

The Department
of Biosciences



Highlights 2017



UiO • University of Oslo

Address from Head of Department

Entering 2017 was like starting the home stretch, as the Department made its last preparations for launching the new bachelor program in Biosciences in August. The new program is a fundamental remake and features the introduction of computational modelling for biosciences already in the first semester. The first half of the program is common for all students with courses spanning the breath of biosciences as well as chemistry, physics and statistics. With this new program, we aim to train new cadres of candidates well prepared for careers in the life sciences for 21st century. Hence, we welcomed 161 new students with both excitement and expectations.

Facilitating active learning is another key to the new program and we have invested in new rooms dedicated for *bring-your-own-device*-based computer-based activities. For the Introductory course in computational modelling in the biosciences (BIOS1100), even a brand new and innovative textbook is being developed. I'm deeply impressed and very grateful for all the efforts that have been devoted to the development the new bachelor program, well aware that this is only the beginning.

The UiO iGEM team impressed us all by their creativity and boldness setting out to develop a biological laser based on live yeast cells, an achievement that earned them a bronze medal in the international iGEM competition in Boston. We are also proud of the team of four high school students who represented Norway in the *international Biology Olympiad* in Coventry; the second year that IBV hosts the Norwegian competition engaging hundreds of students from all over Norway.

Last year marked ten years of excellence in science for our *Center for Ecological and Evolutionary Synthesis* (CEES). CEES has been highly productive and very successful. Over the ten years, a large number of young students and scientists have enjoyed a creative and inspiring environment for their training. CEES continues as a departmental section as it prepares for new activities in the time to come.

Another team of IBV professors and researchers have participated in the *Centre for Immune Regulation* (CIR). CIR has also very successfully completed its ten year's period as a Centre of Excellence. As we celebrate the completed CoEs, we are very proud that two of our young scientists are partners in a new team which was awarded status as Centre of Excellence in 2017; - *the Centre for Cancer Cell Reprogramming* (CanCell).

As part of University of Oslo's strategic investment in Life Science, six teams of researchers were granted funding as *Convergence Environments* and IBV scientists are in the lead of two of these; one that combines natural and social sciences to understand and manage global anthropogenic toxicants (Anthro-TOX) and one for comparative immunology (Compare). IBV scientists are also key partners in the *The Nansen Legacy* is another new nation-wide research program for arctic marine science.

These are just a few highlights indicating that our department continues to foster creativity and excellence in both bioscience and education.



Rein Aasland

*Head of Department
May, 2017*



In brief

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

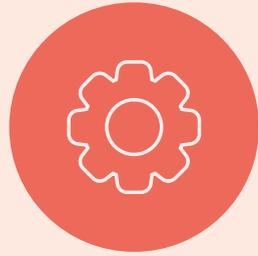
The Department has five research sections (Aquatic Biology and Toxicology, Biochemistry and Molecular Biology, Physiology and Cell Biology, Genetics and Evolutionary Biology and Centre for Ecological and Evolutionary Synthesis). The Department's research focuses on understanding the fundamental biological processes from molecular and cellular level to population and ecosystem level.



331
employees



627
students



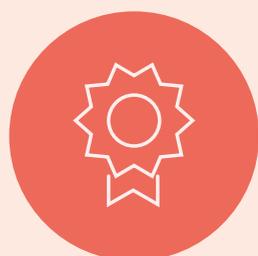
151
projects



430
papers



Income:
349,8
mill NOK



29 132
Credits
produced

Computing in science education

The science faculty'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.

With this in mind, the MN faculty started the process of revising the study programs, and in the autumn of 2017 the first class began the new bachelor program in biosciences. An important part of our new program is to provide students with an introduction to programming in order to create and experiment with models of biological systems.

In 2017 three new rooms for educational purposes were renewed with the newest technology options in order to satisfy our need for computing in our new bachelor program.

Education

161

students started at
the new bachelor-
program in August
2017

441

is the total number
of bachelor
students

72

master candidates
graduated during
2017:

186

is the total
number of master
students

37 in
Biology, and
35 in Molecular
biology and
biochemistry.

24 PhD
candidates
defended
their thesis.

A paper a day...

