

Master 2 internship project

Year 2025-2026

Laboratory/Institute: Institut de Biologie Structurale

Director: W Weissenhorn

Team: Antibodies and Infectious Diseases

Head of the team: P Poignard

Collaboration Adenovirus team, P Fender, IBS

Name and status of the scientist in charge of the project:

P Poignard

HDR: yes ☒ no ☐

Address: 71 av des Martyrs, 38044 Grenoble

Phone: 04 57 42 86 67

e-mail: pascal.poignard@ibs.fr

Program of the Master's degree in Biology:

☒ Microbiology, Infectious Diseases and Immunology ☐ Biochemistry & Structure

☐ Physiology, Epigenetics, Differentiation, Cancer ☐ Neurosciences and Neurobiology

Title of the project:

Human monoclonal antibodies against adenovirus infections

Objectives (up to 3 lines):

To select individuals with strong neutralizing serum titers against different adenovirus species.
To isolate human monoclonal antibodies with broad-spectrum neutralizing activity against these adenovirus species.

Abstract (up to 10 lines): The AID team investigates antibody responses in infections. Its research focuses on two main areas: i) characterizing polyclonal antibody responses in natural infections and following vaccination, particularly in the context of viral infections; and ii) isolating and characterizing human monoclonal antibodies using single B-cell approaches. This expertise supports the development of monoclonal antibodies for infection prevention and treatment, as well as vaccine antigen discovery and rational vaccine design.

In collaboration with the Adenovirus team of P Fender at IBS, the project aims to develop monoclonal antibodies as effective therapeutic molecules against adenoviruses, which remain an unmet medical need and a significant clinical concern for immunocompromised individuals. The master's student will contribute to the early stages of antibody discovery and characterization.

Methods (up to 3 lines):

From selected donors, human monoclonal antibodies will be isolated using single B cell sorting, followed by single-cell PCR and immunoglobulin gene cloning. The resulting antibodies will be produced by transfection and evaluated in neutralization assays against diverse adenoviruses.

Up to 3 relevant publications of the team:

Desveaux JM, Faudry E, Contreras-Martel C, Cretin F, Dergan-Dylon S, Amen A, Bally I, Tardivy-Casemajor V, Chenavier F, Fouquenot D, Caspar Y, Attrée I, Dessen A, Poignard P. Neutralizing human monoclonal antibodies that target the PcrV component of the Type III Secretion System of *Pseudomonas aeruginosa* act through distinct mechanisms eLife 2025 In press <http://doi.org/10.7554/elife.105195.1>

Amen A, Yoo R, Fabra-García A, Bolscher J, Stone W J.R., Bally I, Dergan-Dylon S, Kucharska I, de Jong R M., de Bruijini M, Bousema T, King C. R, MacGill R S., Sauerwein R W., Julien J-P, Poignard P, Jore M M. Target-agnostic identification of human antibodies to *Plasmodium falciparum* sexual forms reveals cross stage recognition of glutamate-rich repeats. eLife 202413:RP97865 <https://doi.org/10.7554/eLife.97865.1>

Landais E, Murrell B, Briney B, Murrell S, Rantalainen K, Berndsen ZT, Ramos A, Wickramasinghe L, Smith ML, Eren K, de Val N, Wu M, Cappelletti A, Umotoy J, Lie Y, Wrin T, Algate P, Chan-Hui PY, Karita E; IAVI Protocol C Investigators; IAVI African HIV Research Network; Ward AB, Wilson IA, Burton DR, Smith D, Pond SLK, Poignard P. HIV Envelope Glycoform Heterogeneity and Localized Diversity Govern the Initiation and Maturation of a V2 Apex Broadly Neutralizing Antibody Lineage. Immunity. 2017 Nov 21;47(5):990-1003.e9. doi: 10.1016/j.immuni.2017.11.002.

Requested domains of expertise (up to 5 keywords):

Immunology

Microbiology

Molecular biology

Biochemistry