The Department of Biosciences

2021

Highlights

UNIVERSITY OF OSLO

> Evolution has been used as an excuse for why cod and other species have not recovered from overfishing. *Our findings* suggest instead that more attention to reducing fishing and addressing other environmental changes, including climate change, will be important for allowing recovery of the cod.

Bastiaan Star
and Malin Pinsky

Address from Head of Department

2021 will be remembered as the year that almost everybody in Norway received an mRNA vaccine for protection against Covid-19. Following three decades of intense research on mRNA vaccines, the vaccine for covid-19 was developed in record time. This also allowed life, teaching and experimental research to gradually get back to normal. The covid-19 pandemic also showed that our researchers could switch their research swiftly, to address new health challenges that included several studies on the covid-19 pandemic.

2021 was also the year when the faculty of mathematics and natural sciences initiated the sustainable development initiative and supported 11 projects with KD positions, including 3 quite large projects at IBV. Most of the UN goals for global sustainable development have been the focus for research at IBV for decades and should position researchers in the forefront of national and international research, and secure long-term funding.

IBV continues to publish high-quality research to uphold its position as a national and international leading Department for Biosciences. Our highlighted publications spans from nest decoration where birds exploit fear of feathers, to the genome stability in cod through decades of exploitation. It is always a joy to follow the contribution of IBV for communicating science in a popular form. IBV was also highlighted with the Student Committees price for best lecturer at the faculty.

It has been two challenging years for teaching and experimental work at IBV. We have managed to fight back due to excellent research worldwide and at IBV. Other joined initiatives might be needed to beat off the disappointing strategies of the ministry of education and research.

Arne Klungland

Arne Klungland
Head of Department

In brief

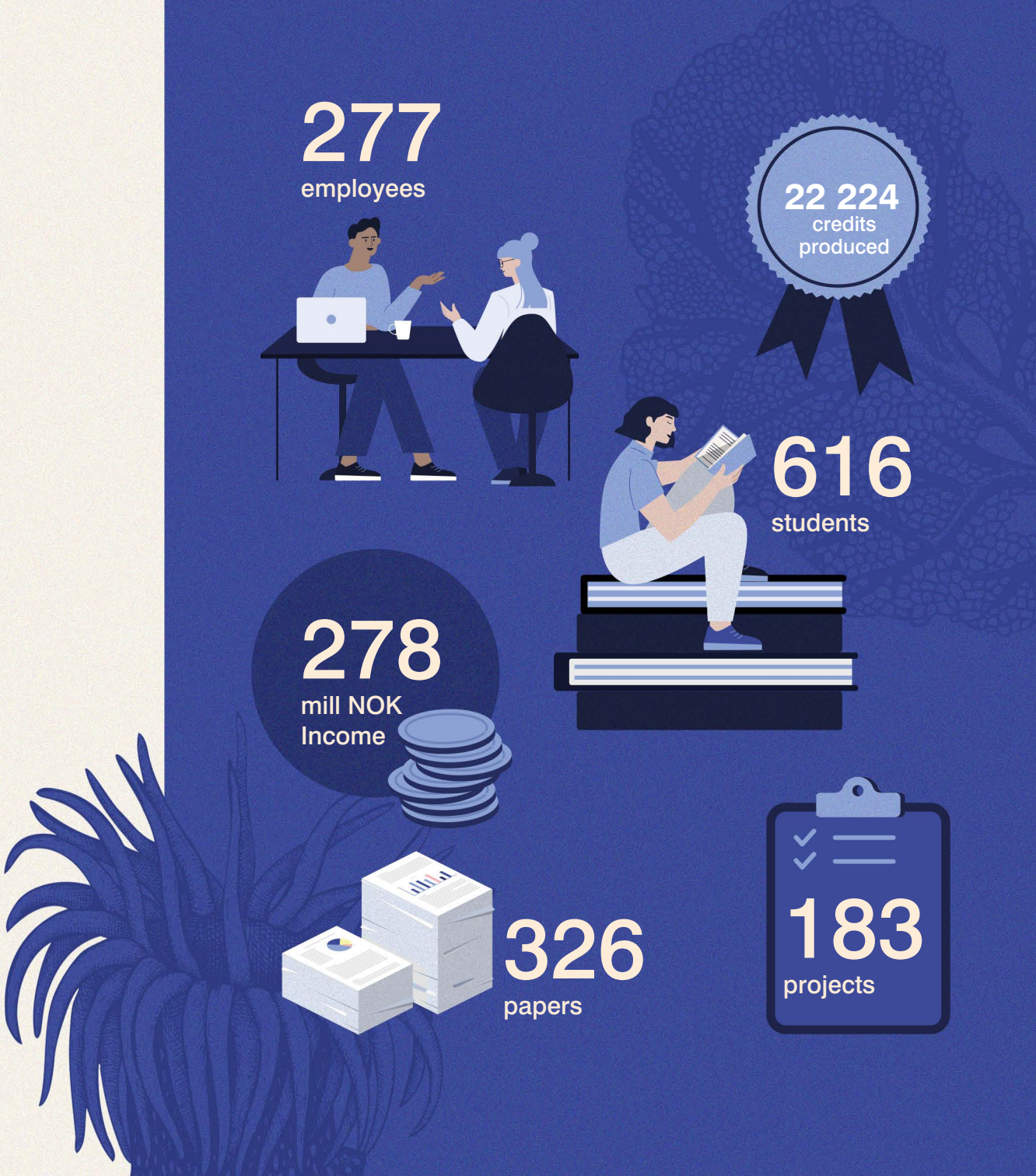
The Department of Biosciences (IBV) was established January 2013, following the merge of the Department of Molecular Biosciences and the Department of Biology.

