The Department of Biosciences

Highlights 2018

UiO : University of Oslo

Address from Head of Department

In autumn 2017, the Department launched its new Bachelor programme in biosciences, which features a common and broad curriculum for all students in the first half of the programme and includes modelling and programming for all students. In the second half of the program, students specialize and many prepare for their master studies.

This year, we launched our new master's program in bioscience, replacing the two previous programs in biology and molecular biosciences. The new master's programme has seven different programme options covering the scientific scope of the Department. We are pleased to see that new programme appears to attract a similar number of well qualified students as the old programmes did.

We were also very pleased to see our students who participated in this year's iGEM competition in synthetic biology competed very well in the finals in Boston.

IBV continues to develop new and strong relations to other disciplines and Departments within the Faculty of Mathematics and Natural Sciences. After several years of planning and preparations, two new centres were established this year: Centre for Biogeochemistry in the Anthropocene (CBA) and Centre for Bioinformatics (SBI). In CBA, IBV researchers join forces with colleagues from the Departments of Geoscience and Chemistry to address interactions and feedbacks between climate, carbon cycling and ecosystems in northern latitudes. SBI, is a joint effort of the Departments of Informatics, Chemistry, Pharmacy and Biosciences to consolidate and develop bioinformatics as a discipline at the Faculty and UiO.

This year also saw the launch of the Nansen Legacy programme, a large, multidisciplinary research programme which targets important questions about the changing environments and marine ecosystems in the Barents Sea and the Arctic. A number of IBV researchers participate in this programme together with scientists from nine other institutions.

Following the Government's decision in autumn 2017 to fund the new Life Science Building at UiO, the planning of the details of the new building commenced in spring 2018 and several IBVers have become involved in this very demanding work.

These are only some of the activities and events that have engaged our Department this year and we are facing exciting and interesting times to come.

Rein Aasland

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Head of Department
May, 2018

In brief

The Department of Biosciences (IBV) was established January 1, 2013, following the merge of the Departments of Molecular Biosciences and Biology.

The Department has five research sections: Aquatic Biology and Toxicology, Biochemistry and Molecular Biology, Physiology and Cell Biology, Genetics and Evolutionary Biology and Centre for Ecological and Evolutionary Synthesis.

The Department's research focuses on understanding the fundamental biological processes from molecular and cellular level to population and ecosystem level.

340
employees

569
students

133
PhD candidates

309
papers

Income:

328
mill NOK

214
projects

Interdisciplinary education for a lifelong career

By studying bioscience, our students learn about the diversity and connections in nature and about how the body normally functions, from organ systems to cells and genes and what goes wrong with disease. We use mathematics and computer tools to model everything from how the brain works to how the climate affects ecosystems.

The department offers both a bachelor program and a master program in biosciences, both a result of a revision of the study programs in 2017. An important part of our new programs is to provide students with an introduction to programming in order to create and experiment with models of biological systems.

The department's goal is for our students to succeed both academically and professionally. This involves creating a robust and interdisciplinary education based on the skills our students will need for a lifelong career.

Education

456

is the total number of bachelor students

169

students started at the new bachelor-program in august 2018

113

is the total number of master students

88

master candidates graduated during 2018

133

is the total number of PhD candidates

26

PhD candidates defended their thesis

Scientific paper of the year

Every year at the Department Christmas Party there is a reward given to the best paper of the year. The award for the best scientific paper went to two articles this year. Both articles address important topics with broad implications, and report key findings in their respective fields.

The authors had very different approaches, which reflects the wide range of disciplines at the department. The findings in both articles have potential biomedical implications, including for cancer and neurological disorders.

The title of the first article is: "The dual methyltransferase METTL 13 targets N terminus and Lys55 of eEF1A and modulates codon-specific translation rates". Magnus E. Jakobsson was first author on the paper.

The second article is entitled: "Removal of perineuronal nets disrupts recall of a remote fear memory". Elise Holter Thompson was first author on the paper.

Science goes viral:

"Mesh socks" protect long-lasting memories in the brain

As the first in the world, brain researchers at IBV have managed to demonstrate that structures outside the brain cells play an important role in the storage of long-term memories. The structures resemble small mesh socks, and the long-term memories disappear when the "sock" dissolves.

