



## Comment from the centre director

Dear reader!

It is my privilege to present the 2020 annual report of the Centre for Digital Life Norway (DLN). This is our fifth annual report, and we now know that we will be continuing to write DLN annual reports for 5 more years. During 2020, in parallel with running all our centre activities, we worked on the application to the call from the Research Council of Norway (RCN) for a new five-year funding period for the centre, and we are currently in the initiation phase of DLN 2.0 (2021–2026) comprising seven partner institutions: the Norwegian University of Science and Technology (NTNU), the University of Oslo (UiO), the University of Bergen (UiB), the Norwegian University of Life Sciences (NMBU), Oslo University Hospital (OUS), SINTEF and UiT The Arctic University of Norway. We assure you that more information about DLN 2.0 will be made available on our website in the coming months!

Just as for all sectors of society, 2020 has been a very special and challenging year for DLN due to the pandemic that has so dramatically affected us all. Many of the 35 DLN research projects are conducting their research more or less as planned. The activities of the network project that manages the centre have been modified in accordance with the “digital life” we were all suddenly forced to live, particularly since gathering researchers and others at workshops, seminars, conferences and other physical events is one of our main tasks. To design digital alternatives has been straightforward for some of these events, but challenging for others. Seen in retrospect, the gathering of researchers in three cities in February 2020, which was a highlight in itself since it was the first time we’ve had these gatherings for all the projects in a region after admitting new projects, is even more appreciated than we could have imagined back then.

Despite the challenging year that you will read more about in this annual report, a lot of good things were accomplished in 2020. An important DLN milestone was achieved with the implementation of the first pilot of the industry internship programme. Seven PhD candidates have carried out their internships in biotech companies; some of them are still in progress. Based on the accumulated feedback and evaluation from both students and industry hosts, the programme has been very successful, and we are currently in the process of initiating a second round of this key activity. Another milestone was the work on phase 1 of the DLN project “A roadmap for academic research-based innovation”. This is an extensive “AS IS” analysis of the current situation in Norway which will serve as a basis for phase 2, starting this year. Innovation is an important aspect of the DLN mandate, and this side-project is an important contribution towards strengthening biotechnology innovation. A

third main activity we want to mention here is our provision of services in data management, including data management planning, which has recently had even greater impact because of new routines and requirements imposed by national and international funding agencies.

Our research school is still growing with currently more than 300 active members making up a novel network of young students and researchers. In parallel to all these arrangements and activities, we are gradually approaching the termination of our first-generation DLN research projects that were funded in 2016 when the centre started. In this respect, we are initiating a process, the ambition of which is to retain all the good DLN ambassadors within the DLN community even after their projects have ended.

At the end of DLN's first five-year period, we are collecting experiences, good practices and lessons learnt in the areas of cross-project communication and collaboration, implementation of responsible research and innovation in research projects, career development and training of future project leaders in biotechnology, as well as how to make transdisciplinary research work well. A white paper covering many of these experiences is forthcoming, and I anticipate that we will manage to critically transfer and apply all the good practices and experiences from the first five years of DLN to further develop and improve our national centre.

Lastly, I am certain that I speak for all of us when I say that we are very much looking forward to the time when we can open up for physical meetings and interaction – hopefully very soon.

Trygve Brautaset  
Scientific director



## Comment from the board chairperson

The year 2020 will be remembered by us all as the year of the corona pandemic – the year that life went digital – this, of course, also includes the board of the Centre for Digital Life Norway (DLN). Board members are located in Tromsø, Trondheim, Bergen and the Oslo region; already a couple years ago we conducted some meetings digitally to reduce the extent of travel. However, 2020 was the first year that we held only digital meetings, since the meeting we had before the pandemic broke loose was a digital one.

Since DLN started in 2016, there has been rapid growth in the portfolio of research projects addressing societal challenges for which digital biotechnology can be part of a solution. Most research projects are embedded in environments very competent in basic research, but less versed in innovation processes. A main priority of DLN has therefore been to assist researchers to see the innovation possibilities in their research projects. However, seeing possibilities is not enough in itself. Going down the path of innovation involves taking risks, both academic and financial, and for many researchers it involves venturing into unfamiliar arenas. To spur the innovation activities in DLN, the Research Council of Norway (RCN) financed the “innovation roadmap project”, which started its phase 1 in 2020. I am looking forward to the effect the project will have once the operational phase 2 begins in 2021.

During 2019, DLN was thoroughly evaluated. Based on this evaluation, RCN issued a call for a new five-year period for the centre with an application deadline before summer 2020. While DLN started with only three partners – NTNU, UiB and UiO – all of whom co-wrote the original network project application, all institutions that received funding for a DLN research project since 2016 have become part of the centre, resulting in four new partners over the years – NMBU, OUS, SINTEF and UiT. It quickly became clear that all seven institutions wanted to be equal partners in a new five-year

network project. A writing group led by centre director Trygve Brautaset was formed, comprising core members from the network project. They were charged with the difficult task of writing a new application that balanced the needs and desires of the seven partners while maintaining an organisational structure of managers and senior advisers for the different competence areas of DLN. All partners were given opportunities to comment on the application, and it took several board meetings for the institutional representatives to reach agreement on all aspects. Therefore, I was very happy when the application for DLN 2.0 was submitted in June.

After swift review and feedback from an international expert panel, a revised application was submitted and was tentatively accepted in the autumn of 2020. All seven institutional partners as of 1 February 2021 will be represented on the board. Furthermore, the work package leaders from the first period have been extended into an expert task force, composed of scientists from all seven partner institutions: NTNU, UiO, UiB, NMBU, OUS, SINTEF and UiT. This task force will provide guidance to the DLN management to ensure that our activities are of best value for the research projects, and – together with board members – they will provide anchoring in the owner institutions.

Thus, with less than five full years of history behind us, DLN is entering its second stage in 2021, stronger and more diversified than ever before. I am looking forward to what the future will bring.

