Internship project Master 2  
Year 2018-2019

Laboratory/Institute: Biology of Cancer and Infection  
Director: Jean-Jacques Feige  
Team: Bacterial Pathogenesis and Cellular Responses  
Head of the team: Ina Attrée

Name and status of the scientist in charge of the project:  
HDR: yes ☒ no ☐
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Program of the Master’s degree in Biology:

☐ Neurosciences and Neurobiology  ☒ Immunology, Microbiology, Infectious Diseases  
☐ Integrative Structural Biology  ☐ Physiology, Epigenetics, Differentiation, Cancer

Title of the project: Impact of the newly discovered regulator ErfA on bacterial virulence

Objectives (up to 3 lines):

The ErfA regulator modulates the pathogenicity of *Pseudomonas aeruginosa* strains, notably by locking the expression of exolysin toxin ExlA. We will investigate the role of ErfA homologues in the biology of different *Pseudomonas* species, particularly in the biocontrol agent *P. chlororaphis*.

Abstract (up to 10 lines):

*Pseudomonas aeruginosa* is an important opportunistic human pathogen whose virulence depends either on Type 3 Secretion System or on newly identified toxin Exolysin (ExlA). A genome-wide screen allowed the discovery of a transcription factor that we named ErfA, which inhibits the expression of the *exlA* gene and modulates bacterial virulence. The interspecies occurrence of the gene indicates its more general role in *Pseudomonas* biology in addition to the virulence regulation which is currently studied in *P. aeruginosa*. Notably, the ExlA-encoding gene is also present in environmental *Pseudomonads* as *Pseudomonas putida*, *Pseudomonas entomophila* and *Pseudomonas chlororaphis*. The goal of the project is to study the role of ErfA in ExlA expression and global virulence in other *Pseudomonads*, in particular in a biocontrol *P. chlororaphis* strain, which is used in agriculture and horticulture because presumed “innocuous”.

Methods (up to 3 lines):

Basic genetics (mating, transformation, phenotypic analysis), molecular biology (cloning, PCR, RT-qPCR), biochemistry (western blots), cellular culture (cytotoxicity assays), gene expression (enzymatic assays, FACS), *Galleria mellonella* infection model

Up to 3 relevant publications of the team:


Requested domains of expertise (up to 5 keywords):

Bacteriology, molecular microbiology, cell culture