P026 Why does *Methanococcus maripaludis* have multiple MCMs?

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Minichromosome maintenance (MCM) proteins are conserved in archaea and eukaryotes and are essential for DNA replication. MCMs are required for both the initiation of replication and for the progression of the replication fork. In eukaryotes there are six MCM homologues (MCM2-7). It is known that MCM2-7 are all required for replication progression. However, the individual roles of each of the subunits in replication are unknown. A simplified version of the MCM complex exists in archaea, with the best studied example being *Methanothermobacter thermautotrophicus*, which has a single MCM homologue that forms a homohexameric complex with ATPase, DNA binding and helicase activity. *Methanococcus maripaludis* is unusual among archaea as four MCM homologues are encoded in its genome, potentially providing a better model for eukaryotic MCMs than the current archaeal systems. I am using a combination of biochemical and genetic techniques to examine whether all four of the *M. maripaludis* MCMs are essential, whether they form a complex and which other proteins they interact with. Here I present my most recent results and discuss their significance in the context of both the archaeal the eukaryotic MCM complexes.