



**Supplementary Figure 1** Maximum likelihood phylogenetic trees illustrating the various evolutionary histories of ORFs from Thaumarchaeota and Group II/III Euryarchaeota. (a) ORF specific of Thaumarchaeota; (b) ORF likely acquired from a euryarchaeotal donor by HGT; (c) ORF likely acquired from a crenarchaeotal donor by HGT; (d) ORF specific of Group II/III Euryarchaeota. Sequences from our fosmids are underlined. The scale bar represents the average number of substitutions per site. Numbers at nodes correspond to bootstrap values (only those >50% are shown).