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Cloning, Purification, and Crystallization Studies of a Putative ArsR Winged Helix-Turn-Helix Transcription Factor from *Methanosarcina acetivorans*. D. Roberts¹, R. D. Barber², J. Roberts¹,
¹DePauw Univ., Greencastle, IN; ²Univ. of Wisconsin-Parkside, Kenosha, WI.

Using bioinformatics, biochemical characterization, and protein crystallography, the aim of this study is to understand the evolution of transcriptional regulators in *M. acetivorans*. Here we report cloning, purification, and crystallization of a his-tagged variant of MA4344, a putative transcription factor belonging to the ArsR family. This family of proteins is thought to help confer metal resistance among these bacteria. The gene was cloned into the pET30b and expressed in *E. coli* (BL21). The protein was purified to greater than 95% in a single-step using a nickel affinity column. The purified his-MA4344 protein crystallized in the tetragonal space group $P4_32_12$, with unit cell parameters $a=b=53.33$ and $c=109.52$ Å. The crystals were soaked in a cryo-solution and then flash-frozen in liquid nitrogen prior to data collection. A 2.1 Å data set was collected to 98% completion on an R-Axis IVB detector system. The Matthews coefficient is 2.9, suggesting one molecule per asymmetric unit. Molecular replacement was performed using SmtB as the search model (33% identity). The molecule appears to form an “Smt-like” dimer, with the molecular two-fold axis falling on the crystallographic two-fold. We are in the process of refining this solution to test its validity.