

ANNUAL REPORT 2022

Here you will find the summary of Centre
for Digital Life Norway from 2022

About Centre for Digital Life Norway

The Centre for Digital Life Norway (DLN) is a national centre for biotechnology research, education and innovation. The centre facilitates transdisciplinary collaboration across institutions, fields of research and the research projects in the centre.

The centre is a collaborative project between 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.

The centre is run by a competence hub and includes a research school and research projects. The competence hub is funded by the Research Council of Norway, and the second funding period DLN 2.0 started in February 2021.

Contents

Comment from the centre director	3
Comment from the board chairperson	5
Centre highlights	8
Projects highlights	38
Event timeline 2022	41
The people	42

Comment from the centre director

It is a privilege to present the 2022 Digital Life Norway (DLN) annual report. In 2022, the COVID-19 pandemic came to an end, allowing students to return to our campuses and infuse them with renewed vitality. We have traded virtual meetings, workshops, conferences, networking, and socialization for in-person ones, ushering in a more dynamic and engaging educational experience.

The wider society has also warmly welcomed this shift, particularly at the Centre, where it has enabled us to continue our critical role in promoting national collaboration in biotechnology. By facilitating physical gatherings once again, we are better positioned to foster meaningful connections and further our mission.

In 2022 our new Centre organization structure has been truly settled. We have established a good balance in number of research projects as existing projects gradually come to an end and new projects are taken into the Centre. We have implemented effective onboarding and alumni procedures for new and terminated projects, respectively. This ensures seamless recruitment and continuation, allowing us to maintain a consistent level of over more than 40 active DLN research projects over the past 1-2 years.



Trygve Brautaset
Scientific director DLN 2.0

The Innovation Roadmap project has started up 12 different pilots and this project is now fully integrated in the Centre and our Board. This project was basis for our DLN event at Arendalsuka including a panel debate on biotechnology and innovations to surface important perspectives from key stakeholders.

Our popular industry internship program was arranged for the third time with high number of motivated applicants; we continue to receive positive feedback both from the PhDs as well as from the host organizations, and a 4th industry internship round is currently under preparation.

In 2022 we made strong connection with our sister project AFINO, first by arranging a DLN-AFINO summer school followed by a joint policy forum with also the Research Council of Norway on board. We also arranged for the 2nd time our signature course on transdisciplinary biotechnology which included several DLN research projects as active contributors and hosts for the practical and experimental parts of this program.

We continued arranging various seminars, meetings and workshops including reintroducing our traditional "Digital Frukost"-series, co-arranging the Norwegian Bioinformatics Days, as well as arranging thematic events on popular science communication, modelling living systems, and more.

We announced calls on best transdisciplinary paper and best use of FAIR principles, and our annual conference was this year physical again in Trondheim focusing on "How to work transdisciplinary in biotechnology". The working group on Key Performance Indicators finished their work and you can read more about all this in this annual report.

Altogether, 2022 has been a very active year for DLN and we are looking very much forward to a hopefully fruitful, inspiring, and productive 2023 together with all of you.

Trygve Brautaset
Scientific director DLN 2.0

Comment from the board chairperson

The year 2022 was the second year of the second 5-year period of DLN. I think it is fair to say that the center is well established and operations are running smoothly, despite frequent change of personnel. DLN is recognized in a broad segment of the Norwegian life science research community as a driving force to spur interdisciplinary research and innovation, integrating responsible research and innovation (RRI) practices in all our work.

Research and innovation in the affiliated researcher projects are supported by the core activities of the center. Since the foundation of the center, the efforts in RRI have been further strengthened by targeted funding from the RCN, first for RRI and currently for innovation. The Innovation Roadmap project is now in its operational phase and a major activity of the DLN, overseen by the coordinators, project leader and the board.



Finn-Eirik Johansen
Board chairperson

I am sure that we will learn things from this project that will have implications way beyond DLN, and will likely impact how the RCN works with universities, research institutes and industry to facilitate innovations in the future.

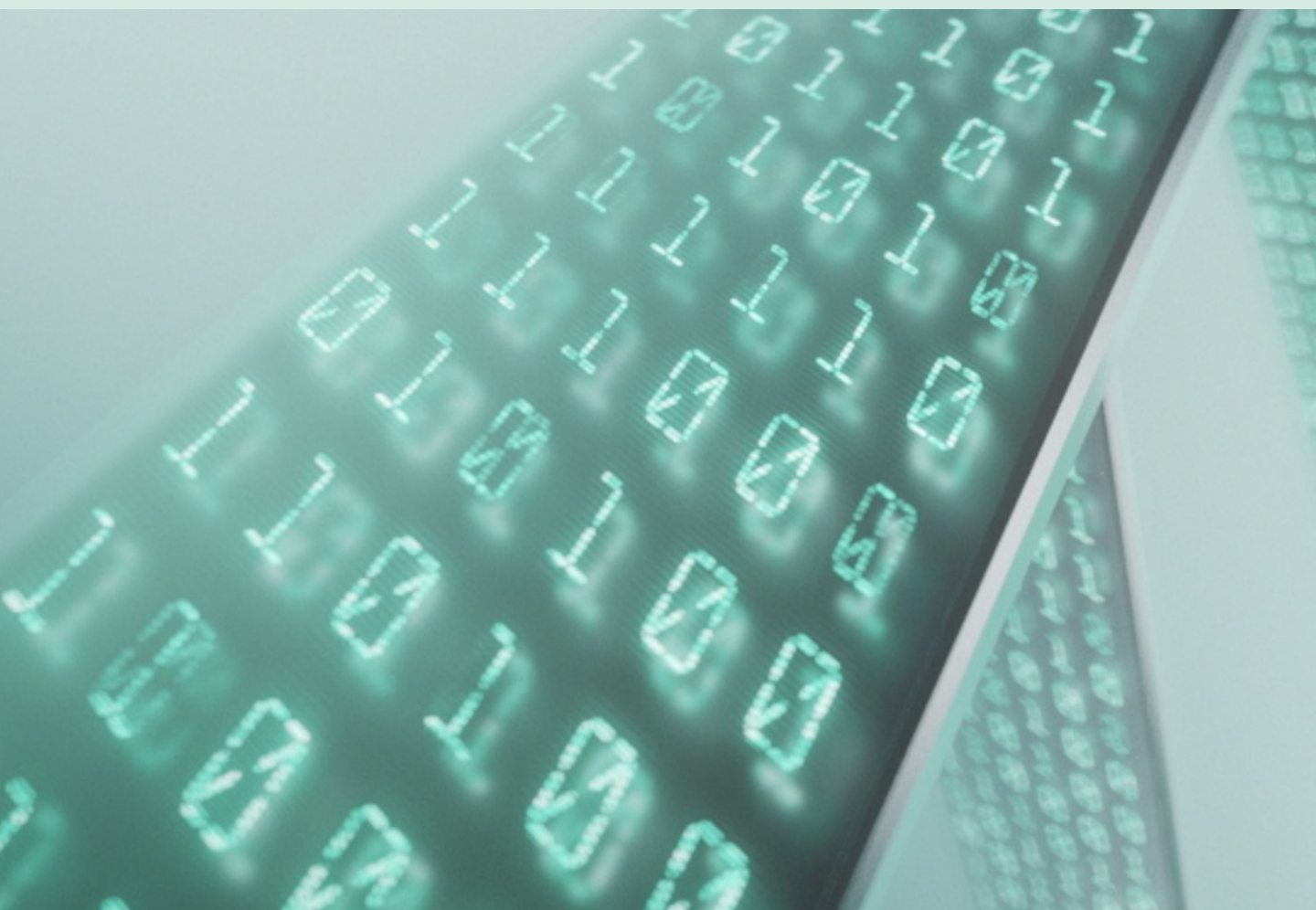
When DLN started, AI was a prominent research area in the digital sciences; computer science, information science, and data science, but had not yet entered life sciences to the extent that we see today. Today, AI permeates all areas of research and has become accessible in everyday life through resources such as ChatGPT, Elicit and others. These technologies will have a major impact on all areas of research. To strengthen the board's competence in this area as well as in innovation, we decided to increase the number of industry representatives. I am very happy that we were able to recruit to the board Ola Engkvist, Head of Molecular AI at AstraZeneca and Adjunct Professor in AI and Machine Learning-Based Drug Design at Chalmers University of Technology. His strong background in computational chemistry, innovation and AI has already proved to be a great asset to DLN.

