Oral Contributions

[MS5-04] The Protein-Protein Interactions that Govern Motility in Mycoplasma genitalium. Bárbara Calisto[a,b], Luca Martinelli[c], Mercè Raterac, Alicia Brotod, Luis Garciad, Luis Gonzalezd, Jaume Piñold; Ignacio Fitac; Daniele de Sanctis[b]

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Mycoplasma genitalium, a cell wall-less bacterium with the smallest genome found in self-replicating organisms, is capable to colonize the human urogenital tract. A most remarkable feature of such an apparently simple bacterium is the presence of a complex cytoskeleton that forms a differentiated protrusion, known as the terminal organelle (TO), which is constituted by three differentiated ultra-structures: terminal button, electrondense core and wheel complex [1,2]. This protrusion is involved in cell motility and also thought to be implicated in cell division and adhesion to host cells being therefore directly implicated in these microorganisms' infectivity and pathogenicity processes. The well conserved Enriched in Aromatic and Glycine Residues motif (EAGR box), which was exclusively found in Mycoplasmas [3], appears up to nine times in proteins of the TO. The crystal structure of one of these motifs revealed that the monomers present a new fold that contains an accurate intra-subunit symmetry that relates two conspicuous hairpins. Other features such as the domain plasticity and the crystal packing suggest a role for the EAGR box in protein-protein interactions[4]. This hypothesis was verified by means of the Biacore technology which confirmed the interaction of the EAGR boxes from the MG200 and MG386 proteins respectively with the MG491 and the MG219 proteins; all components of the TO wheel complex. We also studied these interactions at the molecular level by NMR spectroscopy. The MG200 EAGR box-MG491 adduct was shown to be formed by the interaction of 25 residues at the C-terminus of MG491 and the interface embedded in the dimer formation in the EAGR box crystal structure, while the MG386 EAGR box-MG219 adduct is formed by a larger interface that involves the last seventy residues of the MG219 protein. Futhermore, Mycoplasma genitalium deletion mutants lacking the MG200 or the MG386 EAGR boxes present defects in motility, finally proving that the EAGR boxes are crucial to the correct assembly and stability of the TO and therefore to Mycoplasmas motility.

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