

P053 Role of *vapBC* toxin-antitoxin loci in the thermal stress response of the hyperthermophilic crenarchaeon *Sulfolobus solfataricus*

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Toxin-antitoxin (TA) loci are ubiquitous in prokaryotic microorganisms, including hyperthermophilic archaea, yet their physiological function is largely unknown. For example, preliminary reports suggested TA loci were stress response elements used to help microorganisms survive adverse environmental conditions; however, it was recently shown that knocking out all of the known TA loci in *E. coli* did not hinder the survival of cells under stress. *Sulfolobus solfataricus* encodes at least 26 *vapBC* family loci in its genome. VapCs are PIN domain proteins with putative ribonuclease activity, while VapBs, proteolytically labile proteins, purportedly silence VapC activity when associated as cognate pairs. Global transcriptional analysis of *S. solfataricus* heat shock response dynamics (temperature shift from 80 to 90°C) revealed that several TA loci were triggered by the thermal shift. Disruption mutants for two of these TA loci, *vapBC-6* and *vapBC-22*, yielded observable heat shock phenotypes as well as significant differences in the respective transcriptomes. The results from these experiments will be presented with an eye towards the role of TA loci in archaeal stress response.