Soutenance

THESE

Lundi 09 Novembre à 14h

Salle des séminaires IBS

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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Proteins with RBM (ring-building motif)-like domains involved in *Bacillus subtilis* sporulation

Thèse de Doctorat de l'Université de Grenoble

Ring-building motifs (RBMs) are structural arrangements with a wedge-shaped fold, composed of two α-helices folding against a three stranded β-sheet. These domains are found in components of specialized secretion systems and are postulated to trigger the assembly of protein rings that allow the transport of substrates across the bacterial membranes. During spore formation in *Bacillus subtilis*, a multi-protein complex, called the SpoIIIA-SpoIIQ complex or A-Q complex, assembles in the two membranes that separate the mother cell from the developing spore. This complex, which is required to maintain forespore development, possesses four RBM-containing proteins (SpoIIIAF, SpoIIIAG, SpoIIIAH and GerM), and one of them was shown to form 30-mer oligomeric rings. Based on these structural similarities with components of secretion machineries, the A-Q complex was proposed to form a trans-enveloppe channel that would transport a yet-to-be discovered molecule between the mother cell and forespore. Besides, RBM domains were also predicted in proteins involved in *B. subtilis* spore germination, suggesting that transmembrane channels could also assemble during the germination process. During my PhD, I have solved the crystallographic structure of one of these germination RBM-containing proteins, called YhcN. In parallel, I have studied the oligomerization ability of full-length membrane forms and truncated variants of SpoIIIAF, SpoIIIAG, SpoIIIAH and GerM using biophysical approaches. Altogether, my work shows that RBM domains are not sufficient to trigger ring formation *in vitro* and further suggests that some of these domains might have evolved toward alternative functions.

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