



# Postdoctoral Fellow in Biostatistics

## Job description

Applications are invited for a 3 year position as Postdoctoral Fellow in Biostatistics to be based at the Oslo Centre for Biostatistics and Epidemiology (OCBE), Institute of Basic Medical Sciences (IMB), the Faculty of Medicine, University of Oslo (UiO), Norway. The position is funded by the UiO Faculty of Medicine.

## More about the position

The appointment is a fulltime position and is made for a period of three years (10% of which is devoted to required duties, in the form of teaching and advising activities).

The main purpose of the fellowship is to qualify researchers for work in higher academic positions within their disciplines.

The postdoctor will work on a new project which focuses on the integration of complex and big data across scales and types. The purpose is to develop new methodologies for three biomolecular problems which all call for data integration. Multiple technologies allow collecting data about patients and biological processes, where each data component is based on specialised measurements and contributes a piece of unique knowledge and understanding of the system. Analysing all data together, in an integrative manner, increases power and precision of the prediction (of the process), estimation (of hidden quantities) or classification (of patients in groups or of events in a cell differentiation context).

The statistical challenge is to extract the unique information each data layer carries about the system under study and to quantify the uncertainty of predictions, estimations, classifications in a realistic way. A further challenge comes from the fact that data layers have different resolution (scale) in time and space and they carry different levels of noise.

The project will focus on three unique data sets, in three areas of biomolecular oncology, in collaboration with leading research groups in each of the three areas.

1.) The NBCS (Norwegian breast cancer study) has collected SNP, gene copy number, gene expression, miRNA, methylation, proteins and metabolic spectra which already have been used individually to classify the patients into diseases subtypes. Integrating together these molecular layers should produce disease subtypes which are more specific than those obtained with each component on its own. The different layers have biologically hierarchical relations and modelling these should allow more powerful classifications. Mathematical models of mechanisms will also play an important role. In collaboration with professor Vessela Kristensen

<https://www.med.uio.no/klinmed/personer/vit/vessela/>

2.) Stem cell differentiation. The aim is to identify relative contribution of genomics, epigenomics and 3D genome conformation parameters, to the regulation of adipose stem cell differentiation into adipocytes, with the aim of better understanding metabolic diseases. ChIP-seq, RNAseq and HiC (genome-wide chromosomal interaction) data are available and from these we are able to generate 4D models of chromatin architecture. Key challenges to be solved are integration methods, weighting, statistical importance of the contributions, and 3D structure deconvolution techniques to provide a deeper appreciation of developmental transitions leading to normal and diseased adipocytes. In collaboration with professor Philippe Collas, <http://www.collaslab.org/>

3.) Randomised clinical trial with fish oil. We seek to integrate transcriptome data (using microarray) with metabolome data (using time-of-flight mass spectrometry and nuclear magnetic resonance spectroscopy), to discover integrative biomarkers. These biomarkers are aimed to understand and predict changes in lipids (triglycerides) and inflammatory markers caused by fish oil intake, possibly leading to novel precision strategies for dietary prevention of lifestyle diseases. In collaboration with professor Stine Ulven <http://www.med.uio.no/imb/personer/vit/smulven/>

These three cases launch common challenges to current statistical methodologies, and will lead to papers, algorithms and computational tools which will be tested systematically in these contexts. In addition, each case carries specific aspects which will require specialized versions of the common methodology. Professor Arnoldo Frigessi will collaborate in all parts of the project. <http://www.med.uio.no/imb/english/people/aca/frigessi/index.html>

Candidates will have expertise in mathematical and statistical modelling, computationally intensive inference, numerical analysis of differential equations, machine learning approaches, for biological and biomedical processes. Experience to integrate experimental data is necessary. The ideal candidate has some experience of data analysis in genomics and molecular biology, though this is not an absolute requirement, and a solid methodological competence and experience in other areas of mathematical biology. Applicants must show promises to become leading scientists and to promote a collaborative research environment across disciplines.

