



NORMENT
Norwegian Centre for
Mental Disorders Research



NORMENT

Annual Report 2018



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Leader's Comments

We have now entered the second phase of NORMENT and can profit from the new organization and welcome our new partner, Haukeland University Hospital, to the NORMENT Centre. We are excited to work together with new team members in Bergen. The first period with the new Core Researchers, Lars T. Westlye and Erik Johnsen, has been very promising. In addition, I am very pleased that we now have seven additional scientists as Group Leaders at the Centre. We can already now see the effect on the research activity and initiation of new projects.

In the next years, we have a unique opportunity to make important discoveries in the field of severe mental illness. We will make sure that all our researchers are able to unleash their potential and contribute to the core research goals of NORMENT, and bring the science to the next level. We are also all very grateful to the Core Researchers who left the Centre in 2018, Kenneth Hugdahl and Kjetil Sundet. They have done a tremendous job in building the Centre, and I will use this opportunity to thank them again.

The NORMENT research activities build on integration of a solid infrastructure and organization with novel research ideas. We need to make sure that we have a flexible organization that can support the ever changing needs of frontline research projects. That is why we have reorganised our Core Resource Units (CRU), to have an efficient infrastructure meeting the demands of the researchers for state of the art methodology. Without the necessary support in manpower and equipment, there is not much value in creative ideas and high risk projects. With a constant self-evaluation we will continue to focus on the most promising projects, and develop the organization to meet the demands.

We continued our strong scientific production in 2018. NORMENT researchers were involved in several important discoveries, and we have a series of publications in the best journals in our field. This shows that we have managed the balance between infrastructure and novel ideas, and provided excellent researchers with necessary support



leading to frontline science. The Annual Report gives a detailed overview of the main discoveries. In total, we published 25 publications in journals with impact factors above 10. This year we had even more high impact papers where NORMENT scientists were responsible (first author or senior authors).

The quality of the work was further underscored by the series of awards our researchers received in 2018. In parallel, we were highly successful in obtaining grants, both from national and international funding agencies. I would like to highlight the ERC Starting Grant to Core Researcher Lars T. Westlye. This is very motivating for everyone at NORMENT, and shows the opportunities within the Centre. We will continue to support young talents in developing their careers through competitive grant applications.

We also observed the effect of increasing the focus on dissemination activities. NORMENT researchers were present at "Arendalsuka" to promote research on mental illness, we organized a seminar on bipolar disorders for users and lay people, and we hosted an international research meeting in mental illness with key speakers from leading groups around the world.

Personally, I was also very pleased to receive the Honorary Award from the Bergesen Foundation in 2018. This was a great honour for me, but it was also a recognition of the work we all are doing at NORMENT to generate more knowledge about mental illness. There is a large need for more knowledge, for developing better treatment and prevention regimens, but also for reducing stigma.

Thanks to the whole NORMENT team for their efforts in 2018. It is a pleasure and privilege to be the Director of NORMENT with such an outstanding team of people. I look forward to a fruitful and collaborative new year at the Centre, and I am convinced that 2019 will bring more exciting discoveries.

A handwritten signature in blue ink, which appears to read "Ole A. Andreassen".

Ole A. Andreassen
Centre Director

Scientific Highlights 2018

Our research resulted in many exciting and important findings in 2018, of which several were published in prestigious scientific journals with NORMENT researchers as lead authors.

Using brain imaging, **Dag Alnæs** and colleagues demonstrated that alterations of specific nerve fibers within frontal and temporal regions of the brain of children and adolescents may increase the risk of mental illness later in life (JAMA Psychiatry).

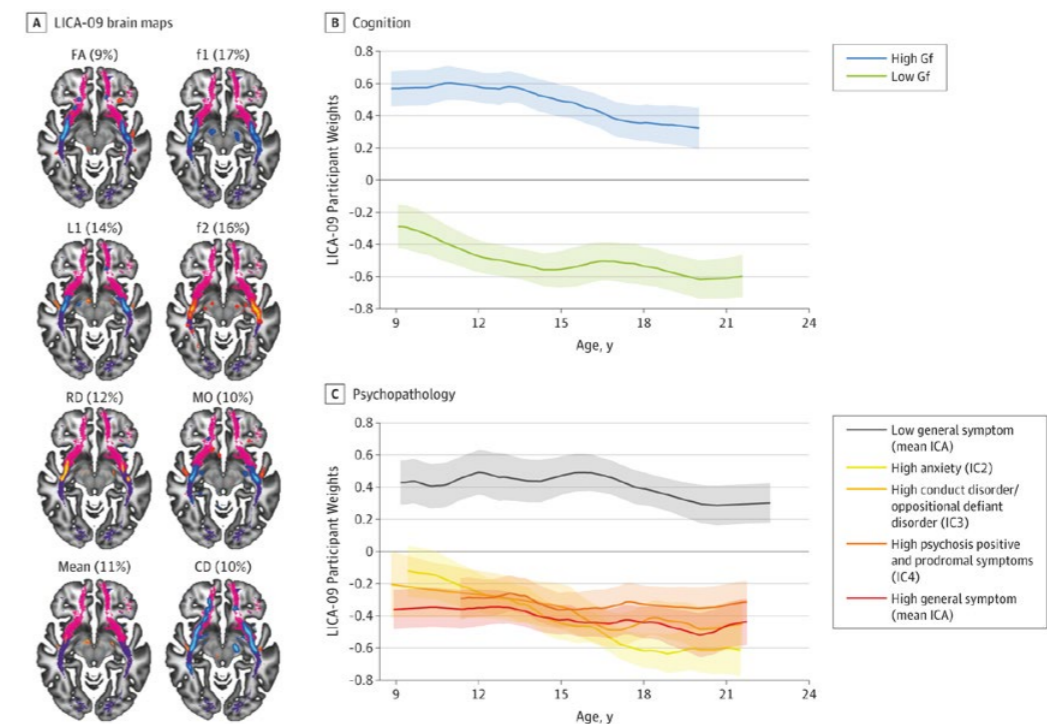
A study by **Ida Sønderby** and collaborators from NORMENT and the ENIGMA Consortium revealed that people with a specific genetic variant have changes in the brain that depend on the number of gene copies in the relevant brain region (Molecular Psychiatry).

Dennis van der Meer and co-workers reported that some genetic variants are associated with the volume of specific areas of the brain structure hippocampus which is involved in memory and altered in mental illness (Molecular Psychiatry).

Through international collaborations, a number of NORMENT researchers were also involved in discoveries of more risk gene variants in schizophrenia (Pardinas et al., Nature Genetics), cognition (Davies et al., Nature Communications), and ADHD (Demontis et al., Nature Genetics), as well as genetic overlap between different brain disorders (Brainstorm Consortium, Science) and brain imaging findings in schizophrenia and bipolar disorder (Wolfers et al., Molecular Psychiatry; Nunes et al., Molecular Psychiatry; van Erp et al., Biological Psychiatry).

Further, several researchers at the Centre identified clinical characteristics that may be useful for further prediction of illness course, such as symptoms (Lyngstad et al., Gardsjord et al., Kjelby et al.), cognitive functions (Demmo et al., Vaskinn et al.), immune factors (Hoseth et al., Fathian et al.), adverse life events (Aas et al., Bless et al.), and medication effects (Gjerde et al.).

For a complete list of NORMENT publications in 2018, [see page 78](#).



Alnæs et al., 2018

Prizes and Awards



Honorary Award to Ole A. Andreassen

NORMENT's Director, professor Ole A. Andreassen, received the [Honorary Award](#) from the Bergesen Foundation for his outstanding research on psychotic disorders. The prize was awarded during a formal ceremony at the University of Oslo on October 04, 2018.

Andreassen received the prize for his contribution within the field of mental disorders research, and also for his role as Director of NORMENT. In their evaluation, the committee emphasized that Andreassen has created a strong and multi-disciplinary research environment through the Centre, and that he has succeeded in combining different scientific and methodological approaches in his research. Further, Andreassen is among the most publishing researchers in Norway, with a number of publications in the most prestigious journals in the field, and has an extensive collaboration with leading research environments both nationally and abroad.

The award included 2 million NOK to be used on further research. In addition, Andreassen received 150.000 NOK as a personal recognition and a statuette by the Norwegian artist Per Ung.

Prize for Outstanding Research to Lars T. Westlye

Associate professor Lars T. Westlye received the [Early Career Award](#) from Oslo University Hospital on June 08, 2018. This prize is awarded yearly to promising research talents at the hospital, and the prize consisting of 150.000 NOK is to be used on research.

The committee stated that Westlye has been most productive having published more than 150 original scientific articles positioned in high profile journals. His research is highly innovative, recently illustrated by discoveries of brain imaging markers of mental illness. For three years in a row, Westlye's research group has been awarded the prize for outstanding scientific paper from Oslo University Hospital.



Young Researcher Award to Torgeir Moberget

Postdoctoral fellow Torgeir Moberget received the [Young Researcher Award 2018](#) from the Fulbright Norway Foundation on June 04, 2018, for his paper on the role of the cerebellum in schizophrenia. The prize is awarded yearly to the best scientific article published by a young researcher who is or has been a Fulbright scholar. Moberget was a scholar at the University of California, Berkeley, USA, in 2011-2012.

The prize-winning paper, "Cerebellar volume and cerebello-cerebral structural covariance in schizophrenia: a multisite mega-analysis of 983 patients and 1349 healthy controls", was published in *Molecular Psychiatry* in 2017, and is the largest brain imaging study to date on the cerebellum in schizophrenia, including brain scans from 2300 participants across 14 international sites. Moberget and collaborators documented that the cerebellum is among the brain regions with the strongest and most consistent differences in schizophrenia. On a group level, patients had smaller cerebellar volumes compared with healthy individuals.



Prize for Outstanding Scientific Paper to Olav B. Smeland

Researcher Olav B. Smeland was awarded the [Prize for Outstanding Scientific Paper](#) published during the first half-year of 2017 from Oslo University Hospital on May 25, 2018. The prize is awarded every half-year to stimulate excellent research and draw attention to the hospital's research activity, and includes 50.000 NOK to be used on research.

In the paper "Identification of genetic loci jointly influencing schizophrenia risk and the cognitive traits of verbal-numerical reasoning" Smeland and co-authors analyzed genome-wide association studies in more than 250.000 individuals, and found that 21 genomic regions were shared between schizophrenia and cognitive traits. The paper was published in *JAMA Psychiatry*.

Another scientific paper by Smeland and colleagues, "Identification of genetic loci shared between schizophrenia and the Big Five personality traits", was one of the top 100 read papers for *Scientific Reports* in 2017, which was announced by Springer Nature, London, on April 28, 2018.



Other awards

Postdoctoral fellow **Jaroslav Rokicki** received the Biological Poster Presentation Award at the Neuronus 2018 IBRO Neuroscience Forum in Krakow, Poland, on April 22, 2018, for his poster "Gene expression in various brain disorders and brains". In this study, Rokicki and colleagues investigated how genes involved in schizophrenia, ADHD and Alzheimer's disease are expressed in the brain.

Researcher **Tobias Kaufmann** received the Travel Fellowship Award from The Society for Biological Psychiatry in New York on May 11, 2018.

PhD student **Eirik Kjelby** received the Award for Best Research Presentation from the Norwegian Psychiatric Association at Psykiatriveka in Bergen on March 13, 2018. The title of the presentation was "Trajectories of depressive symptoms in the acute phase of psychosis: Implications for treatment".

About the Centre



The Norwegian Centre for Mental Disorders Research (NORMENT) is a research centre focusing on understanding the causes and mechanisms underlying severe mental illness. The goal is to better understand why some people develop psychotic symptoms (perceptual disturbances, hallucinations, delusions) and mood disturbances (depression, manic episodes). Ultimately, the hope is that by understanding more about how and why mental illness develops we can contribute to increase the quality of prevention and treatment.

NORMENT was established as a Norwegian Centre of Excellence (CoE) in July 2013, with a 10-year CoE grant from the Research Council of Norway, as well as being funded by several other institutions.

The Centre is based on collaboration between the University of Oslo (host institution), the University of Bergen, Oslo University Hospital, and Haukeland University Hospital. The research on severe mental illness has a long history both in Oslo and Bergen, and is based on many years of collaboration across the current NORMENT sites.

In Oslo, the main research project preceding the Centre of Excellence was a network project called the “Thematically Organized Psychosis” (TOP) study, a thematic effort focused on psychotic disorders. The term “TOP” is still used about the main study protocol at the Centre, in which a large number of people have participated over the years.

In 2018, more than 200 people with various professional backgrounds such as Medicine, Psychology, Biology, Neuroscience, Mathematics, Statistics, Engineering, and Administration were involved at NORMENT, either as employees or affiliated to the Centre.

The research at NORMENT is being carried out in 15 research groups. The main research topics include Genetics (genetic susceptibility and heritability), Brain Imaging (brain structure and function), Outcome Prediction (estimation of illness course and outcome), and Clinical Intervention (test out new treatment). Most if not all research activities depend on a tight collaboration and efficient use of resources across different research groups and scientific disciplines.

An important aim is to create a synergy effect where ideas, knowledge, and competence at the Centre as a whole become greater than its individual components. Using a “vertical synergy” approach, severe mental illnesses are studied across different levels and by combining different methods, to get the most complete picture of mechanisms involved in these complex disorders.



Most of NORMENT’s research is made possible thanks to a large growing database where several thousand participants, both people with mental illness and healthy individuals, have generously volunteered to take part in extensive and time-consuming clinical assessments, neuropsychological testing, and brain imaging. Inclusion of new participants into the studies represents a major activity at the Centre, also thanks to state-of-the-art facilities and an outstanding team of technical and administrative support personnel. NORMENT also has a focus on user involvement and has an active User Council and an employed user representative that give valuable perspectives and input.

The last years, NORMENT has contributed to a series of important discoveries which have been published in recognized international scientific journals such as Science, Nature Genetics, JAMA Psychiatry, Molecular Psychiatry, Biological Psychiatry, and Schizophrenia Bulletin. NORMENT has so far:

- been involved in discoveries of new gene variants associated with severe mental illness, including a large international study reporting over 100 gene variants related to schizophrenia
- gained new knowledge about the immune system and related genes in mental illness
- developed novel and promising statistical tools to study mental disorders
- determined that complications before or during birth may affect brain development and play an important role in psychiatric illness
- identified gene variants related to specific regions and properties of the brain, including the hippocampus and fibre tracts
- detected how brain connections evolve during development and are sensitive to mental health
- detected patterns of brain changes in schizophrenia, including the cerebellum
- identified factors affecting illness progress and outcome, such as childhood trauma and its interaction with genes
- shown that cannabis use reduces the age of onset in bipolar disorder

In the years to come, the research at NORMENT will particularly focus on immune factors and neuronal processes, based on the discoveries of new risk genes for schizophrenia and bipolar disorder. One promising new area of research is to use human stem cells developed from skin cells to investigate molecular and cellular mechanisms in mental illness. We will also start more clinical trials and interventions to follow up our new findings, and improve our approaches for analysing large amounts of data (“big data”). The Centre also seeks to be in the forefront of the development of new digital tools, including apps and other new technology. Altogether, we aim to contribute substantially to a better understanding, care and treatment of severe mental disorders.

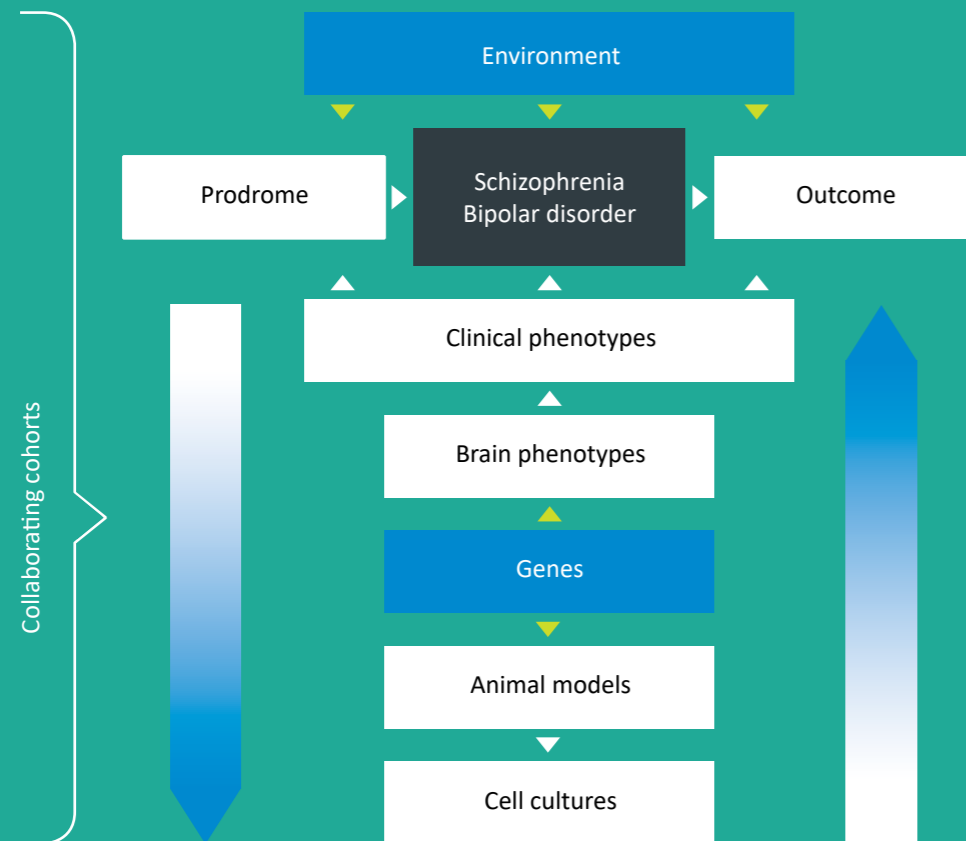
Vision Statement

NORMENT's primary objective is to explore and reveal the underlying pathophysiology of psychotic disorders based on recent discoveries of genetic risk factors, develop tools for stratification and outcome prediction, and translate findings into clinical interventions.

The main research topics at the Centre are Genetics, Brain Imaging, Outcome Prediction, and Clinical Intervention, which are reflected in the following subgoals:

1. **Disclose the complete genetic architecture of psychotic disorders and determine their functional impact**
2. **Identify novel brain imaging phenotypes linking genes and clinical phenotypes in a longitudinal setting**
3. **Use genetic, environmental and clinical factors to predict disease progress and outcome**
4. **Translate pathophysiological discoveries into clinical and pharmacological interventions**

We profit from the homogeneity of the Norwegian population (genetic background, health care system, registries) as the basis for collecting large samples of affected and unaffected people. These individuals are characterized with the same clinical, cognitive, biochemical and imaging protocols to identify new disease mechanisms which are then studied functionally in animal and cell culture models. The aim of this "vertical synergy" approach is to obtain different levels of understanding by bringing together transdisciplinary expertise and methods.



Scientific Aims

GENETICS: Disclose the complete genetic architecture of psychotic disorders and determine their functional impact

Large international genetic studies including NORMENT studies have generated evidence of novel risk genes. Emerging data show overlapping genetic architecture in bipolar disorder and schizophrenia, and involvement of many genes with small effects (polygenic architecture), but also rare variants and copy number variants with larger effects.

Still, the identified genetic variants explain only a small fraction of disease susceptibility. We have developed statistical models supporting that there is a large potential for gene discovery in bipolar disorder and schizophrenia, with relatively small increase in sample size.

Aims:

- Uncover new rare genetic variants conferring risk of bipolar disorder and schizophrenia
- Leverage new statistical methods to determine the polygenic architecture of bipolar disorder and schizophrenia
- Discover biomarkers and biological mechanisms of psychosis risk genes

BRAIN IMAGING: Identify novel brain imaging phenotypes linking genes and clinical phenotypes in a longitudinal setting

Non-invasive MRI technology provides a large opportunity to identify genetically determined brain pathology in patients with psychotic disorders. We will use these methods in our integrated study of brain abnormalities related to clinical characteristics, including developmental trajectories.

Aims:

- Explore brain network dynamics in psychotic disorders and associated phenotypes
- Identify genetic determinants of brain abnormalities
- Determine brain abnormalities underlying key clinical phenotypes and their genetic architecture

OUTCOME PREDICTION: Use genetic, environmental and clinical factors to predict disease progress and outcome

The first episode of schizophrenia and bipolar disorder remits in the majority of patients, but with significant risk for relapse. Psychotic disorders thus have a wide range of possible trajectories, which underlines the importance of ascertaining early predictors of treatment response and of clinical outcome.

We will delineate the course of key clinical and cognitive characteristics, with structural and functional imaging, expanding to the genetic and molecular levels of explanation in a longitudinal design. We expect that these multifactorial data and novel statistical tools will enable us to better predict course and outcome with a clinical useful level of confidence.

