



## Ph.D. Student Position

### **Bacteria-wound dressing interactions studied with holographic imaging and cytometry**

Identifying and quantifying pathogens is a cumbersome process, usually performed by plating and qPCR (genome) analysis. These identification methods, unfortunately, tell us nothing regarding how bacteria attach to and interact with materials and cells. Similarly, optical microscopy is used to image bacteria and biofilms, but it does not allow us to identify bacteria easily and its 2D-nature precludes studying binding interactions.

We have worked on a new technique to image cells in 3D fast enough to capture how they move and interact, and to identify them by their physical properties. This technique, holographic phase-contrast microscopy, can be used to analyze tens of thousands of bacteria rapidly to determine their species and phenotype, in a way similar to flow cytometry.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie SKŁODOWSKA-CURIE grant agreement No 955664



MARIE SKŁODOWSKA-CURIE ACTIONS

## Your future job

You will apply holographic cytometry to characterize various pathogens relevant to healthcare-associated infections, achieving rapid, label-free identification of bacteria.

You will apply holographic methods to investigate hydrogels, bacteria, and their interactions, including the early stages of biofilm formation and infection.

You will complement the investigations of the dynamics using holographic imaging with scanning electron microscopy of the detailed morphology of bacteria, biofilms, hydrogels, and the interface between the two, relevant in the context of wound dressings.

## What we offer

Work in a transdisciplinary research group of physicists, chemists, and microbiologists, in the Institute for Biologically inspired materials, University of Natural Resources and Life Sciences, Vienna. At your disposal are the state-of-the-art labs of the Institute for Biologically inspired materials, including TEM, SEM, all sorts of optical microscopy and colloidal techniques, microbiology, and cell culture facilities.

A European, transdisciplinary, structured doctoral education through the Marie Skłodowska-Curie European Training Network STIMULUS. You will spend extended time performing research and receiving training with our partners.

## What you should do now

Suppose you are interested, and you have or will finish the equivalent of a European master's degree next year in physics, chemistry, materials science, or related discipline. In that case, you can apply to us by submitting:

- Cover letter including your motivation to apply for the chosen position and research interests
- Curriculum Vitae
- Diploma for the highest finished degree (expected date of graduation if your master's degree is not completed)
- Full transcript of grades for your university studies (with grade key in English)
- Reference letters or reference contact persons

Make sure that you submit all the requested documents, or we will not consider your application. The application should be submitted in English; we might additionally ask you

to provide a TOEFL test. You cannot have resided in Austria for more than 12 months during the last 3 years to be eligible.

We especially encourage female applicants, applicants from minority groups, and applicants with disabilities.

You can find more information on the STIMULUS consortium and on the selection process on the [STIMULUS website](#). We plan the interviews for the second half of February 2021, with the possibility to start soon after that. **Applications are welcome until the 31st of January 2021.**

### Employment conditions

- 40 hours per week for 36 months.
- Gross salary: € 2,929/month (following the terms of the collective agreement for university staff, B1), plus additional mobility (€ 1,200/month) and (when applicable) family allowance (€ 500/month).

### Contact and submission of applications

Univ.-Prof. Dr. Erik Reimhult

E-Mail: [tiziana.fresu@boku.ac.at](mailto:tiziana.fresu@boku.ac.at)

Website: <https://boku.ac.at/nano/bimat>, <https://www.stimulus-etn.eu/>