



Protease-guided tumor targeting tools to revolutionize cancer diagnostics and treatment (OncoProTools)

Doctoral Candidate (DC5) – Design and discovery of novel cathepsin S ligands and their evaluation as PET and fluorescent probes for oncology diagnosis

About OncoProTools

[OncoProTools](#) is an [MSCA Doctoral Network](#) that is currently starting up. The mission of OncoProTools is to develop tumor targeting strategies for cancer diagnostics and therapeutics, to make them more effective, selective, patient-friendly and personalized. Tumor targeted diagnostics and therapeutics are molecules that are typically equipped with a vector unit. The vector unit binds to a protein that is overexpressed on cancer cells or in the Tumor Micro-Environment (TME), causing the diagnostic or therapeutic payload to accumulate in the tumor. Exciting, recent innovations rely on small molecule vectors that target TME proteases. Proteases are ideal candidates for tumor targeting: they are often strongly overexpressed in the TME and possess an active site that allows high-affinity anchoring of vectors. Members of this consortium have played a leading role in these recent developments.

OncoProTools wants to force breakthroughs by:

- 1) Exploring innovative venues for protease targeting in cellular immunotherapy.
- 2) Discovering novel vectors that bind to other TME proteases, like cathepsins and granzymes.
- 3) Personalized applications of protease targeting: deliver innovative diagnostics through deeper understanding of TME biology.

OncoProTools will deliver a training program to 10 Doctoral Candidates that truly captures the MSCA values, hence providing them with all capabilities to become leaders of tomorrow's R&I in Europe.

About the Johannes Gutenberg University and the Institute of Pharmaceutical and Biomedical Sciences

The [Johannes Gutenberg-University](#) (JGU) is one of the largest and most diverse universities in Germany. It unites almost all academic disciplines, including the Mainz University Medical Center. Annually, about 660 PhD students complete their studies at the JGU. The Institute of Pharmaceutical and Biomedical Sciences (IPBS) is part of the Faculty of Chemistry, Pharmacy, Geography and Geosciences (FB09) with about 3700 students. The IPBS is responsible for research and training researchers and students of Pharmacy, of Biomedical Chemistry and of Molecular Biotechnology. The division of Pharmaceutical and Medicinal Chemistry of the IPBS both performs basic research and trains researchers in all aspects of drug discovery, especially for cancer research, infectious diseases, protein-ligand interactions, structural biology and RNA biochemistry.

Tasks description

The interdisciplinary doctoral position is hosted by the Pharmaceutical and Medicinal Chemistry division of the IPBS. The [Schirmeister Group](#) has expertise in design, synthesis and biological evaluation of (covalent-reversible) protease inhibitors, especially cathepsin-like cysteine proteases involved in cancer and parasitic diseases.

In this position, you will:

- Design, synthesize and characterize novel cathepsin S inhibitors and transform optimal ligands into radiolabeled, fluorescent or biotinylated derivatives.
- Perform analytical, biochemical and biological investigations on the compounds.
- Write project reports for your local and network supervisors on a regular basis.
- Participate in the General Postgraduate Program (GPP) of the Center for Quality Assurance and Development at the JGU.
- Participate actively to OncoProTools' training, dissemination, communication and valorization program.
- Prepare a doctoral thesis, and publish scientific articles related to the research project.

Furthermore, the selected candidate will take part in the following planned secondments:

- Academic secondment at CSIC-CNB (3 months, Spain) to evaluate fluorescent CatS probes in tumor models.
- Industrial secondment at SCV (3 months, Germany) for radiolabeling procedures, including delivery of GMP-quality products.

Profile & requirements

- Applicants must hold a master's degree or equivalent in the field of Chemistry, Biochemistry, Pharmacy or related disciplines.



- Master students in their final year may apply. Transcripts of the master's degree should be obtained before signing the contract.
- Applicants must have a solid knowledge of organic chemistry, instrumental analytics, biochemical assays and basic knowledge of computer-aided drug design and structural biology.
- Applicants have obtained outstanding academic results.
- Applicants must have an ability to understand and express themselves in both written and spoken English to a level that is sufficiently high for them to derive the full benefit from the network training.
- Applicants must be eligible to enrol on a PhD programme at the host institution.
- Applicants must have the necessary academic skills and background to make the success of a doctoral degree.
- Applicants can be of any nationality but must comply with the Horizon Europe MSCA eligibility criteria:

HORIZON MSCA Mobility Rule: researchers must not have resided or carried out their main activity (work, studies, etc.) in the country of the host organisation for more than 12 months in the 3 years immediately before the recruitment date. Compulsory national service, short stays such as holidays and time spent by the researcher as part of a procedure for obtaining refugee status under the Geneva Convention are not taken into account.

HORIZON MSCA eligibility criteria: supported researchers must be doctoral candidates, i.e. not already in possession of a doctoral degree at the date of the recruitment. Researchers who have successfully defended their doctoral thesis but who have not yet formally been awarded the doctoral degree will not be considered eligible.

Benefits

- ✓ The selected candidate will be employed by the host organisation for **36 months**. In line with JGU regulations and following a positive evaluation by the doctoral committee, the host institution may provide additional funding for a maximum of 12 months to complete a doctoral degree.
- ✓ **The start date will be from January, 1st 2023 onwards.**
- ✓ JGU has received the following EU-grant to recruit a Doctoral Candidate (DC): monthly Living Allowance € 3.342,2; monthly Mobility Allowance € 600; and monthly Family Allowance € 660 (only if applicable). Please note that the final monthly, gross salary will result from deducting (from the mentioned amounts) all compulsory national labour taxes (social security, etc.) to be borne by the employer. More information: https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-2-msca-actions_horizon-2021-2022_en.pdf. Moreover, funding is available for technical and personal skills training and participation in international research events.
- ✓ The opportunity to be part of an MSCA Doctoral Network: the selected candidate will benefit from the designed training programme offered by the host organisation and the OncoProTools consortium.
- ✓ The selected candidate will participate in international secondments to other organisations within the OncoProTools network and in outreach activities targeted at a wide audience.

Please, find additional information in the [Horizon Europe Work Programme MSCA](#) from p.75 onwards.

Application

- Interested candidates are invited to apply for this position by filling in the application form on our website (www.oncoprotocols.eu), via this link: <https://www.uantwerpen.be/en/projects/protease-guided-tumor-targeting-tools/job-openings/submit/>.
- The closing date for applications is **July 15th 2022**.
- The selection committee will review all of the applications as soon as possible after the application deadline. As soon as a decision has been made, we will inform you about the next steps in the selection procedure.
- Pre-selected candidates will be invited to take part in the recruitment event in Antwerp (Belgium) on October 6th, 2022. OncoProTools will offer a financial support of max. € 200 to attend this physical event.
- The recruitment process of DCs within OncoProTools is in line with the principles set out in the [European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers](#).
- Ukrainian researchers are eligible to benefit from the Science4Refugees initiative without the need of holding the refugee status.

Additional information

For additional information about the research project and this individual position, please contact:

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Disclaimer: please note that this offer is subject to the signature of the grant agreement nr° 101073231 expected by mid July 2022