Aims:

- Define clinical trajectories from premorbid stages and related pathophysiological processes
- Identify gene-environment interactions at critical phases of neurodevelopment with relation to clinical outcome, including mortality
- Develop prediction and stratification tools for disease course and outcome

CLINICAL INTERVENTION: Translate pathophysiological discoveries into clinical and pharmacological interventions

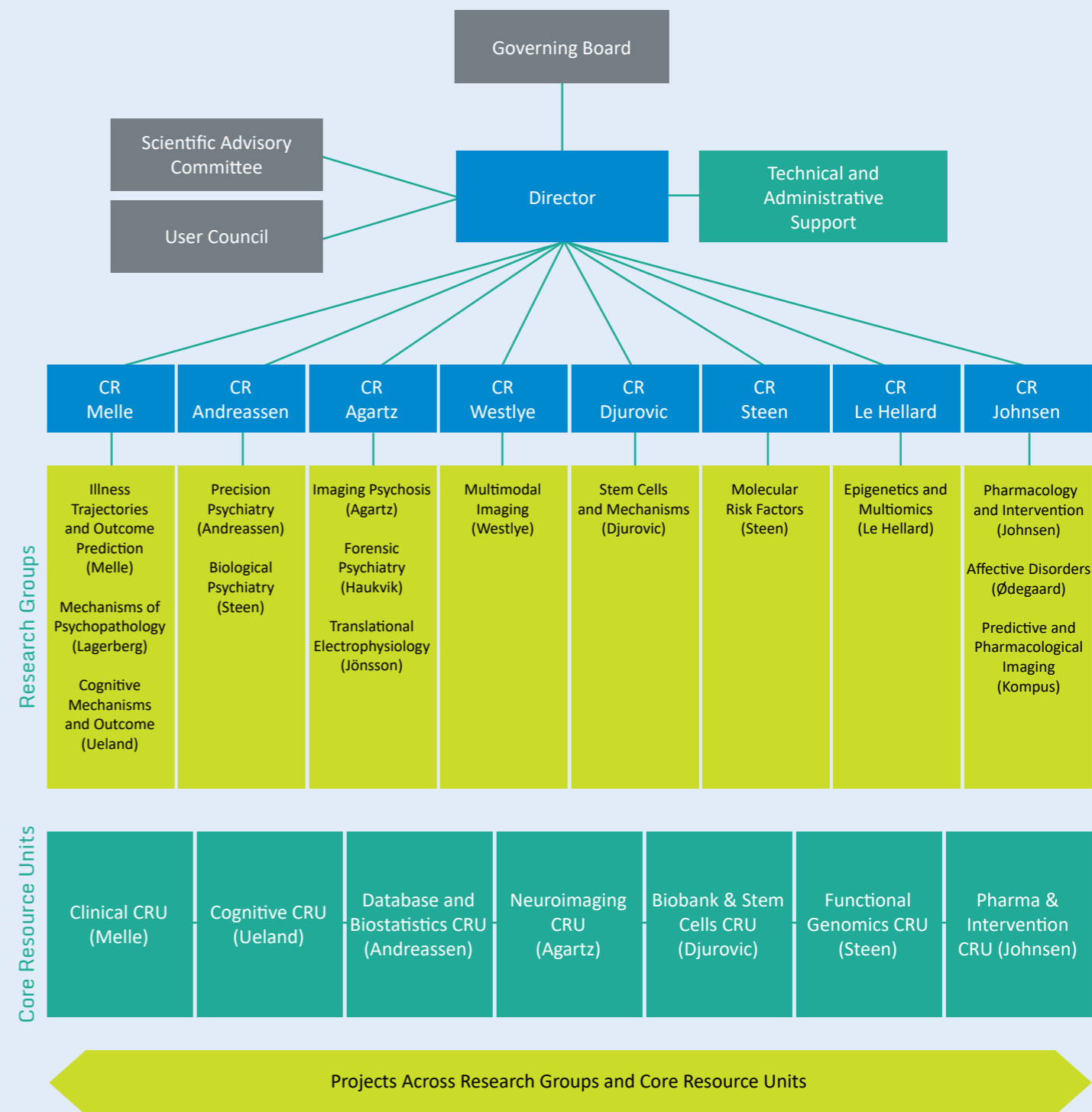
It is a major challenge to move from statistical genetics associations in large samples, to the underlying disease mechanisms of psychosis in individual patients. We will use our rich database and stem cells technology to study immune- and lipid-related pathways based on our previous findings.

Aims:

- Determine immune and lipid-related mechanisms in psychotic disorders
- Develop a stratification approach based on immune dysfunction profiles
- Perform immune system-related interventions in psychotic disorders



Organization of the Centre



CR: Core Researcher, CRU: Core Resource Unit

Governing Board

Chair:
Ivar Prydz Gladhaug*

Professor
Head of Institute
Institute of Clinical Medicine
University of Oslo



Board member:
Marit Bjartveit

Clinic Manager
Division of Mental Health
and Addiction
Oslo University Hospital



Board member:
Timothy Brennan

Professor
Research Dean
Faculty of Social Sciences
University of Oslo



Board member:
Inger Hilde Nordhus**

Professor
Faculty of Psychology
University of Bergen



Board member:
Marit Bakke

Professor
Vice Dean for Research
Faculty of Medicine and
Dentistry
University of Bergen



Board member:
Hans Olav Instefjord

Director
Division of Psychiatry
Haukeland University
Hospital



*Replaced by Dag Kvale 01.01.2019 **01.01.2018 - 30.06.2018

Scientific Advisory Committee

Terry Jernigan

Professor
University of California
San Diego



Michael Foster Green

Professor
University of California
Los Angeles



Peter Falkai

Professor
Ludwig-Maximilian University
Munich



Professor Terry Jernigan:

Professor in Cognitive Science, Psychiatry, and Radiology, and Director of the Center for Human Development, University of California, San Diego (UCSD), USA, as well as Co-Director of the Coordinating Center for the ABCD Study.

Professor Michael Foster Green:

Professor-in-Residence at the Department of Psychiatry and Biobehavioral Sciences and the Semel Institute for Neuroscience and Human Behavior at the Geffen School of Medicine at the University of California Los Angeles (UCLA), USA. He is also Director of the Treatment Unit of the Department of Veteran Affairs VISN 22 Mental Illness Research, Education, and Clinical Center (MIRECC).

Professor Peter Falkai*:

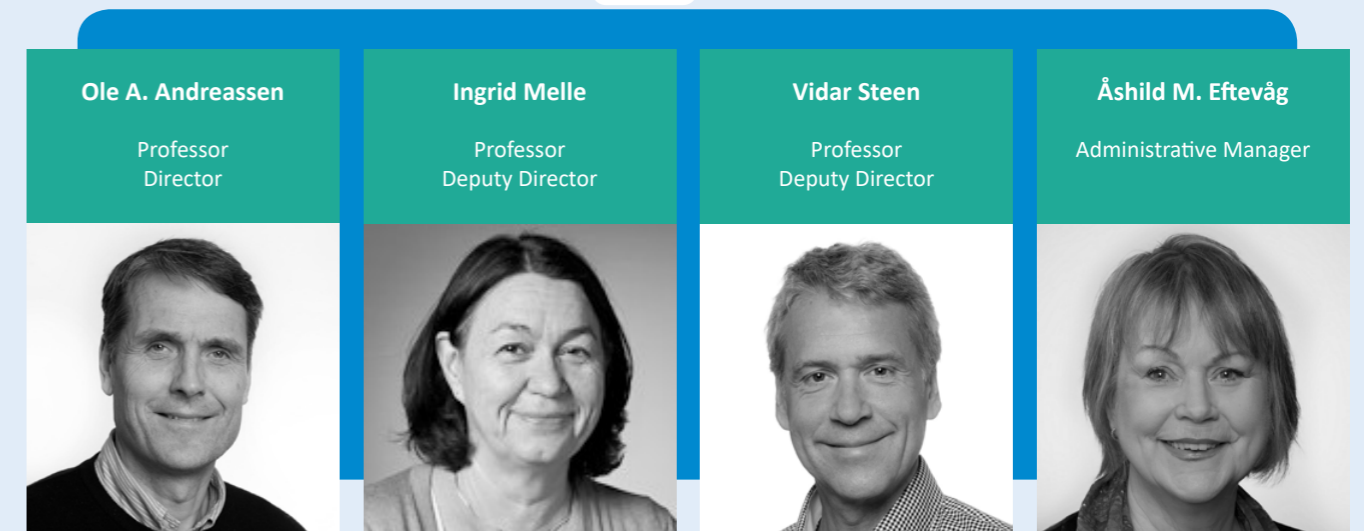
Professor of Psychiatry and Psychotherapy and Chairman of the Department of Psychiatry and Psychotherapy of the Ludwig-Maximilian University in Munich, Germany. He was Chairman of the DGPPN from 2011-2012 and Chairman of the Council of National Societies (NPAs) of the European Psychiatric Association (EPA) from 2012-2014.

Their tasks are as follows:

- Provide advice to the NORMENT leadership in strategic decisions.
- Contribute to NORMENT's research activity by evaluating and advising on the activities within each of the research groups of the Centre and by acting as scientific advisors to the Centre Director.
- Take an active part in NORMENT's annual meetings. Participate in preparing an annual written evaluation with SWOT analysis. Contribute by giving an annual lecture at postgraduate level.

*Replaced Marcella Rietschel during 2018

Centre Management



Scientific Management

Eight Core Researchers (CR) with complementary expertise from different disciplines constitute the scientific management of the Centre. During 2018, Lars T. Westlye and Erik Johnsen replaced Kenneth Hugdahl and Kjetil Sundet as Core Researchers.

- Ole A. Andreassen, Professor, University of Oslo
- Ingrid Melle, Professor, Oslo University Hospital
- Vidar M. Steen, Professor, University of Bergen
- Ingrid Agartz, Professor, University of Oslo
- Srdjan Djurovic, Professor, Oslo University Hospital and University of Bergen
- Stephanie Le Hellard, Professor, University of Bergen
- Lars T. Westlye, Associate Professor, Oslo University Hospital
- Erik Johnsen, Professor II, Haukeland University Hospital

In addition to being part of the scientific leader team, each CR is the head of a Research Group ([see page 29](#)).



From the left: Stephanie Le Hellard, Ole A. Andreassen, Ingrid Agartz, Vidar M. Steen, Ingrid Melle, Erik Johnsen, Lars T. Westlye, Srdjan Djurovic

User Involvement

Lena-Maria Haugerud



Guro Smedsrud



Karoline Fløystad



Fabian Stang



User Council

NORMENT's User Council represents the user community, and consists of individuals who have personal experience, competency and expertise related to mental health. The members of the User Council complement and support the Centre in its effort to carry out research that is relevant for society.

The User Council meets four times a year and provides input to research strategy, gives advice on practical research protocols, and is consulted on matters that affect participants in the studies. The User Council also contributes to dissemination activities, and the members of the Council help strengthen the communication between NORMENT, the user organizations and the community at large.

In 2018, the members of the User Council were:

Lena-Maria Haugerud, Psychiatric Auxiliary Nurse and founder of the National Association for Prevention of Self-Harm

Guro Smedsrud, Master of Science in Biophysics and Medical Technology, and Leader of the Research Committee of the Norwegian Bipolar Association

Karoline Fløystad, Bachelor of Social Services and Freelance Writer

Fabian Stang, Lawyer and Politician

In addition to the four quarterly meetings in 2018, the members of the User Council participated at the NORMENT Annual Retreat in September.

User Representative

NORMENT has employed a part time User Representative to further include the user perspective in the research. The User Representative participates in daily activities at the Centre and brings the user perspective into group meetings, project planning, dissemination activities, and practical operation procedures. Further, the User Representative is involved in projects where the user perspective is particularly relevant, such as the development of smartphone apps and other digital methods of data collection, and acts as a link to user organizations, such as the Norwegian Bipolar Association.

In 2018, the User Representative was **Marthe Hagen**.



Technical and Administrative Support

In order to perform excellent research, NORMENT depends on well-organized support functions that ensure a stable and efficient infrastructure. The Centre is lucky to have a great team of technical and administrative personnel who continuously work to fulfil these functions in a good way. Support functions span from IT assistance and project economy to communication and project coordination.

Technical and administrative support has become increasingly important as the Centre has grown from about 80 employees in 2013 to more than 200 people involved in 2018. In addition, NORMENT affiliates are located at several sites in Oslo and Bergen, and are employed at four different institutions (University of Oslo, University of Bergen, Oslo University Hospital, Haukeland University Hospital).

The Centre size and organization demand well-working support systems, also for internal communication and information flow. Our intranet has become an important arena for exchange of information across the Centre, such as templates, meetings plans, project descriptions, and presentations and video recordings from meetings. In 2018, we succeeded in live streaming many of our meetings, making them available for more people. Support personnel also had an important role in organizing the Centre meetings, such as the Annual Retreat which has become a professional and successful event.

Technical support for data storage and computational platforms is also essential. The central database with all research data is carefully quality controlled and stored on a secure server that is available across the Centre. Database staff clean and prepare data for analysis, and ensure data security and adherence to national and international regulations. Support personnel also keep track of project budgets and yearly reports required by funding agencies, and work to improve central administrative systems, procedures and protocols that are essential for an efficient research organization.



The Centre administration is located in Building 49, Ullevål Hospital, Oslo

Core Resource Units

The daily infrastructure for collection, storage, and processing of scientific data at NORMENT is divided into seven different Core Resource Units (CRU). These are sections that are responsible for and have expertise in different methodological aspects of the data collection, and reflect that the Centre has a strong focus on “vertical synergy” and thereby the integration of various research methods and approaches.

Most scientific projects at the Centre include several Core Resource Units, since they are based on data collected from different groups and involve both clinical and other information about the participants.

The main responsibilities of the different Core Resource Units are described below.

Clinical CRU

Leader: Ingrid Melle

Manager clinical assessment: Trine Vik Lagerberg

The Clinical CRU has the main responsibility for recruitment and standardized scheduled clinical assessments of participants with psychotic disorders in the core research studies at NORMENT. This includes development and maintenance of the common clinical assessment protocol and quality assurance of assessments. The quality assurance includes standardized training of assessment team members, quality assurance and reliability of ratings, preparation of data for entry into the clinical database, and supervision of assessment team members. The assessment team consists of PhD students and research assistants with clinical qualifications to do diagnostic and symptom assessments, in most cases psychiatrists/psychiatric residents or clinical psychologists from the “Illness trajectories and functional outcome”, “Mechanisms of psychopathology”, and “Biological psychiatry” research groups at the Centre.

Cognitive CRU

Leader: Torill Ueland

Manager cognitive assessment: Hanne Christine Mohn

The Cognitive CRU conducts neuropsychological assessment of participants recruited for the core research studies at NORMENT. This includes assessment of patients with psychotic disorders and healthy control individuals at all time-points (baseline and follow-up). The group provides neuropsychological reports for clinical participants. The work of the group also includes development and maintenance of the cognitive assessment protocol and quality assurance of assessments. Quality assurance includes standardized training of assessment team members, calibration to ensure reliability of ratings, as well as preparation of data for entry into the database, and supervision of assessment team members. The assessment team responsible for the clinical participants consists of clinical psychologists and PhD students with qualifications to do neuropsychological assessments. The assessment team responsible for assessing healthy controls consists of psychology students and master degree holders.

Database and Biostatistics CRU

Leader: Ole A. Andreassen

Manager: Thomas Bjella

The main purpose of the Database and Biostatistics CRU is to develop and maintain secure and accessible storage structures, analytical tools, and communication platforms that facilitate and accelerate the process between data collection and data distribution at NORMENT. The unit is connecting the seven Core Resource Units at the Centre, and is integral in defining data properties for all research groups. This includes: 1) Database solution for integration of multidisciplinary data: Setting up a common procedure for data formatting, data transfer and data storage across all units; 2) Communication: Better and transparent communication lines, and regular update intervals on all data; 3) eHealth: eNORMENT service, make all data collection from electronic data capture systems; 4) Ethics and GDPR: Ethical approval for digital consent, and remote web form access; 5) Biostatistics service: Distribute method descriptions and guidelines for big data analysis, and provide code and consultation for data analysis.



Neuroimaging CRU

Leader: Ingrid Agartz,

Manager MRI: Lars T. Westlye, Manager EEG: Torbjørn Elvsåshagen

The Neuroimaging CRU has the main responsibility for providing solid state-of-the-art methodology and infrastructure for magnetic resonance imaging (MRI) and electroencephalography (EEG) in the study of severe mental illness. This includes implementation of standard protocols for MRI and EEG, coordination between different research projects at the Centre, and a close collaboration with the Core Facility at the Department of Radiology, Oslo University Hospital. The Neuroimaging CRU works to guarantee a streamlined logistics from collection to storage and processing of imaging data, will provide access to optimal methods for large-scale as well as innovative imaging (e.g. brain structural, functional, blood flow, metabolism, whole body scanning, electrophysiology), and provide aid to research groups both within and outside NORMENT. The CRU is also responsible for coordination of internal procedures and routines, follow-up of clinical aspects of MRI (e.g., incidental findings), and training of new staff.

Biobank and Stem Cells CRU

Leader: Srdjan Djurovic

The Biobank and Stem Cells CRU coordinates all biobank activities at NORMENT. This includes biological sampling (blood, urine, saliva etc.), treatment of samples (storage, tracking, retrieval), quality control, and shipment between different partners. The CRU also coordinates with the Norwegian Institute of Public Health, and contributes to data capture, organization and data flow. The Biobank and Stem Cells CRU has also established the required competence and facilities for human induced pluripotent stem cell (hiPSC) technology unit in our Centre allowing investigation of neuronal cells from participants. Validated iPSCs are differentiated to neural progenitor cells (neural conversion) and regionalized neuronal subtypes, as well as astrocytes/glia populations under standard in-house methods. Further activities will be aimed to develop a psychopharmacological screening platform for psychiatric disorders using iPSC-derived neurons.

Functional Genomics CRU

Leader: Vidar M. Steen

Co-leader: Stéphanie Le Hellard

The Functional Genomics CRU has expertise and infrastructure for large-scale analysis of the genome, focusing on global gene expression and epigenomics. The team is also equipped for explorative studies and validation experiments in relevant cell cultures and animal models. The current prioritized tasks are RNA sequencing and DNA methylation assays of the clinical samples (patients with schizophrenia spectrum disorders or bipolar disorder as well as healthy controls). We are also responsible for implementation and development of bioinformatic tools for data analysis, including multiomic methods for integration of corresponding genomic, transcriptomic and epigenomic data.

Pharma and Intervention CRU

Leader: Erik Johnsen

The Pharma and Intervention CRU has the main responsibility for facilitating, coordinating and running intervention studies with medicinal products and other treatments for mental disorders. The CRU furthermore follows individuals with mental disorders in a long-term perspective in order to identify markers and predictors of the course of the disorders, as well as effects and side effects of treatment. The CRU includes three research groups covering the areas 1) Pharmacology and intervention, 2) Affective disorders, and 3) Predictive and pharmacological imaging.

Research Groups

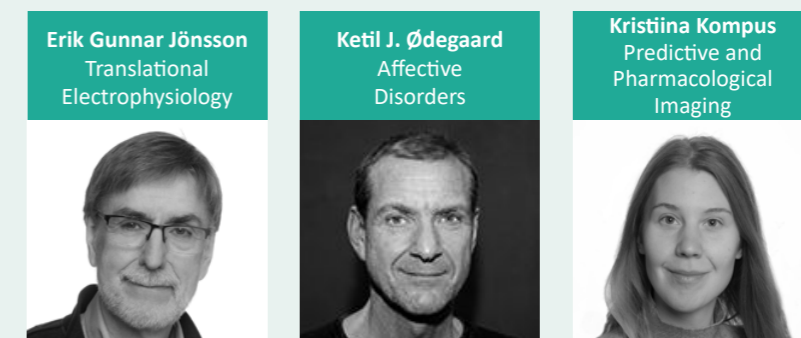
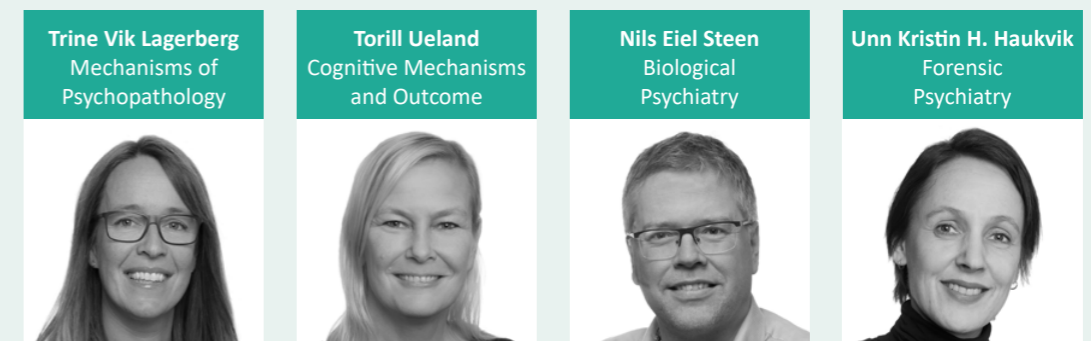
We have organized our research into groups with complementary expertise. Each group has its own Group Leader and a particular focus area of research, but there is a close collaboration across groups and scientific disciplines, as reflected in the “vertical synergy” approach at the Centre ([see page 12](#)).

The number of Research Groups increased from eight to fifteen during 2018, when we entered the second phase as a Centre of Excellence. Some of the new groups are already well-established at their institutions, while others have just recently started. The inclusion of new groups is also part of our career development strategy to give early-stage researchers more responsibility and experience.

All Research Groups and Group Leaders are listed below. Each group has a formal affiliation to one specific Core Researcher (CR) in the scientific management, as shown below:

	CR Melle	CR Andreassen	CR Agartz	CR Westlye	CR Djurovic	CR Steen	CR Le Hellard	CR Johnsen
Research Groups	Illness Trajectories and Outcome Prediction (Melle)	Precision Psychiatry (Andreassen)	Imaging Psychosis (Agartz)	Multimodal Imaging (Westlye)	Stem Cells and Mechanisms (Djurovic)	Molecular Risk Factors (Steen)	Epigenetics and Multiomics (Le Hellard)	Pharmacology and Intervention (Johnsen)
	Mechanisms of Psychopathology (Lagerberg)	Biological Psychiatry (Steen)	Forensic Psychiatry (Haukvik)					Affective Disorders (Ødegaard)
	Cognitive Mechanisms and Outcome (Ueland)		Translational Electrophysiology (Jönsson)					Predictive and Pharmacological Imaging (Kompus)

In addition to our eight Core Researchers ([see page 21](#)), we have seven new Group Leaders:



Illness Trajectories and Outcome Prediction

Group Leader: Ingrid Melle



About the group

Psychotic disorders show large variations in course and outcome. Early course parameters, including length of untreated illness and initial treatment response, are among the most important predictors of long-term outcome. Recent studies have identified a range of genetic loci and environmental risk factors associated with schizophrenia and bipolar disorder. Etiological models for psychotic disorders depict clinical illness as prompted by environmental hits, on the basis of an underlying (genetic) vulnerability.

To what extent vulnerability factors primarily shape an early change-resistant susceptibility and to what extent they are involved in active processes driving symptom formation is not known. Our aim is to identify symptom trajectories and correlates through prospective longitudinal studies of first-treatment participants. The group studies the longitudinal development of negative and psychotic symptoms including the opposite outcomes of full functional recovery versus treatment resistance and suicide with a specific focus on the correlates of vulnerability factors.

Aims

- Identify trajectories of specific symptoms
- Identify correlates of specific trajectories
- Replicate findings in new cohorts
- Develop tools for stratification and risk prediction

Main projects

- Long term development of amotivation and other negative symptoms
- Long term development of psychotic states that do not meet criteria for schizophrenia or bipolar disorder at first treatment
- Long term development of substance use in schizophrenia and bipolar disorder
- Development and predictors of treatment resistance
- Early indicators of full functional recovery
- Early indicators of persistent negative symptoms
- Risk factors for suicidal behavior and suicide

Mechanisms of Psychopathology

Group Leader: Trine Vik Lagerberg



About the group

The focus of the group is to expand our understanding of mechanisms underlying the significant symptom variation seen in psychotic disorders over time and between individuals. Revealing vulnerability factors and drivers of symptom change is important for better and more personalized treatment.

