



Grenoble Alliance for Integrated
Structural & Cell Biology

GRAL MSc RESEARCH SCHOLARSHIP 2020-2021 RESEARCH INTERNSHIP PROPOSAL

Institute / Group

IRIG / IBS – IRPAS

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Research Project Title

Characterization of the interaction between new recombinant Immunoglobulins M and the complement

Description of the project

The overall goal the master internship is focused on the characterization of the interaction between the main activators of the classical complement pathway, the immunoglobulins M, and the first molecule that initiates this pathway, the C1 complex. It is part of a more general project to decipher the molecular mechanisms of the activation of the initiation complex of the classical complement pathway by its activator, a biological process that challenged immunologists for several decades. It will focus on the characterization of the C1/immunoglobulin binding by taking advantage of new developments in protein engineering, biophysics and structural biology. In particular, the internship project will address and answer the following points:

- Expression, purification and control quality of recombinant native IgMs, C1q and mutants, as well as specific antigen templates,
- Biochemical and biophysical characterization of the interactions between C1q, IgMs and their cognate antigens using ELISA, SPR and/or BLI,
- Preliminary structural characterization of the antigen-immunoglobulin-C1 complex using EM

Keywords

Immunology, Complement, Immunoglobulin, Biophysics, Structural Biology

Relevant publications of the team

- N. M. Thielens, F. Tedesco, S. S. Bohlson, C. Gaboriaud, A. J. Tenner, C1q: A fresh look upon an old molecule. *Mol Immunol.* 89, 73–83 (2017).
- I. Bally, A. Inforzato, F. Dalonneau, M. Stravalaci, B. Bottazzi, C. Gaboriaud, N. M. Thielens, Interaction of C1q with pentraxin 3 and IgM revisited: mutational studies with recombinant C1q variants. *Front. Immunol.* 10 (2019), doi:10.3389/fimmu.2019.00461.
- C. Gaboriaud, W. L. Ling, N. M. Thielens, I. Bally, V. Rossi, Deciphering the Fine Details of C1 Assembly and Activation Mechanisms: “Mission Impossible”? *Front Immunol.* 5 (2014), doi:10.3389/fimmu.2014.00565.
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