Postdoc – ground-breaking analytical chemistry project within synthetic biology

Can you take the scientific lead in the development of a next generation platform for metabolomics and fluxomics analysis?

At DTU Biosustain we develop the next generation of bio-sustainable technologies using synthetic biology techniques. We create novel methods and technologies as a foundation for development of new environment friendly products, better and less energy consuming manufacturing processes, new medical treatments, climate friendly farming, etc.

We need your scientific expertise and your positive, collaborative mindset to take the lead in the development of a next generation analytical platform for quantitative biology. Specifically, the aim of the platform is to democratize the ability to accurately, precisely, and reproducibly, quantify small molecules and lipids within cells, and the rates/fluxes of reactions within cells. You will get the opportunity to unfold your skills at the forefront of international science and work in a state-of-the-art-lab that is well financed and equipped to a level that you will be hard pressed to find anywhere else in the world. The position is time limited for 3 years.

Develop a next generation platform for metabolomics and fluxomics composed of multiple LC-MS/MS and GC-MS instruments

Your focus is to develop an analytical platform composed of multiple LC-MS/MS and GC-MS instruments for high throughput, rapid, high coverage, and automated metabolomics and fluxomics of micro-organisms, eukaryotic cell cultures, and mammalian tissues and fluids. You will:

- Develop/refine and validate automated methods for polar and non-polar sample extraction
- Develop/refine and validate methods for C13/N15 metabolic labeling for both polar and non-polar quantification
- Develop/refine and validate methods for rapid and high throughput polar and non-polar metabolite quantification by LC-MS/MS
- Develop/refine and validate methods for rapid and high throughput polar isotope distributions by LC-MS/MS and GC-MS
- Develop and validate metabolic flux analysis (MFA) models for intracellular flux calculations
- Assist in developing automated methods that cover the entire metabolomics and fluxomics workflows (i.e., from sample handling, to data acquisition, to data processing, to data analysis).
- Publish new analytical methods in peer-reviewed journals, present at conferences, and disseminate knowledge to the scientific community
• Lead and coordinate several high impact scientific publications demonstrating the abilities of the platform

We anticipate that you will have a good collaboration with colleagues and partners for automated method development. You will work together with an automation team equipped with benchtop liquid handlers for much of the sample handling method development. Analytical Lab Technicians will assist you with the majority of the manual work. You will also collaborate with Fermentation Engineers for cell growth, and Software Engineers and Bioinformaticians for data handling.

Your expected outcomes at the end of 3 years
• 1-2 first author publications pertaining to the development of rapid LC-MS/MS methods for quantitative non-polar and polar metabolites
• A first author publication describing the development of an analytical platform composed of multiple LC-MS/MS and GC-MS instruments for high throughput, rapid, high coverage, and automated metabolomics and fluxomics of micro-organisms, eukaryotic cell cultures, and mammalian tissues and fluids
• A first author publication in collaboration with DTU Biosustain scientific units describing the application of the platform to generate reference level metabolite levels and flux levels of a multitude of synthetic biology organisms along with the ability of the platform to answer pressing questions in synthetic biology in conjunction with machine learning and metabolic modeling
• Various co-author publications using the platform for various synthetic biology applications

PhD with extensive experience in analytical chemistry
We are looking for an experienced and ambitious Scientist that likes to create results via knowledge sharing and teamwork with due respect to professional and cultural differences. At the same time you must be able to define the road map and be the primary driver of turning ideas into action. Additionally, your CV comprises:

• A PhD in analytical chemistry, systems biology, bioengineering or similar
• Extensive experience in analytical chemistry, and in particular metabolomics and fluxomics
• Experience in conducting scientific research using analytical chemistry to answer questions in biology and biochemistry
• Experience in suspension cultivation of microbes and/or mammalian cells
• Experience in analytical chemistry data processing and statistical data analysis
• Motivation for acquiring skills within script based programming, e.g. Python

DTU Biosustain – your new department
At DTU Biosustain we use synthetic biology techniques for the development of advanced materials and chemicals, smart and sustainable agriculture, and personalized human health applications. We are breaking new land at the absolute forefront of what is possible. We have the funding, the knowhow, and the latest state-of-the-art technology and equipment needed to succeed. We are looking to develop Big-Omics Data generation workflows and then apply advanced AI methods in order to push the boundaries of what is considered the current state-of-the-art in synthetic biology. You can learn more at biosustain.dtu.dk
**AutoFlow Group – your new team**

In The AutoFlow group we translate, build, and maintain automated workflows for Big –Omics Data generation and analysis. We do so by using various liquid handling equipment, analytical instrumentation, and software engineering tools combined with machine learning. Core workflows within AutoFlow include automated strain screening and sample handling for multi-omics analysis, and deep phenotyping using mass spectrometry. We collaborate with other scientific and technical groups including software engineering, genome engineering, analytics, and next generation sequencing.

**Salary and terms of employment**

Your new workplace is the Novo Nordisk Foundation Center for Biosustainability (CFB) at Building 220, Kemitorvet, 2800 Kgs. Lyngby, Denmark.

The appointment will be based on the collective agreement with the Danish Confederation of Professional Associations. The allowance will be agreed upon with the relevant union.

The position is limited for 3 years.

You can read more about career paths at DTU here.

**Application and contact**

Please submit your online application no later than **5 April 2020 (23:59 local time)**. Apply at [www.career.dtu.dk](http://www.career.dtu.dk)

Applications must be submitted as **one PDF file** containing all materials to be given consideration. To apply, please open the link "Apply online", fill out the online application form, and attach **all your materials in English in one PDF file**. The file must include:

- Application (cover letter)
- CV
- Diploma (MSc/PhD)
- List of publications

Applications and enclosures received after the deadline will not be considered.

If you have any questions, you are very welcome to contact Senior Scientist, Douglas McCloskey at domccl@biosustain.dtu.dk or Senior Analytical Chemist, Mette Kristensen at metk@biosustain.dtu.dk. If necessary, we will set up an additional phone call to ensure your understanding of the job and your many opportunities.

All interested candidates irrespective of age, gender, disability, race, religion or ethnic background are encouraged to apply.

**Technology for people**

*DTU develops technology for people. With our international elite research and study programmes,*
we are helping to create a better world and to solve the global challenges formulated in the UN’s 17 Sustainable Development Goals. Hans Christian Ørsted founded DTU in 1829 with a clear vision to develop and create value using science and engineering to benefit society. That vision lives on today. DTU has 11,500 students and 6,000 employees. We work in an international atmosphere and have an inclusive, evolving, and informal working environment. Our main campus is in Kgs. Lyngby north of Copenhagen and we have campuses in Roskilde and Ballerup and in Sisimiut in Greenland.