Epigenetics and Bacterial Infections: The Role of a Novel Histone Deacetylase SIRT2

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Pascale Cossart is Director of the Unité des Interactions Bactéries-Cellules and Professeur de Classe Exceptionnelle at the Institut Pasteur, Paris. She is also Secrétaire perpetuel to the Académie des sciences in Paris. Her project will further investigate recent results obtained in epigenetics and bacterial infections, a new research area in infection biology. In order to establish a successful infection, bacteria manipulate the host chromatin structure, dynamics and function to their own profit. Bacterial pathogens can manipulate chromatin directly by addressing factors that interact with histones or other chromatin components to the nucleus, or indirectly by interacting with signaling pathways which then affect the chromatin structure or dynamics. The Cossart team's research has recently shown that the bacterial pathogen *Listeria monocytogenes* infection induces the nuclear translocation of SIRT2, an event dependent on the interaction between the bacterial protein InlB and its receptor Met on the cell surface and critical for a successful infection *in vivo* as shown by the resistance to infection of SIRT2-/- mice.

A graduate student and a postdoctoral fellow will carry out the project, which has four aims: to elucidate the mechanism underlying SIRT2 nuclear translocation induced by *L. monocytogenes* infection; to investigate the genome-wide impact of SIRT2-induced H3K18 deacetylation during infection with *L. monocytogenes*; to determine whether H3K18 deacetylation by SIRT2 is a common strategy used by other pathogens for host subversion; to determine whether *L. monocytogenes* infection induces an epigenetic memory in the host.