Title: Molecular response to temperature stress in thermoacidophilic archaea

Temperature is a crucial physical parameter for all living organisms. The ability to respond adequately to a temperature rise or drop underlies the survival and fitness of a species. Although it is well understood how bacteria and eukaryotes sense and respond to temperature changes, this is enigmatic for archaea. Nevertheless, many archaeal species thrive in high-temperature habitats that are typified by large temperature gradients, imposing constant heat- and cold-shock stress stimuli on the cells. In this project, you will aim to characterize translational regulation in response to heat- and cold-shock stress in the thermoacidophilic archaeon *Sulfolobus acidocaldarius* living in volcanic hot springs and growing optimally at 75°C. Initially, a system-level approach will be adopted to map all gene regulatory events in response to temperature stress. This is followed by an integrated *in silico*, *in vitro* and *in vivo* approach using bioinformatics, structural probing assays and genetic experiments to search for and characterize RNA thermometers, structured RNA elements that regulate translation by undergoing temperature-dependent conformational changes. This project will not only unravel how temperature sensing and response regulation is performed in *Sulfolobus*, it will also contribute to a better understanding of archaeal translation initiation and of how riboregulation evolved during early evolution.

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