*Methanococcus maripaludis S2* is a model methanogenic archaeon with a fast doubling time and well-developed set of genetic tools. To better our understanding of this organism and the unique properties of its methanogenic enzymes, we have constructed a genome-scale metabolic model of *M. maripaludis* that accounts for 477 of the 1722 protein coding genes (28%) in its genome. Our model is the first for this organism to accurately depict the Wolfe cycle, the central catabolic pathway for methane and energy production in hydrogenotrophic methanogens, and the first model of any organism constructed using the maximum likelihood gap filling approach. This model will provide a platform to generate quantitative and qualitative hypotheses for how to turn the methanogenic enzymes in reverse to oxidize methane to methanol and how to add exergonic sulfate reduction pathways that can make the process energetically viable.

RELEVANT ACTIVITIES

In the box below, please indicate your particular activities which justify favorable consideration of you as a participant and contributor to this meeting.   
This information is important, as it allows the Scientific Organizers to make a thorough assessment when reviewing and selecting participants (max. 1700 characters).

I am a graduate student at the University of Illinois at Urbana-Champaign and conduct my research under Dr. Nathan Price at the Institute for Systems Biology (ISB) in Seattle, WA. In addition to the work presented here, I have begun a project to create a tool that uses the maximum likelihood gap filling tool to make a new fully-functional genome scale model by incrementally modifying an existing model. The expected outcome of this project will be a homology-based method that reduces the time and effort necessary to produce a high-quality model. Outside of these two projects, I am also highly active in education outreach efforts with the Logan Center at ISB and have worked with educators at both K-12 and community college levels to help them integrate systems biology concepts into their curricula. I also am a member of the Editorial Board at ISB where I help write short pieces aimed at the general public on recent publications by members of the institute with the goal of increasing public awareness of the scientific advances at the institute.