The group will mainly focus on affective dysregulation, substance use and sleep, using digital tools (smartphone application, actigraphy) designed to capture a fine-grained picture of several dimensions of symptoms and behaviour in parallel. The group will have a transdiagnostic focus, and the "deep phenotyping" approach will provide new opportunities for identifying subgroups, illness profiles and biomarkers.

Aims

- Contribute to a better understanding of mechanisms underlying the symptom variation seen in psychotic disorders over time and between individuals
- Investigate relationships between affective and psychotic symptoms and relevant behavioral and psychological dimensions such as emotional dysregulation, substance use, sleep irregularities, activity patterns and illness insight
- Identify early signs of relapse

Main projects

- Development and implementation of a digital tool platform for illness monitoring in psychotic disorders
- Substance use in bipolar disorder
- Affective lability in bipolar disorder and its genetic, cognitive and clinical underpinnings
- The temporal relationship between sleep disturbances and clinical characteristics in psychotic disorders.
- Insight and suicidality in bipolar disorder
- The role of affective dysregulation in psychotic disorders

Cognitive Mechanisms and Outcome

Group Leader: Torill Ueland



About the group

The aim of the group is to capture the variation and course of cognitive functioning in psychotic disorders and to identify mechanisms underlying cognitive dysfunction and cognitive heterogeneity. Our goal is to provide better prognostic guidance and improved individualized intervention programs including cognitive remediation. Our studies require both large scale datasets of cognitive performance in combination with other biomarkers, as well as smaller richer datasets measuring cognition in the same individual over time.

Additional important aims are to search for measures of social cognition to better predict real-life functioning and to develop new digital measures of functional outcome. This will provide more valid measures of functioning, allow for more frequent assessments and enable investigation of temporal variations in functioning and co-fluctuations with cognitive and clinical phenomena. Achieving our aims entails using cognitive and clinical data, brain imaging data, genetic data and biochemical assessments, in collaboration with other research groups in the Centre.

Aims

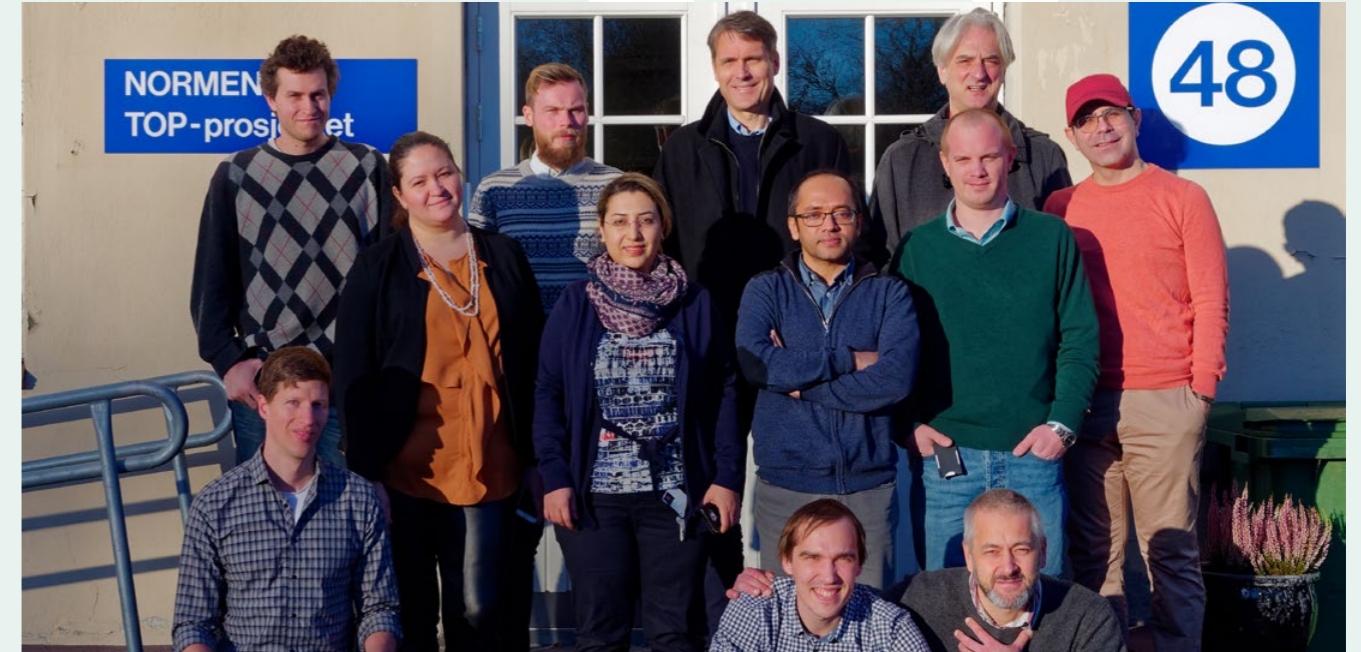
- Identify cognitive markers of subgroups to improve precise diagnoses, outcome and treatment
- Monitor the course of cognitive functioning to better predict illness trajectories
- Search for measures of social cognition to better predict real-life functioning
- Identify sources of cognitive heterogeneity impacting course and outcome
- Develop cognitive remediation programs to improve behaviors not fully responding to medication and psychotherapy

Main projects

- The ecoval study: Investigation of social processes, combining naturalistic observation of real-world functioning with laboratory assessments and functional brain measures (EEG/ERP)
- The 10-year follow-up study: Clinical and neurocognitive trajectories from baseline to follow-up in first-episode psychosis; 1) Trajectories of intellectual functioning and cognition in first-episode schizophrenia spectrum disorders, and relations to cannabis-use; 2) Long-term trajectories and associations to functional outcome and polygenic risk scores
- The Neurocognitive Immune System study: How immune markers and their temporal pattern are associated with cognitive measures
- Cognitive Remediation studies: The effect of targeted training of neurocognitive and social cognitive functions

Precision Psychiatry

Group Leader: Ole A. Andreassen



About the group

The group uses big data and new analytical methods to clarify causes and risk factors in severe mental disorders to improve prevention, diagnosis and treatment. We apply state-of-the-art methodology to examine data from NORMENT and large databases that include several million individuals. We develop mathematical models to understand variation in the human genome, to improve our ability to identify genetic and environmental factors contributing to disease development.

This research is done in close collaboration with international researchers and global consortia, with a strong focus of Nordic partners to leverage the large potential of registries and biobanks. The group's long-term goal is to develop the framework for precision medicine approaches – to apply the discoveries of causal factors in clinical practice – which has great potential in psychiatry.

Aims

- Develop novel tools for big data analysis of mental illness risk factors, to determine genetics factors and interaction with environment
- Develop and validate prediction and stratification methodology in mental illness
- Identify genetic factors involved in the development of mental illness, and comorbidities
- Identify gene-environment interplay in the development of severe mental illness

Main projects

- Identifying actionable resilience factors for mental health with prospective cohorts and novel biostatistical tools
- Identifying genetic risk factors for psychiatric disorders (Norwegian PGC)
- Identifying rare variants in severe neuropsychiatric disorders with long range phasing
- Linking synaptic dysfunction to disease mechanisms in schizophrenia – a multi-level investigation
- Develop novel biostatistical tools, including uni- and bivariate mixture models (MiXeR) and improving prediction and stratification tools
- Large scale data analysis of causes and mechanisms of mental disorders in PGC, ENIGMA, R-LiNK and TRYGGVE
- Comorbidity in mental illness – overlapping genetic risk factors
- Develop and apply novel ICT tools for data collection and recruitment

Biological Psychiatry

Group Leader: Nils Eiel Steen



About the group

The group investigates biological mechanisms in schizophrenia and bipolar disorder by integrating genetic, biological, environmental and clinical data in a translational approach. We use the richly characterized TOP/NORMENT sample in combination with data from international genetic consortia and health registries.

Several biological processes related to severe mental disorders and their treatment are investigated with a special focus on inflammation and mechanisms of cardiovascular comorbidity, as well as candidate metabolism pathways and the endocrine stress regulation system, all which seem involved in severe mental disorders pathophysiology. The overall goal is to increase the knowledge of the underlying biological mechanisms of these disorders with potential implications for prevention, treatment, course prediction and diagnostics.

Aims

- Gain new knowledge of underlying immune mechanisms in severe mental disorders by investigating patterns of immune markers together with environmental, clinical, genetic, and imaging data, other frontline biochemical parameters, and treatment
- Elucidate biological and environmental underpinnings of the increased CVD risk of severe mental disorders and uncover pathophysiological links between severe mental disorders and the cardiometabolic disposition
- Identify stress-related mechanisms of severe mental disorders

Main projects

- Genetic factors associated with immune pathways and psychopharmacological treatment in severe mental disorders
- Immune and clinical phenotypes in psychosis spectrum disorders and impact of psychotropic drugs
- Clinical and cognitive aspects related to cardiometabolic risk in severe mental disorders – underlying mechanisms and prediction of outcome
- The role of inflammation in cardiovascular comorbidity in psychotic disorders
- Overlap between cardiovascular risk factors and brain electrophysiology in severe mental illness – a possible link to social relationships?
- How stress gets under the skin: The role of stress and psychophysiology in schizophrenia, bipolar disorder and in healthy individuals
- Biological alterations in neurodevelopmental disorders

Imaging Psychosis

Group Leader: Ingrid Agartz



About the group

The main focus of the group is brain neuroanatomy studied with advanced magnetic resonance imaging (MRI) methodology and how it relates with aetiology (genes and environmental factors) and early life risk factors (e.g. obstetric complications) as well as with the clinical phenotype, substance use, immune markers, infection exposure and medication.

Advanced MRI phenotypes are used (e.g. cortex thickness, volume and area, myelin mapping, contrast, free-water-DTI) and development of new structural phenotypes is conducted. We investigate large cohorts of schizophrenia or bipolar disorders. In longitudinal follow-up studies, we investigate brain trajectories. One subproject (Youth-TOP) focuses on early-onset psychosis in adolescents, their brain development over time, biomarkers, and early risk factors in this group. We participate in several international consortia and coordinate two international collaborations on adolescent psychosis.

Aims

- Elucidate on aetiology and pathophysiological mechanisms from an imaging perspective
- Characterize brain structure, longitudinal trajectories and the associated symptoms (e.g. sensory perception or hallucinations) using brain imaging, EEG and symptom monitoring devices
- Identify factors compromising brain function and structure
- Investigate how disease factors or treatment impact on brain structure in schizophrenia or bipolar disorder with use of new imaging phenotypes e.g. myelin mapping and free-water DTI
- Investigate adolescent onset psychosis samples for clinical differentiation, brain development, and biomarkers

Main projects

- MRI studies of primary sensory and motor brain regions in psychotic disorders
- Importance of birth and pregnancy complications to brain development cognition in severe mental illness across the age range – is there an area of prevention?
- Effects of exposure to infectious agents in schizophrenia and bipolar disorder – focus on brain and cognitive phenotypes and gene-environment interactions
- Multiparametric myelin mapping in psychotic disorders
- Bridging neuroscience research with clinical applications, using machine learning approaches
- Longitudinal MRI scanning and effects of medication
- Clinical inclusion and follow-up of Youth-TOP participants at the University of Oslo and Karolinska Institutet, Stockholm, and coordination of ENIGMA-EOP study for adolescents with early-onset psychosis

Forensic Psychiatry

Group Leader: Unn Kristin H. Haukvik



About the group

The group has an interdisciplinary approach to the study of violence and aggression in severe mental disorders. Our main focus is to characterize how biopsychosocial factors interact to affect violence risk in severe mental disorders, by combining thorough clinical investigation with advanced brain imaging methods and registry data.

As a thematic research group, we collaborate closely with the other research groups within the Centre. We also explore the potential legal implications of our research, in the intersection between law and neuroscience.

Aims

- Combine frontline MRI methodology with an innovative symptoms-oriented approach to understand the neurobiological underpinnings of violence and aggression in severe mental disorders, and combine this knowledge with social and psychological factors to increase violence prediction accuracy
- Link our research to the unique Norwegian medical model of criminal insanity
- Contribute in the long-term to strengthening legal rights of patients and reduce the number of violent acts committed by persons with psychosis and the stigma associated with violence in severe mental disorders

Main projects

- Violence in severe mental disorders; biological, psychological, and social patterns (STOP) – a clinical study of psychosis patients in security psychiatry wards and persons serving preventive detentions prison sentences
- Mapping antisocial behaviour in psychosis and testing neuroimaging-informed prediction of violence risk
- Insight and phenomenology in psychotic disorders with comorbid violence
- Inflammatory biomarkers of aggression in severe mental disorders
- Developmental trajectories of psychotic and non-psychotic violence
- Reworking the medical model of criminal insanity in the intersection between law and science – empirical data and the legal significance of psychosis

Translational Electrophysiology

Group Leader: Erik Gunnar Jönsson



About the group

The group studies nerve cell function in patients with psychosis and other psychiatric disorders using electroencephalography (EEG) and related electrophysiological methods. The electrophysiological indices are also analyzed in connection with clinical symptoms, genetic variation, morphological variation in the brain, computerized models of nerve cells, and stem cell based methods.

The main aim of the research is to give new knowledge about the disease mechanisms in psychosis and other psychiatric disorders and contribute to the development of more effective treatments.

Aims

- Examine whether EEG-based indices of synaptic function and neuronal excitability regulation are altered in schizophrenia and bipolar disorder
- Assess effects of novel schizophrenia and bipolar disorder genetic risk loci on the EEG-based indices
- Correlate the human EEG indices with stem cell- and computational modelling-based examinations of synaptic function and neuronal excitability regulation
- Examine whether the EEG-based indices can be used to predict illness severity in schizophrenia and bipolar disorder

Main projects

- Genes and the synapse in severe mental illnesses: From stem cells and in vivo brain function to clinical implications (examination of synaptic function in vivo using electrophysiological techniques in individuals with psychotic disorders and healthy controls, in vitro using iPSC-derived neurons from the same participants, and in silico using computational models of synaptic function)
- Sensory and motor networks in psychotic disorders: From structure and function to phenomenology (examination of the relationship between brain myelination, aberrant sensory processing and phenomenology of psychotic disorders)
- Equivalence class formation and cortical synaptic function in autism spectrum disorders (examination of the role of synaptic function and plasticity in the autism spectrum disorders and the relationship between equivalence formation and synaptic function)

Multimodal Imaging

Group Leader: Lars T. Westlye



About the group

In order to characterize the dynamic mechanisms of mental disorders across the lifespan, we utilize various brain imaging modalities and approaches, with a particular emphasis on combining measures of structural and functional connectivity with genetics.

Structural and functional brain characteristics are highly heritable, and our research aims at increasing our understanding of how gene-environment interactions influence mood, cognition and risk of mental disorders during sensitive periods in life.

Aims

- Characterize cognitive, brain and genetic mechanisms of severe mental illnesses, in particular schizophrenia and bipolar disorders
- Use brain imaging to identify neurodevelopmental trajectories associated with genetic and environmental risk
- Apply machine learning techniques on brain imaging data to assess the clinical sensitivity and specificity on an individual level
- Assess specificity of our findings by combining data from patients with different brain disorders, which may allow us to zero in on patterns and mechanisms that are specific to each disorder

Main projects

- Genetic and phenotypic architecture of the ontogenetic determinants of severe mental illness
- Dissecting neurodevelopmental antecedents of mental illness: Towards early risk detection and precision medicine through large-scale imaging genetics
- From synapses to symptoms in maternal mental health during pregnancy and postpartum
- Brains and minds in transition (BRAINMINT): The dark side of neuroplasticity during sensitive life phases
- Cardiovascular risk and brain network function: Common mechanisms and windows of opportunity in brain and mental disorders
- LifespanHealth: Identification of biologically interpretable biomarkers of severe mental illness in a large-scale, multidisciplinary lifespan investigation
- The role of the oxytocin signaling system in mental and physical illnesses

Stem Cells and Mechanisms

Group Leader: Srdjan Djurovic



About the group

The group performs molecular genetic analyses to increase the knowledge and expertise in psychiatric genetics and genomics, and to identify the molecular networks underlying psychiatric disease. We also continually develop an organization to support psychiatric genetic and stem cell studies with design and planning.

Our research group is also responsible for the management and operation of the biobank and stem cell facilities at NORMENT. This includes sampling, treatment of samples (storage, tracking, retrieval) and shipment between different partners, as well as data processing and coordination in order to ensure quality of associated data for the collected biobank samples.

Aims

- Investigate neuronal cells using human induced pluripotent stem cell (hiPSC) technology
- Differentiate validated iPSC's to neural progenitor cells (neural conversion) and regionalized neuronal subtypes, as well as astrocytes/glia populations
- Develop a psychopharmacological screening platform for psychiatric disorders using iPSC-derived neurons
- Continue identifying the polygenic basis of the human brain and neurodevelopmental disorders, and elucidate deep molecular phenotyping

Main projects

- Human induced pluripotent stem cell (hiPSC) technologies in psychiatric molecular genetics
- Identification of the hidden heritability of severe mental disorders
- Identifying the polygenic basis of the human brain and neurodevelopmental disorders
- Prediction of longitudinal outcome and brain phenotypes by polygenic scores
- Identification of genetic loci associated with neurocognitive and MRI phenotypes and implications for disease mechanisms in severe mental disorders
- Cooperation and biobanking with national cohorts and further collaboration with large-scale studies for validation and data quality control steps

Molecular Risk Factors

Group Leader: Vidar M. Steen



About the group

The group aims at identifying and understanding genetic and biological factors that are involved in illness mechanisms and therapeutic response during pharmacological treatment of schizophrenia and bipolar disorder. We use a combination of clinical data, biomarker screening and functional studies in patient samples and various experimental models.

At present, our main research focus is directed towards the role of metabolic factors and inflammation processes in development of psychosis and during antipsychotic treatment. The group is also responsible for running the Genomics Core Facility at the University of Bergen, to provide guidance and service on large-scale genomic analyses, such as whole genome-, exome- and RNA sequencing.

Aims

- Determine whether blood lipid levels influence the clinical outcome in patients with psychotic disorders
- Identify the molecular mechanisms of antipsychotic-induced metabolic effects
- Explore the role of low-grade inflammation and immune responses in peripheral blood as trait or state markers of psychosis
- Identify genetic and transcriptomic risk factors for disease susceptibility and treatment outcome in schizophrenia and bipolar disorder

Main projects

- The effect of drug-related weight gain and lipid disturbances on psychotic symptoms, cognitive function and brain myelin in patients with schizophrenia
- Transcriptional changes in peripheral blood during drug treatment in patients with psychotic disorders: A cross-sectional and longitudinal study
- Molecular mechanisms of antipsychotic-induced metabolic effects
- Low-grade inflammation and innate immune responses in peripheral blood as trait or state markers of psychosis
- Genetic risk factors for disease susceptibility and treatment outcome in schizophrenia and bipolar disorder

Epigenetics and Multiomics

Group Leader: Stéphanie Le Hellard



About the group

The group consists of people with background in genetics, statistics, medicine and informatics who together bring their complementary expertise to try understand the interaction between genetic and environmental risk in mental disorders. We work in close collaboration with clinicians.

We use datasets generated in house or publicly available that combine genetic, epigenetic and gene expression datasets for mental disorders (mostly schizophrenia and bipolar disorders) that are also well annotated for environmental factors.

Aims

- Investigate differences in epigenetic modifications between patients with psychosis and healthy controls
- Identify overlaps in epigenetic risk between mental disorders
- Detect changes in epigenetic modifications across the life span
- Identify differences in epigenetic modifications modulated by environmental factors (cannabis, trauma, alcohol, migration)
- Combine different layers of omic data (genomic, epigenomic, transcriptomic) to identify additional risk factors

Main projects

- Molecular mechanisms of exposure to cannabis in patients with schizophrenia (investigation of differences between cannabis users and non-users in DNA methylation and modelling of these differences in cell models)
- The 3D sample (a combination of genetic, epigenetic and gene expression information to identify common effects across the three dimensions)
- DNA methylation in psychiatric disorders, and mediation of gene by environment effects, from birth to adulthood (examination of variations on DNA methylation associated with mental disorders)
- An evolutionary epigenetics approach to schizophrenia (examination of regions differentially methylated in recent human evolution and their implication in schizophrenia)

Pharmacology and Intervention

Group Leader: Erik Johnsen



About the group

We study schizophrenia spectrum disorders at several levels in an integrated fashion, including clinical symptoms and signs, treatment effects and side effects, brain imaging measures, as well as molecular vulnerability and disease mechanisms.

The research group has more than 15 years of experience in conducting researcher initiated drug trials independently of pharmaceutical industry. The group overlaps with the Bergen Psychosis Research Group at Haukeland University Hospital and the University of Bergen.

Aims

- Identify differential effectiveness among antipsychotic drugs
- Identify predictors of effects and side effects of treatment at the individual level
- Unravel disease mechanisms and potential new treatment targets
- Assess the value of immune-modulating treatment in psychosis
- Assess the value of omega-3 fatty acids in ultra-high risk of psychosis

Main projects

- The Norwegian Prednisolone in Early Psychosis Study (NorPEPS): A double-blind, randomized, placebo-controlled add-on effectiveness study of prednisolone in early psychosis
- The Neuroinflammation in Adolescents with Psychosis Project (NAPP): An observational cohort-study of young people with psychosis
- The Non-Pharmacological treatment of Psychosis study (NonPharm): An observational cohort study following individuals with psychosis seeking treatment without the use of antipsychotic drugs
- The European Long-acting Antipsychotics in Schizophrenia Trial (EULAST): A randomized effectiveness comparison of long-acting versus oral treatment with antipsychotic drugs
- The Placebo-controlled Trial in Subjects at Ultra-High Risk for Psychosis With Omega-3 Fatty Acids in Europe (PURPOSE): A randomized placebo-controlled study of omega-3 fatty acids in ultra-high risk for psychosis to prevent transition to psychosis

Affective Disorders

Group Leader: Ketil J. Ødegaard



About the group

We study bipolar disorders and other illnesses of depression using different methods and approaches. Our studies focus on psychopharmacology, neurostimulating treatment, sensor technology, registry research, cognitive function, genetics, and brain imaging in bipolar disorders and other illnesses including depression.

The research group has a translational focus with the aim of contributing to increased etiological knowledge of pathophysiological processes in affective disorders, mainly through clinical intervention studies. The group also covers the Bergen Bipolar and Depression Research (BBDF) group at Haukeland University Hospital, and consists of collaborating researchers with joint projects on mood disorders.