The Department of Biosciences has five research sections:

- Section for Aquatic biology and toxicology (AQUA)
- Section for Biochemistry and Molecular Biology (BMB)
- Centre for Ecological and Evolutionary Synthesis (CEES)
- Section for Genetics and Evolutionary Biology (EVOGENE)
- Section for Physiology and Cell Biology (FYSCELL)

The research spans the whole domain of biology from biochemistry, molecular biology, physiology, cell biology and genetics to aquatic biology, toxicology, ecology, and evolutionary biology – and combinations thereof.

In 2021, the Department of Biosciences got new management. Arne Klungland is the new head of department, and Melinka Butenko is the new deputy head.



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 bioscience. An important part of our 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

272 is the total number of bachelor students → **110** students started at the new bachelor-program in august 2021

217 is the total number of master students

83 master candidates graduated during 2021

130 is the total number of PhD candidates → **15** PhD candidates defended their thesis

Petter gives you the answer

In 2021 Oslo started to open up after the lockdown. Newly graduated students did not have the easiest hunt in the job market. Nevertheless, there are some who have come out of the situation well. One of these is Petter Ranum.

Is my corona test positive or negative? It has been something most people wondered about during the corona pandemic. By using cell biology work methods, Petter can determine whether the cotton swab you stuck up your nose actually has coronavirus on it or not.

In 2021, Petter worked on analyzing corona tests. In the future, he may work as a researcher. Being a qualified molecular biologist offers many different job opportunities.

Petter Ranum has a Bachelor's degree in Molecular Biology, and Master's degree in Cell Biology, Physiology and Neurology from the Department of Biosciences.

The students' choice

The Mathematics-Natural Science Student Committee has named professor Marianne Fyhn from the Department of Biosciences as Lecturer of the Year 2021. She was nominated for her work in making the subject exciting and useful for the students.

Marianne Fyhn is a hard-working lady who takes no short-cuts. She creates her own, good assignments for group lessons and makes sure to write learning objectives in subjects that otherwise lack this, the students reason.

"Teaching is a rather lonely job, where you never quite know how things are experienced from the students' side. You have a feeling for how you think things are going based on the students' commitment, type of questions and course evaluations, but to receive such recognition as Lecturer of the Year is an enormous boost", says Marianne Fyhn.

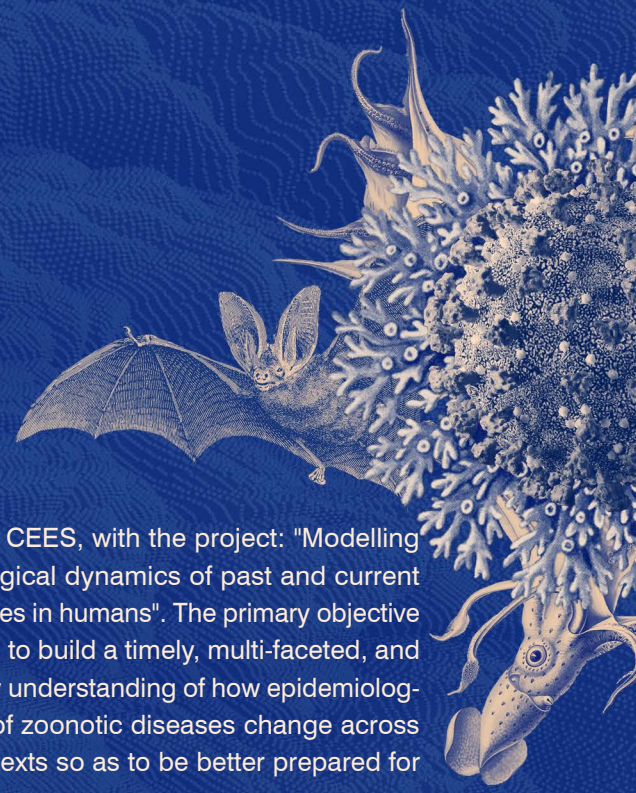
Researcher Project for Young Talents

The Department of Biosciences has not received as many young research talent projects from The Norwegian Research Council since 2015. This year the department received funding for three Researcher Project for Young Talents, which is very good news.

