

Bachelor / Master Thesis position

You are interested on a Bachelor/Master Thesis position on an interesting project? Read below how to apply:

Activities and responsibilities:

Project: "Differentiation of dead neutrophils from living ones by means of virtual staining"

Neutrophils are the most abundant type of granulocyte and account for 50-70% of all white blood cells. They are the first cells to be recruited to inflamed sites during the innate immune response and play an important role in cancer. These so-called "tumour-associated neutrophils" (TANs) promote tumour invasion and metastasis in different ways. Therefore, it is important to analyse the interplay between neutrophils and tumour cells. In this ongoing research project, tumour cells and neutrophils are cultivated together, videos are recorded, and the interaction of the cells is analysed. To detect dead neutrophils, propidium iodide (a fluorescent intercalating agent) is added; if a cell is dead, it appears red. This means that this experiment will always require a fluorescence microscope to detect dead cells, while other types of microscopy would allow a higher throughput. The aim of this thesis will therefore be to enable detection without fluorescence. Possible ways to achieve this could be supervised machine learning or deep learning for cell segmentation. The starting point could be image processing algorithms to transfer existing fluorescence-labelled images into (binary) ground truth masks and use these as training data. Creative ways have to be found to pre-process many measurements from the wet lab collected over a longer period of time, to standardise them and to transfer them into a form that is clear and understandable for machines.

Qualification profile

We seek:

- Highly motivated, team-oriented bachelor/master students (d/f/m) with interest in computational bioimaging, bioinformatics and machine learning
- Programming skills are required; Python is preferred but not a must.
- Prior experience on basic microscopical and immunological methods and theory would be a plus

We offer:

- Intellectual and practical supervision within our interdisciplinary working group

**ZMB - Zentrum für
Medizinische
Biotechnologie**

**INSTITUT FÜR
EXPERIMENTELLE
IMMUNOLOGIE &
BILDGEBUNG**

Prof. Dr. Matthias Gunzer
Tel.: +49 201 183 - 6640
Fax: +49 201 183 - 6642
matthias.gunzer@uni-due.de
matthias.gunzer@uk-essen.de

Sekretariat:
Kamilla Wierzchowski
(-6641)

S05 V01 F29
Universitätsstraße 2
45117 Essen

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- A medically and technically relevant and future-oriented project
- The opportunity to learn and apply state-of-the-art informatics methods on real data

Start: A.s.a.p.

Send application to:

If you are very enthusiastic in science and biomedical technologies and want to join our re-search team, please send your application with short **CV and motivation letter** within **2 weeks of publication** of this advertisement to:

Matthias.Gunzer@uni-due.de.

The aim of the University of Duisburg-Essen is to promote the diversity of its members (see <http://www.uni-due.de/diversity>). It aims to increase the proportion of women in scientific staff and therefore urges qualified women to apply. In accordance with the National Equal Opportunities Act, women are given preferential treatment with equal qualifications. Applications for suitable severely handicapped and equivalent persons pursuant to § 2 para. 3 SGB IX are desired.

We use your data exclusively for application purposes in accordance with the applicable data protection regulations. Further information can be found in the privacy policy on our homepage at www.uk-essen.de.