Karlsruhe Institute of Technology

MAB
PROCESS ENGINEERING IN LIFE SCIENCE

PhD position m/f/d

'Multisensory in-line PAT in DSP for in-silico model-based process monitoring and control'

Starting date: as soon as possible

That's the project

CAARE - "Characterization and Recovery of Bionanoparticles for Vaccine Delivery and Gene Therapy", compare https://www.caare-project.eu/, is a European Doctoral Networks project. Planned research will investigate the characterization and recovery of bionanoparticles for vaccine delivery and gene therapy. Overall, 14 Doctoral Candidates will be trained at seven institutions in five European countries and will be supported by a network of industrial and academic partners.

At KIT you will work at the Institute of Process Engineering in Life Sciences (BLT) - Section IV: Molecular Processing of Bioproducts (MAB). We pursue research in the field of downstream processing of bioproducts especially of pharmaceuticals. We deal with all aspects of modern purification, formulation and analytics in the biopharmaceutical industry.

The project work within the scope of this job posting is designed for the preparation of a dissertation dealing with separation processes for bionanoparticles in downstream processing with a focus on process analytical technology (PAT). In the PhD position available you will develop and apply soft sensors, consisting of PAT and mechanistic / data driven modelling.
'Multisensory in-line PAT in DSP for in-silico model-based process monitoring and control'.
The products to be analysed will be AAVs, VLPs or LNPs.

About the positions, salary, and the research projects

The full-time position is subject to funding, and offered on a fixed-term 36-month contract. Working as a part of an international research team, the successful applicant will complete a research project on:

'Multisensory in-line PAT in DSP for in-silico model-based process monitoring and control'
The objective of this project is the development and application of soft sensors consisting of PAT and mechanistic / data driven modelling allowing process control. Steps to be taken will be:

1. Developing a process applicable PAT method (single / multisensoric) for AAV / LNP / VLP detection during downstream processing.
2. Theoretical investigation of molecule stability during DSP, using molecular interaction simulations such as e.g. Molecular dynamics (MD).
3. Combination of PAT and data driven modelling.
4. Application of the produced soft sensor to investigate the feasibility of process control.

The project will be supervised by Prof. Jürgen Hubbuch and Dr.-Ing. Iris Perner-Nochta. The successful applicant will be enrolled as a doctoral candidate at the Karlsruhe Institute of Technology (KIT) and will work on the above-mentioned topics.

Secondments for this position are foreseen at relevant project partners.

Funding / Salary

The PhD position is part of the EU-funded Doctoral Network CAARE and funded for 36 months through the EU Research Framework Programme Horizon Europe at the level stipulated by Marie Skłodowska-Curie Actions funding rules. They pay a highly competitive and attractive salary, to which mobility and family allowances may be added. In detail, each of the successful applicants will receive (in 36 months): €120,319.20 + €21,600.00 for Mobility Allowance, plus additional budget for "Family allowance" if the conditions for their request under the project are met. All amounts are to be considered before taxes.

Compare also further information on: https://euraxess.ec.europa.eu/jobs/316701

Personal qualification

You have an excellent master's degree in the field of biotechnology, bio-/chemical engineering, (bio) process engineering, bioinformatics, biophysics or biomathematics.

Ideally you have

- Programming skills and knowledge on machine learning and statistical data evaluation, creation of scientific programme codes using common software packages (MATLAB, Python, R)
- Simulation skills with e.g. molecular dynamics and alpha fold
- Knowledge of biopharmaceutical process development; process analytical technologies (PAT) and common analytical methods for biopharmaceuticals will be an advantage;
- Very good communication skills in English both written and verbal;
- An ability to and commitment to producing scientific outputs for publication in peer-reviewed journals;
- Evidence of ability to work independently and collaboratively within an international team;
- A willingness to take on responsibility;
- Interest for / A basic knowledge of the German language.

You are

- Highly motivated, with excellent organisation skills and with strong attention to detail and quality;
- willing to travel to attend secondments, training and academic events.

Specific Requirements / Eligibility criteria

- Master's concerning the scientific disciplinary area of relevance obtained in Germany or the equivalent title obtained abroad (Bioinformatics, Biophysics, Biomathematics, Biotechnology, Bio-/ Chemical Engineering, (Bio) Process Engineering,)
- An excellent track record of academic achievement.
- At the effective starting date of this contract, applicants must not have been awarded with a PhD;

- At the effective starting date of this contract, applicants must not have resided in Germany for more than 12 months in the 36 months immediately before the appointment;
- For more information on the eligibility criteria for European Doctoral Network, please check https://marie-sklodowska-curie-actions.ec.europa.eu/actions/doctoral-networks

Benefits

Become a member of staff of the only German University of Excellence that conducts large-scale research on the national level. Work under excellent working conditions in an international environment. Benefit from specific training when starting your job and from a wide range of further qualification offers. Use our flexible working time models (flexitime, work from home), our sports and leisure offers, as well as our child and holiday care services. We also pay a share of EUR 25/month in the Job Ticket Baden-Württemberg. Enjoy a large variety of dishes, snacks, and beverages at our canteens.

Karlsruhe Institute of Technology (KIT) – The Research University in the Helmholtz Association creates und imparts knowledge for the society and the environment. It is our goal to make significant contributions to mastering the global challenges of mankind in the fields of energy, mobility, and information. For this, around 9800 employees of KIT cooperate in a broad range of disciplines in research, academic education, and innovation.

We prefer to balance the number of employees (f/m/d). Therefore, we kindly ask female applicants to apply for this job.
Recognized severely disabled persons will be preferred if they are equally qualified.
https://www.kit.edu/career/26984.php

Application / Selection process

Please apply per email to: juergen.hubbuch@kit.edu

Admission Procedure:
Assessment of qualifications and oral exam: during the oral test, knowledge of the English language will be tested.

Assessable Qualification:
The candidates must attach to their applications:

1. All relevant documents (application or motivation letter, curriculum vitae, training measures, certificates of Bachelor's and Master's Degree (in original language and in translation (German or English), for candidates from EU: Diploma Supplement in original language and in translation (German or English); for Non-EU candiates: Transcript of Records/Subject and grade overview in original language and in translation (German or English); Grading system)
2. A short description of a research project on the topic *'Description of stability issues of virus particles'*

How to write the research project? Please write down how you intend to conduct the research to investigate this topic. No page limit applies.

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Additional comments

For further information or doubts about the positions and the related application procedures please contact Prof. Jürgen Hubbuch (juergen.hubbuch@kit.edu) and/or Dr.-Ing. Iris Perner-Nochta (iris.perner-nochta@kit.edu), who will be happy to provide more details about the project and how to apply at Karlsruhe Institute of Technology.

Organizational unit:	Karlsruhe Institute of Technology Institute of Process Engineering in Life Sciences Section IV: Biomolecular Separation Engineering https://mab.blt.kit.edu/english
Starting date:	As soon as possible
Contract duration:	36 months
Application up to:	March 15th , 2025
Contact person:	for further information Prof. Hubbuch and/or Dr. Perner-Nochta