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Acteriology & Infectious Diseases

Host related iron acquisition in *Bacillus cereus*: The interplay between surface proteins and siderophores in iron grabbing from ferritin and hemoproteins

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In host-pathogen interactions, the struggle for iron may have major consequences on the outcome of a disease. To cope with the low iron environment encountered in the host, bacteria have evolved multiple iron acquisition systems. Over the past 10 years, our understanding of iron import into Gram-positive bacteria has been greatly improved. The most impressive advances concern the mechanisms of heme acquisition via NEAT proteins. In the human opportunistic pathogen *Bacillus cereus*, a composite NEAT protein named IIsA (Ironregulated leucine rich surface protein A) was previously identified as a surface protein involved in bacterial virulence A, B. Unlike other NEAT proteins, IIsA is able to bind not only to heme and hemoglobin but also ferritin *in vitro* A. As ferritin can store thousands of iron atoms, pathogens remains largely unknown. Here, we show that IIsA recognizes and interacts directly with the ferritin shell, altering the ferritin properties leading to an increase of the siderophores-mediated iron release from the ferritin nanocages. We also characterized the function of IIsA in heme acquisition and we demonstrated that the *B. cereus* Isd system (Iron surface determinants previously described in other Gram-positive bacteria) is a partner of IIsA in this process. Hence, our studies highlight the central role of IIsA in *B. cereus* and describe a unique molecule taking part in iron uptake modulation both *in vivo* and *in vitro*.

Biography

Christina Nielsen Le Roux is agronomist from University of Copenhagen Denmark, and performed her Ph.D. training at Pasteur Institute and at the University Pierre & Marie Curie, Paris, France. She is specialized in host-pathogens interactions with focus on entomo pathogenic and human opportunistic spore forming bacilli. The identification and functions of various virulence and host adaptation factors have been the basis for more than 35 publications and several worldwide collaborations. She is senior scientist at INRA (French National institute for research in agronomy) close to Paris at the Center of Jouy-en-Josas.

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