**P046** Understanding cell wall regeneration in *Methanothermobacter thermautotrophicus*

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*Methanothermobacter thermautotrophicus* ΔH is a methanogenic gram-positive microorganism with an optimal growth temperature of 60°C. It was one of the first methanogens to have its genome sequenced and is a good model for thermophilic hydrogenotrophic methanogens. Many unsuccessful attempts have been made to develop a protocol for the genetic transformation of this organism. A major problem is the presence of a rigid pseudomurein cell wall that presents a barrier to DNA entry. The cell wall fails to regenerate if removed, inhibiting cellular post-transformation proliferation. Here, we present approaches to achieving an understanding of cell wall regeneration in *M. thermautotrophicus*. Using bioinformatics analysis we have identified putative cell wall biogenesis genes. These have been combined with genes containing pseudomurein binding repeats (PMBRs) and used to query existing microarray data to identify changes in expression of cell wall genes that may vary under different growth conditions. We have additionally purified a series of protein markers that bind specifically to pseudomurein that will be used as a tool to detect changes in cell wall structure. The combined data will be used to gain an insight into how this organism regenerates its cell wall, with the long-term goal of developing a transformation protocol.