This funding is intended to give talented young researchers under the age of 40 the opportunity to pursue their ideas and lead a research project. It is targeted towards researchers in the early stages of their careers, who have demonstrated the potential to conduct research of high scientific quality.

Projects funded:

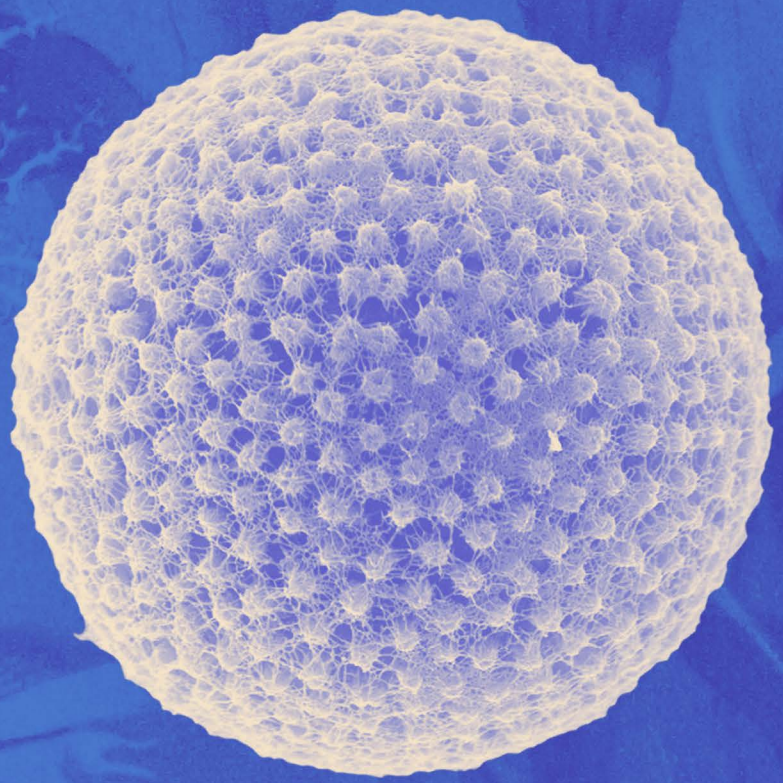
Jonas Paulsen from EVOGENE, with the project: "URGE-3D: Unraveling new gene dysregulation modules in cancer through integrated multi-constraint 3D genome modeling". The goal of URGE-3D is to generate novel computational models of the 3D genome opening up for new understanding of the structure-activity relationships of our genes in normal and disease states.



Ruiyun Li from CEES, with the project: "Modelling the epidemiological dynamics of past and current zoonotic diseases in humans". The primary objective of the project is to build a timely, multi-faceted, and interdisciplinary understanding of how epidemiological dynamics of zoonotic diseases change across ecological contexts so as to be better prepared for future pandemics.

Van Khuong Dinh from AQUA and the Nansen Legacy, with the project: "Vulnerability of overwintering Arctic zooplankton to multiple stressors". This project will pave the way for the scientific community to explore multiple-stressor effects on overwintering thousands of high-latitude species from protozoans to reptiles that go into the diapause during the winter.

The unknown Arctic protist



Unknown microscopic protist measuring 0.006 mm from the Arctic Ocean, captured in the Scanning Electron Microscope at our EM-Lab.

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.

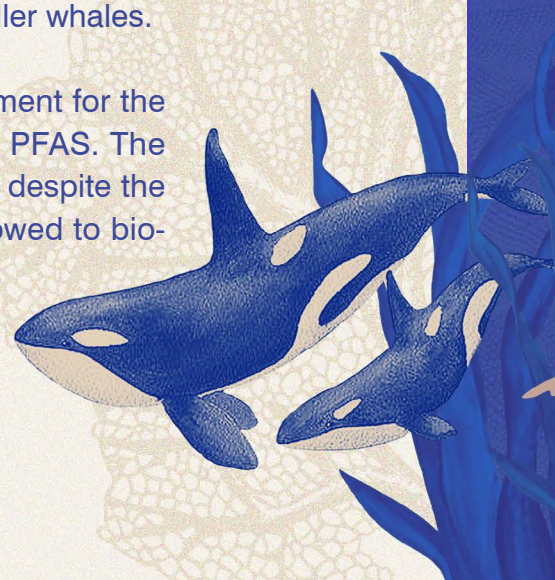
- Ancient DNA laboratory (aDNA)
- CLIPT Stable Isotope Laboratory
- Electron microscopy (EM-Lab)
- Finse Alpine Research Center
- InVivo facility
- Marine Research Station Drøbak
- NORCCA – Algae collection
- Norwegian Sequencing Centre (NSC)
- Oslo NorMIC Imaging Platform
- Proteomics service
- Research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