With restrictions due to the pandemic waning, many of us were looking forward to a return to normality in 2022. Unfortunately, this was not the case as war in Europe has overshadowed most other world events, particularly as viewed from Norway. I encourage you to show support for colleagues, students and the people of Ukraine in any way you can. Let us hope that their situation will improve in 2023.

I wish you all the best for 2023.

Finn-Eirik Johansen
Board chairperson

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.



UNIVERSITY
OF OSLO



UNIVERSITY OF BERGEN



Norwegian University
of Life Sciences



www.digitallifenorway.org

UIT The Arctic University of Norway

Centre highlights

DLN 2.0 includes seven partner institutions and a strong competence hub centered around an Operational Management Team (OMT), an Expert Task Force (ETF) and a Junior Resource Group (JRG). The seven partner institutions are NTNU, UiO, UiB, UiT, NMBU, SINTEF, OUS.



UNIVERSITY
OF OSLO



UNIVERSITY OF BERGEN



Norwegian University
of Life Sciences



UiT The Arctic University of Norway

The overall goal is Digital Life Norway to transform research, innovation and training in digital biotechnology to foster transdisciplinary collaboration and contribute to responsible and sustainable value creation in Norway. In this report, you will find a summary of Digital Life Norway's activities during 2022 towards this goal, in collaboration with our communities of researchers and other partners and stakeholders

COLLABORATION ACROSS DISCIPLINES AND PROJECTS

INNOVATION AND INDUSTRY COLLABORATION

DATA MANAGEMENT

RESPONSIBLE RESEARCH AND INNOVATION (RRI)

TRAINING AND CAREER DEVELOPMENT

DIGITAL LIFE NORWAY RESEARCH SCHOOL

COMMUNICATION AND THE DIGITAL LIFE NORWAY COMMUNITY

Nearly a hundred bioinformaticians gathered at Sundvolden Hotel in September for 'Norwegian Bioinformatics Days 2022'.

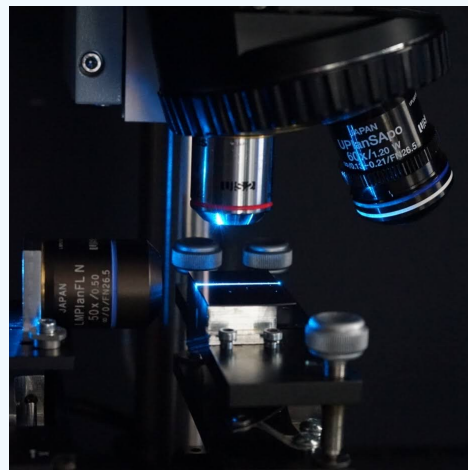


COLLABORATION ACROSS DISCIPLINES AND PROJECTS

Funded cross-project activities

In 2022, four applications for a cross-project activity were funded. The activities include workshops, shared PhD students, and scientific pilot studies. Also, some previously funded activities have come to an end and the involved have shared their experiences.

Overall, we see that the cross-project initiatives leads to closer collaboration between projects at different institutions and different fields, and even new research proposals to the RCNs 'Emerging technologies' call.



[Read more about the DLN-funded cross-project activity: Nanoscopy visualisation of extracellular vesicles here.](#)

Digital Frukost seminar series

After an internal evaluation during the spring in 2022, the 'Digital frukost'-seminar series was relaunched in fall of 2022. Going forward, the series will be fully digital and open, focusing on specific topics or issues within the sphere of responsible digital life science research and education, by bringing in different voices and perspectives from academia and other actors.



First off was a pre-event to the Norwegian Bioinformatics Days 2022 conference, with the title "[Next generation bioinformatics](#)" (co-organized with Tekna). Other topics included "[Can we find the solution to the antibiotic resistance crisis in the ocean](#)" (part of Forskningsdagene), "[Open access week: The rise of the data stewards](#)" (collaboration with University Libraries), and "[AI and responsible research and innovation in health decision-making](#)" (collaboration with NORA).

Some of the events have, in addition to presentations, included a panel discussion. Overall, the new profile of the series is a nice way to encourage collaboration with relevant actors and attracts more registered participants than previous years.

[You can find recordings from the events on our YouTube channel.](#)

Transdisciplinary publication of the year

Following lengthy discussions in the evaluation committee and in the Operational Management Team of DLN, we have decided to not hand out the award this year. [Read why here.](#)

During 2023, DLN will re-evaluate the criteria for the transdisciplinary award to align better with the actual efforts that we know are made in the biotechnology and life science communities, but that are not easily included in a peer-reviewed scientific publication.



Norwegian Bioinformatics Days 2022

Starting in 2021, the centre has been a driving actor in gathering the Norwegian bioinformatics community to a national conference. In September, close to a hundred participants from academia, governmental organizations and industry joined for a meeting at Sundvolden Hotel. A more expensive report from the event can be found [here](#). The co-organised event was a great success and is planned to be repeated biennial – next in collaboration with the ‘Bioinformatics in Bergen’ meeting in 2024, and we hope to meet you there!



Norwegian Bioinformatics Days 2022: Bioinformaticians has the chance to get to know each other and discuss their field through poster viewing and workshops. Left: Ragna Beines (UiB) and Elisabeth Hyldbakk (NTNU).



SENTER FOR
DIGITALT LIV
NORGE

Hvordan skal Norge fremme mer innovasjon fra bioteknologiforskning?



DLN organized event at Arendalsuka 2022 presenting Innovation Roadmap

INNOVATION AND INDUSTRY COLLABORATION

The ambitious goal of the Centre for Digital Life Norway is to transform Norwegian biotechnology research to become more transdisciplinary and to stimulate value creation and innovation.

Innovation Roadmap - Phase two

In February 2022, the Steering Committee of the Innovation Roadmap project (RCN 30 MNOK) approved the action plan, and in August the project formally moved into phase two. In this phase, the project is integrated more directly into DLN and reports to the RCN and the DLN Board on the same terms as the DLN Research School.

In 2022, members of the OMT, led by the innovation senior advisors, launched 8 pilots and 7 pre-projects which are each connected to one or more DLN projects (see figure below). The progress in each pilot will be continuously documented and evaluated along the way. The output of the Roadmap project will be set of evidence-based recommendations which move research towards innovation in digital life sciences.

