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Anaerobic Purification and Crystallization of Cofactor Containing Proteins from *Pyrococcus furiosus*. Bret Dillard*, Zhi-Jie Liu, Francis E. Jenney Jr., M.W.W. Adams, John Rose, Bi-Cheng Wang, Southeast Collaboratory for Structural Genomics, Dept. of Biochemistry and Molecular Biology, The Univ. of Georgia, Athens, GA.

The ability to crystallize proteins and study their structure/function relationships relies on the capability to reproduce the environment in which the proteins are naturally active. When working with the hyperthermophilic archaeon, *Pyrococcus furiosus*, one must use an anaerobic environment in order to maintain cofactors such as iron-sulfur clusters that are present in the proteins as they exist in the native cytoplasm. The purpose of this research is to develop a system which will reproduce that environment and allow us to determine biologically relevant structures of macromolecules. The automated crystallization system that we have developed can carry out microbatch and vapor diffusion experiments in a completely anaerobic environment. The system and its applications will be discussed.

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