Aims

- Study clinical effect of new treatment options for mood disorders
- Study the mechanism of action for electroconvulsive treatment (ECT)
- Study the effect of mood disorders on cognition
- Study the underpinning pathophysiology of mood disorders
- Study the complexity of comorbidity in mood disorders

Main projects

- The Pharmacogenomics of Bipolar Disorder study (PGBD): Identification of genes for lithium response in a prospective sample
- Monitoring of bipolar disorder using sensor technology (part of INTROMAT-study)
- Effects of ECT in treatment of depression: A prospective neuroradiological study of acute and longitudinal effects on brain structure and function
- Treatment-resistant bipolar depression: A randomized controlled trial of electroconvulsive therapy versus algorithm-based pharmacological treatment
- The Global ECT-MRI Research Collaboration (GEMRIC)
- Actigraphy and heart rate variability in mood disorders
- Prescription database research: Mood disorders and comorbidity
- Blue-blocking glasses as additive treatment for mania: A randomized placebo-controlled trial
- Structural brain changes induced by electroconvulsive therapy (ECT)

Predictive and Pharmacological Imaging

Group Leader: Kristiina Kompus



About the group

The group focuses on multimodal functional neuroimaging, combining structural, functional and metabolic MRI indices to improve prediction of symptom trajectory and response to interventions in psychosis patients. Our goal is to find baseline markers in the brain imaging data that can predict treatment response and help tailor the treatment for individual patients.

Further, we aim to improve the basic understanding of the relationship between excitatory/inhibitory neurotransmission, functional and structural connectivity and auditory perception, to understand how the perceptual predictions are set up and maintained as well as altered in psychosis patients, and how they relate to symptoms such as delusions and hallucinations.

Aims

- Establishing the MRS-measured metabolic markers for psychosis
- Finding baseline markers in the brain imaging data that can predict treatment response
- Researching the brain correlates of predictive processes in perception

Main projects

- Multimodal integration of brain imaging data (DTI, fMRI, sMRI, MRS) in psychosis patients
- Excitatory/inhibitory neurotransmission: Relation to hallucinations and medication
- Dynamic connectivity analysis of functional connectivity networks in psychosis patients
- Inflammation markers in blood and brain

Collaboration Across Research Groups

NORMENT is a cross-disciplinary research centre, where sharing of competence and infrastructure is a key principle. We have set aside about half of the Centre of Excellence grant to fund our core infrastructure (Core Resource Units), to enable easy access to state-of-the-art methodology, infrastructure for recruitment and assessment of participants, and database and biobank services. Most if not all research activities at the Centre depend on this tight integration and efficient use of resources across different research groups.

A large degree of NORMENT's research is generated from multidisciplinary projects, and this is also the framework for new project developments and grant applications. Collaborative projects within the Centre are organized through the monthly Synergy Meetings and named Synergy Projects with project lists available on our intranet.

The projects are grouped under different research topics, such as Cannabis, eNORMENT (electronical data collection), Genetics, Imaging Genetics, Immunology, Methylation, mRNA, MRI, and Polygenic Risk Score.

There are specific added values of this cross-disciplinary approach that are related to the main research topics and aims of the Centre:

1. Genetics: Combine large amounts of genetic data with relevant environmental factors, and move this to experimental studies in human stem cells.
2. Brain Imaging: Use advanced imaging technology to study brain characteristics in large groups of participants who are also genotyped and extensively clinically characterized, a sample which is unique internationally.
3. Outcome Prediction: Determine the association between genes, environment, and their effect on different illness trajectories, with the potential of leading to new tools for prediction and early identification of illness.
4. Clinical Intervention: Translate genetic, immunological, imaging, and other pathophysiological findings into clinical and pharmacological interventions to improve treatment.

Being a Centre of Excellence provides great opportunities to broaden and strengthen our cooperation, align research goals, and profit from of our complementary expertise and valuable infrastructure, as well as performing more cost-efficient research through strong leadership and an integrated approach. Further, there is a large degree of sharing of postdoctoral fellows and support personnel across different groups, and several PhD students have been co-supervised by seniors and members of different research groups at the Centre.





Top Day 2018

June 8 - Ullevål, Oslo.

09.15-09.20	Chair (Nils Eiel Steen): Overview of today's program
09.20-09.50	Ingrid Melle: Introduction - status/overview
09.50-10.10	Ibrahim Akkouh: Transcriptomics modelling of severe mental disorders
10.10-10.30	Siv Hege Lyngstad: Associations between genetic risk and levels of avolition/apathy
10.30-10.45	Coffee break
10.45-11.05	Camilla Büchmann: Good psychometric properties of the Birchwood Insight Scale for patients with bipolar disorder.
11.05-11.25	Mathias Valstad: Assessing electrophysiological phenotypes in psychotic disorders
11.25-11.50	Nathalia Zak: Understanding cortical abnormalities in bipolar disorder type II: A longitudinal study of plasticity and structure (PhD summary)
11.50-12.30	Lunch break
12.30-12.35	Chair (Ole A Andreassen): Overview of afternoon program
12.35-12.55	Kristine Engen: Is toxoplasma antibody positivity associated with structural brain changes?
12.55-13.15	Vera Lonning, Kirsten Wedervang-Resell and Claudia Barth: Medication status, serum lipid profiles, and MRI outcomes in Youth-TOP
13.15-13.35	Geneviève Richard: Cognitive aging and post-stroke rehabilitation
13.35-13.55	Adriano Winterton: Effect of Oxytocin SNPs on behavioural and metabolic phenotypes - materials and methods
13.55-14.10	Coffee break
14.10-14.30	Cecilie H. Johannessen: Regional cerebellar volumes and cerebello-cerebral structural covariance in adolescents with early-onset psychosis: a multisample study
14.30-14.50	Magnus Engen: The relationship between negative symptom severity and neurocognition in a 1-year follow-up study
14.50-15.15	Erlend S. Gardsjord: Quality of life in psychosis spectrum disorders (PhD summary)

Researcher Training

NORMENT offers a range of training and development opportunities for our PhD students, postgraduate researchers, and other research staff. About 60 PhD students and 40 postdoctoral fellows were working at or affiliated with the Centre in 2018. During the year, there have been various gatherings and meetings with the aim of contributing to a best possible researcher training. Scientific sharing and synergy across domains were important topics at these events, and is an underlying principle for all research activities at the Centre.

PhD Education and Training of Early-Career Researchers

The PhD students at NORMENT are enrolled at the mandatory PhD education programme at the University of Oslo and University of Bergen. In addition, several PhD students are members of the Norwegian Research School in Neuroscience (NRSN) which organizes courses, training, and a conference for PhD candidates in neuroscience nationwide. NORMENT is also involved in the National Research School in Bioinformatics, Biostatistics and Systems Biology (NORBIS), where PhD students and postdocs may attend courses in genetic analyses and statistics.

During 2018, NORMENT organized regular research meetings where PhD students and postdocs across research groups and scientific disciplines presented their projects, results and future plans. There were also workshops in academic writing and clinical supervision, as well as meetings organized by the different research groups at the Centre where PhD students and postdocs presented their research.

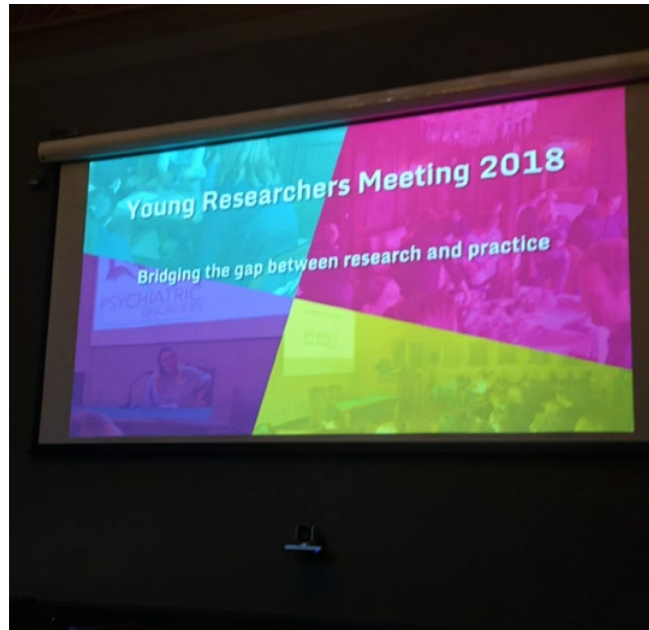
The yearly **TOP Day** is also an important arena for PhD students to get training in dissemination of their research. The term "TOP" comes from the name of the main study at the Centre, the "Thematically Organized Psychosis" study. In 2018, the TOP Day took place in Oslo on June 08. After a general introduction and update by co-director Ingrid Melle, 13 PhD students from various groups and scientific backgrounds presented their research projects, to share ideas and give each other feedback on topics ranging from genes to clinical symptoms.

Another important aspect of the researcher training is a continuous focus on career development of early-career investigators. We emphasize guiding and mentoring of our postdoctoral fellows internally at the Centre, and make an effort to facilitate promotion to faculty positions for

the most talented researchers. Postdocs are encouraged to participate in the postdoctoral programme at the Universities of Oslo and Bergen, which includes courses in career planning, research management, and external funding. Further, our early-stage scientists may participate in international research education and training at the University of California San Diego (UCSD) in the USA, funded in part by the Research Council of Norway (INTPART grant).

To further ameliorate the career development support within the Centre, this topic was highlighted at the NORMENT Annual Retreat, which included presentations and group work (see page 49). Also, at the end of 2018, a Career Development Task Force was established, who will work on improving routines and strategies for support to researchers who are at an early stage in their career.





Young Researchers Meeting

Another important event related to researcher training at the Centre is the Young Researchers Meeting. This was established in 2015 as a yearly one-day meeting for PhD students, postdocs and other researchers who are at an early stage in their career. The meeting is fully planned by the early-career researchers themselves and is an arena to discuss topics that they consider important to their scientific development and career.

The Young Researchers Meeting in 2018 took place on October 29 at The Norwegian Academy of Science and Letters in Oslo, where about 40 people attended. The topic chosen for the meeting was “Bridging the gap between research and practice”, in order to stimulate a discussion about how our research findings can be made applicable, useful and clinically relevant.

Representatives from different groups at the Centre presented their perspectives on this topic. The talks were followed by group discussions and a debate built on the framework of the “Maudsley debates”. The discussions resulted in many interesting reflections, and underscored the importance of research communication both to the clinic and the general public.



Synergy Meetings

The Synergy Meetings are monthly meetings alternating between Oslo and Bergen, where researchers at all levels can present ideas and preliminary data to facilitate interactions and discussions. These meetings reflect NORMENT’s overall focus on “vertical synergy”, in which the aim is to obtain different levels of understanding by bringing together transdisciplinary expertise and methods. An important part of the meetings is to initiate new collaborative projects and discuss ongoing projects across the Centre. Each meeting ends with a to-do list, and the Synergy Projects lists on our internal webpages are updated.

During 2018, there were eight Synergy Meetings in total, each with 20-40 participants from different groups at the Centre. The meetings covered broad topics such as Polygenic Risk Scores, Transdiagnostics, Imaging and Antipsychotics, Registry Research, Cannabis, and Development.



Annual Retreat

The Annual Retreat is the main event for everyone at NORMENT, and is organized as a yearly two-day conference in an interactive and enthusiastic atmosphere. In 2018, the meeting took place on September 17-18 at Grand Hotel Terminus in Bergen. More than 120 people from Oslo and Bergen participated, in addition to members of our Scientific Advisory Committee, the User Council, and external people invited to give talks on specific topics of relevance for the work at NORMENT.

The main part of the programme consisted of plenary lectures based on NORMENT’s four research aims. In each session, Group Leaders first presented an overview of the current field, including projects, important findings and future plans. Postdoctoral researchers then gave an update of specific projects and results.

Akiah Ottesen Berg received the prize for best scientific speaker for her presentation “Vitamin D levels, brain volume and genetic architecture in patients with psychosis”. This prize was awarded for the first time, with the aim of highlighting the importance of dissemination at the Centre and the need for presenting our research in an understandable way across scientific disciplines and groups. The committee consisted of people in the administration and the User Council.

At this year’s retreat, there was also a particular focus on career development. Katrine Borgen from Mobilize Nordic was invited to give a talk on the development of research organizations. Two of our former Core Researchers, professors Kjetil Sundet and Kenneth Hugdahl, shared their experiences from a long life in academia.

Career development was also the topic of this year’s social activity, which included group work with a high level of creativity! Groups were formed based on position (PhD students, postdocs, technical/administrative personnel etc.), and each group handed in their report about how to improve career development at the Centre. We will continue working on career development in the coming year. [See page 75](#) for pictures of the group activity.



During the poster session at the end of the first day, master students and PhD students, as well as postdocs, got the opportunity to present new findings and discuss projects and ideas in a more informal setting.

This year’s prize for best poster was awarded to **Tobias Kaufmann** for his poster entitled “Brain disorders are associated with increased brain age”. With the prize also comes a grant of NOK 10.000 from the Dr. Einar Martens Foundation to be used on research.

[See pages 48-49](#) for more pictures and the programme.

These people also presented posters at the retreat:

Anne-Kristin Stavrum: Identification of molecular mechanisms following cannabis exposure in patients with psychosis

Dennis van der Meer: Brain scans from 21297 individuals reveal the genetic architecture of hippocampal subfield volumes

Eirik Kjelby: Antidepressive effectiveness of amisulpride, aripiprazole and olanzapine: a pragmatic, randomized trial

Francesca Puppo: Optogenetics- and imaging-assisted functional characterization of iPSC-derived neurons

Ida Elken Sørderby: ENIGMA-CNV: Positive dose response of the 1q21.1 distal CNV on ICV through an effect on cortical surface area

Lavinia Athanasiu Andresen: Genetic variants associated with cardiometabolic abnormalities during treatment with selective serotonin reuptake inhibitors - a genome-wide association study

Lena Antonsen Stabell: Predictors of treatment satisfaction in acute phase psychosis - comparison between antipsychotic naïve and previously medicated patients

Magnus Johan Engen: Cognitive functioning in first-episode psychosis patients with and without persistent negative symptoms: A 1-year follow-up study

Monica Aas: Elevated hair cortisol concentrations is associated with childhood maltreatment experiences in schizophrenia and in bipolar disorders

Oleksandr Frei: Beyond SNP heritability: Polygenicity and discoverability estimated for multiple phenotypes with a univariate gaussian mixture model

Sarah Weber: Dynamic functional connectivity of fMRI resting state networks in patients with psychosis

Siv Hege Lyngstad: Searching for genetic vulnerability underlying apathy in schizophrenia spectrum disorders



Tobias Kaufmann was awarded the poster prize at the Annual Retreat.



Annual Retreat 2018

September 17 - Day one

13:00 - 13:30	Welcome address and status of NORMENT. Ole A. Andreassen
13:30 - 15:00	Session I. How to build a career. Moderator: Ingrid Melle
13:30 - 14:15	Katrine Borgen (Mobilize Nordic): Development of research organizations - phases and group archetypes
14:15 - 14:45	Kjetil Sundet: The answer is neurocognition - and what was the question?
14:45 - 15:15	Kenneth Hugdahl: Did as good as I could: Discovered nothing
15:30 - 16:20	Session II. Disclose the genetic architecture of psychotic disorders and determine their functional impact. Moderator: Trine Vik Lagerberg
15:30 - 15:50	Overview: Projects, past, present and future. Vidar M. Steen & Srdjan Djurovic
15:50 - 16:05	Tatiana Polushina: Analysis of multi-omic data in psychosis
16:05 - 16:20	Matt Vandenberghe: High Throughput Functional phenotyping of iPSCs-derived neurons from patients
16:30 - 17:20	Session III. Identify novel brain imaging phenotypes linking genes and clinical phenotypes in a longitudinal setting. Moderator: Anja Torsvik
16:30 - 16:50	Overview: Projects, past, present and future. Lars T. Westlye
16:50 - 17:05	Ida Elken Sønnderby: CNVs with brain structural effects
17:05 - 17:20	Akiah Ottesen Berg: Vitamin D levels, brain volume and genetic architecture in patients with psychosis
17:20 - 17:30	Presentation of group work and team building activity.
17:30 - 18:30	Poster session PhD students and post docs present recent posters and compete for the "Doktor Einar Martens Legat Poster Prize 2018" of 10.000 NOK
18:30 - 19:30	Group activity
From 19:30	Aperitif
20:00	Dinner



September 18 - Day two

09:00 - 09:50	Session IV. Use genetic, environmental and clinical factors to predict disease progress and outcome, applying novel statistical tools. Moderator: Erik Johnsen
09:00 - 09:20	Overview: Projects, past, present and future. Ingrid Melle
09:20 - 09:35	Oleksandr Frei: Beyond SNP Heritability: Polygenicity and Discoverability Estimated for Multiple Phenotypes with a Univariate Gaussian Mixture Model.
09:35 - 09:50	Carmen Simonsen: Self-rated disability at one year follow-up
10:00 - 10:50	Session V. Translate pathophysiological discoveries into stratification strategies, prevention efforts and clinical psychopharmacological interventions. Moderator: Stephanie Le Hellard
10:00 - 10:20	Overview: Projects, past, present and future. Erik Johnsen
10:20 - 10:35	Anja Torsvik: Transcriptional evidence for a granulocyte immune response in psychotic disorders - potential biomarkers for stratification and treatment prediction
10:35 - 11:00	Group photo
11:00 - 11:45	Session VI. Central Support Moderator: Ingrid Agartz
11:00 - 11:15	Christine Lycke Brandt: Dissemination and internal communication
11:15 - 11:30	Thomas Bjella: Database
11:30 - 11:45	Tatiana Polushina and Margrethe Collier Høegh: Young scientist meeting past and future
11:45 - 13:45	Group work including lunch
13:45 - 15:00	Presentation of results from group work
15:00	Adjourn. Ole A. Andreassen

PhD Dissertations

2013

Dieset, Ingrid: Endothelial and inflammatory markers in schizophrenia and bipolar disorder, supervisor: Ole A. Andreassen, 28.11.2013

Reckless, Greg: A functional MRI investigation of the relationship between extrinsic motivation and decision-making: normal characteristics and possible dysfunction in schizophrenia. supervisor: Jimmy Jensen, 20.12.2013

Wirgenes, Katrine: Genetic factors in schizophrenia associated with endophenotypes, supervisor: Ole A. Andreassen, 04.12.2013

2014

Barder, Helene: Longitudinal neurocognitive trajectories in first-episode psychosis: Relationships between illness severity and cognitive course, supervisor: Kjetil Sundet, 23.06.2014

Bratlien, Unni: The relevance of premorbid and prodromal phases in psychotic disorders, supervisor: Merete Gløde, 28.05.2014

Elvsåshagen, Torbjørn: A study of cortical structure and plasticity in bipolar II disorder, supervisor: Ulrik Fredrik Malt, 19.05.2014

Falkenberg, Liv Eggset: Neuronal underpinnings of healthy and dysfunctional cognitive control, supervisor: Kenneth Hugdahl, 05.12.2014

Holmen, Aina: Neurocognition in early-onset schizophrenia with a particular focus on executive function, supervisor: Bjørn Rishovd Rund, 23.01.2014

Mattingdal, Morten: Functional profiling of single-nucleotide polymorphisms associated with bipolar disorder, supervisor: Ole A. Andreassen, 02.09.2014

Mork, Erlend: Self-harm in patients with schizophrenia; risk factors and clinical characteristics, supervisor: Lars Møhlum, 04.09.2014

2015

Bless, Josef: The smartphone as a research tool in psychology. Assessment of language lateralization and training of auditory attention, supervisor: Kenneth Hugdahl, 15.10.2015

Fernandes, Carla P. D.: A genetic study of schizophrenia and bipolar disorder - a cognitive endophenotype approach, supervisor: Stephanie Le Hellard, 05.03.2015

Gjevik, Elen: Psychiatric comorbidity in children with autism spectrum disorder - from genes to clinical characteristics. supervisor: Ole A. Andreassen, 27.05.2015

Sönmez, Nasrettin: Depressive symptoms and cognitive behavior therapy in first episode psychosis, supervisor: Jan Ivar Røssberg, 29.05.2015

2016

Bolstad, Ingeborg: Effects of aripiprazole vs haloperidol on brain activity in healthy volunteers, supervisor: Jimmy Jensen, 08.03.2016

Brandt, Christine Lycke: Brain networks in psychotic disorders: A neuroimaging study of working memory related activation, connectivity and anatomy, supervisor: Lars Tjelta Westlye, 13.06.2016

Lystad, June Ullevoldsæter: Neurocognition, cognitive remediation and functional outcome in schizophrenia spectrum disorders, supervisor: Torill Ueland, 09.12.2016

2017

Skåtun, Kristina: Abnormal brain connectivity in schizophrenia and bipolar disorder – a resting state functional MRI study, supervisor: Lars T. Westlye, 19.01.2017

Nerhus, Mari: Migration and Vitamin D in psychotic disorders – A cross sectional study of clinical and cognitive correlates, supervisor: Ingrid Melle, 03.03.2017

Haram, Marit: The relationship between oxytocin pathway genes and personality traits and psychosis characteristics, supervisor: Martin Tesli, 01.06.2017

Jørgensen, Kjetil Nordbø: Understanding brain structure alterations in severe mental disorders: The influence of cigarette smoking, antipsychotic medication and weight gain, supervisor: Ingrid Agartz, 20.06.2017

Haatveit, Beathe: Executive functioning in schizophrenia spectrum disorders: Methods of measurement and longitudinal course, supervisor: Torill Ueland, 22.08.2017

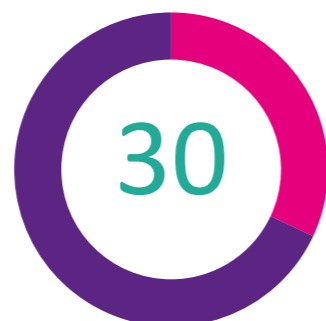
Mørch-Johnsen, Lynn: Brain structure imaging of apathy and auditory hallucinations in psychotic disorders, supervisor: Ingrid Agartz, 01.12.2017

Østefjells, Tiril: Metacognition in severe mental disorders, supervisor: Jan Ivar Røssberg, 07.12.2017

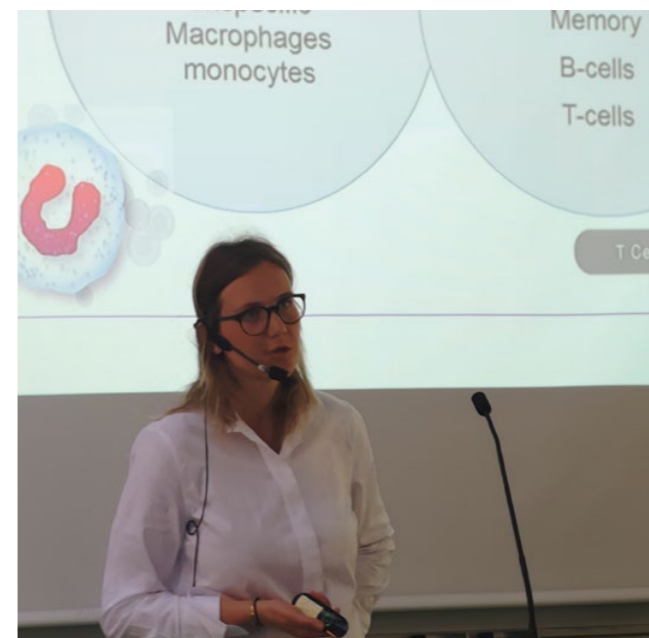
Kvitland, Levi: Cannabis use in the early phase of bipolar disorder. A naturalistic longitudinal study of a first treatment sample, supervisor: Petter Andreas Ringen, 08.12.2017

30 people have so far completed their PhDs at the Centre

20 female



10 male



In 2018, five PhD students at NORMENT defended their doctoral thesis.