«This phase of the Innovation Roadmap project “will experiment with 30-40 different ideas, inspired and tested internationally and adapted to our situations, each with the aim to help the transition of academic ideas into products, ideas, services, solutions, which make an impact in society. Many of these pilots have not been tested before in Norway. We will work closely together with other relevant actors, in all of Norway. This will also help to build new enthusiasm for innovation in academia.”, [says UiO Professor and project manager Arnoldo Frigessi.](#)

[Read more about innovation roadmap here.](#)

Action Plan 2022-2023

DLN Innovation Academy		Pre-project	Planning	Implementation	Evaluation
IA1	Lean Innovation in Life Sciences – Innovation in the Age of disruption (seminar)				
IA3	DLN Industry Internship				
IA4	"DLN Mini MBA" - BI Summer Business School				
DLN Innovation Accelerator					
AC4.1	Academic Business Developer – PROVIZ (NTNU)				
AC4.2	Academic Business Developer – Innofree - Oxymod (NMBU)				
AC4.3	Academic Business Developer – MUSICAL - nanoRIP+DigiBiotics/NanoAI (UiT)				
AC4.4	Academic Business Developer – Calinhib (OUS/UiO)			PA6	
AC1 + AC14	Design thinking/Lean innovation to facilitate innovation and business development Sandpit for idea generation	On hold			
AC9	Non-commercial business models for data driven ideas (DrugLogics/PRESORT/DigiSal)				
DLN Innovation Funding					
FU4	Overview of funding instruments for innovation and commercialisation				
FU1	Proof of Concept Grants (bridging the first 'Valley of Death')	FU4			
DLN Transdisciplinary Actions					
TA1	'Value your Data' Team				
TA2	Trans-/interdisciplinary work shops				
DLN Entrepreneurial and Spin-Out Actions					
ES1	Impact investment				
DLN Policy Actions					
PA6	Value creation without TTO support	Terminated (see AC4.4)			

Arendalsuka 2022

In August 2022 Phase 2 of the project was presented at Arendalsuka. Arendalsuka is the largest political gathering in Norway where various organisations can talk directly with leading decision makers from academia, business, civil society and politics.



From the left: [Kim Noguera Gabrielli](#) - Director [UN Global Compact Norway](#), [Monica Larsen](#) - Senior Adviser - Legemiddelindustrien (LMI), [Trygve Brautaset](#), Scientific Director - Digital Life Norway, [Stine Fiksdal](#) - Director - VIS - Vestlandets Innovasjonsselskap, [Alexandra Patriksson](#), Senior Adviser Innovation - Digital Life Norway, [Christoffer Hals](#), Senior Adviser Communications - Digital Life Norway, [Ellen Marie Forsberg](#) - Director and researcher - [NORSUS](#), [Arnoldo Frigessi](#), Project lead and Professor at UiO, [Anne Kjersti Fahlvik](#) - Executive Director, Industries, Technologies, Health, Life Sciences Research Council of Norway

The event asked the following question: "How should Norway stimulate to more innovation from biotechnology research?" As an introduction to this question, project leader for Innovation Roadmap, professor Arnoldo Frigessi at UiO, together with Senior advisor for Innovation at DLN, Alexandra Patriksson, presented the Innovation Roadmap project. The event had an open discussion with invited panelists.

[Read more about the event and see video recordings here \(In Norwegian\).](#)

Norwegian stand at Nordic Life Science Days



Centre for Digital Life Norway at the Norwegian Stand at NLSDays 2022

Nordic Life Science Days is the largest Nordic partnering conference dedicated to the life science industry. In September 2022 the conference was in Malmö, Sweden.

Centre for Digital Life Norway and three of DLN research projects was part of the Norwegian stand together with friends from Oslo Cancer Cluster, SPARK Norway, The Research Council of Norway, Inven2, Aleap, Innovation Norway, The Life Science Cluster, Norwegian Health Tech, Veksthuset for livsvitenskap – Life Science Growth House, Legemiddelindustrien (LMI), Nansen Neuroscience Network, VIS (Vestlandets Innovasjonsselskap) and Norwegian Inflammation Network (NORIN). DLN supported the projects in meetings with potential collaborators.

DLN Industry Internship

2022 also was the third year of the successful and highly popular Industry Internship programme of DLN. A total of 11 companies, both Norwegian and international, showed their interest in the programme by sending in 14 different project proposals. 8 companies with one project each were lucky to host an intern over three months. The Industry Internship programme is run as a collaboration between the DLN research school and DLN Innovation, and open for all PhD students who are members of the research school to apply. DLN received 39 student applications for the internship stipend. The host organisations are recruited through the DLN network of industry and other relevant organisations.



[Verena Mertes](#) PhD student at UiO had internship at ArcticZymes Technologies in Tromsø

Feedback from the companies were overwhelmingly positive, reporting back that it was very valuable for the companies having a DLN Intern as they are highly qualified and brought much competence with them. The majority of the companies found it important or very important to give the students insight into how it is to work in the industry, and to promote cooperation between the industry and academia. Other important motivations to participate in the program were to contribute to more students choosing a career within the industry, as well as allowing the companies to allocate a person to a project otherwise not prioritized due to lack of resources.

When the interns are finished with their internship, they are required to write a blog post or other publishable text to communicate their experience with working outside of academia. Currently four blog posts are out, and more are in the workings, among these, one is being planned to try to be published in a national open access journal, Khrono or similar. The students are also presenting the program and their experiences to different institutional boards and committees to establish the importance of such internships being an integral part of a PhD educational path.

Read about the interns experiences and feedback below:

- [Olaug Elisabeth Torheim Bergum: How I ended up at the Norwegian Institute of Public Health \(NIPH/FHI\)](#)
- [Bente Sirin Barge: "Applying for the DLN industrial internship turned out to be one of the best decisions I made this year"](#).
- [Ataur Rahman used the LC-MS to see the degradation pattern of the antimicrobial peptides in his internship](#)
- [Verena Mertes had a great internship at ArcticZymes Technologies in Tromsø from September to November](#)



Physical Software Carpentry Workshop for essential research computing skills Dec 2022, Bergen

DATA MANAGEMENT

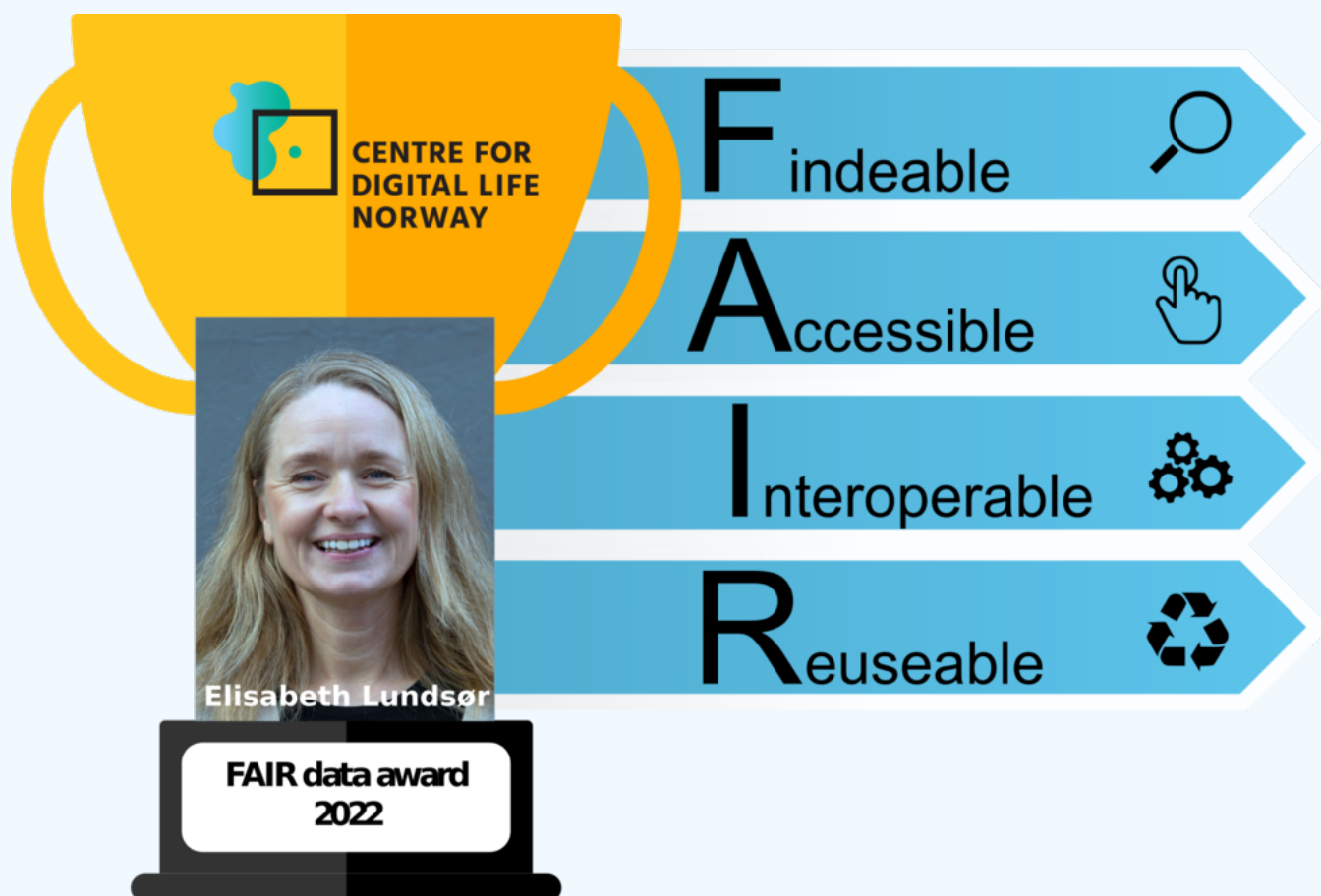
The Data & Models competence area of the Centre for Digital Life Norway (DLN) has had a productive year in 2022, with a continued focus on building competencies, developing infrastructure and engaging in policy work. These three pillars have helped to further advance DLN's mission to promote responsible and sustainable use of data in life sciences research.