A paper is issued from the Department of biosciences, almost daily. In 2017 429 articles were published in level 1 or 2 journals. 104 of these papers were published in level 2 journals. In addition, at least 13 books have been issued with our employees as authors or contributors.

Every year at the Department Christmas Party there is a reward given to the best paper of the year. This year all sections had nominated at least one paper each, and the papers are of high quality and are highly regarded at the department. In total 12 papers were nominated.

The winner was:

A c-Myb mutant causes deregulated differentiation due to impaired histone binding and abrogated pioneer factor function. Bettina Fuglerud was first author on the paper. The paper was considered a good state of the art-paper since it's probably the first time ATAC-seq methods were used in Norway.



Science goes viral: Goldfish happy hour's and COD on the move in the Viking Age

Some of our research has made it to the headlines in the media worldwide. It has long been known that gold fish produce ethanol to cope with low oxygen levels, but in August Göran Nilssons group revealed the mechanisms of how this is possible. The paper went viral and the gold fish news could be read around the world.

The cod is also a key species in Norway, and it caught quite a lot of attention when it was discovered that cod remains in several Viking settlements in Europe were in fact, from Lofoten in Norway. The discovery was made by analysing ancient DNA in fish bones. This method is likely to reveal a lot more in years to come considering every day life early in history.



Centres of Excellence moves to a new era

The last 10 years the Department has hosted one Centre of Excellence: Centre of Ecological and Evolutionary Synthesis, and has been involved in CIR: Centre for Immune Regulation.

The Centres were established 10 years ago, and they will continue as sections in their host departments.



Selected samples from 10 years of excellence

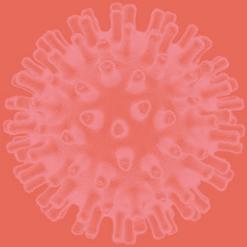
The special character of the immunsystem of Cod was discovered when a whole genome sequencing of the cod was conducted. This has generated knowledge not only of this special immune system, but also about how the immune system affects speciation.

Overfishing and high fishing pressure can result in unwanted evolutionary traits. Over time it turns out that our behaviour in nature can affect populations in a rather short time.

The climate can be a driver for plague outbreaks in areas with pathogen reservoirs in nature. Several different pathogens and their reservoirs have been studied over time and this gives us a unique insight in how diseases are spread and how we can prevent outbreaks.

Ecology and evolution has been more closely linked than ever. The centre has found a possible solution to the stasis paradox and more resently the Red Queen hypothesis and the stasis situation have been linked to different evolutionary and ecological conditions. Thus they are no more contradictory theories!

How does new species occur? By studying hybrid speciation in sparrows the researchers discovered how speciation occurs on a molecular level.



Innovation and technology transfer

The winner of the IBV innovation award was Stian Foss, working on Inger Sandlies group. Inger Sandlie has won several innovation prizes and is known to have more than a 100 patents. Jan Terje Andersen is now following up on his ideas, working on IgG-variants in order to improve the half time of medicine. They have already signed a contract with a medical company, and this idea is likely to improve the every day life of a lot of people that are relying on high and frequent doses of medicine.

Since 2013 a student team has participated in the competition iGEM: International genetically engineered machine. An iGEM-team from 2016 has continued with their idea and is now on the verge of establishing a company. Their iGEM idea was to use an easy way to track antibiotic resistance in bacteria in order to avoid spreading the resistance.

During 2017 11 Dofis from the Department were registered by Inven2, the Technology Transfer Office of the University of Oslo.





Preparing for the future by investing in research infrastructure

The Department has 10 larger research infrastructures, including a marine field station (Drøbak) and an alpine field station (Finse).

Existing sci fi

Recent upgrades involve the ancient DNA lab, our new isotope laboratory, and northern europe's largest algae culture collection.

Plans ahead

Plans ahead involve: A new GMO plant facility, upgrades within the In Vitro facility, and long term planning for both our field stations and research vessels.

Prizes and awards

The best lecturer

The student committees awarded Tone Fredsvik Gregers the Golden Lazer Award.

Science communication Prize

The winner of the Communications Prize was Nils Chr. Stenseth.