The appointment is central to the present project. The appointed candidate will have full operational responsibility for her/his research within the project. He/she will be responsible for progress in all three project areas, developing methodology, implementing algorithms and producing scientific results of substantial interest, published in top peer-reviewed scientific journals. She/he will lead and contribute enthusiastically to the collaborative research project, multidisciplinary research setting, with the aim of producing best science with impact. The post holder will contribute to the strategic research leadership of OCBE.

The role holder is expected to contribute to the management and organisation of the project, by taking direct responsibilities in the administrative and leading tasks of this project. The location of OCBE is in the campus of UiO in Oslo. Working language is English.

## Qualification requirements

- Applicants must hold a degree equivalent to a Norwegian doctoral degree in biostatistics, statistics or mathematics. The doctoral dissertation must be submitted for evaluation at the time point of candidate selection. Finally, appointment is dependent on the public defence of the doctoral thesis being approved
- Fluent oral and written communication skills in English

The following qualifications will count in the assessment of the applicants:

Her/his research has been in the broad area of data integration, from a Bayesian or classical point of view and has experience collaborating with scientists in other disciplines. Candidates to the position will have some experience and/or clear potentials to initiate, develop and manage an independent scientific programme. Some experience in advising in biostatistics is interesting. The role holder will possess sufficient administrative skills to manage projects and contribute to the common workload of the project. Candidates must demonstrate team spirit in developing their research, with strong interpersonal skills. Proficiency with programming languages (R, Matlab, Python, C++, FEniCs or others) is necessary.

## We offer

- Salary NOK 515 200 - 576 100 per annum depending on qualifications in position as Postdoctoral Research Fellow (position code 1352)
- Three years full time employment
- Annual paid leave for 5 weeks, plus public holidays
- A professionally stimulating working environment
- Attractive [welfare benefits](#) and a generous [pension agreement](#)
- Access to public health services through membership of the National Insurance Scheme
- Participation in the [Postdoctoral Programme](#) at the Faculty of Medicine

## How to apply

The application must include

- Cover letter (statement of motivation, summarizing scientific work and research interest)
- CV (summarizing education, positions, pedagogical experience, administrative experience and other qualifying activity)
- Copies of educational certificates (academic transcripts only)
- A complete list of publications, including manuscripts and work in progress.
- List of reference persons: 2-3 references (name, relation to candidate, e-mail and phone number)

The application with attachments must be submitted through our electronic recruiting system. Foreign applicants are advised to attach an explanation of their University's grading system. Please note that all documents should be in English (or a Scandinavian language).

In assessing the applications, special emphasis will be placed on the documented, academic qualifications and the candidate's motivation and personal suitability. Interviews with the best qualified candidates will be arranged.

It is expected that the successful candidate will be able to complete the project in the course of the period of employment.

## Formal regulations

Please [see the guidelines](#) and regulations for appointments to Postdoctoral fellowships at the University of Oslo.

Please note that no one can be appointed as a postdoctoral fellow for more than one specified period at the same institution in Norway. If you already have been employed as a postdoctoral fellow at the University of Oslo, you are not eligible for the above position.

According to the Norwegian Freedom and Information Act (Offentleglova) information about the applicant may be included in the public applicant list, also in cases where the applicant has requested non-disclosure.

The University of Oslo has an [agreement](#) for all employees, aiming to secure rights to research results etc.

The University of Oslo aims to achieve a balanced gender composition in the workforce and to recruit people with ethnic minority backgrounds.

## Contact information

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## About the University of Oslo

**The University of Oslo** is Norway's oldest and highest ranked educational and research institution, with 28 000 students and 7000 employees. With its broad range of academic disciplines and internationally recognised research communities, UiO is an important contributor to society.

**The Institute of Basic Medical Sciences** overall objective is to promote basic medical knowledge in order to understand normal processes, provide insight into mechanisms that cause illness, and promote good health. The Institute is responsible for teaching in basic medical sciences for the programmes of professional study in medicine and the Master's programme in clinical nutrition. The Institute has more than 300 employees and is located in Domus Medica.

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