DLN FAIR data award 2022

DLN is thrilled to congratulate Elisabeth Lundsør from the University of Oslo as winner of the DLN FAIR Data award 2022! The team's [Inner Oslofjorden Phytoplankton Database](#) is a comprehensive database containing quantitative phytoplankton cell counts, associated metadata and available environmental data from 605 sampling events from 1896 to 2020.

"We are honored to receive this award. It was a long and tedious job collecting all the data from "boxes and drawers", and convincing everyone that it was essential to share it. This reward greatly acknowledges that work and shows everyone how important and appreciated data sharing is!" - Elisabeth Lundsør

[Read more about the award here.](#)



Competence workshops

After several virtual workshops, DLN held its first [in-person software carpentry workshop in December in Bergen](#) together with ELIXIR Norway, NRIS and the UiB library. This workshop aimed to provide attendees with hands-on training in open-source software development, data visualization thereby improving their competencies in these areas.

In addition, DLN organized two [data management planning workshops](#) with the institutions and ELIXIR Norway. Further the Data & models team contributed to three PhD courses with lectures on Research Data Management (RDM) aspects.

These initiatives have helped to build the competencies of the wider life science research community, enabling them to handle and manage their data more effectively.

Infrastructure development

DLN has been working on [interoperability between easyDMP and the Data Stewardship Wizard](#) together with ELIXIR Norway and Sigma2. This includes the exchange of data management plans (DMPs) in the RDA DCS format, making it easier for researchers to reuse the information from their DMPs across different tools. Furthermore, DLN has further developed the possibilities to use the Norwegian e-infrastructure for Life Sciences through the user interface of SEEK, improving the useability for the community.

Policy engagement

In 2022, DLN joined the Digital Sequence Information Scientific Network (DSI scientific network) open letter on the Convention on Biological Diversity (CBD) and appealed to the Norwegian government. Possibly as a result of the DSI scientific network's efforts, the CBD Conference of the Parties (COP 15) in 2022 released a statement on the need for [FAIR and open digital sequence information](#). Additionally, the Research Council of Norway has now changed its policy and [assesses proposals based on open data and open science](#). This change aligns with the opinion expressed across several hearings and opinion pieces by the DLN data & model team, and we are very pleased with this outcome.

Data management events

Below is a list of DLN Data management events in 2022:

[FAIR Data Management in Life Sciences](#)

[Life Science Data Management: Planning workshop](#)

[Data management in practice with FAIRDOM-SEEK](#)

[Digital Frukost - Open Access Week: The Rise of the Data Stewards](#)

[Software Carpentry course in research computing skills: Shell, R for reproducible analysis, Git](#)

[Webinar: Open Data requirements for Life Science Projects](#)

[Data management in practice with FAIRDOM-SEEK](#)

[Data Management Planning workshop for Life Science Projects](#)



Policy Forum September 2022

RESPONSIBLE RESEARCH AND INNOVATION

The primary focus of Responsible research and innovation (RRI) activities have been towards building stronger institutional anchoring and collaborating with other stakeholders. While the focus in DLN 1.0 have been towards the research projects themselves, DLN 2.0 and 2022 activities emphasized increased collaboration with the Research Council of Norway and also strengthening the interaction and collaboration with the AFINO centre.

Key performance indicators developed in and for DLN

In 2022, DLN acted on its commitment to developing a set of Key Performance Indicators (KPIs) for the centre's activities, outputs, milestones and objectives. DLN's normative platform is developed from RCN's RRI framework in and around DLN's role as a 'lighthouse' for transformation of life science research in Norway. To learn about DLN's process and progress towards this goal and define a framework for reporting and accountability, a KPI working group was initiated in spring 2022 with the following members:

- Anders Braarud Hanssen, NTNU, DLN Senior adviser for RRI
- Randi Elisabeth Taxt, UiO, DLN Senior adviser for Innovation
- Elisabeth Gulbrandsen, Research Council of Norway (previously)
- Tom Pike, OsloMet, DLN board member industry representative
- Hanne Haslene-Hox, SINTEF, DLN project leader & Expert Task Force member
- Kjetill Sigurd Jakobsen, UiO, DLN project leader & Expert Task Force member
- Kam Sripada, NTNU, DLN Centre manager & Chair of KPI working group

Building on existing relevant material, the KPIs working group initiated a fresh attempt to comprehensively understand the lessons and impact of DLN's diverse initiatives and activities. According to DLN's RRI framework, "The emphasis of impact evaluation is shifting from (end) product to process, and from verdicts/judgements to learning and improving" (Samfunnsansvarlig innovasjon – Et RRI-rammeverk).

Therefore, DLN does not approach these KPIs as a pass/fail exam, but rather as an evaluative inquiry. KPIs used within this context can be useful in terms of guiding activities, soliciting support for activities and promoting accountability, in particular towards NFR. In addition, they should be useful for centre constituents, practical to measure and aligned with the strategic goals of DLN. At the same time, they can draw attention to what DLN is funded to produce: culture change and transformative research in life science in Norway aligned with societal values. As the largest single recipient of biotechnology funding from NFR, DLN has a responsibility to function as a learning arena and deliver insights that can shape future initiatives.

The term KPI was chosen for this work as it is an established term. However, considering input from the DLN International Advisory Council, we recognize that these indicators also encompass related terms such as "performance directions," "performance parameters," and "experiences" and are also linked to "principles" and "best practices."

Over 2022, the KPIs working group convened several times to identify and discuss the "tensions" at the heart of DLN's mission and developed the following list:

I. Definitions of success

II. Outcomes

III. Who and where

IV. Collaboration

V. Culture change

VI. Open science

VII. Transdisciplinary

VIII. Climate sustainability

The working group developed a matrix tool in Excel for collecting and reporting KPIs to address the tensions outlined above. Beginning in 2023, members from each DLN competence area will add information to the matrix tool to write their reflections, experiences, anecdotes, success stories, and other relevant data from their activities over the last year. Information from DLN projects will also be collected and used towards an understanding of KPIs in DLN.

