The University of Oslo is Norway’s oldest and highest ranked educational and research institution, with 28,000 students and 7,000 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.

**Postdoctoral Fellow in Statistics/Data Science (three years)**

Applications are invited for a 3 year position as Postdoctoral Fellow in Statistics/Data Science to be based at the 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.

The postdoc 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. In collaboration with professor Vessela Kristensen [https://www.med.uio.no/klinmed/personer/vit/vessela/](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/](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/english/people/aca/frigessi/index.html](http://www.med.uio.no/imb/english/people/aca/frigessi/index.html).

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.

Candidates will have expertise in statistical modelling, computationally intensive inference, high dimensional machine learning...
approaches, for biological and biomedical processes. Experience to analyze and 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 applications areas can compensate for absence of knowledge of genomics. Applicants must show promises to become leading scientists and to promote a collaborative research environment across disciplines. Together with colleagues at UiO, the postdoc will shape research in integrative data science.

An excellent and enthusiastic young scientist is sought to be part of one of Europe’s most active biostatistics departments at an exciting time. Currently, OCBE has eight tenured professors, four tenured associate professors, fifteen tenured researchers, post-doctoral fellows and PhD students, making up a group of about 60 scientists. OCBE is internationally recognized, with interests spanning a broad range of areas (including time-to-event models, data integration, causal inference, statistical genomics, Bayesian inference, stochastic simulation algorithms, probabilistic graphical models, machine learning, evolution and population genetics, informative missingness and measurement error models, epidemiological studies of lifestyle and chronic diseases, stochastic models for infectious diseases, high dimensional data and models) and numerous collaborations with leading bio-medical research groups internationally and in Norway. In the last national research evaluation, OCBE was judged as excellent by an international committee. OCBE has a leading role in the recently funded prestigious centre for research-based innovation BigInsight, a consortium of academic, industrial and public partners, with a funding of about 4 mil Euro annually until 2023. Furthermore, OCBE hosts the ERC Advanced Grant of Professor Corander (Scalable inference algorithms for Bayesian evolutionary epidemiology) from 2017 until 2022, and several further important projects in the areas of statistical methods for biobank, health survey and registry data, of causal inference and of mathematical models for personalised cancer therapy.

OCBE is responsible for the bio-statistical teaching for the professional study in medicine, for the faculty's bachelor and master programmes and for the PhD training. OCBE also provides an extensive advisory service for bio-medical and clinical researchers at the University of Oslo and the Oslo University Hospital, often also an existing source of data and challenges for our discipline.

This position is part of a substantial investment in the computational life sciences by the University of Oslo, through the programme UiO:Life Science. In particular, this position is part of the Faculty of Medicine strategic plan, with focus on digital life sciences with high potential in basic and clinical medicine.

Job description/role summary

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.

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

Qualification requirements/person profile

- Applicants must hold a degree equivalent to a Norwegian doctoral degree in statistics, mathematics, data science, computer science or in another relevant field

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 student supervision 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++ or others) is necessary.

We offer

- Salary NOK 490 900 - 569 000 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

Teaching and research positions at UiO are, as a rule, considered to be “specially independent” in nature and are, as such, not normally subject to regulations regarding work hours. Work hours are regulated by UiO's administrative guidelines regulating workins hours for employees in academic positions. See: [https://www.uio.no/english/about/regulations/personnel/academic/regulation-working-hours.html](https://www.uio.no/english/about/regulations/personnel/academic/regulation-working-hours.html)

Starting date: as soon as possible, and preferably by 31.12.2017.
How to apply

The application must include

- Cover letter (statement of motivation and research interests)
- CV (summarizing education, positions, and academic work and scientific publications)
- A complete list of publications
- List of at least three reference persons (name, relation to candidate, e-mail and phone number)
- Documentation of basic pedagogical competence (if available) and lecturing experience
- Documentation of scientific advising competence (if available)
- Description of up to 10 publications which the applicant considers particularly noteworthy
- The same 10 publications uploaded as PDF-files (preferably combined into one file but maximum 10 MB)
- Other qualifications and documentation

The application with attachments must be delivered in our electronic recruiting system, please follow the link “apply for this job”. 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).

A scientific evaluation committee will be appointed to evaluate the applications. The committee will interview shortlisted candidates remotely or in person and will propose a ranked list. The final appointment is made by the institute. The evaluation process can take up to two months. The basis for the assessment of the applicant will include the education and training, scientific production and quality, professional and academic experience, teaching experience and qualifications as well as the documented experience in administration and management. As part of the ranking of qualified applicants, the full scope of these qualifications will be explicitly assessed. Particular weight will be attached to qualifications that are central to the job description. Recent scientific qualifications will carry more weight than other qualifications. Originality, quality and innovation will be given priority before volume.

Informal enquiries can be addressed to Professor Arnoldo Frigessi (frigessi@medisin.uio.no) or to any other senior member of the present project.

Formal regulations

Please see the guidelines and regulations for appointments to Postdoctoral fellowships at the University of Oslo.

No one can be appointed for more than one specified period at the same institution.
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 and intellectual property.

In accordance with the University of Oslo’s equal opportunities policy, we invite applications from all interested individuals regardless of sex or ethnicity.

Deadline: 3rd of November, 2017

Contact persons:

Professor Arnoldo Frigessi (frigessi@medisin.uio.no, mobile +47 95735574)

Jobbnorge ID: 142692, Deadline: Friday, November 3, 2017