Séminaire

CONFÉRENCIER INVITÉ

Vendredi 08 Février 2019 à 11h

Salle des séminaires

Institut de biologie structurale - 71 avenue des Martyrs CS 10090 38044 Grenoble Cedex 9 - T.+33 (0)4 57 42 85 00

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Bacterial cell division and morphogenesis: what can we learn from studying *cocci*?

Peptidoglycan is the main component of the bacterial wall and protects cells from the mechanical stress that results from high intracellular turgor. Peptidoglycan biosynthesis is very similar in all bacteria; bacterial shapes are therefore mainly determined by the spatial and temporal regulation of peptidoglycan synthesis rather than by its chemical composition. The shape of rods, such as *Bacillus subtilis* or *Escherichia coli*, is generated by the action of two peptidoglycan synthesis machineries that act at the septum and at the lateral wall. We have used Staphylococcus aureus as simpler model for cell division and morphogenesis studies because it has only one cell wall synthesis machinery, which is diverted from the cell periphery to the septum in preparation for division. Cell division starts with the recruitment of the tubulin homologue protein FtsZ to the future division site. This initiates the assembly of the divisome, a multi-molecular machinery that carries out cytokinesis. We found that cytokinesis is biphasic, with a first, slow, step which is dependent on FtsZ treadmilling followed by a second, fast step, driven by peptidoglycan synthesis. This work reconciles existing hypothesis on the origin of the force required to drive cytokinesis.

Hôte : J. Timmins (IBS/VIC) & C. Morlot (IBS/PG)