

Assembly and Interactions of the Archaellum Motor

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The archaeal motility structure, the archaellum, is evolutionary not related to bacterial flagella, but shows structural homology to type IV pili. In line with this homology the archaellum filament is assembled from a membrane platform and its rotation is driven by ATP hydrolysis. We have chosen the thermoacidophilic archaeon *Sulfolobus acidocaldarius* as model organism to study the assembly and function of the archaellum.

The *S. acidocaldarius* archaellum consists of only seven proteins (FlaB, X, F, G, H, I and J), of which we have analyzed five subunits structurally and biochemically. FlaX, FlaH and FlaI form the cytoplasmic motor complex. While FlaI is the only active ATPase in the motor complex nucleotide-binding by FlaH is essential for the FlaI/H interaction and for the assembly of the archaellum filament. Slow autophosphorylation of FlaH changes its affinities towards FlaI and therefore is involved in the switch of FlaI from assembling the archaellum to rotating the whole structure. FlaF and FlaG form a tetrameric complex and anchor the archaellum in the cell envelop. Their possible role in the archaellum assembly process and in the rotation of the motor complex will be presented and discussed.