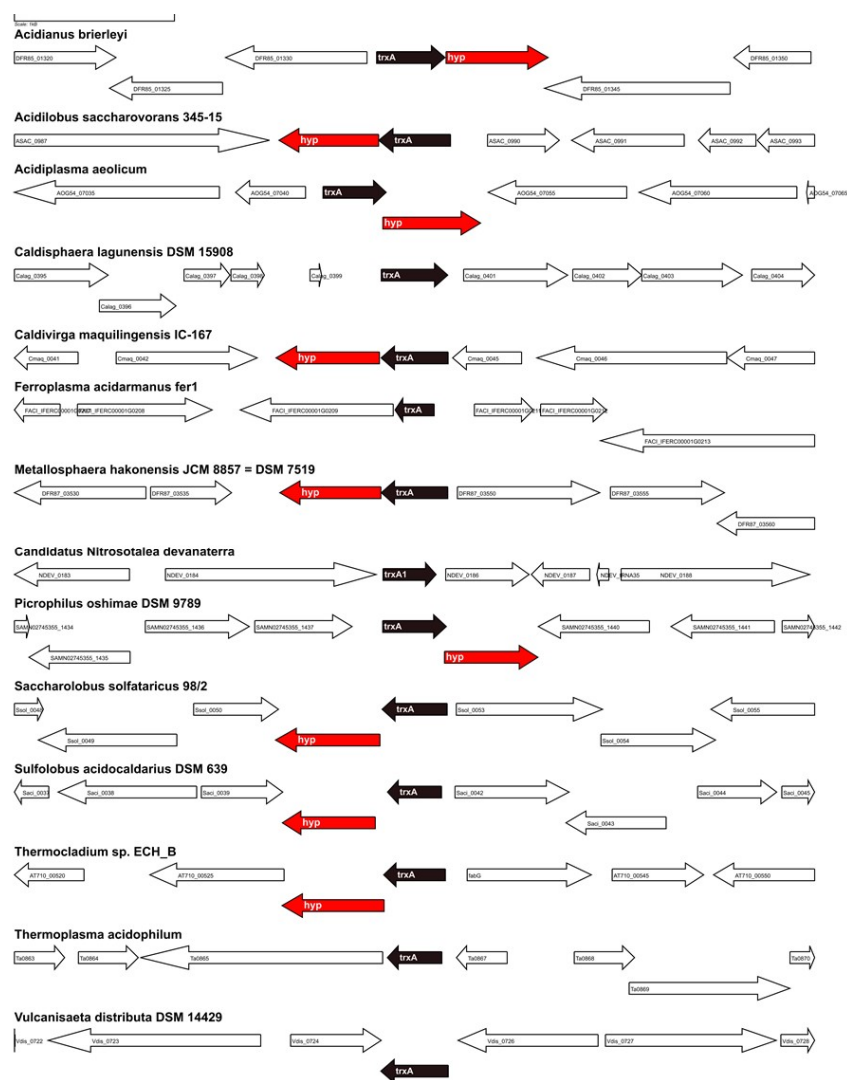


Figure S5. Genomic context of *trxA* and the conserved hypothetical protein OG0923 in several representative genomes. Locus tag for genes are shown inside each of the arrows. Color Coding: red=hypothetical OG0923, black = *trxA*. White: non-conserved genes