



## Master Thesis/Internship Project Position:

# Integrative modeling methodologies for characterization of TLR7 genetic variants

**Duration:** ≥ 6 months (can be adjusted based on availability and fit)

**Location:** CSSB Centre for Structural Systems Biology, Hamburg, Germany

### Project Overview

We invite applications from motivated Master's students to join the research groups of “**Integrative Virology**” (Head: Prof. Dr. Maya Topf) and “**Virus Immunology**” (Head: Prof. Dr. Marcus Altfeld) at the Leibniz Institute for Experimental Virology in Hamburg. The lab of Prof. Topf focuses on the development of integrative structural methodologies. It combines experimental data with bioinformatics and modelling techniques in order to characterize macromolecular machines. The lab of Prof. Altfeld focuses on the characterization of protective immune responses against human pathogenic viruses.

Toll-like receptor 7 (TLR7) belongs to the pattern recognition receptor family and is located in endosomes. It recognizes single-stranded ribonucleic acid (RNA) molecules and synthetic RNA analogs-oligoribonucleotides. Genetic variants of TLR7 gene have been described in a series of immunological-based disorders with the most recently reported ones to be linked with the severity of autoimmune diseases and COVID-19. Despite that several of those variants have been identified at a genetic level, their impact to receptor's structural conformation and molecular dynamics remains rather unexplored.

### Responsibilities

The successful candidate will utilize computational machine learning-based software for TLR7 structure modeling. You will have the opportunity to integrate bioinformatics and molecular data for receptor conformation and structure. Advanced computational analysis will be used for the molecular dynamics simulation of the variants to study their effect on receptor regulation. Furthermore, the candidate will learn cell culture and transfection protocols of mammalian cells for the functional characterization of the genetic variants.

### Qualifications

- Background in computer or natural sciences, ideally in Computational Biology, Biochemistry, Molecular Biology or a related field
- High motivation
- Experience with modeling methodologies is a plus, but not mandatory
- Fluent in English

### Benefits

- International environment within EMBL and LIV
- Cutting edge facilities and resources
- Financial compensation

For further information on this opportunity and application submission, please contact Dr. Sanjana Nair ([sanjana.nair@cssb-hamburg.de](mailto:sanjana.nair@cssb-hamburg.de)) and Dr. Nikolaos Skenteris ([nikolaos.skenteris@leibniz-liv.de](mailto:nikolaos.skenteris@leibniz-liv.de)).

For information about the LIV and the departments, please visit the following website:

<https://www.leibniz-liv.de/>

We look forward to receiving your complete and informative application (CV and motivation letter) documents in English language by 15.05.2023, preferably to the aforementioned emails. Please add contact details for reference and state your earliest possible starting date.

The Leibniz Institute of Virology promotes professional equality for all genders. Women are particularly encouraged to apply. Severely disabled persons will be given preferential consideration in case of otherwise equal suitability, qualification and professional performance.

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