Finn-Eirik Johansen  
Board chairperson



## Centre highlights

The Centre for Digital Life Norway transforms Norwegian biotechnology research and education to increase innovation and value creation for society. The centre has research projects all over the country. Transdisciplinary collaboration is our trademark. In 2020, the centre was run by a network project with representatives from NTNU, UiO and UiB.

The main focus of the network project in 2020 was on direct support and guidance of the research projects in the centre to reach the goal of transforming Norwegian biotechnology research so as to increase innovation and value creation.

Support is aimed at stimulating collaboration across disciplines and projects; innovation, commercialisation and industry collaboration; better research data management; career development and responsible research and innovation (RRI). Our guidance is supplemented with calls to fund activities on innovation, data management and collaboration between the research projects.

In the following sections, you will find further information about the work of each competence area.

## STIMULATE COLLABORATION ACROSS DISCIPLINES AND PROJECTS

### Synergies in the Digital Life Norway community through project collaborations

The centre offers funding each year to support activities across research projects in the centre. This is one of the advantages of being a part of the Digital Life Norway community – we enable research projects to acquire synergies that may not have evolved in isolated projects. Several project collaborations were funded in 2020.



In early March, 22 researchers from dCod 1.0, DigiSal and AurOmega met in Bergen for a cross-project workshop, *Lipidomics in systems biology – methodology and data handling*, focusing on the use of lipid levels as an endpoint for effects on the metabolic system. The workshop gathered researchers with diverse backgrounds to discuss the complex field of lipid compounds, lipidomics methods and big data management and analysis.

- [Read the blog "United fish researchers" about the collaboration.](#)

Another research collaboration conducted in 2020 involved dCod 1.0 and 3DLife. Here researchers wanted to explore whether established protocols and materials for making 3D tissue structures for human cells could be used to extend the culture time for cells and tissue constructs, beyond what is currently possible, for whale and fish cells used for testing environmental pollutants in the sea.

- [Read the blog "Successful use of 3DLife methodology across species" about the collaboration.](#)

In addition, a pilot research project between Calinhib and EV-LiquidBiopsy was funded, and preliminary experiments were conducted. The aim of this collaboration was to test whether endothelial cells could initiate or stimulate calcification of valve interstitial cells by a paracrine function where extracellular vesicles act as messengers. This collaboration will continue in 2021.

Finally, a pilot project and workshop between EV-LiquidBiopsy and nanoRIP received funding in 2020. Researchers from these two projects are interested in visualising cellular nanostructures, and the planned pilot and workshop will hopefully identify potential innovative research collaborations for the two DLN projects. This work will be conducted in 2021.

### Prize for transdisciplinary publication 2020

A major aim of the digital life initiative is to create convergence across disciplines, an objective that can be both challenging and time consuming. Each year, therefore, we specially acknowledge and reward research projects within the centre that have published work resulting from transdisciplinary efforts.

For 2020, the best transdisciplinary publication was awarded the antibiotics project INBioPharm at SINTEF and NTNU.

- [Read the news about the award.](#)

## STIMULATE INNOVATION, COMMERCIALISATION AND INDUSTRY COLLABORATION

### Innovation roadmap project launched

How can we increase impact and innovation from academic digital life research? This question is addressed through the project «A roadmap for academic research-intensive innovation», which was launched in January 2020. The project is funded by the Research Council of Norway (RCN) and has been the main focus of the innovation team throughout 2020.

The objective is to design and initiate a change process in Norwegian universities and research institutions, with a view to gradually enhancing the innovation mindset and culture among researchers. Our intention is to contribute to increased translation and valorisation of research findings into products or services of societal and economic value. In June, the project delivered an AS IS report, which is a status report on the Norwegian innovation ecosystem presenting strengths and weaknesses identified within six thematic domains: research capacity, transdisciplinarity and convergence; innovation culture in academia; public and private funding; idea producer–idea user links; innovation ecosystems; and innovation support and commercialisation. The findings will be followed up in a four-year action plan that is in progress.

- [Read the news article about the work conducted in 2020 and the plans for 2021.](#)

### Involvement in industry internship initiative

The innovation team has been heavily involved in the development of the centre's industry internship initiative that was launched in spring 2020. The team has recruited industry partners for the initiative in Norway and Sweden. Read more about this initiative in the training and career development section.

### Development of new know-how webinar series and other courses

In autumn 2020, the centre planned new know-how webinar series for the research and innovation value chain to be launched in spring 2021. The goal is to build knowledge about what to do when in terms of matters involving regulation and protection of intellectual property rights (IPR), respectively. The webinars are tailored to the needs of researchers in the centre, but free and open to all.

- [See the planned webinars spring 2021.](#)
- [Read more about why the centre has developed the webinars on regulatory affairs for drugs and medical devices.](#)
- [Read more about why the centre has developed the webinars on IPR in digital biotech.](#)

The development of a course in design thinking for health technology students and teachers in collaboration with the Nordic–Baltic GREAT network started in the fall 2020. We also wrote a successful application for funding from the RCN for a second edition of our workshop on lean innovation in life sciences in collaboration with The Life Science Cluster.

- [Read more about the centre's involvement in the GREAT network and the courses that have been developed for launch 2021.](#)



## Direct support and guidance

The innovation team of the centre is offering support and guidance in the early innovation phases. In 2020, the team has helped projects find industrial and research partners, identified relevant funding calls and provided assistance with grant applications, and helped in the development of commercial strategies and plans. One project has received a major EU grant. Two projects have been granted innovation funding from the centre to run a commercial validation assessment through the Aleap health incubator and a third project to do a patent search report. One project has received funding from the RCN to run an intellectual asset management process with subsequent patent filing. At the end of 2020, we began to recruit new projects that will go through the Aleap process in 2021.

