Functional characterization of YrzD, a new cell division protein of *Bacillus subtilis*

Santos, V.T., de Souza R.F, Tavares J.R. and Gueiros-Filho F.J

Departamento de Bioquímica, IQ, USP.

During growth, bacteria elongate and then divide into two identical daughter cells by a process called binary fission. Binary fission is initiated by FtsZ, a prokaryotic tubulin homologue that polymerizes into a ring at the cytoplasmic surface of the cell membrane. The Z ring serves as a seed for the nucleation of several other division proteins, culminating in the formation of the divisome, the protein machine responsible for septum formation. Today, at least fifteen proteins are known to be part of the divisome. Here we describe the initial characterization of a new divisome protein in *Bacillus subtilis* called YrzD. *yrzD* encodes a 98 amino-acid protein of unknown function that is conserved among the Bacillus group. YrzD was found after a search in the STRING database showing that it has similar pattern of co occurrence to some of the proteins involved in cell division, such as ZapA. To confirm this prediction we used GFP fusions and fluorescence microscopy to show that YrzD localizes to the divisome complex. Experiments with a red fluorescent FtsZ fusion (FtsZ-mCherry) and GFP-YrzD showed a frequency of co-localization between Z rings and YrzD of 42,2%. This suggests that there is a significant delay between Z ring formation and the recruitment of YrzD to the divisome. Using strains lacking different division proteins, we showed that recruitment of YrzD to the divisome depends on DivIVA, a late divisome protein involved in the control of septum position. We are currently knocking out *yrzD* to understand the role of this protein in division.