



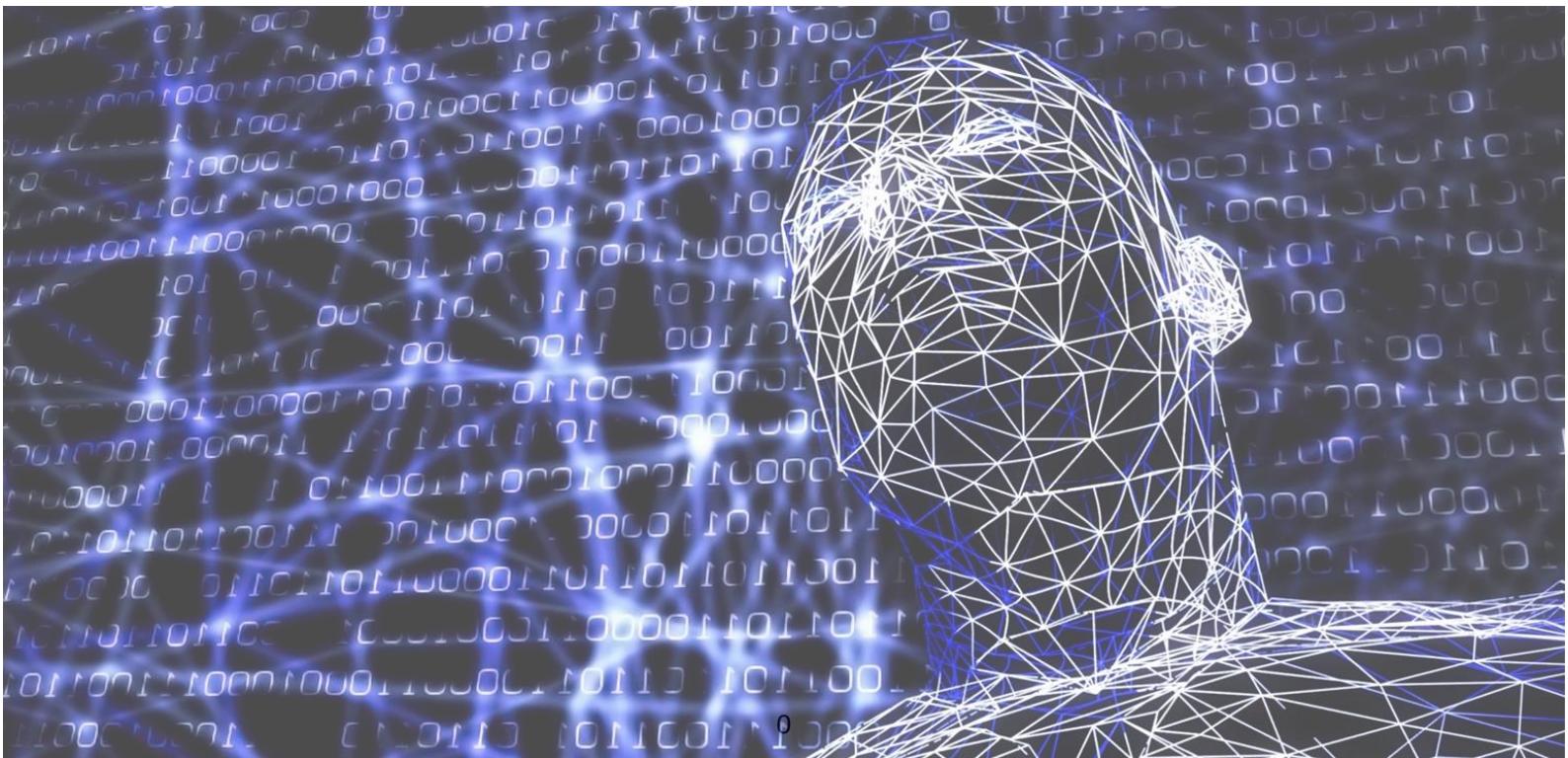
Strategic Workshop and Awareness Event

"Systems Medicine in Norway - From data to clinical practice"

REPORT D6.4 / T6.3



26 September 2019, 9:00 a.m. – 5.30 p.m.
@ Park Inn Hotel, Gardermoen, Norway



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Awareness event in Norway

The awareness even was organised in Oslo the 26th of September 2019.