Popular science in Titan

Titan.uio.no is a newspaper for science and technology at the University of Oslo. The most read article from our department in Titan in 2021, was about Clare Andvik and her research about killer whales and toxins.

Clare Andvik and her colleagues discovered that a stranded killer whale baby had just as high levels of toxic chemicals as adults. The calf had not eaten anything other than his mother's milk. The research shows that new toxic chemicals can be transferred directly from mother to offspring in killer whales.

The results can be used as an argument for the regulation of the chemical pollutant PFAS. The research shows it is found in wildlife, despite the fact that it is not supposed to be allowed to bio-accumulate or be present in animals.

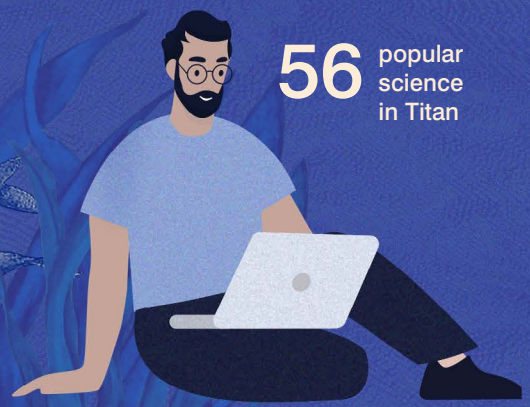


Reported research results 2021

64 popular science communication

326 journal articles

110 conference contribution



56 popular science in Titan

13 books and reports

758 in the media

183

active projects

Currently there are 194 active projects led by, or involving, our researchers.

11

projects funded by EU

88

projects are financed by The Research Council of Norway

3

new Researcher Projects for Young Talents from RCN

5

projects are funded by The Norwegian Cancer Society

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

The Nansen Legacy

This 6-year research project constitutes an integrated arctic perspective on climate and ecosystem change – from physical processes to living resources, and from understanding the past to predicting the future. The core activities being research expeditions into ice-covered waters of the Barents Sea and adjacent Arctic Basin.

The Nansen Legacy comprises a dedicated Norwegian national team of ten institutions committed to Arctic research, and to the Barents Sea region in particular. The UiO and IBV is involved in all parts of the project, and responsible for leading the work on human impacts, such as ocean acidifaction, pollution and commercial fisheries.

In 2021, the Nansen Legacy team spent 128 days with RV Kronprins Haakon out at sea, collecting data. One of these were postdoctoral fellow Khuong Dinh from IBV, investigating *the response of Arctic zooplankton* to multiple stressors like marine heatwaves and ocean acidification.

International working environment

277
employees

35 different countries

49%
women

Overall 49% of our employees are women. Counting only scientific staff the number will be 48%. However, only 26% of our professors are women, whereas 71% of the PhD students are.

International staff

American	6
Argentinian	1
Austrian	1
Belgian	1
British	4
Canadian	3
Chinese	6
Costarican	1
Croatian	1
Cypriot	1
Danish	3
Dutch	10
Estonian	2
Ethiopian	1
Finnish	1
French	7
German	19
Greek	2
Indian	4
Iraqi	1
Icelandic	1
Italian	7
Malaysian	1
Mauritian	1
Mexican	1
Norwegian	169
Palestinian	1
Polish	4
Portuguese	1
Spanish	7
Swedish	5
Swiss	1
Taiwanese	1
Turkish	1
Vietnamese	1

Funding

278 The total income during 2021 (mill NOK)

179 Basis income (mill NOK)

Basis

	Basis	Basis
Salary	66%	146 191
Running expenses	31%	68 843
Equipment	2%	-
Overhead	0%	0
Total	**100%**	**220 341**

(alle tall i 1000 kr)

99 projects (mill NOK)

External projects

	EFV	EFV
Salary	56%	54 370
Running expenses	19%	18 123
Equipment	1%	637
Overhead	25%	24 457
Total	**100%**	**97 588**

Fear of feathers

The blue tit fakes its own death to keep occupants away from the nest. With the help of some well-placed feathers, the birds stage a crime scene to scare away competitors.

We have chosen to call our idea the fear-of-feathers hypothesis

Tore Slagsvold, professor emeritus

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