Ragni Mørch: Inflammatory pathways in severe mental disorder – a transdiagnostic approach, supervisor: Ole A. Andreassen, May 15, 2018



Erlend Strand Gardsjord: Subjective quality of life in first episode psychosis - A 10-year follow-up study, supervisor: Jan Ivar Røssberg, September 20, 2018



Niladri Banerjee: An evolutionary epigenetics approach to schizophrenia, supervisor: Stephanie Le Hellard, September 28, 2018



Eva Z. Hoseth: Aberrant TNF and Notch signaling pathways in schizophrenia and bipolar disorder, supervisor: Ole A. Andreassen, November 30, 2018



Christine Demmo: Neurocognitive functioning, clinical course and functional outcome in the early phase of bipolar I disorder: A prospective longitudinal study, supervisor: Torill Ueland, October 25, 2018

International Collaboration

The research at NORMENT requires close cooperation with leading research environments, both nationally and internationally. Researchers at the Centre collaborate with a large number of researchers abroad ([see page 56](#)), participate in a series of international networks and consortia ([see page 57](#)), and have several bilateral research programmes with international institutions, mainly in Europe and the USA. NORMENT also actively recruits excellent researchers from other countries through international advertisements and networking, and as a result of this the Centre staff consisted of people from 29 nationalities in 2018.

Our international collaborations resulted in a number of important scientific findings in 2018, including the detection of genetic variants associated with specific subregions of the hippocampus (van der Meer et al., *Molecular Psychiatry*), a genetic overlap between pathological mechanisms of schizophrenia and pharmacological mechanisms of antipsychotic medication (Kauppi et al., *American Journal of Psychiatry*), and identification of novel genetic risk variants for schizophrenia (Pardinas et al., *Nature Genetics*).

As part of the Enhancing Neuro Imaging Genetics Through Meta Analysis (ENIGMA) consortium we also contributed to several findings, such as a genetic variant associated with intracranial brain volume and basal ganglia (Sønderby et al., *Molecular Psychiatry*), brain abnormalities in schizophrenia (van Erp et al., *Biological Psychiatry*), and identification of bipolar disorders using MRI and machine learning (Nunes et al., *Molecular Psychiatry*).

Through the Psychiatric Genomics Consortium (PGC) we reported overlapping genetic architecture between bipolar disorder and schizophrenia (Bipolar Disorder and Schizophrenia Working Group of the PGC, Cell), shared heritability between brain disorders (Brainstorm Consortium, *Science*), and for the first time significant genetic variants associated with ADHD (Demontis et al., *Nature Genetics*). Further, we contributed to reviews of recent genetic findings in psychiatric genetics (Sullivan et al., *American Journal of Psychiatry*; Smoller et al., *Molecular Psychiatry*).

Guest Researchers

Three international guest researchers have part-time positions at NORMENT and collaborate closely with researchers at the Centre.

Professor Anders M. Dale, associate professor **Anna Devor** and professor **Wesley Thompson** from the University of California San Diego, USA, contribute with knowledge and analyses, participate in project discussions, and are involved in planning of future studies with our researchers.

Anders M. Dale and Wesley Thompson visited the Centre in 2018, and Thompson gave a lecture on the [ABCD study](#) on brain development. Several researchers from NORMENT also visited San Diego during the year, for training and collaborative discussions.

Visits abroad

As part of our international collaboration, we also emphasize the mobility of PhD students, postdoctoral fellows and senior scientists exchanged with a diversity of countries. In 2018, **postdoc Francesca Puppo** stayed half a year in San Diego, USA, to visit the lab of Anna Devor at the University of California and do imaging in stem cell derived neuronal cultures. **Researcher Monica Aas** spent eight months at Kings College London, England, to collaborate on projects related to her “Stress under Skin” research project.

Several people also had shorter stays abroad, to discuss collaborative projects and participate in project meetings. Some examples are shown here:

Anja Vaskinn visited Dr. Elizabeth Bromley, University of California San Diego, USA, for video-ethnography training.

Claudia Barth visited Karolinska Schizophrenia Project (KaSP), Karolinska Institutet Stockholm, Sweden, for discussion of collaborative projects.

Daniel Quintana visited MOE Key Lab for Neuroinformation, University of Electronic Science and Technology of China, China, for discussion of oxytocin research collaboration.

Elin Inderhaug visited Dr. Vivi Heine, Department of Complex Trait Genetics, Vrije Universiteit, Netherlands, to exchange experiences regarding stem cell work and differentiation of neurons.

Florian Krull visited Hauke Bratsch, Center for Translational Imaging and Precision Medicine, University of California San Diego, USA, to share know-how about technical infrastructure.

Hanne Christine Mohn visited the Clinical Long-term Investigation of Psychosis in Sweden (CLIPS), Region Västra Götaland, Sweden, for data analysis and to finalize papers.

Isabella Kusztrits visited the Cognitive NeuroPsychiatry Group Groningen, Cognitive Neuroscience Center UMCG, Netherlands, for collaboration discussion.

Jaroslav Rokicki visited the Integrative Brain Imaging Center (IBIC), National Center of Neurology and Psychiatry (NCNP), Japan, for discussion of collaborative projects.

Kevin O’Connell and others visited professor Dan Stein, Department of Psychiatry, University of Cape Town, South Africa, for discussion of our INTPART collaboration with South Africa.

Lynn Marquardt visited professor Iris Sommer and Sanne Schuit-Koops, University Medical Center Utrecht, Netherlands, for exchange of data in a collaborative project.

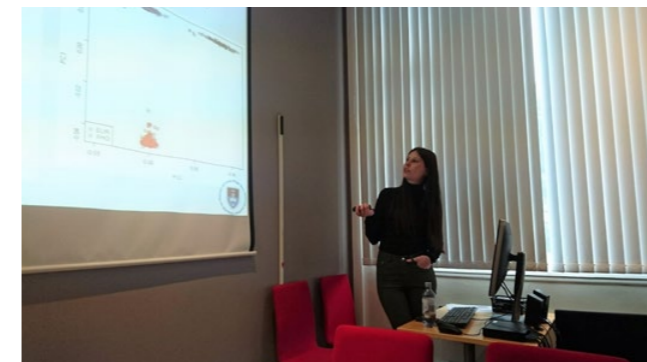
Oleksandr Frei had two visits to the Center for Multimodal Imaging and Genetics, University of California San Diego, USA, to prepare manuscripts and collaborate on ongoing projects.

Tatiana Polushina visited the Laboratory of Memory Circuits, Achucarro Basque Center for Neuroscience, Spain, for a kick-off meeting in ERA-NET NEURON project in posttraumatic stress disorder.

Visits from abroad

Another part of our international involvement is to host students from European countries for internships and training. In 2018, three master students visited the Centre as part of the Erasmus programme. **Daniël Roelfs** from the University of Lund, Sweden, and **Adrià Marly Pèlach** from the University of Barcelona, Spain, both were part of the Translational Electrophysiology Group for six months, while **Jessica Izzo** from the University of Turin, Italy had a three months internship in the Multimodal Imaging Group.

We also have regular visits from international researchers coming for project meetings, collaborative discussions and to give guest lectures. Some of these visits are mentioned below:



As part of our new INTPART-collaboration with the University of Cape Town, South Africa, two students visited the Centre in September. **Mary Mufford** and **Megan Campbell** participated at the Annual Retreat in Bergen, and joined meetings and a project seminar in Oslo to introduce this collaboration to people in Oslo.



Professor Kerry Ressler from Harvard Medical School, USA, was invited speaker for the Dr. Einar Martens Lecture 2018 in Bergen in September, in relation to Niladri Banerjee’s thesis defense. He gave a talk on amygdala cell and circuit function.

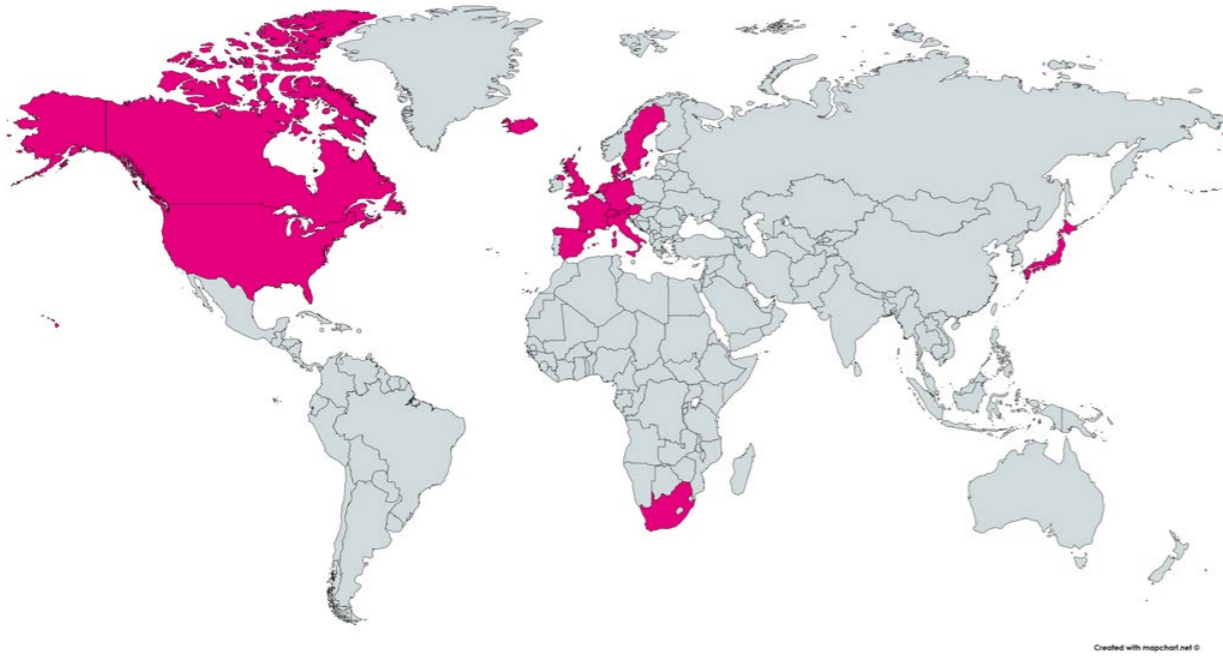
Dr. Valerij G. Kiselev from the University of Freiburg, Germany, visited Oslo in November and gave a lecture on “Tissue microstructure through the window of diffusion MRI”.



Professor James Walters from Cardiff University, UK, and **professor Paul Thompson** from the University of Southern California, USA, and director of the ENIGMA Consortium, were invited speakers and had meetings with researchers at the Centre when they were in Norway for the “Research conference in Mental Health and Addiction” that NORMENT organized in May/June ([see page 63](#)).

Professor Sheri Johnson from the University of California, Berkeley, USA, visited the clinical and cognitive groups in Oslo in September for a one-day seminar on affective dysregulation in bipolar disorder and collaboration on functional evaluations.

Professor Iris Sommer from University Medical Center Groningen, Netherlands, visited research groups in Bergen several times during the year for collaborative meetings, including in the Norwegian Prednisolone in Early Psychosis Study (NorPEPS).



International Collaborators

Nordic Countries

Denmark

- Christian Gerlach, Professor, University of Southern Denmark, Odense
- Randi Starrfelt, Professor, University of Copenhagen
- Thomas Werge, Professor, iPSYCH and Mental Health Centre Sct. Hans, Copenhagen

Iceland

- Hreinn Stefansson, Head of CNS Department, deCODE genetics, Reykjavik
- Kristinn Johnsen, Director, Mentis Cura, Reykjavik

Sweden

- Anna Falk, Associate Professor, Karolinska Institutet, Stockholm
- Göran Engberg, Professor, Karolinska Institutet, Stockholm
- Håkan Ahlström, Professor, Akademiska Hospital, Uppsala
- Lars Farde, Professor, Karolinska Institutet, Stockholm
- Lars Nyberg, Professor, University of Umeå
- Mikael Landén, Professor, University of Gothenburg
- Patrick F. Sullivan, Professor, Karolinska Institutet, Stockholm
- Simon Cervenka, Senior Lecturer, Karolinska Institutet, Stockholm
- Sophie Erhardt, Professor, Karolinska Institutet, Stockholm

Europe

Austria

- W. Wolfgang Fleischhacker, Professor, Medizinische Universität Innsbruck

France

- Bruno Etain, Senior Scientist, Hôpital Henri Mondor-Chenevier, Creteil
- Chantal Henry, Professor, Hôpital Henri Mondor-Chenevier, Creteil
- Frank Bellivier, Professor, Université Denis Diderot, Paris

Germany

- Andreas Meyer-Lindenberg, Professor, University Medical Centre Mannheim
- Douglas Garrett, Fellow, Max Planck Institute for Human Development, Berlin
- Emanuel Schwarz, Research Associate, Central Institute of Mental Health, Mannheim
- Falk Kiefer, Professor, Central Institute of Mental Health, Mannheim
- Marcella Rietschel, Professor, Central Institute of Mental Health, Mannheim
- Markus Nöthen, Professor, University of Bonn
- Michael Peitz, Professor, University of Bonn
- Tania Lincoln, Professor, Hamburg University
- Vadim V. Nikulin, Principal Investigator, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig

Italy

- Alessandro Bertolino, Professor, University of Bari
- Francesco Benedetti, Director, San Raffaele Scientific Institute, Milan
- Silvana Galderisi, Professor, University of Naples

Netherlands

- Andre Aleman, Professor, Groningen University Medical Center
- Danielle Posthuma, Professor, Vrije Universiteit, Amsterdam
- Dirk Schubert, Professor, Utrecht University Medical Center
- Iris Sommer, Professor, Utrecht University Medical Center
- Vivi Heine, Professor, Vrije Universiteit, Amsterdam

Spain

- Mazahir Hasan, Research Professor, Achucarro Basque Center for Neuroscience, Bilbao
- Miguel Lopez, Senior Research Scientist, University of Santiago de Compostela

Switzerland

- Ahmad Abu-Akel, Professor, University of Lausanne
- Narly Golestani, Professor, University of Geneva
- Stefan Kaiser, Professor, University of Geneva
- Stefan Borgwardt, Professor, University of Basel
- Sven Cichon, Professor, University of Basel

United Kingdom

- Adrian J. Harwood, Professor, Cardiff University
- Angela Vincent, Professor Emeritus, University of Oxford
- Clara Strauss, Honorary Senior Lecturer, Sussex University, Brighton
- Gwenaëlle Douaud, Associate Professor, University of Oxford
- Michael O'Donovan, Professor, Cardiff University
- James Walters, Professor, Cardiff University
- Stephen Smith, Professor, Oxford University

USA

- Anders M. Dale, Professor, University of California, San Diego
- Anna Devor, Associate Professor, University of California, San Diego
- Elizabeth Bromley, Associate Professor, Semel Institute for Neuroscience and Human Behavior, University of California, Los Angeles
- John Kelsoe, Professor, University of California, San Diego
- Jordan Smoller, Professor, Harvard Medical School, Boston
- Joseph Ventura, Professor, University of California, Los Angeles
- Judith M. Ford, Professor, Laboratory of Clinical and Cognitive Neuroscience, University of California, San Francisco
- Kathleen Merikangas, Professor, National Institute of Mental Health, Bethesda
- Kerry Ressler, Professor, McLean Hospital, Harvard Medical School, Boston
- Melvin McInnis, Professor, University of Michigan
- Michael McCarthy, Associate Professor, University of California, San Diego
- Morris Bell, Professor, Yale School of Medicine, New Haven
- Ofer Pasternak, Associate Professor, Harvard Medical School, Boston
- Patrick Sullivan, Professor, University of North Carolina of Chapel Hill
- Paul Thompson, Professor, University of Southern California, Los Angeles
- Rene Kahn, Professor, Icahn School of Medicine at Mount Sinai, New York
- Robert H. Yolken, Professor, Johns Hopkins School of Medicine, New York
- Susan McGurk, Professor, Boston University
- Wesley Thompson, Associate Professor, University of California, San Diego
- William Horan, Senior Scientist, University of California, Los Angeles

Other Countries

Canada

- Stephen Hart, Professor, Simon Fraser University, Burnaby

Japan

- Gaku Okugawa, Associate Professor, Kansai Medical University, Osaka

South Africa

- Dan Stein, Professor, University of Cape Town

International Projects and Consortia

[Brainstorm Consortium](#)

[COGENT - Cognitive Genomics Consortium](#)

[CHARGE - Cohorts for Heart and Aging Research in Genomic Epidemiology](#)

[ECNP Bipolar Disorder - European College of Neuropsychopharmacology Bipolar Disorders Network](#) (Ole A. Andreassen chairs Bipolar Network)

[ECNP Schizophrenia - European College of Neuropsychopharmacology Schizophrenia Network](#)

[ENIGMA - Enhancing Neuro Imaging Genetics Through Meta-Analysis](#) (Ole A. Andreassen chairs the Bipolar Working Group, Ingrid Agartz chairs the Early Onset Psychosis Working Group, Ida E. Sørnderby and Ole A. Andreassen co-chair the CNV Working Group)

[EuroNES - European Negative Symptoms Research Network](#)

[GEMRIC – The Global ECT-MRI Research Collaboration](#)

[HVN - Hearing Voices Network](#)

[IMAGEMEND - Imaging Genetics for Mental Disorders](#)

[ICHR - International Consortium on Hallucination Research](#)

[KaSP - Karolinska Schizophrenia Project](#)

[MINDDS – Maximising Research Impact in Neurodevelopmental Disorders](#)

[PGBD – Pharmacogenomics of Bipolar Disorder](#)

[PGC - Psychiatric Genomics Consortium](#) (Ole A. Andreassen chairs the Bipolar Disorder Working Group)

[PsychDPC - Psychiatric Diagnostic and Prevention Consortium](#)

[R-LiNK - Optimizing Response to Lithium Treatment through Personalized Evaluation of Individuals with Bipolar I Disorder](#)

[STRATA-G – Schizophrenia: Treatment Resistance and Therapeutic Advances - Genetics](#)

[TRYGGVE 2 – Nordic collaboration for sensitive data](#)

Dissemination and Communication

Dissemination is an important part of research. At NORMENT, we have a continuous focus on communicating our findings, not only to other researchers through publications in scientific journals and presentations at scientific conferences and meetings, but also to patient organizations, health personnel, and the general public. A selection of our dissemination activities in 2018 are listed on the following pages.

During 2018, we have improved and updated our website (www.med.uio/norment) with information about the new organization, research topics, and research groups at the Centre. We have also published news articles and researcher texts on a regular basis, to reach out with our research to a broader audience.

Twitter (<https://twitter.com/SFFNORMENT>) has also been used to share news about publications, meetings, thesis defences, and other information related to science and mental disorders. Since the creation of our Twitter account in 2016, we have posted about 550 tweets, of which 130 were posted in 2018. At the end of the year, NORMENT had around 390 followers on Twitter.

136 Publications in scientific journals

85 International scientific presentations (39 oral presentations, 46 posters)

68 National scientific presentations (48 oral presentations, 20 posters)

114 Oral presentations for patient organizations and health personnel

25 Oral presentations and other activities for the general public

33 News articles, interviews and feature articles in the media

■ SIRS (14)

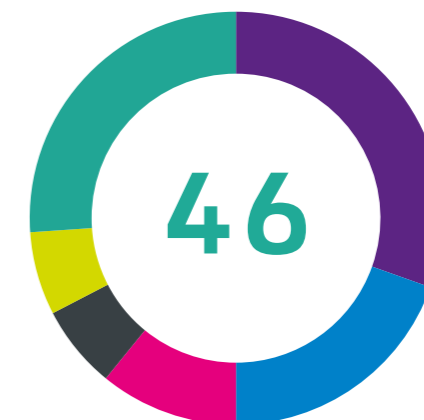
■ SOBP (9)

■ WCPG (5)

■ IEPA (3)

■ OHBM (3)

■ Other (12)



Poster presentations at international scientific conferences

SIRS: Schizophrenia International Research Society Conference
 SOBP: Society of Biological Psychiatry
 WCPG: World Congress of Psychiatric Genetics
 IEPA: International Conference on Early Intervention in Mental Health
 OHBM: Annual Meeting of the Organization for Human Brain Mapping

MANGE SLITER PSYKISK

Mer enn én av fire studenter opplever psykiske plager. I tillegg vil 16-22 % av den voksne befolkningen ha en psykisk lidelse i løpet av 12 måneder, viser tall fra FHI.

#godmo



Scientific Conferences and Meetings

Selected International Oral Presentations



Aminoff, Sofie R: Affective lability and polygenic risk in bipolar disorder, 11th International Conference on Early Intervention in Mental Health (IEPA), Boston, USA, October 7-10, 2018.

Andreassen, Ole A: Intranasal administration of Esketamine – a promising new antidepressant, Scandinavian College of Neuropsychopharmacology (SCNP), Århus, Denmark, April 12, 2018.

Andreassen, Ole A: Biological insight from large-scale studies of bipolar disorder with multi-modal imaging and genetics, Society of Biological Psychiatry (SOBP), New York, USA, May 11, 2018.

Banerjee, Niladri: An evolutionary epigenetics approach to schizophrenia, World Congress of Psychiatric Genetics (WCPG), Glasgow, United Kingdom, September 11-15, 2018.

Berg, Akiah Ottesen: Environmental risk factors and symptoms in immigrants with psychotic disorder, World Congress of Psychiatry (WCP), Mexico City, Mexico, September 29, 2019.

Dunvoll, Guro: Equivalence Class Formation and N400 in Participants with High Functioning Autism Spectrum Disorder, 9th Conference of The European Association for Behavior Analysis (EABA), Wurtzburg, Germany, September 22, 2018.