The popular science article published in Titan went viral in 2018, and is based on three scientific articles from the Centre for Integrative Neuroplasticity (CINPLA), led by Marianne Fyhn.

The three scientific articles on the subject were published in the highly acclaimed journal Proceedings of the National Academy of Sciences, and they have attracted much attention.

The researchers in the CINPLA group hope that new knowledge about the functioning of the brain will enable us to understand brain disorders in the long term – and in the long term will open up new possibilities for the treatment of, for example, Alzheimer's disease and other disorders.

Triple alliance ready for climate fight

The new Centre for Biogeochemistry in the Anthropocene (CBA) is studying interactions and feedbacks between climate carbon cycling and ecosystems in northern latitudes.

CBA is a joint operation between the Department of Biosciences, Geosciences and Chemistry. CBA is led by centre leader Dag Hessen, who is joined by Rolf David Vogt and Terje Koren Berntsen in the leader group.

At the Centre for Biogeochemistry in the Anthropocene (CBA), the goal is to assess and predict changes in global carbon cycling, a crucial requirement to develop strategies to counter anthropogenic climate change. They integrate research at various scales from the molecular level to organisms, catchments, and up to regions.

The broad diversity of their research activities is also reflected by the large variety of our analytical tools, from chromatography to measure chemical or molecular speciation up to remote sensing to detect changes at the regional level. They apply experiments, computational approaches and models when appropriate, and CBA also takes advantage of large datasets and field sites.

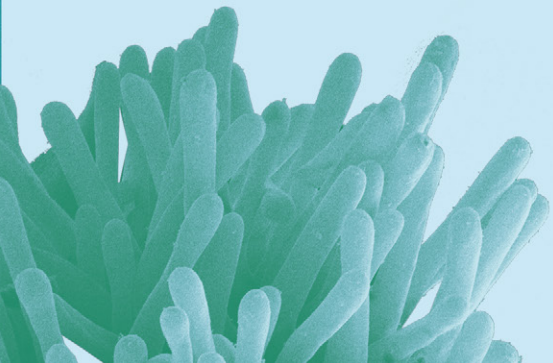
New Chair and a new era at CEES

The new Chair of Centre for Ecological and Evolutionary Synthesis (CEES), Kjetill S. Jakobsen, has been a member of the CEES Core since the beginning of the Centre in 2007.

Professor Jakobsen's research has dealt with quite diverse aspects of evolutionary genetics and genomics. A main theme in his work relates to the genetic forces (both ongoing and historical) acting upon populations, and how the genetics relates to ecological and evolutionary processes. In recent years Jakobsen has been instrumental in developing the full spectrum of the CEES research profile.

Nils Chr. Stenseth left the position as CEES Chair earlier this year, for a new position as Faculty Professor at the The Faculty of Mathematics and Natural Sciences. He will continue as a researcher at CEES.

The 10 year period of CEES as a Norwegian Centre of Excellence (CoE) ended in October 2017, but CEES continues as a centre and section at the Department.



Big win in Boston

Each year, the Department of Biosciences sends an interdisciplinary student team to the iGEM-competition in Boston. iGEM stands for International Genetically Engineered Machine and is an international competition in biological programming.

The student team developed an effective test that can detect fungal infection using the gene editing tool CRISPR. The title of the project is "Canditect – Fast detection of vulvovaginal Candida albicans using CRISPR/dCas9". And they got back for the effort.

The student team won a gold medal for their contribution, in addition to the victory in the category «Best Diagnostic Project». The students were awarded not only for their elegant project design, but also for their good and clear presentation in Boston.

This is the best result since 2014, when the first student team from the University of Oslo participated in the international iGEM competition in synthetic biology.

Research infrastructure

The Department has 12 larger research infrastructures, including a marine field station at Drøbak and an alpine field station at Finse. The department includes several units with heavy equipment and a highly competent technical staff that works closely with the scientists. Most of these facilities can be hired for research activities.

