M1-Molecular and Cellular Biology (MCB)
Internship Proposal Form
Chemistry-Biology Department

(Deadline Friday 18th December 2020)

Laboratory Address and Affiliation:

Institut de Biologie Structurale
71 avenue des Martyrs
38000 Grenoble

Laboratory/Team Research area (Keyword)

Groupe Membrane & Pathogens (Team F. Fieschi)
Immunité, récepteur de type Lectine, SARS-CoV-2, interactions glycoproteines-lectines, protéines recombinantes

Summary of the Proposed Internship Project (10 lines)

Title:

C-type lectins receptors involved in SARS-CoV2 interaction and trans-infection: characterization of the interaction and inhibitors screening

DESCRIPTION:

The Membrane and Pathogens team has been working for many years on lectin receptors capable of recognizing glycosylations expressed on the surface of viruses and in particular on the Spike protein of the SARS-CoV2 virus (Covid19 virus). We have recently demonstrated their capacity to participate in the SARS-CoV2 capture and transmission to cells permissive for infection. Thus, these CLRs are involved in SARS-CoV-2 trans-infection phenomena.

The extracellular part of these lectins will be produced and purified in order to study and characterize their structure, their mode of binding with sugars and ultimately develop inhibitors.

Investigations on the structure of some of these lectins (L-SIGN and L-SECtin) are essential to understand the mode of binding of the ligand to its receptor.

The aim of this training course is to produce and purify these lectin receptors recombinantly in *E. coli* bacteria. WT and mutant versions of the SARSCoV-2 Spike protein will be produced in HEK 293 cells. In addition, inhibitors already known for other lectin receptors will be tested on L-SIGN and L-SECtin by surface plasmon resonance. For this purpose, surfaces functionalized with lectins will be generated in an oriented way to mimic the modalities of multivalent interactions between the virus and the cell surface.

Co-crystallogenesis of CLRs with different saccharide ligands will be tested.

Methodologies and/or Techniques to be used potentially

Over-expression of recombinant proteins (E.coli and Eucaryotic cell-HEK), cell culture,
Protein purification by affinity and exclusion chromatography,
SPR (surface plasmon resonance),
Crystallisation.

Person to contact:

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Additional information

Upon application please provide your transcripts of records of the last two years and CV.
This internship proposal is, of course, dependent on the evolution of the pandemic and health conditions.

Proposal Form send as a PDF fil to: mohamed.benharouga@cea.fr

File has to be named as: name-Internship-M1-MCB-2019.pdf