Johannessen, Cecilie: Regional cerebellar volumes and cerebello-cerebral structural covariance in adolescents with early-onset psychosis: a multisample study, Society of Biological Psychiatry (SOBP), New York, USA, May 10, 2018.

Johnsen, Erik: Effectiveness of antipsychotic treatments in schizophrenia, Scandinavian College of Neuropsychopharmacology (SCNP), Århus, Denmark, April 13, 2018.

Kaufmann, Tobias: Task-related stability in the connectome fingerprint is sensitive to mental illness, Society of Biological Psychiatry (SOBP), New York, USA, May 09-12, 2018.



Kaufmann, Tobias: Patterns of brain ageing show genetic overlap with common brain disorders, World Congress of Psychiatric Genetics (WCPG), Glasgow, United Kingdom, September 11-15, 2018.

Kompus, Kristiina: Glutamatergic modification of lateralized connectivity patterns of the superior temporal gyrus during oddball paradigm, 6th North Sea Laterality International Meeting, Dundee, United Kingdom, August 22, 2018.

Sinkeviciute, Igne: Meta-analysis of efficacy of cognitive enhancers for patients with schizophrenia-spectrum disorders, 6th Biennial Schizophrenia International Research Society Conference (SIRS), Florence, Italy, April 04-08, 2018.

Steen, Nils Eiel: Inflammation and genetics in major psychiatric disorders and cognitive impairment, Virginia-Nordic Precision Neuroscience (VNP), Oslo, Norway, September 19-21, 2018.

Sønderby, Ida Elken: Positive dose response of the 1q21.1 distal CNV on ICV through an effect on cortical surface area, World Congress of Psychiatric Genetics (WCPG), Glasgow, United Kingdom, September 11-15, 2018.

Ueland, Torill: Cognitive remediation in early phase psychosis: results from a randomized controlled trial, 32nd Nordic Congress of Psychiatry (NCP), Reykjavik, Iceland, June 13-16, 2018.

Valstad, Mathias: Visual evoked potential potentiation using checkerboard stimulation: Assessing electrophysiological phenotypes for psychotic disorders, Neuronus IBRO Neuroscience Forum, Krakow, Poland, April 20-22, 2018.

van der Meer, Dennis: Brain scans from 21297 individuals reveal the genetic architecture of hippocampal subfield volumes, Neuronus IBRO Neuroscience Forum, Krakow, Poland, April 20-22, 2018.

Vaskinn, Anja: Training of Affect Recognition: effects on social cognition and functioning, 21st Annual Cognitive Remediation in Psychiatry conference, New York, USA, June 05, 2018.

Selected International Poster Presentations

Aas, Monica: Reduced brain-derived neurotrophic factor is associated with later clinical illness stages of psychosis continuum disorder, Society of Biological Psychiatry (SOBP), New York, USA, May 09-12, 2018.

Alnæs, Dag: Brain variability in schizophrenia spectrum disorder, Society of Biological Psychiatry (SOBP), New York, USA, May 09-12, 2018.

Andresen, Lavinia A: Genetic variants associated with cardiometabolic abnormalities during treatment with selective serotonin reuptake inhibitors: A genome-wide association study, World Congress of Psychiatric Genetics (WCPG), Glasgow, United Kingdom, September 11-15, 2018.

Berg, Akiah Ottesen: Environmental risk factors and symptoms in immigrants with psychotic disorder, World Congress of Psychiatry (WCP), Mexico City, Mexico, September 29, 2018.

Bless, Josef: Real-time assessment of auditory hallucinations using a smartphone app; results from a pilot study, 6th Biennial Schizophrenia International Research Society Conference (SIRS), Florence, Italy, April 04-08, 2018.



Büchmann, Camilla: Validity of the Birchwood Insight Scale in patients with schizophrenia spectrum- and bipolar disorders, 11th International Conference on Early Intervention in Mental Health (IEPA), Boston, USA, October 7-10, 2018.

Craig-Craven, Alexander: Measurement bias under functional spectroscopy conditions: A simulation study, 24th Annual Meeting of the Organization for Human Brain Mapping (OHBM), Singapore, June 17, 2018.

Dunvoll, Guro: Equivalence Class Formation and the EEG-Based N400 Component, Association for Behavior Analysis International 44th Annual Convention, San Diego, USA, May 26, 2018.

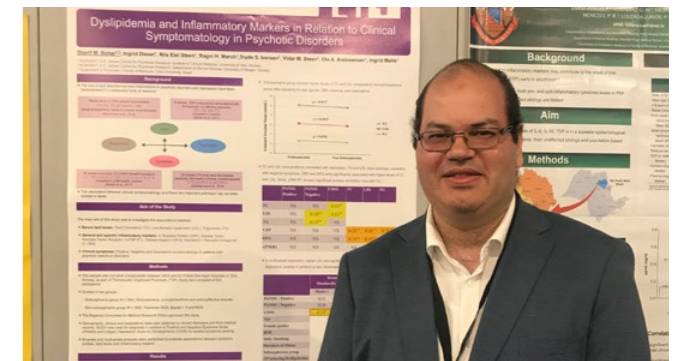
Elvsåshagen, Torbjørn: Long-Term Potentiation-Like Visual Evoked Potential Plasticity in a Large Sample of Healthy Volunteers: Effect Sizes and Response Rates, Society of Biological Psychiatry (SOBP), New York, USA, May 10, 2018.

Engen, Magnus Johan: Cognitive functioning in first-episode psychosis patients with and without persistent negative symptoms: A 1-year follow-up study, 6th Biennial

Schizophrenia International Research Society Conference (SIRS), Florence, Italy, April 04-08, 2018.

Færden, Ann: Behind apathy and depression in first episode psychosis: Significant correlations of reduced interests and hopelessness, 6th Biennial Schizophrenia International Research Society Conference (SIRS), Florence, Italy, April 04-08, 2018.

Fathian, Farivar: The serum level of C-reactive protein in schizophrenia-spectrum disorders: Longitudinal relationship to cognitive function in acute phase of psychosis in a pragmatic, randomized trial, 6th Biennial Schizophrenia International Research Society Conference (SIRS), Florence, Italy, April 04-08, 2018.



Gohar, Sherif: Dyslipidemia and Inflammatory Markers in Relation to Clinical Symptomatology in Psychotic Disorders, 6th Biennial Schizophrenia International Research Society Conference (SIRS), Florence, Italy, April 04-08, 2018.

Hjelmervik, Helene: Excitatory-inhibitory imbalance and auditory hallucinations in schizophrenia - Preliminary results, 6th Biennial Schizophrenia International Research Society Conference (SIRS), Florence, Italy, April 04-08, 2018.

Jørgensen, Kjetil N: Cumulative use of antipsychotic medication and brain structure in psychotic disorders: a prescription registry-based MRI study, Society of Biological Psychiatry (SOBP), New York, USA, May 09-12, 2018.

Kaufmann, Tobias: Brain disorders are associated with increased brain age, Society of Biological Psychiatry (SOBP), New York, USA, May 09-12, 2018.

Kompus, Kristiina: Effective connectivity of superior temporal regions modulated by glutamate during oddball paradigm: an 1H-MRS- fMRI experiment, 8th Mismatch Negativity Conference (MMN), Helsinki, Finland, June 12, 2018.

Kusztrits, Isabella: Psychotic experiences in a Norwegian sample - tentative results of a questionnaire validation, 6th Biennial Schizophrenia International Research Society Conference (SIRS), Florence, Italy, April 04-08, 2018.

Laloyaux, Julien: Beliefs about their voices and degree of resilience in persons with auditory verbal hallucinations with and without need for care, 6th Biennial Schizophrenia International Research Society Conference (SIRS), Florence, Italy, April 04-08, 2018.

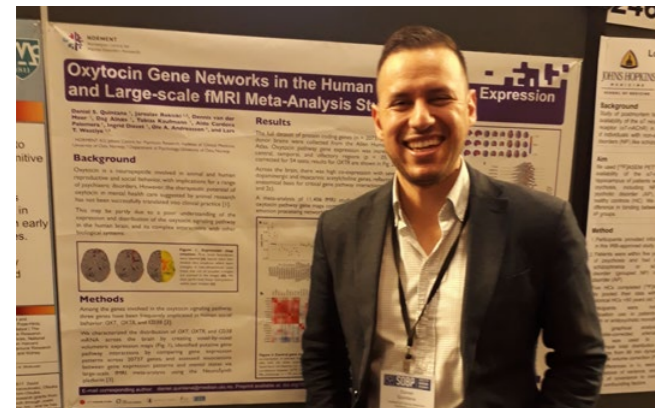
Maglanoc, Luigi A: Can various estimates of resting-state functional connectivity predict polygenic risk scores for depression and neuroticism?, 6th Biennial Conference on Brain Connectivity, Montreal, Canada, October 26-28, 2018.

Marquardt, Lynn: Transcranial direct current stimulation (tDCS) in a non-clinical population as a model for treatment of auditory verbal hallucinations in schizophrenia, 24th Annual Meeting of the Organization for Human Brain Mapping (OHBM), Singapore, June 17, 2018.

Maximov, Ivan: Diffusion kurtosis imaging in chronic disorders of consciousness: state estimation and treatment prognosis, International Society of Magnetic Resonance in Medicine (ISMRM), Paris, France, June 18-21, 2018.

Moberget, Torgeir: Common genetic variants influencing human cerebellar grey matter volume - a genome-wide association study of 12578 healthy participants, Society for Neuroscience, San Diego, USA, November 07, 2018.

Puppo, Francesca: Functional characterization of iPSC-derived neuronal networks, Center for Engineered Natural Intelligence (CENI) Symposium, San Diego, USA, December 04, 2018.



Quintana, Daniel: Oxytocin gene networks in the human brain: A gene expression and large-scale fMRI meta-analysis, Society of Biological Psychiatry (SOBP), New York, USA, May 09-12, 2018.

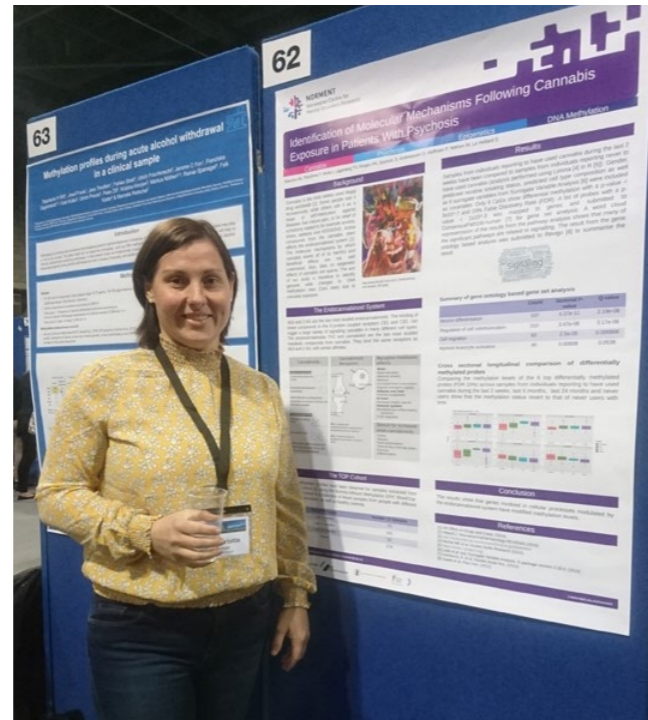
Rokicki, Jaroslav: Gene expression patterns in the disordered brain, Society of Biological Psychiatry (SOBP), New York, USA, May 09-12, 2018.

Rødevand, Linn: Cardiovascular disease risk in patients with schizophrenia and bipolar disorder, 6th Biennial Schizophrenia International Research Society Conference (SIRS), Florence, Italy, April 04-08, 2018.

Simonsen, Carmen: Experienced stigma in first-episode psychosis: a 1-year follow-up study, 11th International Conference on Early Intervention in Mental Health (IEPA), Boston, USA, October 7-10, 2018.

Smeland, Olav: Genome-wide analysis reveals extensive genetic overlap between schizophrenia, bipolar disorder and intelligence, World Congress of Psychiatric Genetics (WCPG), Glasgow, United Kingdom, September 11-15, 2018.

Stabell, Lena Antonsen: Predictors of treatment satisfaction in acute phase psychosis: Comparison between antipsychotic naïve and previously medicated patients, 6th Biennial Schizophrenia International Research Society Conference (SIRS), Florence, Italy, April 04-08, 2018.



Stavrum, Anne-Kristin: Identification of Molecular Mechanisms Following Cannabis Exposure in Patients With Psychosis, World Congress of Psychiatric Genetics (WCPG), Glasgow, United Kingdom, September 11-15, 2018.

Stokowy, Tomasz: Analysis options for human whole genome sequencing, American Society of Human Genetics (ASHG), San Diego, USA, October 16-20, 2018.

Svendsen, Ingrid Hartveit: Self-disturbances and diagnostic stability in first episode psychosis—a seven year follow-up study, 6th Biennial Schizophrenia International Research Society Conference (SIRS), Florence, Italy, April 04-08, 2018.

Sønderby, Ida Elken: Negative dose response of the 16p11.2 distal CNV on intracranial volume and structures of the basal ganglia, 24th Annual Meeting of the Organization for Human Brain Mapping (OHBM), Singapore, June 17, 2018.

van der Meer, Dennis: Brain scans from 21297 individuals reveal the genetic architecture of hippocampal subfield volumes, Society of Biological Psychiatry (SOBP), New York, USA, May 09-12, 2018.

Vedal, Trude S: Antipsychotic drug use and thyroid function in patients with severe mental disorders, 6th Biennial Schizophrenia International Research Society Conference (SIRS), Florence, Italy, April 04-08, 2018.

Villar, Jonelle: Identification of Epigenetic Modifications Following Antipsychotic Treatment, World Congress of Psychiatric Genetics (WCPG), Glasgow, United Kingdom, September 11-15, 2018.

RCN Conference 2018
31 May - 1 June
Mental Health and Addiction
Norwegian Research Opportunities

NORMENT organized the **Research Conference on Mental Health and Addiction** together with SERAF (Norwegian Centre for Addiction Research) at Fornebu on May 31 to June 01, 2018. The conference was funded by The Research Council of Norway, and was aimed at researchers within mental health and drug addiction across scientific disciplines.

This year's topic was "Norwegian Research Opportunities". In addition to plenary lectures by Nordic and international speakers, the conference included parallel seminars and network meetings, as well as informal discussions.

Some of the topics were:

- Health registry data for research
- E-health and app technology
- Biophysical psychiatry - can computers model thoughts and emotion?
- Norwegian clinical research in mental health
- Updates from PGC and ENIGMA consortia

Selected National Oral Presentations

(For presentations at the Annual Retreat, [see page 51](#))

Andreassen, Ole A: Genetics of complex disorders - synergy from studies of cancer and mental illness, NCMM Network meeting, Oslo, February 27, 2018.

Andresen, Lavinia A: TOP Biobank, Biobank Norway conference, Oslo, March 13, 2018.



Bjella, Thomas: Self-monitoring symptoms of psychotic disorders, EHIN (E-helse i Norge) Conference, Oslo, November 13, 2018.

Bless, Josef: iVoice - assessing auditory hallucinations in real-time, Research Conference on Mental Health and Addiction, Fornebu, May 31, 2018.

Dunvoll, Guro: Stimulus Equivalence and N400; EEG Measures of Class Members, Norsk Atferdsanalytisk Forening (NAFO-seminaret), Storefjell, April 25-29, 2018.

Dwyer, Gerard: Combined fMRI/MRS, 6th National PhD Conference in Neuroscience (NRSN), Inderøy, September 19-21, 2018.

Elvsåshagen, Torbjørn: Evidence for brain structure and function changes after hours of sleep or sleep deprivation, Gardermokurset, Gardermoen, November 11, 2018.

Frei, Oleksandr: Update on Bivariate Gaussian Mixture Model with application to recent relevant GWAS results, Scandinavian approach for personalized medicine in psychiatry, Hafjell, February 2, 2018.

Haukvik, Unn Kristin: Strafferettslig tilregnelighet og nevrotenskap, Bergen-Gjøteborg Symposiet, Bergen, May 15, 2018.

Hansson, Lars: New Oragene kit pilot test, BUPGEN national meeting, Oslo, October 25, 2018.

Johnsen, Erik: Cross-talk between neurotransmitters and inflammation: venues for new treatments? Psykiatriveka, Bergen, March 15, 2018.

Kessler, Ute: ECT - Hva vet vi om mulige virkningsmekanismer og effekter på hjernen, Psykiatriveka, Bergen, March 15, 2018.

Lagerberg, Trine Vik: MinDag - an app for illness monitoring in severe mental disorders, EHIN, Oslo, November 13, 2018.

Marquardt, Lynn: tDCS in healthy participants; MR spectroscopy analysis, 6th National PhD Conference in Neuroscience (NRSN), Inderøy, September 19-21, 2018.

Maximov, Ivan: RF pulse design in MRI, Norwegian Siemens meeting, Stavanger, September 20, 2018.

Melle, Ingrid: Course and outcome of psychotic disorders, Research Conference on Mental Health and Addiction, Fornebu, June 01, 2018.

Polushina, Tatiana: Analysis of multi-omics data, Bioinformatics in Bergen (BiB), Os, October 02-03, 2018.

Quintana, Daniel: The dose dependent effects of intranasal oxytocin on social cognition in adult males with autism: a randomised controlled trial, Nasjonal Autisemekonferanse, Tønsberg, June 06, 2018.

Stavrum, Anne-Kristin: Bias in gene set analyses due to differing numbers of probes associated with each gene, Martens Scientific day, Bergen, December 06, 2018.

Svendsen, Ingrid Hartveit: Innlandets Forskningskonferanse for Helse- og Sosialfag, Gjøvik, September 27, 2018.

Sønderby, Ida Elken: ENIGMA-CNV and some findings, Research Conference on Mental Health and Addiction, Fornebu, June 01, 2018.

Torsvik, Anja: Current knowledge of the association between psychosis and immunity? Results from biological and genetic studies, The Bergen Early Psychosis Symposium, Bergen, May 29, 2018.



Torsvik, Anja: Global gene expression analysis of whole blood reveals a shared innate immunity signature in schizophrenia and bipolar disorder, Clinical Science Department Day, Bergen, December 12, 2018.

Ueland, Torill: Update on cognitive remediation for psychosis research in Norway, Cognitive and Affective Remediation Training meeting, Bergen, August 16, 2018.

Vaskinn, Anja: Using video in mental health research: ethical approval and consent forms, eVIR Seminar: Post GDPR. Ethics and Data Protection when using video/audio data, Oslo, November 28, 2018.

Winterton, Adriano: The oxytocin signalling pathway in severe psychiatric disorders and metabolic syndrome, 6th National PhD Conference in Neuroscience (NRSN), Inderøy, September 19-21, 2018.

Selected National Poster Presentations

(For posters at the NORMENT Annual Retreat, [see page 49](#))

Beck, Dani: Cardiovascular risk and brain network function, 6th National PhD Conference in Neuroscience (NRSN), Inderøy, September 19-21, 2018.

Kusztrits, Isabella: Transcranial direct current stimulation is not altering source monitoring abilities in healthy participants, 6th National PhD Conference in Neuroscience (NRSN), Inderøy, September 19-21, 2018.

Maximov, Ivan: Modelling of white matter architecture, University of Oslo - Life Science Summer student projects, Oslo, March 05, 2018.

Stabell, Lena Antonsen: Predictors of treatment satisfaction in acute phase psychosis: Comparison between antipsychotic naïve and previously medicated patients, Forskningsdag, Helse-Bergen, Bergen, May 23, 2018.

Stautland, Andrea: Clinical characteristics of bipolar disorder with comorbid migraine – preliminary findings, Medisin- og odontologistudentenes forskningskonferanse (Frampeik), Trondheim, November 21, 2018.

Stavrum, Anne-Kristin: Identification of molecular mechanisms following cannabis exposure in patients with psychosis, Bioinformatics in Bergen (BiB), Os, October 02-03, 2018.

Winterton, Adriano: The oxytocin signalling pathway in severe psychiatric disorders and metabolic syndrome, 6th National PhD Conference in Neuroscience (NRSN), Inderøy, September 19-21, 2018.

Patient Organizations and Health Personnel



Several researchers from NORMENT contributed in a new version of the most comprehensive Norwegian psychiatry textbook, "Lærebok i psykiatri", which was published in January 2018.

Ingrid Melle and Ole A. Andreassen were editors of the book, while Akiha Ottesen Berg, Torbjørn Elvsåshagen, Terje Nærland, Vidar M. Steen, Kjetil Sundet, and Ketil J. Ødegaard contributed chapters on different aspects of mental disorders.

Selected Presentations

Aminoff, Sofie Ragnhild: Mestringskurs for pasienter og pårørende, Bipolarforeningen, Oslo, March 23, 2018.

Andreassen, Ole A: Har medikamenter sluttet å virke? Yngre legers symposium, Oslo, April 06, 2018.

Berg, Akiha Ottesen: Skjebne eller patologi? Introduksjon til krysskulturelle forhold ved traumereaksjoner, Akuttpsykiatrikonferansen, Oslo, February 08, 2018.

Engen, Magnus Johan: Diagnosis: continuum or category, internundervisning, Fengselspsykiatrien Oslo fengsel, August 17, 2018.

Engh, John Abel: Presentation on course for family members of patients with psychosis, Tønsberg, April, 2018.

Hirnstain, Marco: Why do people with psychosis hear voices and how can we reduce them? Staff meeting, DPS Bjørkeli, Voss, June 19, 2018.

Hjell, Gabriella: Inflammatory biomarkers of violence in severe mental disorders, Østfold hospital semiannual research meeting, Kalnes, September 19, 2018.

Hoprekstad, Gunnhild: Inflammasjon og psykose – NorPEPS, Bjørgvin DPS, Tertnes, August 23, 2018.

Johannessen, Cecilie: Youth-TOP - background, participation and early results, family seminar at Children and Adolescent Department Oslo university hospital, Oslo, April 11, 2018.

Johnsen, Erik: Farmakologisk behandling av ikke-affektive psykoser, obligatorisk emnekurs psykofarmakologi, Bergen, January 16, 2018.

Kjelby, Eirik: Psykopharmaceuticals, VID Betanien høyskole, January 08, 2018.

Kroken, Rune Andreas: Somatisk helse, Regionalt møte om pakkeforløp, Bergen, September 15, 2018.

Lagerberg, Trine Vik: Affective lability and substance use in bipolar disorder, Vinderen DPS, Oslo, September 27, 2018.