Aims of the event

The main objective of this symposium was to connect people and groups working within different areas of relevance to systems medicine to share information, find new partners, solve problems and to be inspired to apply for funding from future calls. It was also an aim to give them some insight into why they should embrace patient organisations and what benefit it could give them.

The secondary objectives of the day were to leave the participants with the following:

- Updated information regarding relevant national calls and EU-calls
- A better understanding of what is happening internationally within this field
- A larger network with potential collaboration partners
- Contribute to a common understanding of how to develop the field further

The conference was arranged by [The Research Council of Norway](#) and [Centre for Digital Life Norway](#). The Centre for Digital Life Norway is a national centre for biotechnology education, research, and innovation within digital biotechnology. One of the goals for the organizer was to get input from Norwegian research environments with regards to what needs to be in place to advance this field further.

Target audience

The primary target audience for this symposium were researchers working in universities or institutes, clinicians who are connected to research activities and representatives from companies. The target audience all work within systems medicine or want to employ this methodology.

Reporting rationale

This report is part of ERACoSysMed Task 6.3 (Additional activities to create awareness of systems medicine) and refers to Deliverable D6.4.

Agenda for the day

The event was held in Oslo Norway, Park Inn Hotel Oslo Airport the 26th September 2020.

Agenda

09:00 - 09:30 Registration, Mingling and Coffee

09:30 - 09:45 Welcome

09:45 - 10:00 Future Funding Opportunities

10:00 - 10:30 Setting the Stage - Systems Medicine in a Setting

- Professor Rod Hose - The University of Sheffield, Professor of Computational Biomechanics

10:30 - 11:15 Competence and Message Arena

- "What are my challenges, what can I offer and what do I need in future projects?"

11:15 - 11:45 Towards Personalized Computer Simulations of Cancer Therapy

- Alvaro Köhn-Luque

11:45 - 12:00 Mathematical Models and Algorithms for Data Fusion

- Evrim Acar - Simula

12:00 - 13:00 LUNCH

13:00 - 14:00 Simulating Project Constructions

- Participants are divided into groups and will make a fictive plan for an optimal project.

14:00 - 14:30 Systems Medicine - From a clinician's point of view

- Hanne Flinstad Harbo

14:30 - 14:45 A Novel Probabilistic Vision for Combining Genomic Data

- Valeria Vitelli - University of Oslo.

14:45 - 15:00 The Benefits of including Patient Organisations

15:00 - 15:15 Summary and Conclusion

15:15 - 15:45 Coffee and Cakes

- Posters from group session are displayed

Summary of the speakers

For the audience to receive relevant information, we chose speakers that would cover a wide range of subjects. All the speakers and their background is listed below.



Rod Hose

Professor of Computational Biomechanics, , The University of Sheffield

Rod works with the development of methods and workflows for the computational analysis of (primarily) cardiovascular systems, and in their translation to clinical application. He is involved in all aspects of the process, from clinical data collection and management through image processing to the building of detailed three dimensional models of the vasculature and on to determination of appropriate boundary conditions, numerical solution and data reduction. Rod is also involved in the development of the European Commission's Virtual Physiological Human initiative.



Alvaro Köhn-Luque

Researcher , Department of Biostatistics at the Faculty of Medicine at University of Oslo

Alvaro Köhn-Luque is a member of the Center for Research-based Innovation (SFI) Big Insight and works in the Department of Biostatistics at the Faculty of Medicine at University of Oslo. His experience includes mathematical modeling and simulation of complex processes in biology. The object of his research is to study drug response in cancer using mathematics and computer simulations. The goal is to run personalized computer simulations able to predict the effect of the therapy in a given patient. The vision is that this type of personalised simulations will assist oncologists in the future to decide the most appropriate therapy, dose and schedule for each patient.



Evrim Acar

Chief Research Scientist/Research Professor, Simula

We develop data fusion methods to jointly analyze data from multiple sources and extract interpretable patterns with the potential to be used as biomarkers. We mainly focus on two domains: (i) joint analysis of neuroimaging signals (multi-channel electroencephalography (EEG) and functional Magnetic Resonance Imaging (fMRI)) to discover diagnostic biomarkers for psychiatric diseases, and (ii) joint analysis of metabolomics measurements from multiple platforms to discover metabolic biomarkers for various diseases and different types of diets.