- [Read about the AI-Mind project that the centre supported in the application process for an EU grant.](#)
- [Read about the experience of the Calinhib and DIAP projects that went through the process with Aleap in 2020.](#)

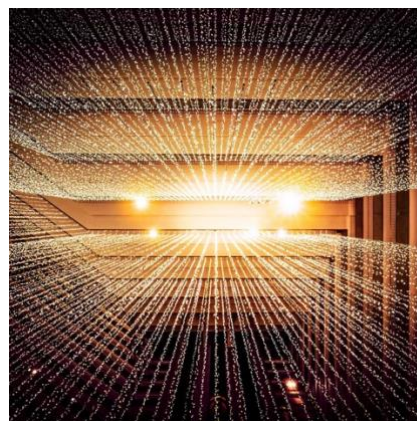
## Centre project admitted to innovation programme at UiO

The Calinhib project was admitted to the SPARK Norway innovation programme at UiO in January 2020. The programme aims to further develop ideas within health-related life sciences for the benefit of patients and society. Admission includes having a mentor assigned to the project, as well as advisers and a project coordinator who is responsible for following up innovation development. The centre is one of the partners of SPARK Norway. The Calinhib project also received EU funding to test 100 000 small molecules against an investigated target in one of the European high throughput facilities.

## STIMULATE BETTER RESEARCH DATA MANAGEMENT

### Raised awareness of the importance of data management

The year 2020 was a turning point in the reception of data management within the life science research community. The centre has advocated for improvements in research data management ever since it started. Data management and its planning are now permanent requirements imposed by funders, and the mainstream research community is now fully aware of their importance. We perceive that the pioneering work of the centre can benefit not only projects within the centre but the entire research community.



### Workshops at five universities

During 2020, in collaboration with ELIXIR Norway and local university libraries and IT units, the centre has conducted open workshops at the five largest Norwegian universities on data management planning using the open-source tool Data Stewardship Wizard as a major resource.

### Improvement of tools and international appreciation

The centre has continued its activity to improve the existing data management tools and has enabled the development of new collaborative features in the Data Stewardship Wizard.

Together with ELIXIR Norway, the centre also participated in a staff exchange within the FAIRDOM consortium. During several extended online meetings, the partners worked out a roadmap for future developments on the open-source software SEEK and the public FAIRDOMHub platform.

Our competence in data management within the centre has also received international acknowledgement. In 2020, the centre's data management coordinator was offered a seat on the Data Stewardship Wizard Advisory Board.

### **Direct support and guidance**

We are delighted to report several initiatives on data management stemming from the Digital Life Norway community. As mentioned in the cross-projects section, the centre supported cross-project activity for AurOmega, dCod 1.0 and DigiSal and their workshop on *Lipidomics in systems biology – methodology and data handling* early in 2020. Furthermore, data management support funding was awarded to a cross-project collaboration between BEDPAN, BioZement 2.0 and AurOmega to establish a lab information and management system and electronic lab notebook based on existing open-source components.

### **Supported new research infrastructure**

The Digital Life Norway research community will be an important reference group for the new research infrastructure for the life science data management programme BioMedData that was launched in June with support from the centre. This exciting new infrastructure that bridges data management across 11 Norwegian life science research infrastructure programmes has been made possible by the previous coordination activities of the centre. Digital Life Norway projects can join the BioMedData data management network and benefit from the direct exchange with the data stewards at the research infrastructures.

- [Read more about the launch of BioMedData.](#)

### **Debate article from the centre: Five percent of funding to data management?**

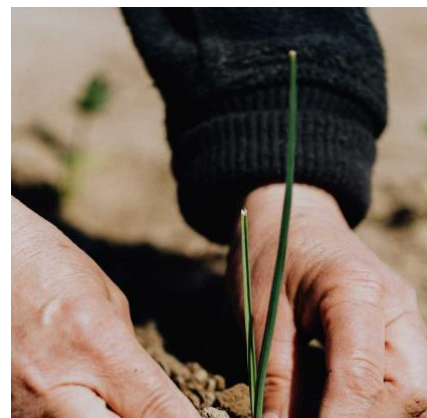
Professor Barend Mons in GO FAIR argued in Nature in February and at our Digital Life conference in November that researchers should set aside five percent of research funds to ensure that research data are reusable. Based on the centre's experience in assisting projects with data management, we believe researchers should consider this already during the application process.

- [Read our article on khrono.no \(in Norwegian\).](#)

## **RESPONSIBLE RESEARCH AND INNOVATION (RRI)**

### **Extension of mutual learning processes**

Research and innovation in biotechnology take place in society. This is why a policy of responsible research and innovation (RRI) underpins all activities in the centre. The mutual learning processes between the Research Council of Norway (RCN) and the centre were extended with a dedicated learning forum in April 2020. The forum will focus on mutual learning and knowledge exchange on responsible research and innovation dimensions in the centre in addition to broader policy-based issues. The forum will play a vital role as the centre proceeds into its second funding period, where implementation of the working methods of the centre in the host institutions will be given higher priority.



## **Responsible innovation high on the agenda**

Through 2020, the RRI work in the centre has been closely integrated with the innovation roadmap project and the work on the AS IS report described in the innovation section above. Whereas responsible research has been high on the agenda in the centre, responsible innovation has remained a relatively unexplored area. The innovation roadmap process has highlighted the importance of also cultivating this aspect of the transdisciplinary research projects in the centre. Perspectives related to responsible research and innovation will be applied across all six domains in the follow-up of the innovation roadmap project during the next four years.

## **The Digital Life Norway RRI course**

One major contribution from the centre's RRI group is the RRI course *Science, technology, and society*. The first part of the course was held for the second time in the autumn. Read more about the importance of this course in the training and career development section.

