Force Generation in Bacterial Cell Division

FtsZ, a bacterial homologue of tubulin, plays a central role in bacterial cell division. It is the first of many proteins recruited to the division site to form the Z-ring, a dynamic structure that recycles on the time scale of seconds and is required for division to proceed. FtsZ has been recently shown to form rings inside tubular liposomes and to constrict the liposome membrane without the presence of other proteins, particularly molecular motors which appear to be absent from the bacterial proteome. In this talk, I will discuss models for both the in vivo and in vitro experimental observations that attempt to elucidate the mechanics and dynamics of the FtsZ rings.