This tool will be used yearly to learn about DLN's performance towards transforming biotechnology in Norway and be referenced between major assessment activities, as a living document. The working group began a summary document on conflicting values and considerations around KPIs anchored in DLN's RRI framework and DLN aims to develop this work further.

Policy forum

Building on the previous policy forums in 2020 and 2021, DLN co-organized a 2-day policy forum at Kringler gjestegård in September 2022. Alongside AFINO the event sought to build stronger collaboration, learning and knowledge exchange between AFINO and DLN and discuss the changing policy landscape with participants from the Research Council of Norway.

[Read more about it here and see video interviews with participants.](#)



Anders Braarud Hansen (DLN) and Anne Blanchard (AFINO) coordinated the policy forum. Photo: Eva Hilde Murvold

Joint summer school with AFINO

On August 7-9, DLN and [AFINO](#) co-organized a summer school at UiO focusing on 'critical research within institutions' challenging participants from the research schools of AFINO and DLN to share experiences working on [inter- and transdisciplinary research and RRI-related research problems](#).

More RRI-related events

Among other RRI-related events was the PhD-course Transdisciplinary biotechnology Course, held between 3-6 October and December 1-2 in Trondheim and the [Modelling Living Systems seminar on September 15-16 in Bergen](#).

RRI was also a key topic in several of the Digital Frukost-events during the year.



Workshop on Public Engagement. From the left: Marta Eide (DLN), Kam Sripada (DLN), Giovanni De Grandis (AFINO)



Arnstein's Ladder (1969)
Degrees of Citizen Participation

DLN participated in the **Workshop on Public Engagement**, hosted by AFINO and the Danish Board of Technology (DBT), 19-20 May 2022, in Bergen. Participants from around Norway discussed how public engagement is an intervention in an RRI process. DBT described the wide variety of [methods to engage the public](#) – as well as what is NOT considered real engagement (see e.g., Arnstein's Ladder).

RRI emphasised in Innovation Roadmap project

Responsible Research has been increasingly emphasized as a cross-cutting topic in the Innovation Roadmap project. On February 28, the basis for this roadmap was presented. The report TO BE: Moving the Digital Life Sciences in Norway towards increased innovation - Lessons from international innovation practices was based on 13 case studies from nine countries and examines international practice in supporting research-based innovation and entrepreneurship.

The report underscore how RRI-principles in innovation processes and projects is a key factor in building legitimacy and anchoring of innovation activities in a sustainable manner. The RRI team have participated in the planning and implementation of several of the pilots stemming from the Roadmap with particular focus on the pilot AC1, Investor networks and Impact Investing.



Lab Olympics the 6th Annual Research School Conference

TRAINING AND CAREER DEVELOPMENT - DIGITAL LIFE NORWAY RESEARCH SCHOOL

Science based on convergence in line with the Digital Life mission is challenging, intellectually as well as culturally. It requires that talented young researchers are given opportunities to explore new horizons and embark on challenging scientific and societal problems, perhaps at the risk of failure.

In addition, they will meet the intellectual challenge of scientific work in true transdisciplinary research groups, integrating knowledge across boundaries.

Excellent researcher training and networking through the research school is a main success factor for the entire Digital Life mission.

Promoting transdisciplinary integration

The main goals of the research school are to promote transdisciplinary integration, build a culture for innovation, and create a new collective team spirit among all younger scientists who are connected to digital biotechnology.

An important challenge for the research school is to create a distinct scientific profile and a feeling of belonging and commitment in a large and highly transdisciplinary group of PhD-students, postdocs, and their supervisors. The most important networking activities are PhD-courses, generic courses, and the annual 2-day conference for members.

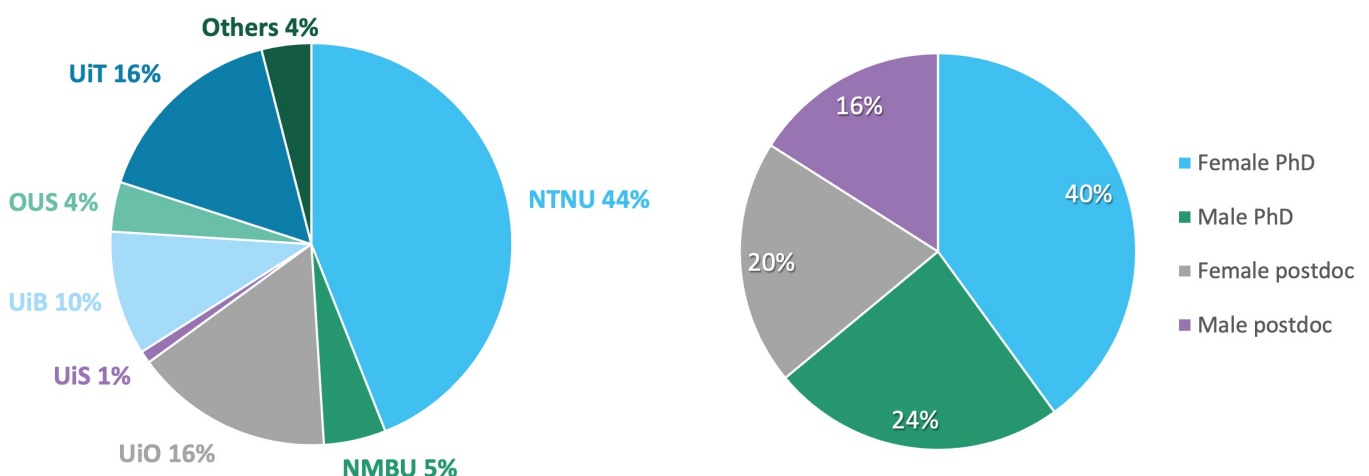
Trying to bring together young researchers with such diverse and transdisciplinary backgrounds is challenging, but in many ways, we have already succeeded in creating fora where PhD-students and post doctors can broaden their horizons and networks. There are good reasons to be optimistic of the Digital Life-concept among young researchers.

Memberships

The research school opened for memberships December 2016, and as of December 2022 has 466 members and >300 alumni. The research school offers an arena for networking and career development to 300 PhD students and 166 post doctors, of which 277 females and 189 males. Our network also includes PhD supervisors and newsletter subscribers.

The members come from a wide variety of scientific fields, from humanities, medical physics, and computer science to more classic disciplines of biotechnology.

MEMBERS OF DLN RESEARCH SCHOOL 2022



Events

The main purpose of the research school is to create a community for PhD students and postdocs within the Digital Life Norway disciplines. This is predominantly pursued through physical events where young researchers can meet and get to know each other, but we also offer a variety of digital courses. In 2022, we organized and supported over 20 events with >260 participants and handed out ~40 travel grants.

[A complete overview of the 2022 events can be found on our website.](#)

The 6th Annual Research School Conference

The annual conference for and by the members of the research school was held at [Voksenåsen Hotel in Oslo from June 13-15th](#). The aim with this conference is to bring together scientists from different backgrounds and places to mingle, learn from each other's experiences, ideas, and aspirations. After troubling corona years, the participants were given a chance to reconnect, make new friends and build future dreams. This year's topics focused on how to establish contacts and a professional network; where to apply for the most suitable funding for our research projects; and how to envision a transition from academia to work in companies.



