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## Molecular actors of bacterial diseases: Protein structures directed by biology

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There is an overall consensus that to develop improved drugs and vaccine control strategies, we need to gain a better understanding of the biology of involved pathogens. Innate immune recognition of bacterial pathogens is based on the detection of constitutive and conserved products of microbial metabolism on the bacterial cell surface. Lipopolysaccharides, lipoproteins, peptidoglycan and lipoteichoic acids are all unique molecules synthesized by bacteria but not eukaryotic cells. These products denominated Pathogen Associated Molecular Patterns are considered as the key molecular signatures of microbial invaders by the innate immune system and their recognition signals the presence of infection. The molecular arsenal of human host immune responses and small molecule mediators together define a dynamic host-pathogen interactome. Therefore, targeting proteins involved in host-pathogen interactions is a promising strategy for the development of new and effective anti-microbial drugs. Structural biology including molecular biology, biochemistry and biophysics concerned with the three-dimensional structure of biological macromolecules is of great interest to biologistssince macromolecules carry out most of the cellular functions. As such, it has enormous impact on biomedical research and on biology in general. A tour through applications of structural biology to the understanding of molecular determinants of cellular processes involved in bacterial diseases will be presented.

### Biography

Rita Berisio is Senior Researcher at the Insitute of Biostructures and Bioimaging of the "The National Research Council". She has been responsible for a number of funding initiatives for example Coordinator of a project funded by the Mizutani Foundation for Glycoscience, grant-holder of the COST Action BM1003, Coordinator of a project of the Indigo Linking Programme, funded by EU. Her activities focus on structure/function relationship in macromolecules of biological interest combining crystallography and other physical-chemical techniques with molecular biology and biochemical studies. She is the co-author of about 95 publications on international journals among which *Nat StructBiol*, *Mol Cell*, *JACS* and *PNAS*.

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