

1 master student / diploma thesis project
is available at the
Medical University Innsbruck
Institute of Virology

Technical Supervision: Emmanuel Heilmann PhD, Francesco Costacurta, MSc
Supervisor: Univ.-Prof.ⁱⁿ Dr.ⁱⁿ Dorothee von Laer

Project: Viral resistance testing, mutation selection, molecular cloning of mutations, testing mutations for resistance, paper drafting

The Institute of Virology developed a safe and innovative method for the selection of SARS-CoV-2 main protease (3CL^{pro}/M^{pro}) variants resistant to protease inhibitors (<https://www.science.org/doi/10.1126/scitranslmed.abq7360>). With this method, we described resistance mutations against the first protease inhibitor licensed for the treatment of SARS-CoV-2, the Pfizer drug Paxlovid (Nirmatrelvir / Ritonavir).

The aim of this project will be to select resistance mutations against the late stage clinical candidate “Ensitrelvir”, a protease inhibitor developed by Shionogi. The putative resistance of the emerged mutations to this inhibitor will be assessed with recently established protease activity assays (<https://www.nature.com/articles/s42003-022-03277-0>). We plan to publish the findings in a short paper with the master / diploma thesis student as first author.

The methods / task of this thesis will include among others:

- cell culture
- producing / purifying virus
- molecular cloning
- resistance testing
- molecular modelling
- paper drafting

Candidates must have a bachelor degree in Life Sciences (e.g. in Molecular Medicine, Biology, Human Biology, Biochemistry, Pharmacy, etc.) or are currently enrolled in human medicine studies with a special personal interest in scientific lab work. In the latter case, the project can be done within the context of a diploma thesis.

We suggest some weeks of lab rotation in the Institute of Virology before starting the thesis so both sides can ascertain if the project and personal interests are in line. In case the candidate is highly motivated and skilled, a monthly salary of 460 € can be arranged for the time of the thesis.

Please send your application to:

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