Networking workshop with Stein Wesenberg at the 6th Annual Research School Conference



Musical surprise opening by Trondheim based student orchestra Strindens Promenade Orchester at Digital Life conference 2022

COMMUNICATION AND THE DIGITAL LIFE NORWAY COMMUNITY

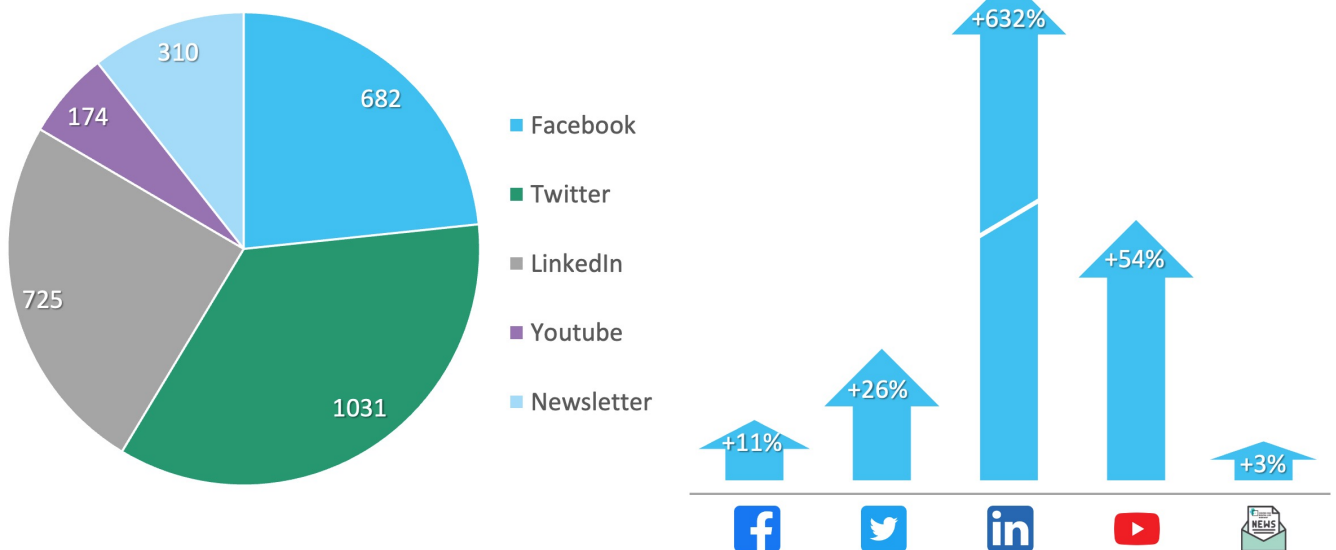
Effective internal and external communication is crucial to reach the goals of Centre for Digital Life Norway. This includes communication between and across the competence hub, the projects, owner institutions and other stakeholders. The Centre also encourage member projects to communicate across disciplines and to make their research accessible to the public through popular science communication.

Monthly newsletters & social media

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

In 2022 we saw an increase in followers and subscribers on all platforms.

SUBSCRIBERS/FOLLOWERS



Digital Life Conference 2022

Centre for Digital Life Norway would like to thank all participants and contributors to the annual Digital Life 2022 conference in Trondheim! This year's theme was how to work transdisciplinary in biotechnology, and we got exposed to many good examples on how this can be done. We also had insightful workshops and a poster session back by popular demand this year. Here is a quick recap of the conference with video recordings of the plenary event.



Digital Life 2022 RECAP

#digitallife2022

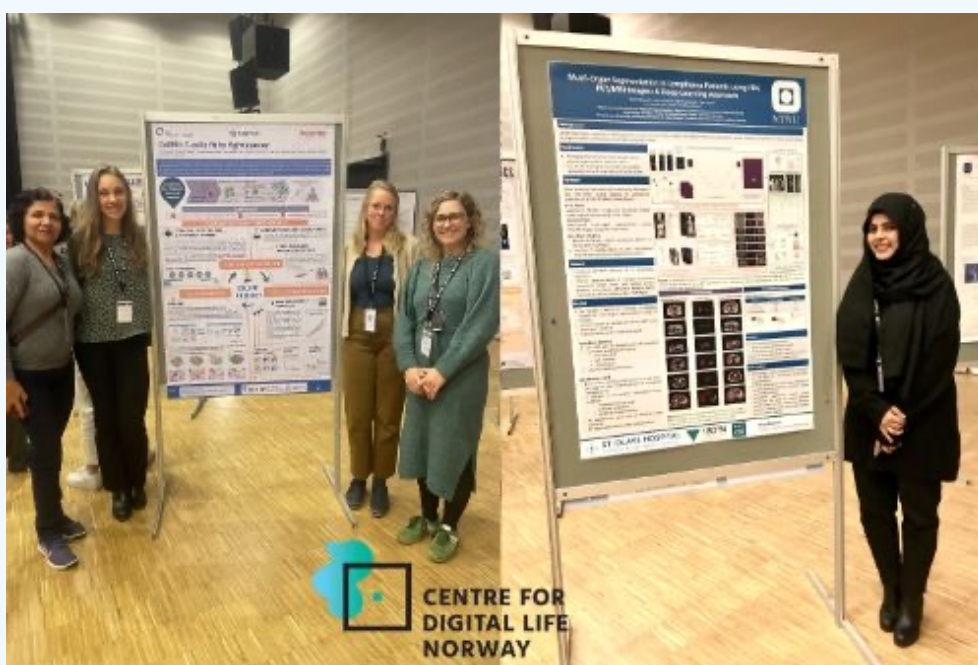


[Please find a summary of the conference and videos of selected presentations](#)

Voters' Choice Poster Award at the Digital Life 2022

For the 2022 Digital Life conference, young researchers again had the opportunity to share their research in a poster session, which returned by popular request. A total of 16 posters were part of the session, and all conference participants could vote for their top posters through an online voting system. Topics ranged from new models for analyzing composition, pressure, and spatial distribution in anatomy; biosensing with nanoparticles; multiomics, modeling, and AI in cancer; and more.

You can [read all the poster abstracts here](#).



We congratulate the joint winners of the Voters' Choice Poster Award at the Digital Life 2022 conference:

[Léa Rosselle PhD](#) (Postdoc at Oslo University Hospital Translational Research Unit) with "CellFit: T cells fit to fight cancer" and [Anum Masood PhD](#) (Postdoc at NTNU MR Physics Group and MR Cancer Group) with "Automated Lymphoma Cancer Detection and Ann-Arbor Staging Using Deep Learning with 18F-FDG PET/MR Images."

Both winners received 5000 NOK to use towards their research.

Forskning for folket! (Science to the people!)

[Popular science](#) helps to increase the participation of more people in society in research and allows them to contribute with their own perspectives.

Centre for Digital Life Norway encourages our member projects to share their research widely and make it understandable for other disciplines and the public in general. This is an important part of working towards the Centre's overall goal to [foster transdisciplinary collaboration and contribute to responsible and sustainable creation of value for Norwegian society](#).

On the evening before the Digital Life 2022 conference kicked-off in October, the Centre organised a [popular science challenge at a public event in Trondheim](#). The challenge was tackled head-on by young researchers from Digital Life Norway member projects.

[Please find a summary and recordings for the presentations below \(in Norwegian\)](#).



From left: Christoffer Hals (DLN), Maria Karoline Andersen (NTNU), Giang-Son Nguyen (SINTEF), Benedicte Garmann-Johnsen (UiO), og Aman S. Chahal (NTNU)

Project videos

The first projects to become members in DLN 2.0 got assistance to make an information video that communicates the project to a broad audience. The project research groups and communications at the DLN worked together to plan and execute the video productions with assistance from professional video production companies (RedAnt and Newslab).



Filming ProstOmics-project at NTNU and St. Olavs hospital

The first projects to become members in DLN 2.0 got assistance to make an information video that communicates the project to a broad audience. The project research groups and communications at the DLN worked together to plan and execute the video productions with assistance from professional video production companies (RedAnt and Newslab).

