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Geographic barriers have a well established role in the divergence of animal and plant species, but because of their small size and abundance, unicellular organisms were thought to be able to disperse in a more widespread manner. The current model of microbial biodiversity suggests that unrestricted dispersal constrains the development of global species richness. In the July 24 Sciencexpress, Rachel J. Whitaker and colleagues at the University of California, Berkeley, challenge this assumption and describe a biogeographic pattern in the archaebacterium *Sulfolobus solfataricus* (*Sciencexpress* 2003, DOI:10.1126/science.1086909).

Whitaker *et al*. examined the population structure in *Sulfolobus* collected from geothermal springs in Kamchatka (Russia), Yellowstone National Park, Alaska, and Iceland. They analyzed the sequence of nine protein-coding loci and observed that genetic distances between populations increased proportionally with geographic distance.

These results "may show that there is limited exchange of cells between the study sites. The small total area constituted by geothermal springs on Earth's surface, their mutual remoteness, and the fact that the specialized obligate thermophiles succumb under more normal ambient temperatures are unusual properties of microbial biota and may explain the limited transfer of cells from one site to the other. It may be the exception that supports the rule," writes Tom Fenchel from the University of Copenhagen in an accompanying Perspective article.

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