Hanne Flinstad Harbo

Professor , The Department of Neurology, the Department of Clinical Medicine at the University of Oslo

Hanne Flinstad Harbo is a professor at the Department of Neurology, the Department of Clinical Medicine at the University of Oslo and the head of department and chief physician at the Neurological Department, the Neurological Clinic (NVR), Oslo University Hospital. Harbo works mostly clinically and researchally with the investigation and treatment of inflammatory diseases of the central nervous system, especially multiple sclerosis (MS). She is, among other things, a work pack leader in the EU-Horizon 2020-funded project "MultipleMS", and the Biotek 2021 project "Sys4MS"

**Valeria Vitelli - University of Oslo.**

Associate Professor in Biostatistics at the Oslo Center for Biostatistics and Epidemiology,
Department of Biostatistics, University of Oslo

Valeria's research experience spans from the analysis of high-dimensional and complex data to cancer genomics. The research project aims at developing novel statistical methods capable of combining heterogeneous data and/or studies in the field of cancer genomics. Analysing the data jointly is crucial for gaining power, for enhancing the solidity and reproducibility of results, and possibly for studying cancer in a novel perspective. The ultimate goal is to account for the different sources of uncertainty in the data, and to jointly propagate them in the results. Our vision is that all data types inform on the disease in different and complementary ways, and in the digital medicine revolution these unified statistical techniques will be crucial for personalized decisions.

**Ole Alexander Opdalshei**

Secretary General at the Norwegian Cancer Society (NSC)

NSC have 116 000 members, 27 000 volunteers and 190 employees, who are all dedicated to promoting cancer causes. NSC works continuously to improve society's attitude to the prevention and treatment of cancer. They fight cancer locally, nationally and globally through research and preventive measures, information, support, advice and lobbying.

**Lars Petter Korsnes**

Senior Adviser and National Contact Point at The Research Council of Norway

Lars works with innovation and value creation in the health industry and works as a National Contact Point at The Research Council of Norway. He knows the research and innovation system well and can give a good guide to relevant EU-calls.

Link to the presentations

Our partner "Digital Life Norway" was responsible for filming the presentations and made them publicly available on their YouTube channel. There were some issues with the sound at the venue, so some presentations have not been made public.

Rod Hose: <https://www.youtube.com/watch?v=yHBzolpKe7Y>

Alvaro Köhn-Luque: <https://www.youtube.com/watch?v=oh2uXK3aR1A>

Hanne Flinstad Harbo: <https://www.youtube.com/watch?v=uMtYI8XBgsQ>

Ole Alexander Opdalshei: <https://www.youtube.com/watch?v=ZCI1N-vG160>

Lars Petter Korsnes: <https://www.youtube.com/watch?v=0ILpNN5bYX8>

Summary of the event

Awareness and networking

One of the main objectives of the event was to encourage new collaborations between research groups, clinicians and companies. Due to this, all the participants were pre-grouped to ensure that the members of the groups had diverse backgrounds.

The networking sessions were distributed in between the talks to make the day more interactive. Before lunch there was a small session where members of the groups would discuss their main challenges and present to the other groups what competence they lack in relation to their future projects. In the session after lunch, they were challenged to create a new "fictive" project based on the resources they had in the group.

Information about upcoming calls

Since there were no more calls in this initiative, the National Contact Point (NCP) at the Research Council of Norway, Lars Petter Korsnes, held a presentation about upcoming calls in the EU, which may be of interest to the participants and encourage new collaboration initiatives. The focus was on Horizon 2020 and Horizon Europe. It was greatly encouraged to apply for projects under some of the calls referred to as Norway needs to be better represented.

Information from the patient organisations

The Norwegian Cancer Society, represented by Ole Alexander Opdalshei, introduced what needs and challenges the cancer patients have regarding treatment and a life quality. He emphasized how important it is to collaborate closely with patient organizations both to be able to put your research area on the political agenda and to make sure that you have the right goals that are also aligned with the needs from the different stakeholders.