[You can see the videos on the Digital Life Norway YouTube channel here.](#)

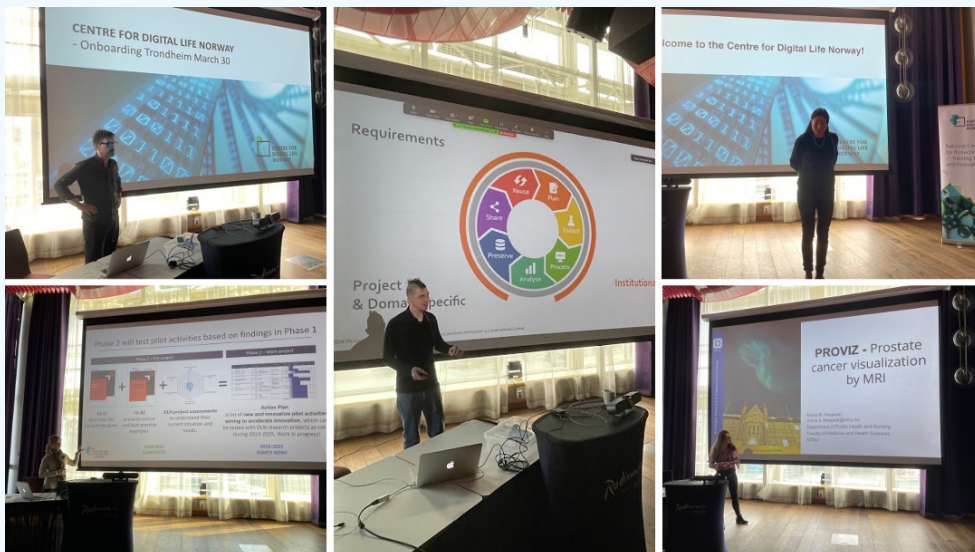
New member projects and onboarding

In 2022 two new exciting projects joined the Centre - [CellFit](#) and [FINALphagy](#).

DLN organized onboarding sessions in Tromsø and Trondheim for the projects that joined in 2021. During these sessions, DLN introduced the new projects to its areas of competence and services. The existing member projects also participated in these sessions, providing an opportunity for both new and existing members to network and mingle.



In February the Digital Life Norway-team launched an onboarding kick-off with two new member projects based at UiT - The Arctic University of Norway. The two projects were [NanoAI](#) and [SOLIS](#)



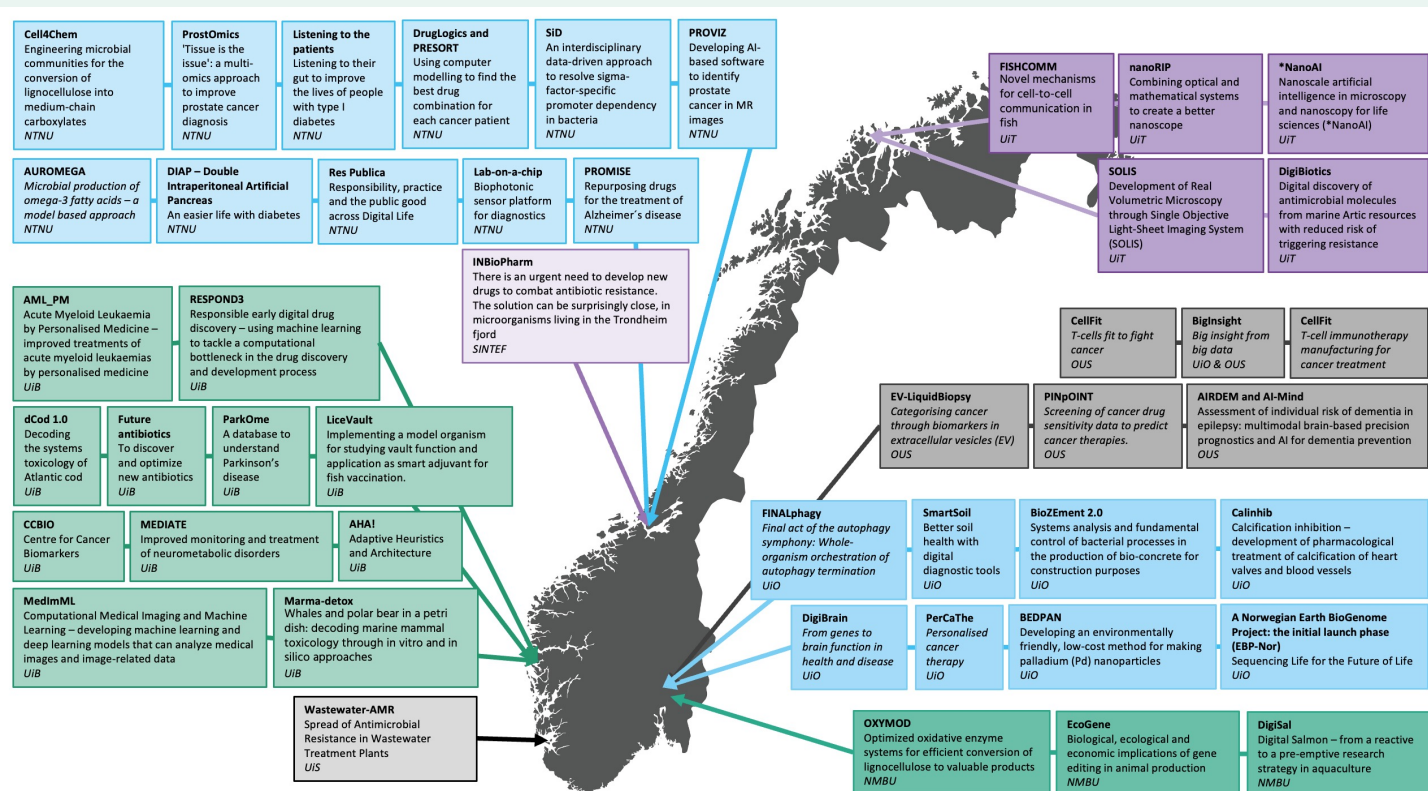
In March the Digital Life Norway team launched an onboarding kick-off with a new member project based at NTNU - [ProstOmics](#).

Projects highlights

The centre has more than 45 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.

Map includes projects added in early 2023. Projects that have passed their completion date remain in the DLN network and are now called “alumni projects.” Both active and alumni projects are shown on this map.

[Click on the map to get full overview of all the projects.](#)



PhD defences

Several PhD candidates in the research projects in the Centre for Digital Life Norway defended their theses in 2022. 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

Karina Dale, UiB

[Mixture effects of environmental contaminants in Atlantic cod \(*Gadus morhua*\) : Combining experimental approaches to study contaminant-induced biological responses](#)

DigiBrain project - From genes to brain function in health and disease

Linn Rødevand, UiO

[Cardiovascular disease risk across psychosocial and genetic factors in severe mental disorders](#)

OXYMOD - Optimized oxidative enzyme systems for efficient conversion of lignocellulose to valuable products

Anton Stepnov, NMBU

[An investigation of the interplay between in situ hydrogen peroxide production and catalytic efficiency in lytic polysaccharide monooxygenase reactions](#)

DigiBiotics - Digital discovery of antimicrobial molecules from marine Arctic resources with reduced risk of triggering resistance

Marte Jenssen, UiT, DLN Junior Resource Group

[Bioprospecting of marine microorganisms for the discovery of antibacterial compounds - Isolation, structure elucidation and bioactivity assessment of marine microbial natural products](#)

PROVIZ - Prostate cancer visualization by MRI

Maria Bårdsen Hesjedal, NTNU, DLN Junior Resource Group

[Interdisciplinarity & Transdisciplinarity in Practice - A Study of an Attempt of Transforming Biotechnology Research](#)

Genome-scale metabolic modeling of metabolism in *Bacillus safensis*

Emil Karlsen, NTNU, DLN Junior Resource Group

[Theoretical and applied aspects of genome-scale metabolic modeling](#)

DigiBiotics - Digital discovery of antimicrobial molecules from marine Arctic resources with reduced risk of triggering resistance.

