STRUCTURAL BIOLOGY AT THE PASTEUR INSTITUTE OF MONTEVIDEO : PROTEIN CRYSTALLOGRAPHY TO UNDERSTAND BACTERIAL LIPID BIOSYNTHESIS REGULATION

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The “Institut Pasteur de Montevideo” (IPMONT) has been launched recently to perform basic research in biomedical sciences with a strong focus on the molecular level. Structural Biology is one of the major axes in which the IPMONT has actively engaged in, with special emphasis in macromolecular crystallography, protein biophysics and structural bioinformatics. The integration with ongoing efforts in Latin America is foreseen as a key issue. My lab is interested in the molecular understanding of lipid biosynthesis regulation in Gram+ bacteria, for which detailed knowledge of relevant events still remains fragmentary. We have focused on the study of two proteins that play a central role in the lipid homeostasis of *Bacillus subtilis*: DesK and FapR (1). The synthesis of unsaturated fatty acids is tightly controlled in response to cold shock, through a two-components system that includes a trans-membrane histidine-kinase, DesK, from which we have recently solved the 3D structures of the entire cytoplasmic domain (DesKC) (2). The crystal structures from both the wild-type enzyme, as well as an inactive mutant (H188V), allowed us to pinpoint mobile elements that might play important roles in signal transduction. We are currently working to solve the structure of DesKC in complex with its cognate response regulator DesR, in order to understand how specificity is determined.

(1) G. Schujman et al., (2006) *EMBO J* **25:** 4074
(2) D. Albanesi et al., (2008), submitted

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