## **White paper on transdisciplinarity in progress**

The aim of the digital life initiative of RCN is «to create economic, societal and environmental value in Norway from biotechnological research and innovation, by encouraging transdisciplinary research». The centre plays an important part in reaching this aim. But what is really transdisciplinarity, and what might, and should, it mean in the centre? How can the centre facilitate transdisciplinarity in biotechnology research and innovation in better ways in the years to come? The work with a white paper that address these issues, started fall 2020. Persons who are connected with the centre were invited to give their input.

## **Science communication on Instagram**

In 2020 the RRI working group in hired a researcher from a research project in the centre to work on outreach on Instagram. On the [Instagram account @Marta\\_forskar](#) she shares insights into environmental pollution, biotechnology and life in academia. Through graphic illustrations and pictures, she hopes to be a supplement to the more established influencer culture focused on training, diet and fashion. On the first day of the National Science Week in September, she visited NRK morning studio digitally and talked about her Instagram project.

- [Read more about the Instagram project and listen to the radio programme.](#)

## **Grand award to RRI researcher in the centre**

In February 2020, Heidrun Åm, project leader of the research project *Res Publica – Responsibility, practice, and the public good across Digital Life Norway*, was honoured with the Royal Norwegian Society of Science and Letters' (DKNVS) scientific award to younger researchers, for her humanistic and social scientific approach to technology and biomedicine, and the fact that she has already led several large research projects, including her work in the centre.

- [Read more about the reward.](#)

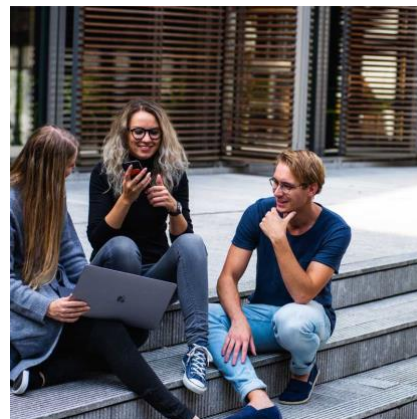


## TRAINING AND CAREER DEVELOPMENT

### Launch of industry internships

In 2020 the centre finally launched the pilot for the new industry internship programme. It was a long time in the making, and the process involved embassies, boards, industry contacts, and a lawyer working hard to set up an acceptable contract for the companies and the Norwegian universities – all these efforts went into offering PhD students invaluable insight into the industry sector.

Seven PhD students were selected for three-month internships in companies in Sweden or Norway, all costs covered by the centre. Four of the candidates finished their internships in 2020, having gained new knowledge about working in the industry and about themselves. Importantly, they all viewed the industry afterwards as a more attractive workplace, giving them a realistic and – thanks to the internship – more accessible alternative to an academic career.



Read about their first-hand experiences:

- [Blog from intern: Industry internship against all odds.](#)
- [Blog from interns published in Nature: Why industry internships can be your ‘golden ticket’ to a prosperous career.](#)
- [Read more about the development and launch of the programme.](#)

### Launch of signature course in transdisciplinary life science

The first-ever version of the Digital Life Norway PhD course *Transdisciplinary life science* was held in the fall 2020. The aim of the course is to help young researchers work better in inter- and transdisciplinary teams, by focusing on team processes, data management, responsible research and innovation (RRI), and, thanks to covid-19, digital work platforms. Participants worked on real scientific projects administered by digital life researchers, thereby also gaining knowledge on new research questions and methods. Towards the end, they wrote reports on the scientific part of the project and presented their thoughts and reflections on the transdisciplinary team processes. In the end, both the students and the course organisers learned a few lessons, and we are looking forward to the next round of the course in 2022.

- [Read more about the course.](#)

### Second round of responsible research and innovation (RRI) course

In 2020, the RRI course *Science, technology, and society* developed by the centre, was held for the second time (half of it was moved to 2021 due to covid-19). This course is particularly important for both the research school and the centre, as RRI is one of the centre’s core activities. The course is an excellent platform for researchers to learn how to adopt the RRI principles in their research practice with room for meaningful discussions and reflections in a generous and trustworthy environment.

- [Read more about the course.](#)

### **Matchmaking for mobility grant for young researchers**

In the fall the centre teamed up with the Swedish life science research institution Science for Life Laboratory (SciLifeLab) to help PhDs and postdocs associated to DLN connect with research groups at SciLifeLab to apply for the Research Council of Norway's three-year researcher projects with international mobility grant.

- [Read about the call and the matchmaking process.](#)

### **DIGITAL LIFE NORWAY RESEARCH SCHOOL ACTIVITIES**

#### **Events**

The main purpose of the research school is to create a community for PhD students and postdocs within the Digital Life Norway disciplines. Normally this is predominantly pursued through physical events where young researchers can meet and get to know each other. In 2020 due to covid-19 many events have been cancelled and some digitalised.

- [A complete overview of the 2020 events can be found on our website.](#)



#### **Mid-term evaluation**

The Research Council of Norway (RCN) organised a mid-term evaluation of national research schools in 2020. We were evaluated on quality and success related to original plans, resulting in a recommendation for continuation of the research school. The evaluation panel also provided suggestions for improvements, which will be useful for our further work.

- [The report is available on the RCN website \(in Norwegian\).](#)

#### **The 4th annual research school conference**

The annual conference was transformed from a two-and-a-half-day event at a scenic location outside Tromsø, to a one-day digital event. The committee of young researchers worked hard to adapt the programme, and the speakers needed to tailor their talks to a digital audience, meaning less speaking time and allowing for digital feedback. Trying to maintain some of the real conference purpose, we managed to gather most of the 80 participants for local dinners in the evening, in Tromsø, Trondheim, Bergen, and Oslo. Although the dinners softened the corona blow, we are hoping 2021 allows for a proper physical conference again.

- [See the conference programme for 2020 and the plans for 2021.](#)

#### **Meet a former member of the research school who is now an entrepreneur**

Entrepreneurial love at first sight; Norwegian algae; patented tissue engineering technology; funding from the Research Council of Norway; Oslo Innovation Week; biotech investors; organs for transplantation and links to the Digital Life Norway project 3DLife and the research school.

