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Crenarchaeon sequence

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Pyrobaculum aerophilum is a hyperthermophilic crenarchaeon that cannot tolerate the presence of elemental sulfur. In the January 22 issue of *Proceedings of the National Academy of Sciences*, Fitz-Gibbon *et al.* report the complete genome sequence of the *P. aerophilum* IM2 strain that was isolated from a boiling marine water hole in Maronti Beach, Italy (*Proc Natl Acad Sci USA* 2002, **99**:984-989). The genome is 2.2 Mb long, has a 51% G+C content, and contains 2,587 predicted proteins. They found examples of instability of mononucleotide runs and failed to find evidence for a mismatch repair system, suggesting a 'mutator phenotype'. *P. aerophilum* lacks 5' untranslated regions suggesting an unusual mechanism for translation initiation. The genome contains enzymes for the glyoxylate cycle, 2-oxoacid dehydrogenase multienzyme complexes, and glycolysis. The *P. aerophilum* genome has inactivated adenylylsulfate reductase genes, explaining its sulfur intolerance and offering a means for developing a genetic system based on selection for a sulfur-tolerance plasmid.

References

1. *Pyrobaculum aerophilum* sp. nov., a novel nitrate-reducing hyperthermophilic archaeum.
2. *Proceedings of the National Academy of Sciences*, [<http://www.pnas.org>]