The Innovation Prize

The winner of the Innovation Prize was Stian Foss for his work with a new IgG-based drug. The drug can be given less frequently and in lower doses, which is health economically beneficial and highly beneficial to patient treatment.

Darwin Prize

This years Darwin Prize was given to Anne Krag Brysting.

Health, Safety and Environment Prize

Anne Krag Brysting won the HSE-Prize for her effort to make lab work and field work as secure as possible.

The employee of the year

This years employee of the year was Hans Petter Hersleth.

Reported research results 2017

Our researchers have published a number of scientific articles and book chapters in 2017. They have also given talks and presentations at a large number of conferences around the world. You can see all of the Departments results reported in CRISIn.



430

journal articles



13

books chapters



300

conference presentations



9

in the media



22

reports



50

popular science in Titan

151

active projects

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

12
projects

are funded by
The Norwegian
Cancer Society.

12
projects

are funded by EU.



In addition,
the department got
two new FRIBIOMED-
projects, Young research
talents grant, and one
of our researchers
is a co-pi on a TOPP-
FORSK project.



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

110
projects

are funded by the
Norwegian Research
Council.

Funding

The total income during 2017 was 349,8 mill NOK

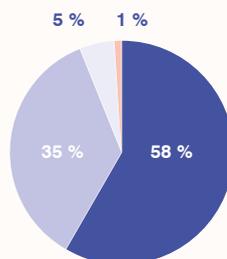
Basis income: 201 mill NOK

Projects: 148,8 mill NOK

(11,4 mill from EU and 123,3 mill from NRC).

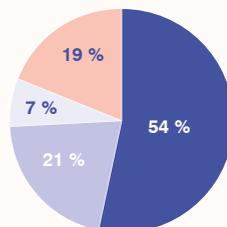
Basis

	Basis	Basis
● Salary	58 %	133 806
● Running expenses	35 %	81 153
● Equipment	5 %	11 086
● Overhead	1 %	3 324
Total	100 %	229 369



External projects

	External projects	EFV
● Salary	54 %	85 014
● Running expenses	21 %	33 279
● Equipment	7 %	10 775
● Overhead	19 %	29 584
Total	100 %	158 652



An international working environment



340
employees

The Department has more than 340 employees. 70 of these are PhD students.



40
different
countries

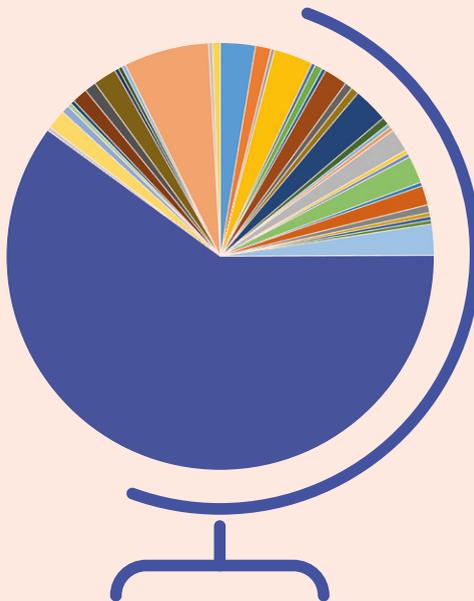
40 % of our staff is from a foreign country, and 40 different countries are represented.



47.4%
are women

Overall, 47.4% of our employees are women. Counting only scientific staff the number will be 45%. However, only 21% of our professors are woman, whereas 65% of the PhD students are.

International staff



American	9	Croatian	2	Guatemalan	1	Polish	5
Australian	4	Cypriot	1	Indian	6	Portuguese	2
Austrian	2	Czech	1	Iraqi	1	Russian	1
Belorussian	1	Danish	6	Iranian	1	Serbian	1
Brazilian	1	Dutch	8	Italian	7	Spanish	4
British	10	Estonian	2	Japanese	1	Swiss	3
Bulgarian	1	Ethiopian	2	Moroccan	1	Swedish	6
Canadian	2	French	9	Mauritian	1	Tunisian	1
Chinese	5	German	22	Norwegian	205	Turkish	1
Colombian	1	Greek	2	Palestinian	1	Vietnamese	1



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