KJELDGAARD Lectures - Bruno Lemaitre

Wednesday 7 May 2025 at 13:15-14:00

Followed by PhD-session at 14:30-15:00

(Coffee and cake will be served between lecture and PhD-session)

1871-120 (Nucleus)

Hosted by: Rune Hartmann

Professor Bruno Lemaitre

- Global Health Institute (EPFL)
  Lausanne, CH

Layers of immunity: Deconstructing the Drosophila effector response

Following decades of neglect where adaptive immunity captured most of the attention, innate immune mechanisms have become central to our understanding of immunology. However, the recent emphasis on innate immunity has focused on the first two phases of the immune response: recognition and signaling. In contrast, the contribution of immune effectors individually or collectively to host resistance has not yet been investigated to the same extent. We are currently dissecting the *Drosophila* innate immune response with a focus on effectors. Since immune effectors are members of multigene families, their function cannot be adequately addressed by the single mutant approach that still prevails today. Thus, we are generating flies carrying single and multiple mutations of immune effectors in a defined genetic background, which will allow comparative analysis of gene function either individually or collectively at the level of gene families. Our study will be done both at the level of individual effectors and immune modules. Recently, we have characterised how antimicrobial peptides individually or collectively contribute to host defense. Our studies reveal an unexpected level of specificality at the effector level as a single antimicrobial peptide can determine survival or death to a defined pathogen. We have also identified a family of stress proteins that protect the host against antimicrobial peptides increasing their specificity. We also address the role of immune effectors beyond immunity in contexts that have been implied but not well demonstrated, notably in the control of the gut microbiota and the elimination of tumor cells, neurodegeneration, and aging. By deciphering how immune effectors combat infectious microbes and impact non-immune processes, our work will illuminate critical aspects of *Drosophila* host defense and will be instrumental in comprehension of innate immunity in general.

The Kjeldgaard Lecture Series is organised by
Dept. Molecular Biology and Genetics
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