- Ancient DNA laboratory (aDNA)
- CLIPT Stable Isotope Laboratory
- Electron microscopy (EM-Lab)
- Finse Alpine Research Center
- InVivo facility
- Marine Research Station Drøbak
- NORCCA – Algae collection
- Norwegian Sequencing Centre (NSC)
- Oslo NorMIC Imaging Platform
- Proteomics service
- Research vessels
- The Plant laboratory – The Phytotron

Prizes and awards

The best lecturer	The prize was not awarded this year, as the subject committee's candidate, Tone Fredsvik Gregers, has already been named Lecturer of the Year by the faculty's students.
Science communication Prize	The winner of the Communications Prize was Katharine Vestre for her good ability to convey research, for her commitment to the students, and to promote the department abroad.
Darwin Prize	This years Darwin Prize was given to Sissel Jentoft.
Health, Safety and Environment Prize	Marit Ledsaak and Tove Klungervik won the HSE-Prize for their effort to make lab work and field work as secure as possible.
The employee of the year	This years employee of the year was Anna Virginia Black Mazzarella.

Reported research results 2018

309
journal articles

11
books chapters

191
conference contribution

30
in the media

23
reports

55
popular science in Titan

214
active projects

Currently there are 214 active projects led by, or involving, our researchers.

10
projects

projects are funded by The Norwegian Cancer Society

12
projects

projects are funded by EU Horizon 2020

1 New RCN Young Research Talent project "Genomics of speciation: dissecting mechanisms of reproductive barriers in fungi" with Inger Skrede as principal investigator

The department takes part in the large research project the Nansen Legacy

111
projects

projects are funded by the Norwegian Research Council

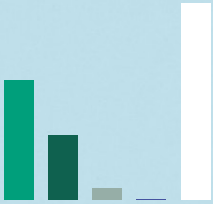
Funding

The total income during 2018 was 328 mill NOK

Basis income
190
mill NOK

Projects
138
mill NOK

Basis



	Basis	Basis
Salary	61%	139 900
Running expenses	33%	76 398
Equipment	6%	14 277
Overhead	0%	0
Total	**100%**	**230 575**

External projects

	External projects	EFV
Salary	53%	74 025
Running expenses	17%	24 477
Equipment	3%	3 743
Overhead	27%	38 485
Total	**100%**	**140 730**

An international working environment

340 employees

The Department has 340 employees.

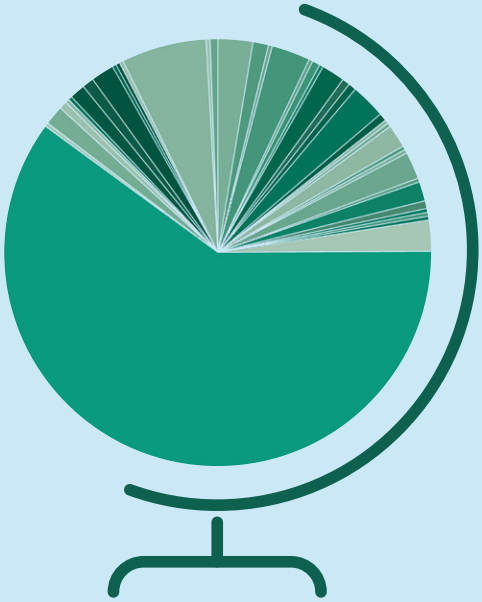
39 different countries

40% of our staff is from a foreign country, and 39 different countries are represented.

53% are women

Overall 53% of our employees are women. Counting only scientific staff the number will be 50 %. However, only 29% of our professors are women, whereas 69% of the PhD students are.

International staff



American	8	Dutch	8	Italian	8	Russian	1
Australian	4	Estonian	2	Chinese	4	Serbian	2
Austrian	2	Ethiopian	2	Croatian	2	Singaporean	2
Brazilian	1	French	7	Cypriot	1	Spanish	8
British	10	German	22	Moroccan	1	Swiss	2
Bulgarian	1	Greek	2	Mauritian	1	Swedish	6
Canadian	2	Guatemalan	1	Norwegian	204	Tunisian	1
Czech	1	Indian	5	Palestinian	1	Tyrkish	1
Colombian	1	Iraqi	1	Polish	5	Vietnamese	1
Danish	6	Iranian	1	Portuguese	2		

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