Lund-Heimark, Hallvard: Elderly patients with no previous psychiatric history: factors relating to psychiatric acute admissions, meeting at the psychiatric acute unit, Sandviken Hospital, Bergen, November 19, 2018.

Løberg, Else-Marie: Kva veit vi om helse og levekår til utsette barn og unge, Utsette barn og unge - utfordringsbilete – tilrådingar om eigna tiltak i regi av Fylkesmannen i Hordaland, Bergen, September 25, 2018.

Melle, Ingrid: Ny forskning på psykoser: Konsekvenser for diagnostikk og relevans for praksis, fagdag, Sykehuset Vestfold, Tønsberg, February 27, 2018.

Moberget, Torgeir: Cerebellum og kognisjon, avdeling for neurohabilitering, Oslo University Hospital, March 21, 2018.

Mørch-Johnsen, Lynn: Hjerneforandringer ved schizofreni, Fagmøte, Sykehuset Østfold, May, 2018.

Simonsen, Carmen: Psychosis in children and adolescents – transdiagnostics, network meeting, Vestre Viken Hospital, Drammen, October 26, 2018.

Steen, Nils Eiel: Mind and body – somatic conditions in severe mental disorders, a key to understanding underlying mechanisms, staff meeting, Oslo University Hospital, March, 2018.

Steen, Vidar M: Molecular diagnostic markers: Opportunities and challenges, Laboratory Clinic Seminar, Os, January 05, 2018.

Strømme, Maria F: Medication free treatment of psychosis, Kronstad DPS, Bergen, November 14, 2018.

Ueland, Torill: Er hjernen virkelig stjernen? Forskningsdag, Klinikkk Psykisk Helse og avhengighet, Oslo universitetssykehus, Oslo, June 14, 2018.

Wedervang-Resell, Kirsten: Psykoselidelser hos barn og unge, heldagsseminar for leger i spesialisering, Helse Sør-Øst, Larvik, October 15, 2018.

General Public



In collaboration with the Norwegian Bipolar Association, NORMENT organized a thematic evening on work bipolar disorder and recovery in Oslo on October 16, 2018.

The event was open to everyone and was chaired by Pia Beate Pedersen from the podcast "Pia og Psyken".



Trine Vik Lagerberg presented bipolar disorder research at NORMENT, and Carmen Simonsen gave a talk on recovery in bipolar disorder. They also participated in a "sofa discussion", together with Stig L. Bech from the Bipolar Association and June U. Lystad from Oslo University Hospital

Selected Presentations

Andreassen, Ole A: Verdiskaping av helsedata for bedre behandling, LifeSci symposium, Oslo, January 10, 2018.

Andreassen, Ole A: Foredrag i forbindelse med utdeling av Bergesenprisen, Oslo, October 04, 2018.

Faerden, Ann: Hvordan forstår vi psykoser i 2018? Temakveld, Oslo University Hospital, Oslo, December 3, 2018.

Frei, Evgeniia: Modelling Psychiatric Disorders using induced Pluripotent Stem Cells, Lomonosov Moscow State University, Moscow, Russia, April 25, 2018.

Johnsen, Erik: Hva er psykose? Verdensdagen for psykisk helse, åpent møte Psykiatrisk klinikk, Bergen, October 03, 2018.

Ringen, Petter Andreas: Psykiatrien - hvor står du, og hvor går du? Medisinsk-filosofisk forum, Oslo, Nov 13, 2018.

Steen, Vidar M: Personalized medicine in medical genetics: Opportunities and challenges, TEKNA open meeting, Bergen, September 19, 2018.

Ødegaard, Ketil J: What is Bipolar Disorder? Open day for the public, Sandviken sykehus, Bergen, November 2018.

Other Activities

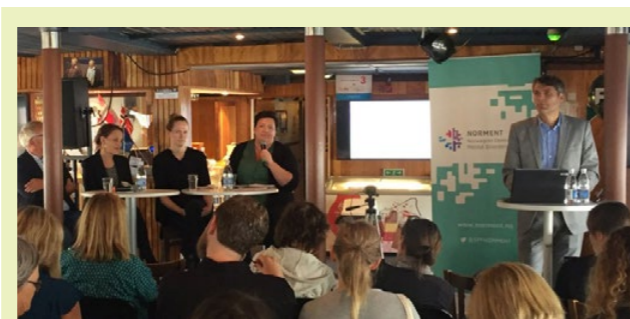
Berg, Akiah Ottesen: [Skjebne eller patologi? Introduksjon til krysskulturelle forhold ved traumereaksjoner](#), ROP-TV, February 10, 2018.

Elvsåshagen, Torbjørn: Event chair, Hvordan møter vi psykisk helse og økt forekomst av depresjon i befolkningen? Nansen Neuroscience Meeting and Hjerneverket, Oslo, November 23, 2018.

Haukvik, Unn Kristin: Co-hosting, [Psykopoden](#), podcast, six episodes during 2018

Løberg, Else-Marie: Debate, RØST-konferansen, Bergen, August 20, 2018.

Quintana, Daniel: Co-hosting, [Everything Hertz](#), podcast



NORMENT participated at Arendalsuka 2018, the yearly political festival in Arendal, Norway, on August 14, 2018. We hosted the event "[Mentale lidelser koster: Forsker vi nok?](#)" together with the Norwegian Bipolar Association, to highlight the importance of mental disorders research.



Centre Director Ole A. Andreassen opened the seminar by presenting the mismatch between funding of mental disorders research and burden of illness, and claimed that more funding is needed to make significant discoveries.

There was also a panel discussion covering important areas of research and user experiences, with questions from the audience. Unn K. Haukvik and Marthe Hagen from NORMENT participated in the panel discussion, together with Jan Ivar Røssberg from the University of Oslo and Tonje Fjeldstad Smith from the Bipolar Association.

Media Coverage

Alnæs, Dag: [General cognitive, psychopathology factors linked to white matter patterns](#), Healio, January 24, 2018.

Andreassen, Ole A: [Riktig bruk av medisiner ved psykiske lidelser gir god effekt?](#) Aftenposten, January 09, 2018.

Andreassen, Ole A: [Samtalerapi ved psykiske lidelser: Kan man snakke seg frisk?](#) Aftenposten, February 04, 2018.

Andreassen, Ole A: [Ja, man kan bli frisk av schizofreni](#), Aftenposten February 27, 2018.

Andreassen, Ole A: [Forskere: Snart kan du teste deg for demens](#), VG, July 07, 2018.



Andreassen, Ole A: [Norske eksperter: Tror på kraftig nedgang i psykiske lidelser](#), VG, October 23, 2018.

Andreassen, Ole A: [Vil kunne behandle psykiske lidelser som vi behandler hjertesykdom](#), God Morgen Norge, TV2, October 24, 2018. (see page 58)

Andreassen, Ole A: [Ja til moderat plan for åpen tilgang til forskningsresultater](#), Aftenposten, November 15, 2018.

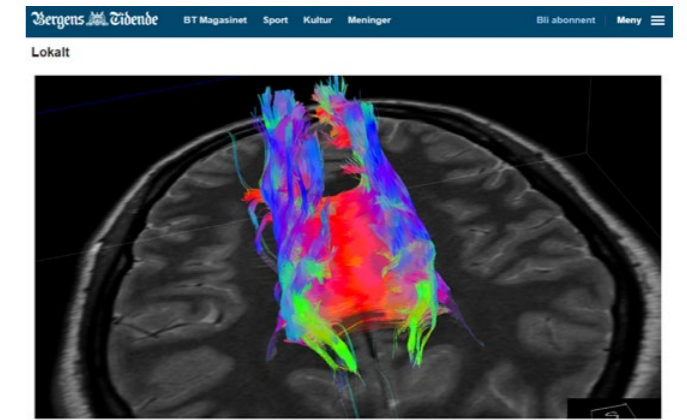
Andreassen, Ole A: [Professor ber foreldre stresse ned i oppdragelsen: "Det viktigste man overfører til sine barn, er genene"](#), A-Magasinet, December 28, 2018.

Bjella, Thomas: [Før jeg går, doktor, kan du anbefale en app mot depresjon?](#) Dagsavisen, December 05, 2018.

Elvsåshagen, Torbjørn: [Changes in Cerebral Blood Flow During the Sleep-Wake Cycle](#), Brainpost, November 27, 2018.

Hoprekstad, Gunnhild: [Nytt forskningsprosjekt i Bergen: Kan betennelsesdempende medisin hjelpe psykosepasienter?](#) Aftenposten, June 24, 2018.

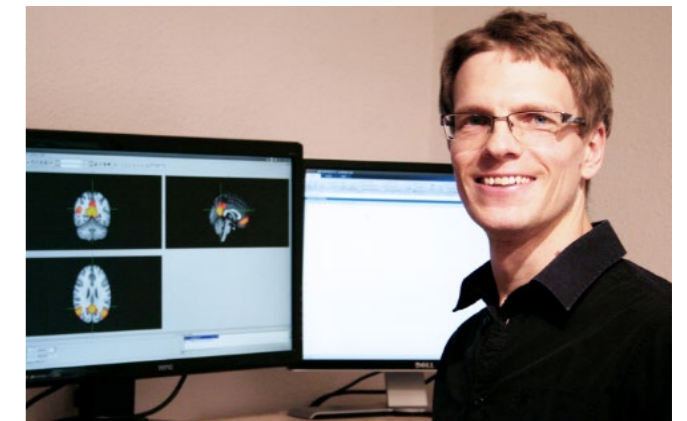
Hugdahl, Kenneth: [Sikrer millioner med jobb etter fylte 70](#), Bergens Tidende, March 14, 2018.



BILDER SOM AVSLØRER: Forskerer du et kne, reagerer kroppen med en betennelse, vinner stemmer til og det blir en hevelse. Slik tenker man at det også er i hjernen, der betennelse kan gi psykiske. Dagsavisen skriver som dette viser vasssteinene i hjernen. Målet er å studere mulige betennelser i hjernen ved å se på endringer i vasssteinene. FOTO: FOTO: HELSE BERGEN

– En revolusjon innen psykosebehandling

Johnsen, Erik: [En revolusjon innen psykosebehandling](#), Bergens Tidende, June 24, 2018.



Kaufmann, Tobias: ['Functional Fingerprint' May Identify Brains Over a Lifetime](#), Quanta Magazine August 16, 2018.

Kessler, Ute: [Bruker MR på jakt etter elektrosjokk-svar](#), Dagens Medisin, October 29, 2018.

Kompus, Kristina: [The woman whose tumor made her religion deadly](#), BBC Future, February 28, 2018.

Kusztrits, Isabella: [Forsker på innbilte stemmer](#), NRK Dagsrevyen, March 09, 2018.

Lagerberg, Trine Vik: [Før jeg går, doktor, kan du anbefale en app mot depresjon?](#) Dagsavisen, December 05, 2018.

Laloyaux, Julien: [Ny studie avviser at kvinner er bedre enn menn til multitasking](#), TV2, October 03, 2018.

Shadrin, Alexey: [ADHD Shares Genetic Basis With Educational Under-attainment](#), MD Magazine, February 14, 2018.

Vedal, Trude Seselie: [Antipsychotics may alter thyroid function, conference news article](#), Medscape, April 18, 2018.

Ødegaard, Ketil Joachim: [Bruker MR på jakt etter elektrosjokk-svar](#), Dagens Medisin, Oktober 29, 2018.



Societal Impact and Innovation

Mental disorders such as schizophrenia and bipolar disorders are major challenges and costs for the European health care system and severely affect both the patients and their families. To cope with the future challenges, it is clear that a new generation of scientists and health care personnel is required in the area of mental disorders.

This shortage in skilled workers has been addressed in the European Commission where the knowledge needs of future PhD programmes have been further developed. Due to the long-time period from discovery to impact of health care, it is too early to identify concrete changes in the treatment of people with severe mental disorders based on the current results.

The training of many psychiatrists and psychologists at the Centre will have a large and lasting impact on future research in mental disorders in Norway. We observe that new knowledge is brought into clinical practice and also into the education of health care personnel.

The Centre has so far provided added value by developing tools for prediction and stratification (genetics, imaging) which can lead to new knowledge to improve clinical treatment. It is likely that new genetic findings in due time will be implemented in the diagnostics of psychotic disorders, as supplementary information for the clinical decisions.

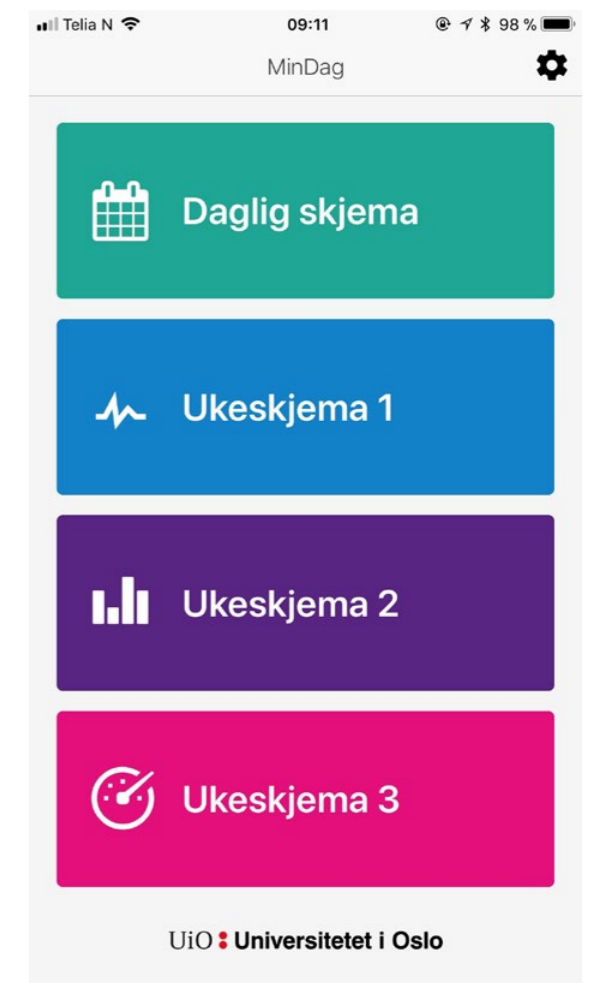
Gaining more knowledge about mechanisms and developing diagnostic tools for stratification and outcome prediction will lead to better treatment planning for psychotic disorders and will thus be directly and indirectly of huge value to society.

It is also important to note that the resources we have established so far (e.g., patient samples with rich phenotype information, biobanks and large-scale genotyping data) contribute to international consortia. Our data are also made available to collaborators as much as the ethical approval allows us. These procedures increase the value of our research investments.

We have been involved in two pending patent applications related to treatment of social dysfunction and biostatistical tools.

In addition, as part of our eNORMENT strategy we have developed a smartphone app called “MinDag” (“My Day”). The primary function of the app is to allow for collection of data from study participants on areas such as sleep, mood, symptoms, and drug use over time.

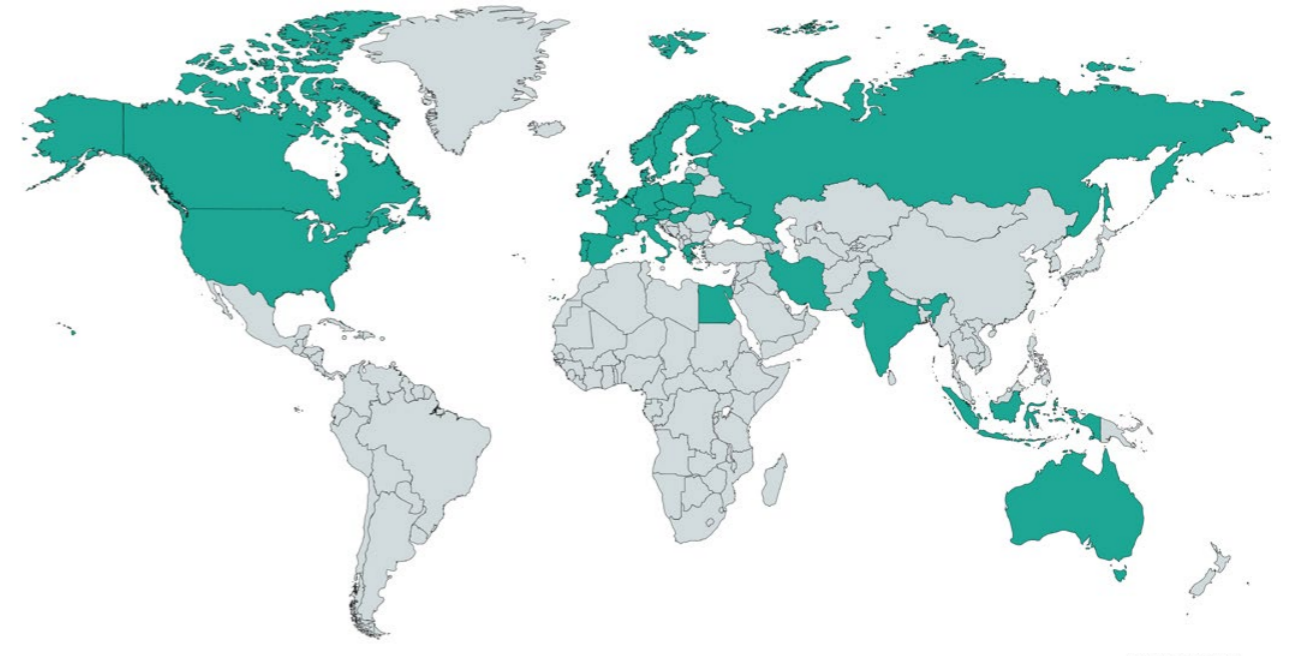
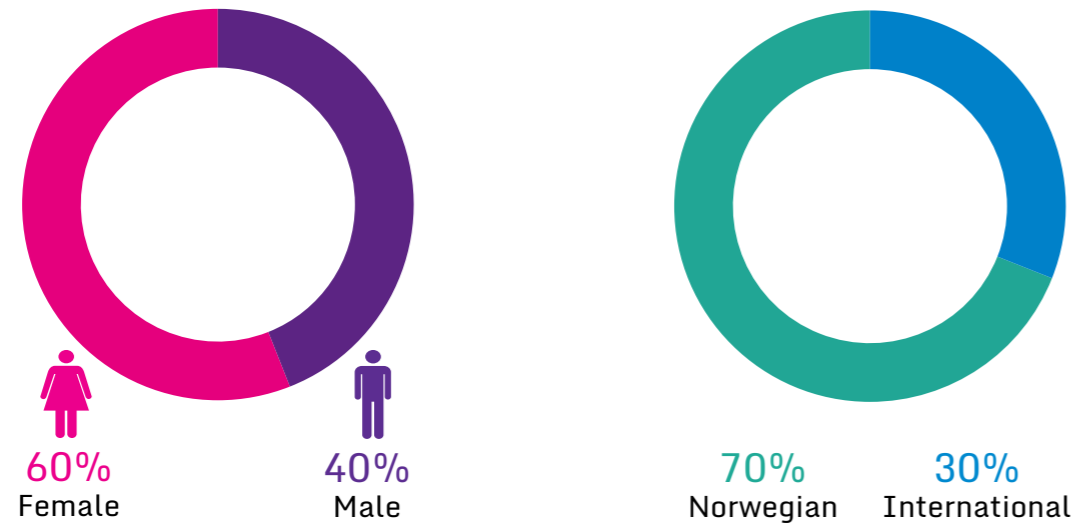
The overall goal with the “MinDag” project is to improve the understanding of interactions between lifestyle factors, environment, and symptoms. Having the participants track symptoms and other factors over time can also allow for new insight into early detection and diagnostics, as well as improve treatment and early signs of relapse. In the future, the aim is to develop a program for research based on app technology and translate the app solutions to clinical use.