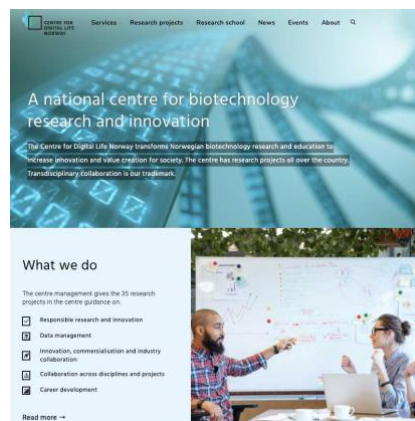
- [Read the past, present and future story of the start-up ClexBio.](#)

## COMMUNICATION AND THE DIGITAL LIFE NORWAY COMMUNITY

### Physical networking in three cities February 2020

At the end of 2019, twelve new partner projects entered the centre. As part of the admission process, the network project, for the first time, hosted network meetings in Bergen, Oslo and Trondheim in the first week of February 2020. The project leaders of nearly all the 35 research projects of the centre and members of the centre management attended the meetings to learn about each other's work. As part of the meetings, the plans for the centre's work on the innovation roadmap project that was launched in January were presented. The meetings were a success and will be repeated in the future.

- [Read more about the networking.](#)



### Monthly newsletters and renewed website

Information about the centre's activities are published on our website [digitallifenorway.org](http://digitallifenorway.org) and shared through [monthly newsletters](#) and on [Twitter](#), [Facebook](#) and [LinkedIn](#).

By June, all 35 projects had their own webpage on the centre website, and in autumn, we revised and redesigned our website to showcase the centre's projects and what we do in the centre even better. The monthly newsletters that were established in 2019 continued throughout 2020, with content contributed from both the centre management and the research projects.

### Digital Life 2020

The Digital Life conference is the annual meeting place for the Digital Life Norway community. In 2020, we invited the community to a fully digital event on Zoom. We hosted scientific talks by top international keynote speakers. Experienced Digital Life Norway projects presented their scientific results as well as lessons learnt with regard to responsible research and innovation (RRI), innovation, data management, career development and cross-project collaboration, all of which are important aspects of the centre. The participants were also invited to take part in small social groups. Seven projects contributed with videos that were shared in social media before the event and were shown during the breaks at the event.

- [Recordings of some of the talks and videos from projects can be found on the conference webpage.](#)

### Digital breakfast seminar series

In 2020 our longstanding breakfast seminar series "Digital frukost" expanded to other cities in addition to Bergen. We had our first joint event together with the Norwegian Artificial Intelligence Research Consortium (NORA) in Oslo as well as an event in Bergen in February. Later meetings have been a joint effort between UiB and NTNU, and moved to the digital sphere, with the added benefit of reaching even more people.

### National science week and Nobel week in the centre

Morning coffee, podcast, laboratory visit and panel discussions. Several digital life brain researchers from the DigiBrain project at UiO and the ParkOme project at UiB were very active during the National Science Week where this year's topic was the brain.

- [Watch recordings of the events.](#)

Researchers in the EcoGene project at NMBU are studying the biological, ecological and economic implications of CRISPR gene editing in animal production. To celebrate the Nobel Prize in Chemistry 2020 for the discovery of the CRISPR/Cas9 genetic scissors, they made a Nobel edition of the project video originally made for Digital Life 2020. The centre also hosted a digital breakfast on CRISPR.

- [Read more about the Nobel week in the centre and watch the EcoGene video.](#)



## Projects highlights

The centre has 35 transdisciplinary biotechnology projects led by universities and research institutes all over the country. The projects combine biotechnology with digital technology in health, aquaculture, agriculture, and industrial biotechnology.

For the projects marked with at star \* you can click on the project name to read more about highlights from 2020.

									
<a href="#">3DLife*</a>	<a href="#">AHA!*</a>	<a href="#">AIRDEM</a>	<a href="#">AML PM</a>	<a href="#">AUROMEGA*</a>	<a href="#">BEDPAN*</a>	<a href="#">BigInsight*</a>	<a href="#">BioZement20*</a>	<a href="#">Calinhib*</a>	<a href="#">CCBIO*</a>
									
<a href="#">dCod 1.0*</a>	<a href="#">DIAP*</a>	<a href="#">DigiBiotics</a>	<a href="#">DigiBrain*</a>	<a href="#">DigiSal*</a>	<a href="#">DrugLogic/PRESORT*</a>	<a href="#">EcoGene*</a>	<a href="#">EV-LiquidBiopsy*</a>	<a href="#">Futureantibiotics</a>	<a href="#">INBioPharm*</a>
									
<a href="#">Lab-on-a-chip*</a>	<a href="#">LiceVault*</a>	<a href="#">Listening to the patients*</a>	<a href="#">MEDIATE*</a>	<a href="#">MedImML</a>	<a href="#">nanoRIP</a>	<a href="#">OXYMOD*</a>	<a href="#">ParkOme</a>	<a href="#">PerCaThe*</a>	<a href="#">PINPOINT*</a>
									
<a href="#">PROVIZ*</a>	<a href="#">Res Publica*</a>	<a href="#">RESPOND3*</a>	<a href="#">SmartSoil*</a>	<a href="#">WastewaterAMR*</a>					

## PhD defences in the projects 2020

Several PhD candidates in the research projects in the Centre for Digital Life Norway defended their theses in 2020. Click on the name of their theses to download from the host universities of the candidates.

