



Novel mRNA nanotherapeutics against antibiotic-resistant pulmonary infections

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We are looking for a PhD student for a joint research activity between Biointerfaces Group at the University of Applied Sciences & Arts Northwestern Switzerland (<https://www.nanobiointerfaces.ch>), Infection Biology Group at the University of Basel (<https://biomedizin.unibas.ch/en/research/research-groups/khanna-gremmelmaier-lab/>), and the Nanopharmaceutical and Regulatory Science Group at the University of Basel (<https://pharma.unibas.ch/de/research/research-groups/nanopharmaceutical-regulatory-science/>).

The student will moreover become a member of the Swiss Nanoscience Institute (SNI) PhD school and will benefit from personal support, a strongly interdisciplinary social environment, training in soft skills offered by the PhD program, and many internal SNI events. The earliest start date is January 1st 2025.

Project description: Antimicrobial resistance (AMR) is a global health concern. In recent decades, pan-resistant bacteria have emerged, rendering commonly available antibiotics ineffective. Consequently, many pivotal advancements in modern medicine are now under threat. As the development of new antimicrobials stagnates, there is an urgent need for alternative strategies to identify clinically effective treatments. Antimicrobial peptides (AMPs) have emerged as promising alternatives to antibiotics due to their high efficacy and low resistance rates against several bacterial strains. However, clinical application of AMPs is hampered by their toxicity, immunogenicity, and rapid degradation in vivo. In this project, we aim to develop a novel strategy for AMP-mediated treatment of antibiotic-resistant pulmonary infections via taking advantage of nanoparticle and mRNA technologies to synthesize and release AMPs directly at the site of infection. mRNA technology has gained significant attention in various therapeutic areas, particularly in the development of vaccines for COVID-19. However, the potential of mRNA therapies against antimicrobial resistance has not yet been explored. With this project, we aim to bring the mRNA therapeutics beyond the current state-of-the-art.

Candidate profile: We expect candidates to have a relevant background in biology, chemistry, nanosciences, or a similar field. Prior experience in at least one of the followings is a must: microbiology (growth curves, inhibition assays, etc.), molecular biology (mRNA transfection, mammalian cell culture, etc.), nanoformulation development (lipid nanoparticles, polymer nanoparticles, liposomes, etc.). Over the course of the project, the candidate will acquire a wide range of skills in nanoformulation development, mRNA delivery, transfection, microbial and mammalian cell cultures.

Applications should be made online at: phd.nanoscience.ch

Please consider applying early, since the decision to fill the vacancy can be taken at any time in the process.

For further information, contact Prof. Dr. Oya Tagit : oya.tagit@fhnw.ch

Applications made via email will NOT be considered.