Eric Juskewitz, UiT, DLN Junior Resource Group

[Antimicrobial activity and mode of action - Examples from natural products, peptides, and peptidomimetics](#)

BEDPAN - Developing an environmentally friendly, low-cost method for making palladium (Pd) nanoparticles

Nadeem Joudeh, UiO

[Escherichia coli-mediated palladium nanoparticle synthesis](#)

2022 AT A GLANCE

February 10.-14.
NBS Contact Meeting

April 4.
Data Management Planning
workshop for Life Science
Projects

May 9.
Data management in practice with
FAIRDOM-SEEK

June 13.-15.
6th conference of Digital Life Norway Research School

June 14.
FAIR Data Management in Life
Sciences

June 20.
SUMMER SCHOOL: Collaborative
scientific software
development 2022

August 18.
Arendalsuka - Hvordan skal Norge
fremme mer innovasjon fra
bioteknologiforskning?

August 26.
Digital Frukost: Next
generation bioinformatics

September 1.-2.
The DLN and AFINO Policy
Forum

September 7.-9.
AFINO and DLN Summer School:
"Engaging in critical research
within institutions"

September 15.-16.
Modelling Living Systems - From
foundational problems to
applications

September 26.
Life Science Data Management:
Planning workshop

September 28.-30.
Norwegian Bioinformatics Days
2022

September 28.-30.
Nordic Life Science Days

September 30.
Digital Frukost/
Forskningsdagene: Can we find
the solution to the antibiotic
resistance crisis in the ocean?

October 3. & December 2.
BT8121 - Transdisciplinary
biotechnology - a Digital Life
Norway course part 1

October 17.
Data management in practice with
FAIRDOM-SEEK

October 20.
Volterra Lecture: Lise Bitsch PhD -
"Public engagement work in
the Human Brain Project"

October 19.
Public event:
Forskning for folket – unge
forskere forteller!

October 20.-21.
Digital Life Conference 2022

October 28.
Digital Frukost/Open Access
Week: The Rise of the Data
Stewards

November 25.
Digital Frukost: AI and
responsible research and
innovation in health decision-
making

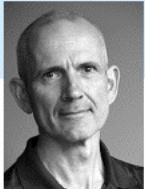
December 5.-6.
Software Carpentry course in
research computing skills:
Shell, R for reproducible
analysis, Git

[See all 2022 events in the event calendar](#)

The People

The Board: Members from the seven host institutions, NTNU, UiO, UiB, NMBU, OUS, SINTEF and UiT, in addition to industry representation and the Research Council of Norway.

DLN Board



Finn-Eirik Johansen
Chairman of the Board
UiO



Øyvind Weiby Gregersen
Board Member
NTNU



Marit Bakke
Board Member
UiB



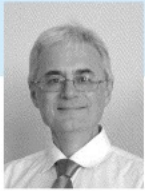
Sigrid Gåseidnes
Board Member
NMBU



Peder Heyerdahl Utne
Board Member
OUS



Eli Aamot
Board Member
SINTEF



Arne Smalås
Board Member
UiT



Emilie Lasson
Board Member
NorthSea Therapeutics B.V.



Tom Pike
Board Member
Life Science
Industry Professional



Ola Engkvist
Board Member
AstraZeneca



Elisabeth Gulbrandsen
Board Observer
Research Council of Norway



The Expert Task Force is part of the The Centre for Digital Life Norway (DLN) competence hub.

Expert Task Force



Trygve Brautaset
Scientific Director
Professor NTNU



Kam Sripada
Centre Manager
NTNU



Olav Haraldseth
Professor NTNU



Roger Strand
Professor UiB



Hanne Haslene-Hox
Research Scientist
SINTEF



Kjetill S. Jakobsen
Professor UiO



Marianne Fyhn
Professor UiO



Janna Saarela
Director NCMM UiO



Vessela N. Kristensen
Professor UiO



Arnaldo Frigessi
Professor UiO



Inge Jonassen
Professor UiB



Camilla Krakstad
Professor UiB



Susanna Röblitz
Professor UiB



Phillip Pope
Ass. Professor NMBU



Jeanette H. Andersen
Professor UiT



The Junior Resource Group (JRG) is a voice of young researchers in digital biotechnology in Norway. Its members provide advice and feedback that help shape DLN's activities to reach PhD students, post-docs, and other younger researchers.

In 2022, as three previous JRG members moved ahead in their careers, we invited applications to join the JRG and were happy to select four engaged younger researchers from around Norway.

Together with continuing JRG members Maria Bårdsen Hesjedal and Emil Karlsen, the JRG members bring expertise on diverse research topics, ranging from zebrafish models of pediatric brain cancer, to socio-economic aspects of CRISPR in aquaculture, pharmacological treatment of heart valve calcification, the human muscle transcriptome, transdisciplinarity in biotechnology, and advanced data analysis in the life sciences.

They have all been active participants in DLN and the DLN Research School. Younger researchers should feel free to reach out to the JRG with questions or feedback.

Junior Resource Group



Maria Hesjedal
PhD Student NTNU



Emil Karlsen
PhD Student NTNU



Arsenii Zabirnyk
Postdoc OUS/UiO



Nancy Saana Banono
Postdoc UiO



Chidimma Phoebe Echebiri
PhD Student INN



Olga Mikhailova
Postdoc NMBU

The Digital Life Norway (DLN) International Advisory Committee (IAC) is a stakeholder panel consisting of internationally renowned experts in fields of high relevance to the DLN mission, with a proven track record in managing large and complex academic structures. The IAC serves as consultants and advisors to the DLN competence hub by reviewing the progress of DLN 2.0 with an international lens. In addition, the IAC contributes independent recommendations on academic matters, DLN's internal operations, and DLN's role as a national network.

International Advisory Committee



Dr. Dominique Chu
University of Kent



Professor Ulrike Felt
University of Vienna

The operational management team of the Centre for Digital Life Norway (DLN).

The team is part of the [centre's competence hub](#) and consists of a centre manager and senior advisers employed at NTNU, UiO and UiB.

Operational Management Team



Kam Sripada
Centre Manager
Center Management
NTNU



Elisabeth Hyldbakk
Administrative Coordinator
Center Management
NTNU



Korbinian Bösl
Senior Engineer
Data and Models
UiB



Marta Eide
Senior Adviser
Data and Models
UiB



Rosalie Zwiggelaar
Senior Adviser
Training and Career
Development
NTNU



Christoffer Hals
Senior Adviser
Communications
UiO



Alexandra Patriksson
Senior Adviser
Innovation and Industry
Involvement
UiO



Randi Elisabeth Taxt
Senior Adviser
Innovation and Industry
Involvement
UiO



Anders Braarud Hanssen
Senior Adviser
Responsible Research and
Innovation
NTNU



Anamika Chatterjee
Senior Adviser
Responsible Research and
Innovation
NTNU

Follow us & sign up for our DLN
and Research School
[newsletters!](#)



@DigitaltLiv



@Centre for Digital Life Norway



@DigitaltLifeNorway



@DigitaltLifeNorway



UNIVERSITY
OF OSLO



UNIVERSITY OF BERGEN



Oslo
universitetssykehus



Norwegian University
of Life Sciences



UiT The Arctic University of Norway