### **dCod 1.0 – decoding the systems toxicology of Atlantic cod**

Håvard G. Frøysa, UiB

[Estimation and identifiability of kinetic parameters in dynamical models of biochemical reaction networks](#)

Xiaokang Zhang, UiB

[Biomarker Discovery Using Statistical and Machine Learning Approaches on Gene Expression Data](#)

### **DIAP – Double Intraperitoneal Artificial Pancreas – an easier life with diabetes**

Marte K. Åm, NTNU

[The intraperitoneal artificial pancreas: glucose sensing and glucagon delivery](#)

Ine L. Jernelv, NTNU

[Mid-Infrared Tuneable Laser Spectroscopy for Glucose Sensing](#)

### **DigiBrain – from genes to brain function in health and disease**

Marte Julie Sætra, UiO

[Computational modeling of ion concentration dynamics and metabolic oxygen consumption in brain tissue](#)

[Read interview with her on p3.no](#)

Alessio Buccino, UiO

[A computationally-assisted approach to extracellular neural electrophysiology with multi-electrode arrays](#)

Mikkel Lepperød, UiO

[Dissecting neuronal circuits for navigation in experiments and models](#)

Charlotte Christensen, UiO

[Balancing stability and plasticity perturbations of extracellular matrix and inhibitory activity in the mature grid cell network](#)

Elise Thompson, UiO

[Perineuronal nets in memory processing and behavior](#)

### **AHA! – Adaptive Heuristics and Architecture – modelling life and behaviour**

Camilla Håkonsrud Jensen, UiB

[Hormone strategies as a key for understanding life history trade-offs in fish](#)

Jacqueline Weidner, UiB

[Modelling fish growth under hormonal regulation as a factor in Pace of Life](#)

### **Druglogics/PRESORT – using computer modelling to find the best drug combination for each cancer patient**

Vasundra Touré, NTNU

[Improving the FAIRness of causal interactions in systems biology](#) (summary, full-text not available)

### **BigInsight – big insight from big data and PerCaThe – personalised cancer therapy**

Zhi Zhao, UiO

[Multivariate structured penalized and Bayesian regressions for pharmacogenomic screens](#) (summary, full-text not available)

Dagim Shiferaw Tadele, UiO

[Development of novel approaches for treatment of leukemia](#) (summary, full-text not available)

Laure Piechaczyk, UiO

Identifying new avenues for leukemia treatment using genomewide CRISPR/Cas9 and *ex vivo* drug sensitivity screens (summary, full-text not available)

Aurelie Nguea, UiO

Nutrient stress responses in the budding yeast. *Saccharomyces cerevisiae*

#### **CCBIO – Centre for Cancer Biomarkers**

Martin Pilskog, UiB

Predictive biomarkers for response to treatment with sunitinib in renal cancer patients

Jahedul Alam, UiB

Novel Insights into Integrin  $\alpha 11$  Expression and Function

Hilde Renate Engerud, UiB

Molecular markers to predict prognosis and guide therapy in endometrial cancer

Caroline Benedicte Nitter Engen, UiB

Exploring the boundaries of precision haemato-oncology: The case of FLT3 length mutated acute myeloid leukaemia

Tone Hoel Lende, UiB

Proliferation in operable breast cancer: Aspects of prognostication and relevance of carbohydrate metabolism

Tormod Karlsen Bjånes, UiB

Drug delivery in pancreatic cancer: Quantitative studies of gemcitabine and sonoporation in patients and cell line models

Harsh Nitin Dongre, UiB

Biomarkers and preclinical models for more precise diagnosis and personalized treatment of oral and vulva carcinomas (not available online)

Yaping Hua, UiB

Discovery and characterization of novel STAT3 and androgen receptor inhibitors in prostate cancer cells on [uib.no](http://uib.no) (summary, full-text not available)

Hanna Elisabeth Dillekås, UiB

Importance of physical trauma on recurrence of breast cancer: Can tissue trauma synchronize growth of dormant micrometastases?

Ragnhild Haugse, UiB

Molecular mechanisms of sonoporation in cancer therapy: Optimization of sonoporation parameters and investigations of intracellular signalling (summary, full-text not available).

Nazar Gafar Abdulrahman Mohamed, UiB

Biomarker Identification in Oral Squamous Cell Carcinoma. Study on Cohorts of Patients from Sudan (not available online)

Sissel Dyrstad, UiB

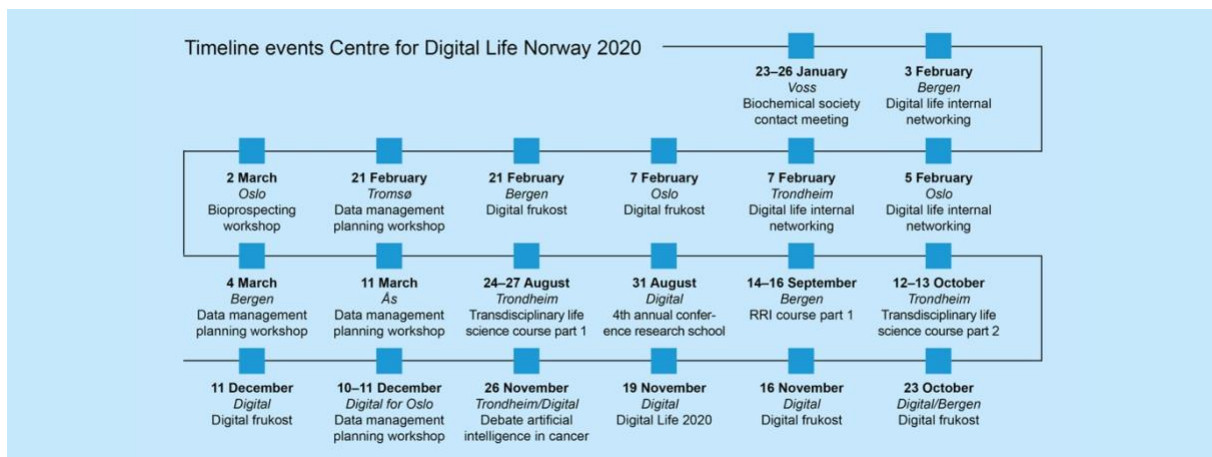
A study on metabolic rewiring in cancer cell plasticity

