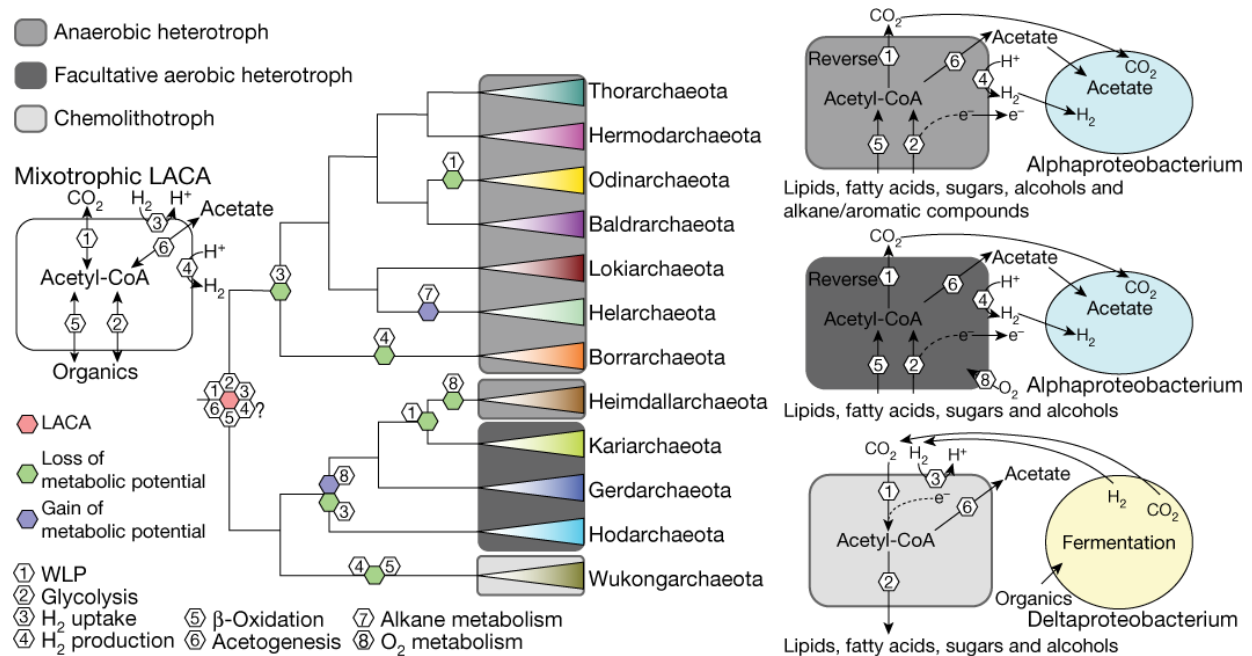


Expanding the phylogenetic diversity of Asgard archaea

April 29 2021, by Bob Yirka



Reconstruction and evolution of key metabolic processes in Asgard archaea.

Credit: *Nature* (2021). DOI: 10.1038/s41586-021-03494-3

A team of researchers affiliated with several institutions in China and one in the U.S. has found evidence of multiple novel Asgard MAGs that expands the phylogenetic diversity of Asgard. In their paper published in the journal *Nature*, the group describes their analysis of multiple complete or mostly complete genomes of Asgard archaea.

Eukaryotes are organisms that have DNA in the form of chromosomes in a nucleus—they include all known living things except eubacteria and archaea. Archaea are [single-celled organisms](#) that do not have cell nuclei, which makes them prokaryotes—until recently, they were thought to be a form of bacteria.

Over the past several years, researchers have been studying the relationship between eukaryotes and Archaea and the Archaeal tree and have discovered that there is a superphylum called Asgard. Researchers studying specimens in this group have begun to wonder if they are ancestors or sisters to other archaea. In this new effort, the researchers sought to find that answer by analyzing the genomes of 162 Asgard archaea, which included 75 that had not been studied before. They found evidence of phylogenetic diversity in Asgard to the extent that they are proposing six new phyla on the family tree. Their study did not clear up the evolutionary relationship between Asgard archaea and eukaryotes, however. But the team did find support for the idea that eukaryotes should be thought of as a sister group or as a higher branch of eukaryotes as ancestors with the archaea group.

The new phyla suggested by the team are: Baldr-, Hod-, Kari, Hermod- and Boor-, which were named after Norse deities, and another named after a mythological Chinese character, Wukongarchaeota. The team also found evidence of eukaryotic signature proteins in the Asgard archaea. A closer look at Wukongarchaeota showed it to be an obligate hydrogenotrophic acetogen, which is dramatically different from other known Asgard [archaea](#)—that was why the team chose a character known for creating havoc in a heavenly realm as its namesake.

More information: Yang Liu et al. Expanded diversity of Asgard archaea and their relationships with eukaryotes, *Nature* (2021). [DOI: 10.1038/s41586-021-03494-3](https://doi.org/10.1038/s41586-021-03494-3)

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