

Description of Additional Supplementary Files:

Supplementary Data 1: Statistical analysis of the optimal GDP-binding temperature of Asgard EF-1A proteins. T_{opt} , calculated optimal GDPbinding temperature; q_{05} , 5th percentile of the peak temperature distribution; q_{95} , 95th percentile of the peak temperature distribution.

Supplementary Data 2: Prediction of optimal growth temperature of Asgard archaea based on the proteomic features. The sample collection environments for metagenomics are listed.

Supplementary Data 3: Amino acid sequences of ancestral Asgard EF-1A used in this study.