Ehsan Hajjar, UiB

Next generation leukemia diagnostics and therapy through p53 isoforms (not available online)



## Events 2020



23–26 January, Voss

[Digital Life at Norwegian Biochemical Society contact meeting 2020](#)

3 February, Bergen; 5 February, Oslo; and 7 February, Trondheim  
[Digital Life internal networking](#)

7 February, Oslo

[Digital frukost: Artificial intelligence and medicine](#)

21 February, Bergen

[Digital frukost: Topology in biology](#)

21 February, Tromsø

[Data management planning workshop for life science projects](#)

2 March, Oslo

[Digital Life Norway bioprospecting workshop: Access, regulation and digital data](#)

4 March, Bergen

[Data management planning workshop for life science projects](#)

11 March, Ås

[Data management planning workshop for life science projects](#)

24–27 August, Trondheim

Transdisciplinary life science – a Digital Life Norway course – part 1

31 August, digital

4th annual conference of Digital Life Norway Research School

14–16 September, Bergen

Science, technology, and society: RRI course Digital Life Norway – part 1

12–13 October, Trondheim

Transdisciplinary life science – a Digital Life Norway course – part 2

23 October, digital/Bergen

Digital frukost: NTNU CODVID-19 taskforce

16 November, digital

Digital frukost: Measuring organelle surface tension in living cells

19 November, digital

Digital Life 2020

26 November, Trondheim, digital

Artificial intelligence in cancer diagnostics – between hope, realism, and ethical challenges

10–11 December, digital for Oslo

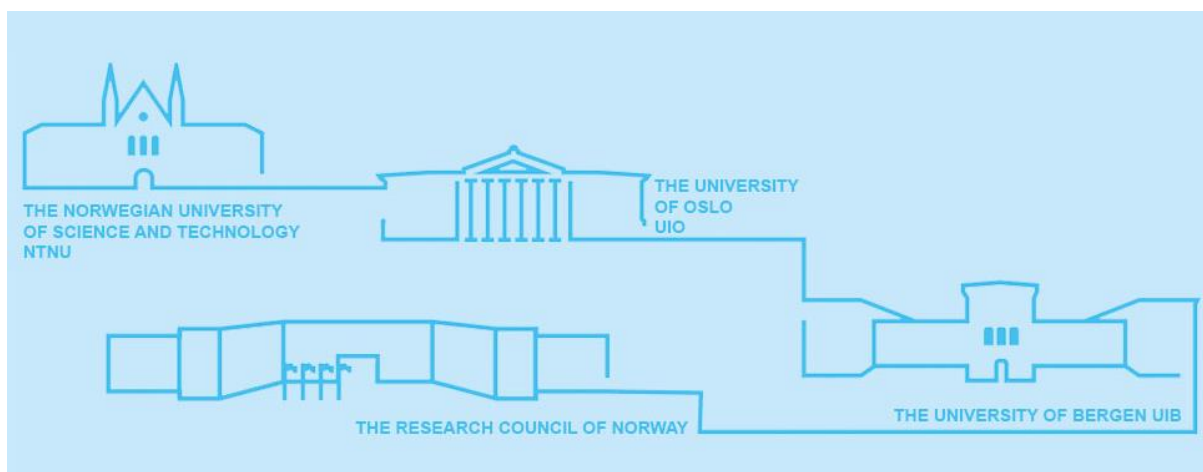
Data management planning workshop for life science projects

11 December, digital

Digital frukost: Applications of the CRISPR/Cas system in diatoms

## Facts and figures

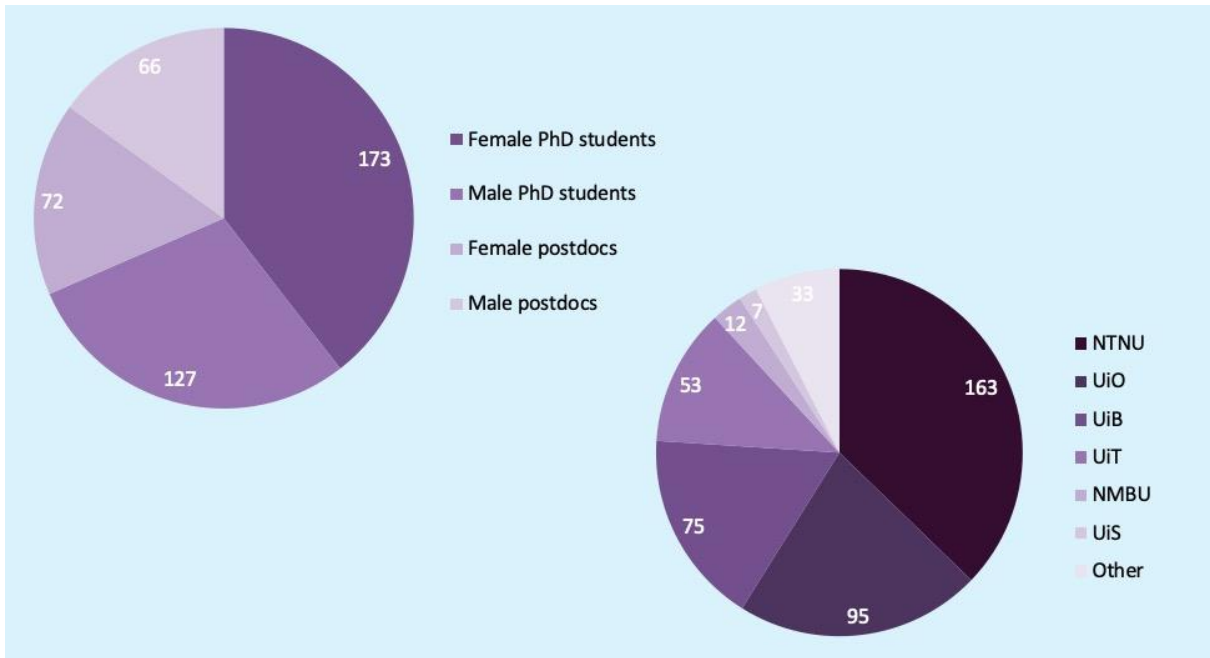
### Centre for Digital Life Norway funding sources 2020



The network project that has managed the centre has been financed by the Research Council of Norway and the three universities that has been running the network project: NTNU, UiO and UiB.