Patient involvement in research projects can give added insight into the project and help the project to tailor their information so that it is easier to recruit patients to clinical studies. There is a large report from National Institute for Health Research (NHS) called [INVOLVE](#), where they explored the impact of public involvement in health and social care research. The report concluded that public involvement increases patient recruitment, benefited the qualitative research and outcome measures.

Presentations

The presenters had presentations based upon what kind of research they are involved with. They were also challenged to tell what kind of challenges they have met, how they have solved them and what kind of needs they have in their research.

The following is some of the elements that were presented:

- Systems medicine is an enabling technology where the use of the tools varies from medical technology to cancer diagnostics.
- Many of the tools that are being developed for these projects can be used for other projects, but there is a lack both of coordination and communication in the field across the different application areas.

- There are amazing databases out there, but sometimes it is difficult to get access to them. Some hospitals spent decades collecting some the information, so they either want to be involved in how these data are used or receive some kind of renumeration.
- Systems medicine is an amazing tool to compare data across different sources and it is possible to merge the data in such a way that you get relevant statistics. It is possible to find correlations between MRI-scans and genomic markers, even if the input data is very different.
- Systems medicine can learn from other industries, such as the aviation industry, many of the mechanistic models that are already developed, can be applied to medical research.
- A systems medicine project can be strengthened if you are conscient about putting together a multi-disciplinary team.
- Systems medicine is a good tool to run predictions even before you give a patient any medication.
- The researchers want to have more medical doctors connected to their project, but these are often very hard to get a hold of since they are very busy.
- The General Data Protection Regulation (GDPR) has been a challenge, but many of the EU projects have now made a good plan for how to handle this.

In general, the presentations were informative and gave the audience a good introduction to the different fields in systems medicine, also what challenges they are facing and what kind of collaboration they are looking for.

Evaluation

This evaluation is based on talks with the participants and the feedback that was received after the conference.

Target audience

There were in total 64 participants, this includes the speakers and the administration. Out of these, 10 of them were either presenting or involved in arranging the conference.

More companies attended than we had expected, but also fewer clinicians, to be able to mobilize these segments you need to show that it is really worth their time.

Looking into the reason why the companies attended, we received feedback that they wanted to find out what was "cutting edge" research within this exciting field and that they wanted to see if they could initiate a collaboration with a good research group.

Type of participants	Number
Company	13
Research Institutions	47
Other	4

Aims of the event

We had originally listed some objectives for the event so that we could use these to look back and see if we were able to reach these.

1. Updated information regarding relevant national calls and EU-calls
 - All the participants received updated information regarding upcoming EU-calls and used this information for the networking sessions.
2. A better understanding of what is happening internationally within this field
 - Many of our speakers had international collaborations and presented this in a good way to the audience. Rod Hose works from the UK and is involved in many EU-projects and Hanne Flinstad Harbo is part of a large project in ERACoSysMed looking at Multiple sclerosis.
3. A larger network with potential collaboration partners
 - Systems medicine is a collective term for many different areas and many different tools are used. Many of the participants attending this conference had never met each other.
4. Contribute to a common understanding of how to develop the field further
 - Many of the participants agreed that to be able to move this field further there needs to be better collaboration and communication within the systems medicine community in Norway.

Suggested topics for future events

Many of the participants gave feedback that one of the strengths of this conference was the Cross-disciplinary involvement. When there is a conference, the focus is normally within a thematic area and not on the tools enabling the research and how to learn from someone who works with completely different things. As an example, a project that have a lot of data have specific demands in regard to collaborative online solutions and these must often be developed as a part of the project. These kinds of tools could be shared to save time and costs. Another example is the algorithms used to find patterns in genomic data, these can also be applied to find statistical relevance in medical images.

It was suggested that a topic for an upcoming event could have more focus on collaboration between different actors, such as different thematic areas and companies and patient organisations. It was also a clear wish to have focus on how to get funding for the different projects.

Conclusion

The awareness event was a good pilot for how to encourage cross-disciplinary work and how to harvest benefits from working with partners you normally never would approach. The presentation form the Patient organisation also gave some new ideas on how and why to include patient organisations.

Challenges presented by the researchers were access to clinicians and companies, access to patients and relevant clinical databases and a lack of general tools for online collaboration with large datasets and many partners. It also became clear from the event that there is a lack of focus on the development of tools for Systems Medicine that can be used across disciplines.