Norwegian Centre for Mental Disorders Research (NORMENT) is a Norwegian Centre of Excellence established by the Research Council of Norway in July 2013.

NORMENT is integrated with the K. G. Jebsen Centre for Psychosis Research, funded by the K.G. Jebsen Foundation. This provides a unique opportunity to perform comprehensive and long-term research, reaching across the country.

The Centre has a clear clinical profile, involving investigations of patients with state-of-the-art clinical assessments and research technology, and translating findings to experimental studies for the identification of underlying mechanisms.

We have ambitious scientific goals, focusing on understanding the underlying mechanisms of severe mental disorders. This is a field with large unmet needs and lack of knowledge, which makes the work of our Centre of Excellence very important. We have focused on four main areas of activities to answer the following research questions:

- Why do antipsychotic medications have severe side effects?
- How can brain imaging help link genes to clinical characteristics?
- Where is the ‘hidden heritability’ of severe mental disorders?
- How can we predict outcome in patients experiencing their first signs of disease?
Leader’s comments

The first phase of the NORMENT has been used to establish the Centre identity, both in terms of scientific focus and coordinated organisation and communication. We have made significant progress in these aspects in 2014, and the first full year of activity turned out to be a productive and rewarding year for the NORMENT Centre.

We have continued to develop a synergistic team of research groups and work units, and established structures for project coordination, expertise sharing and strong method platforms. The scientific achievements have been excellent. We have participated in discovery of new gene variants associated with psychiatric disorders, and especially the Nature paper in July identifying 108 gene variants for schizophrenia was a breakthrough in the field.

We have also found indications that socioeconomic stressors in adolescence may increase the risk for psychotic disorders and that environmental risk factors reduce the age at onset of bipolar disorder and are likely to be involved in the development of the disorder, with indications of gene x environmental interactions. Using state-of-the-art brain imaging tools, we have determined how environmental factors (obstetric complications) affect brain development, and may play a causative role in psychiatric disorders.

Furthermore, the Centre has developed new statistical methodology to boost the power of genetic studies, thereby strongly increasing the output from genetics data in many fields of human disease research.

We have also provided evidence how animal models can be used for translational studies of antipsychotic side effects, and shown how schizophrenia risk genes relate to immune system induce abnormal behaviour and altered brain function when transferred to mouse models.

These aspects are now followed up in new clinical studies focusing on prediction of long-term course and outcome. Emerging data indicates that early treatment response is a key predictor. There are always several challenges involved in developing a new Centre of Excellence, and the current most pressing issue is the lack of adequate office and lab space, which we hope will be finalized in 2015.

Despite this limitation, the coordination of the research activity between the different partners seems to work very well, and we have been successful in recruiting new and talented researchers to the Centre.

This makes me very optimistic for the next year and I look forward to new discoveries in 2015.

Ole A. Andreassen, Director NORMENT
Vision statement

NORMENT’s primary objective is to reveal underlying pathophysiological mechanisms in schizophrenia and bipolar disorder and to develop tools for stratification and outcome prediction, using a vertical synergy approach, with the following sub goals:

1) Define new targets to optimize the ratio of beneficial vs. adverse effects of antipsychotics.
2) Identify genetic variants or expression variation to reveal ‘missing heritability’.
3) Determine new brain imaging phenotypes linking genes and core clinical phenotypes.
4) Use genetic and environmental factors to predict disease progress and outcome.

We will take advantage of 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 will be characterized with the same clinical, cognitive, biochemical and imaging protocols to identify new mechanisms which will be studied functionally in animal and cell culture models.

Scientific aims

1. Define New Targets for Antipsychotic Medication

Antipsychotic medications are the cornerstone in the treatment of schizophrenia, and have in recent years also been used for bipolar disorder. The medications are not equally effective for all patients, and have a limited effect on the core symptoms for approximately 20% of those treated.

Adverse effects are problematic and in some cases serious, such as cardiovascular risk factors (weight gain, abnormal fat levels in the blood, diabetes etc.). Research at NORMENT has a particular focus on the immune and lipid (fat) metabolism systems.

We use animal and other experimental models to enhance our knowledge about the mechanisms of action of antipsychotic medication. We aim to optimize antipsychotic treatment by increasing the desired effect of medication and reducing adverse effects.
2. Identify Genetic Factors for Psychiatric Disorders – Common and Rare Variants

Family and twin studies have shown that schizophrenia and bipolar disorder have high heritability. Researchers at NORMENT have contributed to major international GWA (“genomewide association studies”). We have found evidence for new vulnerability genes for these disorders.

Preliminary results show that inherited changes in many genes (i.e. gene variants) are involved, but each variant contributes to a relatively modest degree. The identified gene variants explain only a small portion of susceptibility to psychotic disorders. Heritability is therefore still far from fully explained.

In our research, we use combined approaches that include new genotyping methods to identify rare genetic variants. We also use new statistical methods for mapping multiple gene variants, each of which has a small effect on its own.

3. Brain Imaging: Identify Brain MRI Phenotypes Linking Genes to Core Clinical Phenotypes

Advanced neuroimaging techniques including structural and functional MRI have revolutionized the understanding of the structural and functional makeup of the human brain.