## Members of the Digital Life Norway Research School



### By gender

173 female PhD students, 127 male PhD students, 72 female postdocs and 66 male postdocs.

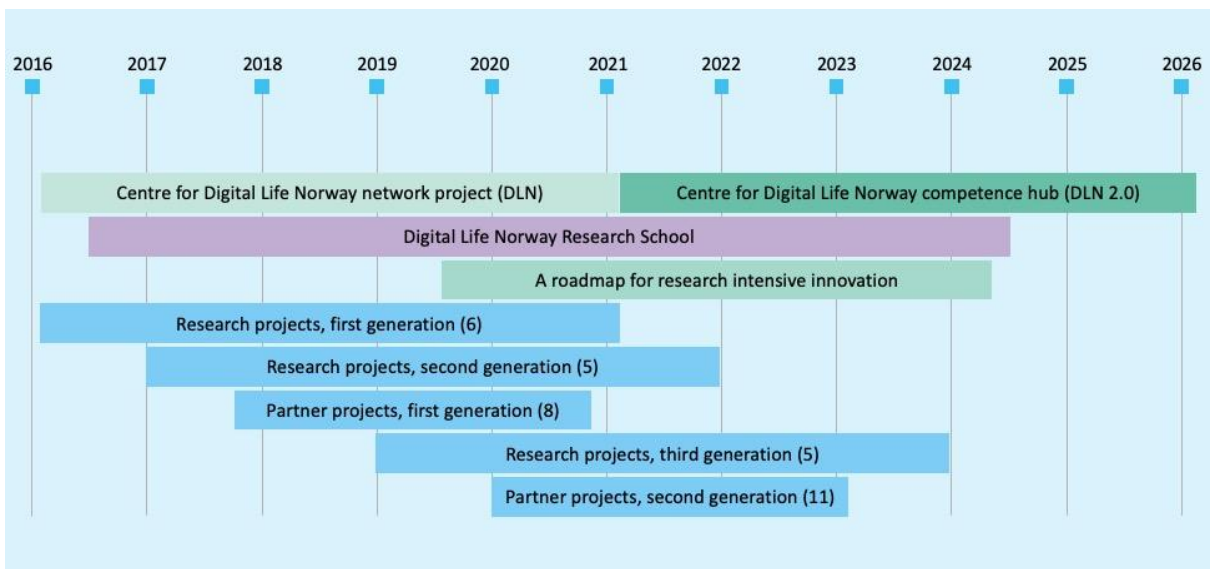
### By university

163 NTNU, 95 UiO, 75 UiB, 53 UiT, 12 NMBU, 7 UiS and 33 others.

Other PhDs: Nord university, Western Norway University of Applied Sciences (HVL), OsloMet, University of South-Eastern Norway (USN) and Inland Norway University of Applied Sciences (INN).

Other postdocs: Nofima, Oslo University Hospital (OUS), NIBIO, NORCE, Haukeland University Hospital (HUS) and Stavanger University Hospital (SUS).

## The Digital Life Norway timeline



## The people

### Employees in the network project per 31 December 2020



Top row from the left: Trygve Brautaset, centre leader and scientific director, NTNU; Liv Eggset Falkenberg, acting centre coordinator and coordinator research school and training and recruitment, NTNU; Brage Hansen, higher executive officer, NTNU; Olav Haraldseth, professor NTNU, leader of the research school and training and recruitment work group; and Ragnhild Inderberg Vestrum, coordinator, NTNU.

Middle row from the left: Inge Jonassen, professor UiB, leader of data management/competence and infrastructure work group; Korbinian Bösl, coordinator data management/competence and infrastructure, UiB; Kari Ersland, coordinator competence and infrastructure, UiB; Roger Strand, professor UiB, leader of the responsible research and innovation (RRI) work group for NTNU; and Anders Braarud Hanssen, coordinator responsible research and innovation (RRI), NTNU (20%).

Bottom row from the left: Arnaldo Frigessi, professor UiO, leader of the innovation and industry involvement work group; Alexandra Patriksson coordinator innovation and industry involvement, UiO; Beate Rygg Johnsen, coordinator innovation and industry involvement, UiO; Norunn K. Torheim, coordinator communications, UiO; and Kjetill S. Jakobsen, professor UiO, leader of the communications/inreach and outreach work group.

Not on the picture: Hilde Zwaig Kolstad, Raffael Himmelsbach and Rune Kleppe who were employed in the network project until summer 2020.

## Members of the board 2020



Top row from the left: Finn-Eirik Johansen, chairperson, University of Oslo (UiO); Tor Grande, Norwegian University of Science and Technology (NTNU); Marit Bakke, University of Bergen (UiB); Kari Kolstad, Norwegian University of Life Sciences (NMBU); and Arne Smalås UiT The Arctic University of Norway.

Bottom row from the left: Eli Aamot, SINTEF; Peder Heyerdahl Utne, Oslo University Hospital (OUS); Emilie Lassen, NorthSea Therapeutics B.V.; and Gerd Nilsen, Thermo Fisher Scientific.

Not on the picture: Øystein Rønning, observer, the Research Council of Norway.

## Members of the scientific advisory board 2020



From the left: Anne-Claude Gavin, Vera van Noort, Dominique Chu, Rudi Balling and Ulrike Felt.

Centre for Digital Life Norway is a national centre for biotechnology research and innovation and is supported by the Research Council of Norway.

