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Parasitism derived

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Archaeons are a group of organisms phylogenetically distinct from bacteria and eukaryotes. They inhabit a range of extreme conditions such as hydrothermal vents or anoxic environments that are thought to reflect the conditions that existed on the primordial earth. The recently discovered *Nanoarchaeum equitans* represents a novel archaeon kingdom and grows in conjunction with the crenarchaeon *Ignicoccus*. In the October 13 [Proceedings of the National Academy of Sciences](#), Elizabeth Waters and colleagues at [Diversa](#) show that *N. equitans* is parasitic rather than symbiotic and has evolved from a primitive ancestor instead of reductively from a more complex form (*Proc Natl Acad Sci USA*, DOI:10.1073/pnas.1735403100, October 13, 2003).

Waters *et al.* sequenced what turned out to be the smallest genome to date and observed a circular chromosome only 490 kb long, with 552 coding sequences covering 95% of the genome and containing little noncoding or pseudogene sequence that would have suggested reductive evolution. Function was assigned to two thirds of the genes; 18% had homologues of unknown function, and the remainder represented archaeal-specific sequences. Analysis of gene function, together with the observation that overinfection of the host *Ignicoccus* impedes its growth, pointed toward the lifestyle of an obligate parasite.

"We suggest that this microbe is a derived, but genomically stable parasite that diverged anciently from the archael lineage. The complexity of its information processing systems and the simplicity of its metabolic apparatus suggests an unanticipated world of organisms to be discovered," the authors conclude.

References

1. Archaeons, [<http://tolweb.org/tree?group=Archaea&contgroup=Life>]
2. *Proceedings of the National Academy of Sciences USA*, [<http://www.pnas.org>]
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