Screenshot from the MinDag app

Facts about NORMENT

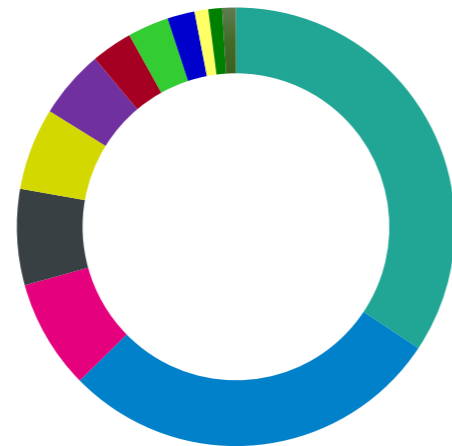
Employees



29 different nationalities are represented at NORMENT

Professional Backgrounds

- Medicine 34%
- Psychology 28%
- Neuroscience 8%
- Biology 7%
- Nursing 6%
- Other 5%
- Mathematics 3%
- Genetics 3%
- Engineering 2%
- Business/Administration 1%
- Informatics 1%
- Physics 1%



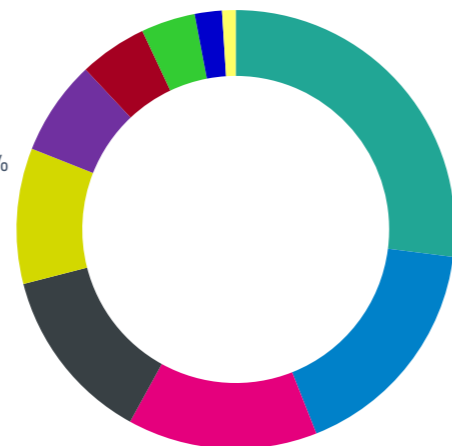
Office Locations

- Oslo, Ullevål 51%
- Bergen, Haukeland 18%
- Bergen, Sandviken 12%
- Oslo, Vinderen 7%
- Oslo, Gaustad/Rikshospitalet 4%
- Other location 8%



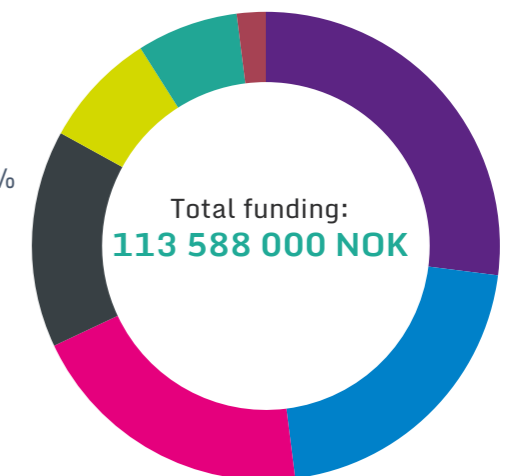
Staff Positions

- PhD students 27%
- Postdoctoral fellows 17%
- Technical personnel 14%
- Professors/Associate professors 13%
- Researchers 10%
- Other research personnel 7%
- Scientific assistants 5%
- Master students 4%
- Administrative personnel 2%
- User representative 0,5%



Funding

- RCN (other project funding) 27%
- Other public funding 21%
- Own funding - in kind (partner institutions) 20%
- RCN (CoE funding) 15%
- Private funding 8%
- Financing from host institution 7%
- International project funding 2%



NORMENT Staff

Last name	First name	Position	Research group leader
Aaberg	Linn-Marie Elise	Nurse	Erik Johnsen
Aas	Monica	Researcher	Nils Eiel Steen
Abdelrazik	Heba	Postdoctoral Fellow	Stéphanie Le Hellard
Agartz	Ingrid	Core researcher, Professor	Ingrid Agartz
Akkouh	Ibrahim	PhD student	Srdjan Djurovic
Alisaukiene	Renata	PhD student	Erik Johnsen
Alnæs	Dag	Postdoctoral fellow	Lars T. Westlye
Aminoff	Sofie Ragnhild	Postdoctoral fellow	Trine Vik Lagerberg
Andersen	Jostein	Master student	Lars T. Westlye
Anderssen	Jannicke Fjæra	PhD student	Ingrid Melle
Andreassen	Ole	Core researcher, Professor	Ole A. Andreassen
Andreou	Dimitrios	Postdoctoral fellow	Ingrid Agartz
Andresen	Lavinia Athanasiu	Engineer	Srdjan Djurovic
Asghar*	Asma	Administrative personnel	
Asp	Martine	Medical student	Ingrid Agartz
Bahrami	Shahram	Postdoctoral fellow	Ole A. Andreassen
Bakke	Laura Anne Wortinger	Postdoctoral fellow	Ingrid Agartz
Bakken	Eivind	Nurse	Nils Eiel Steen
Balafkan	Novin	Postdoctoral fellow	Erik Johnsen
Banerjee	Niladri	PhD student	Stéphanie Le Hellard
Barrett	Elizabeth Ann	Psychologist	Trine Vik Lagerberg
Barth	Claudia	Postdoctoral fellow	Ingrid Agartz
Bartz-Johannessen	Christoffer	Biostatistician	Erik Johnsen
Beck	Dani	PhD student	Lars T. Westlye
Bell	Christina	PhD student	Unn K. Haukvik
Benjamin	Beatrice	Scientific assistant	Erik Jönsson
Beresniewicz	Justyna	PhD student	Kristiina Kompus
Berg	Akiah Ottesen	Postdoctoral fellow	Ingrid Melle
Berle	Jan Øystein	Associate professor	Erik Johnsen
Berzi	Alan	Bioengineer	Srdjan Djurovic
Bettella	Francesco	Researcher	Ole A. Andreassen
Bjarke	Jill	Research coordinator	Erik Johnsen
Bjella	Thomas	Database consultant	Ole A. Andreassen
Bjerkaas-Kjeldal	Kristine	Research technician	Srdjan Djurovic
Bless	Josef	Postdoctoral fellow	Kristiina Kompus
Brandt	Christine Lycke	Research coordinator	Lars T. Westlye
Brattbakk	Hans-Richard	Engineer	Vidar M. Steen

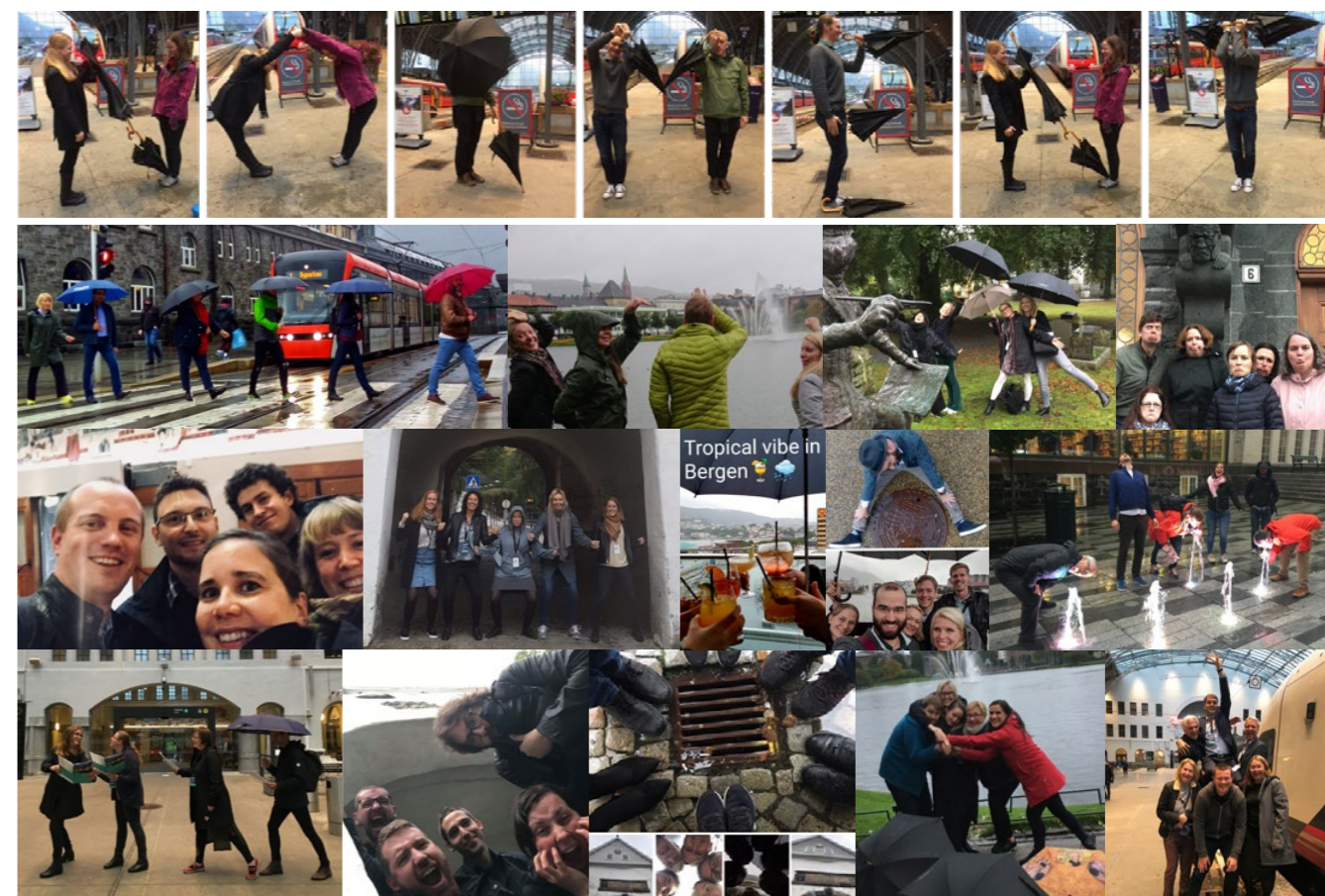
Last name	First name	Position	Research group leader
Brecke	Vilde	Master student	Kristiina Kompus
Bringsli	Jorunn Skeie	Engineer	Vidar M. Steen
Brunstad	Solveig	Medical student	Stéphanie Le Hellard
Bruun	Sandra	Research coordinator	Lars T. Westlye
Buer	Liliana	Database consultant	Ole A. Andreassen
Büchmann	Camilla Bakkalia	PhD student	Trine Vik Lagerberg
Bärthel Flaaten	Camilla	PhD student	Torill Ueland
Craig-Craven	Alexander Richard	Engineer	Kristiina Kompus
Dale	Anders	Guest researcher, Professor	Ole A. Andreassen
de Lange	Ann-Marie	Postdoctoral fellow	Lars T. Westlye
Demmo*	Christine	PhD student	Torill Ueland
Devor	Anna	Guest researcher, Associate professor	Srdjan Djurovic
Diekmann	Silvia	Head physician	Ketil J. Ødegaard
Dieset	Ingrid	Researcher	Nils Eiel Steen
Djurovic	Srdjan	Core researcher, Professor	Srdjan Djurovic
Drachman	Tove Matzen	Clinical assessment personnel	Ingrid Agartz
Drosos	Petros	PhD student	Erik Johnsen
Dunvoll	Guro	PhD student	Erik Jönsson
Duus*	Inger	Medical student	Vidar M. Steen
Dwyer	Gerard	PhD student	Kristiina Kompus
Dæhlen	Martine	Scientific assistant	Lars T. Westlye
Dørum	Erlend Solberg	PhD student	Lars T. Westlye
Eftevåg	Åshild Maria	Administrative manager	
Elvsåshagen	Torbjørn	Postdoctoral fellow	Erik Jönsson
Engen	Kristine	PhD student	Ingrid Agartz
Engen	Magnus Johan	PhD student	Torill Ueland
Enggh	John Abel	Postdoctoral fellow	Nils Eiel Steen
Engvig	Andreas	Researcher	Lars T. Westlye
Ersland	Kari Merete	Postdoctoral fellow	Vidar M. Steen
Espeseth	Thomas	Researcher	Torill Ueland
Faerden	Ann	Supervisor	Ingrid Melle
Fagerbakke Strømme	Maria	PhD student	Erik Johnsen
Fasmer	Ole Bernt	Professor	Ketil J. Ødegaard
Fathian	Farivar	PhD student	Erik Johnsen
Fernandes Neto	Carla	Engineer	Stéphanie Le Hellard
Feyer	Frida	Scientific assistant	Torill Ueland
Fischer-Vieler	Thomas	PhD student	Unn K. Haukvik
Frei	Evgeniia	Engineer	Srdjan Djurovic
Frei	Oleksandr	Postdoctoral fellow	Ole A. Andreassen
Frid	Leila Marie	Nurse	Ketil J. Ødegaard
Frøland	Kate	Administrative personnel	
Frøyhaug	Mathias	Scientific assistant	Torill Ueland
Gani	Osman	Postdoctoral fellow	Ole A. Andreassen

Last name	First name	Position	Research group leader
Gardsjord*	Erlend Strand	PhD student	Ingrid Melle
Gjerde	Kristian Varden	PhD student	Erik Johnsen
Gjerde	Priyanthi Borgen	PhD student	Vidar M. Steen
Gjestad	Rolf	Statistical analyst	Erik Johnsen
Gohar	Sherif	Postdoctoral fellow	Ingrid Melle
Grimstad*	Kristoffer	Neuropsychological assessment personnel	Torill Ueland
Gundersen	Line	Nurse	Nils Eiel Steen
Gurholt	Tiril Pedersen	Postdoctoral fellow	Lars T. Westlye
Haatveit	Beathe	Postdoctoral fellow	Torill Ueland
Hagen	Marthe	User representative	Ingrid Melle
Hansson	Lars	Engineer	Srdjan Djurovic
Hartberg	Cecilie	Postdoctoral fellow	Ingrid Agartz
Hassani*	Sahar	Postdoctoral fellow	Srdjan Djurovic
Haugen	Egil Anders	Nurse	Erik Johnsen
Haukvik	Unn Kristin	Group leader, Associate professor	Unn K. Haukvik
Helleland	Tor	Administrative personnel	
Henriksen	Tone	PhD student	Ketil J. Ødegaard
Hirnstain	Marco	Researcher	Kristiina Kompus
Hjell	Gabriela	PhD student	Unn K. Haukvik
Hjelmervik	Helene	Postdoctoral fellow	Kristiina Kompus
Hjelmtveit	Torkild	Nurse	Ketil J. Ødegaard
Hoffart Lunding	Synve	PhD student	Nils Eiel Steen
Holdhus	Rita	Engineer	Vidar M. Steen
Hope	Sigrun	Researcher	Ole A. Andreassen
Hoprekstad	Gunnhild Eldhuset	PhD student	Erik Johnsen
Hoseth*	Eva Z.	PhD student	Nils Eiel Steen
Huflåtten	Idun Bernadotte	Neuropsychological assessment personnel	Torill Ueland
Hugdahl*	Kenneth	Core researcher, Professor	
Hughes	Timothy	Researcher	Srdjan Djurovic
Huitfeldt*	Caroline	Nurse	
Høegh	Margrethe C.	PhD student	Trine Vik Lagerberg
Ihler	Henrik Myhre	PhD student	Trine Vik Lagerberg
Inderhaug	Elin	Bioengineer	Srdjan Djurovic
Jakobsen	Petter	PhD student	Ketil J. Ødegaard
Johannessen	Cecilie	PhD student	Ingrid Agartz
Johnsen	Erik	Core researcher, Professor II	Erik Johnsen
Jönsson	Erik	Group leader, Professor	Erik Jönsson
Jørgensen	Kjetil Nordbø	Postdoctoral fellow	Ingrid Agartz
Kaufmann	Tobias	Researcher	Lars T. Westlye
Kazimierczak	Katarzyna	Research technician	Kristiina Kompus
Kessler	Ute	Researcher	Ketil J. Ødegaard
Kjelby	Eirik	PhD student	Erik Johnsen
Kolskår	Knut	PhD student	Lars T. Westlye

Last name	First name	Position	Research group leader
Kompus	Kristiina	Group leader, Associate professor	Kristiina Kompus
Kristiansen	Ingvil Julie	Nurse	Erik Johnsen
Krogenes	Marianne	Nurse	Erik Johnsen
Kroken	Rune Andreas	Associate professor	Erik Johnsen
Krull	Florian	Postdoctoral fellow	Ole A. Andreassen
Kusztrits	Isabella	PhD student	Kristiina Kompus
Lagerberg	Trine Vik	Group leader, Section manager	Trine Vik Lagerberg
Laloyaux	Julien	Postdoctoral fellow	Kristiina Kompus
Lange	Elisabeth H.	PhD student	Ingrid Agartz
Langeland	Marianne	Nurse	Ketil J. Ødegaard
Larøi	Frank	Professor	Erik Johnsen
Le Hellard	Stephanie	Core researcher, Professor	Stéphanie Le Hellard
Leistad Christensen	Karin Louise	Scientific assistant	Lars T. Westlye
Lengali	Lilly	Scientific assistant	Lars T. Westlye
Lofthus	Ingvild Sandø	Master student	Lars T. Westlye
Lonning	Vera	Researcher	Ingrid Agartz
Lund	Anders	Professor	Ketil J. Ødegaard
Lund	Martina Jonette	Scientific assistant	Lars T. Westlye
Lund-Heimark	Hallvard	Resident doctor	Erik Johnsen
Lyngstad	Siv Hege	PhD student	Ingrid Melle
Løberg	Else-Marie	Professor	Erik Johnsen
Løchen	Aili	Scientific assistant	Lars T. Westlye
Maglanoc	Luigi Angelo	PhD student	Lars T. Westlye
Markl	Therese	Database consultant	Ole A. Andreassen
Marquardt	Lynn	PhD student	Kristiina Kompus
Maximov	Ivan	Postdoctoral fellow	Lars T. Westlye
Melle	Ingrid	Core researcher, Professor	Ingrid Melle
Moberget	Torgeir	Postdoctoral fellow	Lars T. Westlye
Mohn	Hanne Christine	Neuropsychological assessment personnel	Torill Ueland
Monereo Sánchez	Jennifer	Research technician	Lars T. Westlye
Myhre	Anne Margrethe	Associate professor	Ingrid Agartz
Mæland	Steffen	Postdoctoral fellow	Ole A. Andreassen
Mørch-Johnsen	Lynn	Researcher	Ingrid Agartz
Mørkved	Nina	PhD student	Erik Johnsen
Nerland	Stener	Scientific assistant	Ingrid Agartz
Norbom	Linn	PhD student	Lars T. Westlye
Nærland	Terje	Researcher	Ole A. Andreassen
Nævdal	Marianne Strømme	Engineer	Vidar M. Steen
O'Connell	Kevin	Postdoctoral fellow	Ole A. Andreassen
Olsen	Stine Holmstul	Clinical assessment personnel	Trine Vik Lagerberg
Oltedal	Leif	Associate professor	Ketil J. Ødegaard
Ormerod Skaarud	Monica B. E. G.	PhD student	Nils Eiel Steen
Pedersen	Geir	Researcher	Ole A. Andreassen

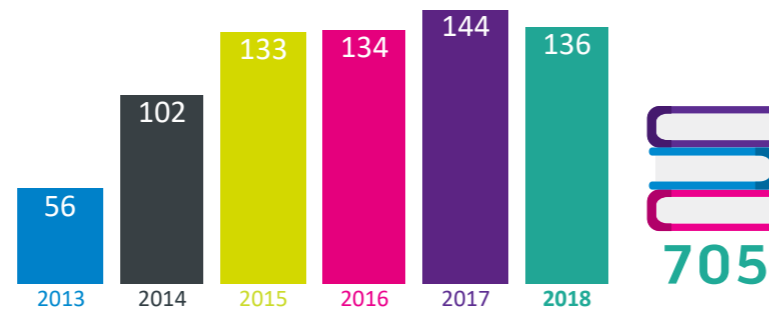
Last name	First name	Position	Research group leader
Pelach	Adrià Marly	Master student	Erik Jönsson
Polushina	Tatiana	Researcher	Stéphanie Le Hellard
Puppo	Francesca	Postdoctoral fellow	Srdjan Djurovic
Quintana	Daniel	Researcher	Lars T. Westlye
Reponen	Elina	PhD student	Nils Eiel Steen
Requena	Jordi	Postdoctoral fellow	Srdjan Djurovic
Richard	Geneviève	PhD student	Lars T. Westlye
Ringen	Petter Andreas	Researcher	Ingrid Melle
Roelfs	Daniël	Scientific assistant	Erik Jönsson
Rokicki	Jaroslav	Postdoctoral fellow	Lars T. Westlye
Romm	Kristin Lie	Associate professor	Ingrid Melle
Rødevand	Linn	PhD student	Nils Eiel Steen
Sanders	Anne-Marthe	PhD student	Lars T. Westlye
Sayed Qureshi	Sophia	Master student	Stéphanie Le Hellard
Shadrin	Alexey	Postdoctoral fellow	Ole A. Andreassen
Simonsen	Carmen	Postdoctoral fellow	Ingrid Melle
Sinkeviciute	Igne	PhD student	Erik Johnsen
Skrede	Silje	Researcher	Vidar M. Steen
Slapø	Nora	Scientific assistant	Erik Jönsson
Smeland	Olav B	Postdoctoral fellow	Ole A. Andreassen
Smelror	Runar	PhD student	Ingrid Agartz
Srinivasan	Saurabh	PhD student	Ole A. Andreassen
Stabell	Lena Antonsen	Database consultant	Erik Johnsen
Stautland	Andrea	Medical student	Ketil J. Ødegaard
Stavrum	Anne-Kristin	Postdoctoral fellow	Stéphanie Le Hellard
Steen	Vidar M.	Core researcher, Professor	Vidar M. Steen
Steen	Nils Eiel	Group leader, Associate professor	Nils Eiel Steen
Stokowy	Tomasz	Engineer	Vidar M. Steen
Storli	Ragnhild Bettina	Administrative personnel	
Storvestre	Guttorm Breivik	PhD student	Unn K. Haukvik
Sundet*	Kjetil	Core researcher, Professor	
Svendsen	Ingrid Hartveit	PhD student	Ingrid Melle
Syrstad	Vigdis Elin Giæver	PhD student	Ketil J. Ødegaard
Szabo	Attila	Researcher	Srdjan Djurovic
Sæther	Linn Sofie	Scientific assistant	Torill Ueland
Sønderby	Ida Elken	Researcher	Srdjan Djurovic
Sørensen	Håkon	Neuropsychological assessment personnel	Torill Ueland
Tamnes	Christian K.	Associate professor	Lars T. Westlye
Tesli	Martin	Researcher	Ole A. Andreassen
Thompson	Wesley Kurt	Guest researcher, Professor	Ole A. Andreassen
Torsvik	Anja	Postdoctoral fellow	Vidar M. Steen
Trentani	Andrea	Engineer	Vidar M. Steen
Tønnesen	Siren	PhD student	Lars T. Westlye

Last name	First name	Position	Research group leader
Ueland	Torill	Group leader, Associate professor	Torill Ueland
Ulrichsen	Kristine Moe	PhD student	Lars T. Westlye
Valstad	Mathias	PhD student	Erik Jönsson
van der Meer	Dennis	Researcher	Lars T. Westlye
Vandenbergh	Matthieu	Postdoctoral fellow	Srdjan Djurovic
Vaskinn	Anja	Researcher	Torill Ueland
Vedal	Trude Seselie Jahr	PhD student	Erik Jönsson
Vik	Ruth Kristine	Research coordinator	Ingrid Melle
Villar	Jonelle	Master student	Stéphanie Le Hellard
Værnes	Tor Gunnar	PhD student	Trine Vik Lagerberg
Wang*	Yunpeng	Researcher	Ole A. Andreassen
Weber	Sarah	Postdoctoral fellow	Kristiina Kompus
Wedervang-Resell	Kirsten	PhD student	Ingrid Agartz
Werner	Maren C Frogner	PhD student	Nils Eiel Steen
Westlye	Lars T.	Core researcher, Associate professor	Lars T. Westlye
Widing	Line Hustad	PhD student	Ingrid Melle
Winterton	Adriano	PhD student	Lars T. Westlye
Witoelar*	Aree	Postdoctoral fellow	Ole A. Andreassen
Zak	Nathalia	PhD student	Lars T. Westlye
Ødegaard	Ketil Joachim	Group leader, Professor	Ketil J. Ødegaard
Åsbø	Gina	Clinical assessment personnel	Ingrid Melle



From the Annual Retreat Group Activities ([see pages 49-51](#) for more information)

Publications 2018



NORMENT researchers published 136 scientific papers in 2018, of which 25 were published in scientific journals with an impact factor of above 10, including *Nature Genetics*, *JAMA Psychiatry*, *American Journal of Psychiatry*, *Molecular Psychiatry*, and *Nature Communications*.

Aas M, Dieset I, Morch R, Steen NE, Hope S, Reponen EJ, et al. Reduced brain-derived neurotrophic factor is associated with childhood trauma experiences and number of depressive episodes in severe mental disorders. *Schizophr Res*. 2018.

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Broce I, Karch CM, Wen N, Fan CC, Wang Y, Tan CH, et al. Immune-related genetic enrichment in frontotemporal dementia: An analysis of genome-wide association studies. *PLoS Med*. 2018;15(1):e1002487.

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Faerden A, Lyngstad SH, Simonsen C, Ringen PA, Papsuev O, Dieset I, et al. Reliability and validity of the self-report version of the apathy evaluation scale in first-episode psychosis: Concordance with the clinical version at baseline and 12 months follow-up. *Psychiatry Res*. 2018;267:140-7.

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