NORMENT researchers have contributed to the identification of structural brain abnormalities in schizophrenia, including volumetric alterations in front temporal cortical areas and subcortical structures. Partly overlapping and partly diverging patterns have been found in bipolar disorder.

Structural and functional brain phenotypes are highly heritable, and current research at NORMENT aims to identify the genetic underpinnings of individual differences in the structural and functional organization of the human brain, and to disentangle the genetic and phenotypic associations with severe neuropsychiatric disorders.

4. Predict Course and Outcome – Including Mortality

Some patients with severe mental disorders recover completely while others develop chronic illness. Currently, we can mainly make general assumptions about the most likely prognosis for someone who develops a severe mental illness and are not able to predict the personal outcome for individual patients. One of the main goals for NORMENT is to investigate how we can improve our understanding of course and outcome. Ultimately, the goal is to make personalized predictions for patients coming to their first treatment. We are doing this by examining how genetic and environmental risk factors influence the course of the disorder, by combining clinical- and cognitive assessments with brain imaging.

During 2014, the main focus has been on investigating how specific environmental risk factors influence clinical-, cognitive- and morphological characteristics either individually, or in interaction with other environmental and genetic risk factors. At present, we are studying the effects of early traumatic events, cannabis use and migration- with additional studies of how the effects of trauma interact with the effects of cannabis use and of migration. We have also studied how trauma interacts with genetic factors – in this case variant in the BDNF gene – on cognition and on structural changes in hippocampal subfields.

This line of research is done in close collaboration with several of NORMENT’s groups and with international colleagues in Paris, France and Milan, Italy. To study the effects on course and outcome we also need well-described patient cohorts followed from their first treatment. Within the NORMENT Centre we have established a large first-treatment schizophrenia spectrum cohort and are working to establish a first-treatment bipolar spectrum cohort in collaboration with Norwegian colleagues in the NORSMI network. We are now ready to launch a long-term (5 and 10 year follow ups) of the schizophrenia cohort. We have already started out a five-year follow up of patients at Innlandet Hospital in collaboration with the regional research network. The first part of the long-term follow-up will have a particular focus on functioning, cognition and negative symptoms.
Achievements

- Implemented new statistical tools for gene based association analyses and allelic heterogeneity
- Developed a team in translational psychiatry, focusing on immune and cardiovascular comorbidity
- Finished the protocol for a long-term follow-up study of first episode patients
- New neurocognitive and functional outcome protocol for 5-, 10-, and future NORMENT follow up studies developed
- Developed a new smartphone app for sampling of symptom-data in real-time, collaboration between Bergen and Oslo
- Several translational studies listed in Research aims/deliverables published and/or submitted
- Improved the new statistical tools for improved gene discovery in a range of polygenic complex disorders
- First study on the relationship between temporal and frontal lobe glutamate concentrations and PANSS hallucination scores published
- Investigate for consistency of MR measures across scanners
- Longitudinal neuroimaging – 1-year follow-up finished
- Participated in genetic and imaging genetics consortia for large scale association discovery
- Genotyped a large sample of cases and controls, nearly 25,000 participants
- Developed new MRI multimodal imaging analysis protocol
- Started upgrade of Centre MRI scanners in both Bergen and Oslo and synchronized protocols
- Established principles for 'biophysical psychiatry' approach
- Received NIH funding for a big data grant (big data to knowledge, BD2K) involving the ENIGMA study
- Completed data collection for cognitive remediation study and social cognition PhD project
- New biomarkers: NMDA receptor antibodies, viral serology
Scientific currency

**Papers**

NORMENT scientist authored or co-authored 102 papers in international peer-reviewed journals in 2014. Of the papers published in 2014, 25 papers appeared in journals with an impact factor above 5. Six of these appeared in journals with an impact factor above 15, (one with impact factor above 35). In general the quality and visibility of publications from the Centre is high.

NORMENT scientists have extensive collaborations with national and international research groups. More than 50% of the papers published in 2014 with one or more NORMENT authors are the result of collaborations with national institutions. Impact factor based on collaborations are illustrated in the figures below. NORMENT publications in 2014 are presented on page 28 of this report. National and international collaborators are listed on page 20 and 22.

**Dissemination of research result**

NORMENT members gave 48 talks as invited speakers at international scientific meetings in 2014. In addition 105 oral presentations and 56 posters were presented by NORMENT scientists. NORMENT staff gave also 65 lectures, aimed at a targeted audience and the general public.

These include postgraduate lectures, research seminars, training course at universities and hospitals. Talks, posters and dissemination activities aimed at targeted audience and the public, as well as media coverage, are listed in the back of this report.

**Prizes and awards:**

Professor Kenneth Hugdahl was awarded the 2014 “Møbius” prize, from the Research Council of Norway.

http://www.forskningsradet.no/no/Nyheter/Forskningsradet_deler_ut_tre_priser_i_dag/1254001581512?lang=no

Professor Kenneth Hugdahl received honorary Meltzer Award for 2013, from University of Bergen.

http://www.uib.no/aktuelt/63020/meltzers-%C3%A6respris-til-kenneth-hugdahl

Post doc Monica Aas received 2014 NARSAD Young Investigator Grant for her studies on the effects of trauma in schizophrenia and bipolar disorders.

Post doc Martin Steen Tesli received Travel Award, at World Congress of Psychiatric Genetics, Copenhagen October 2014.

Prof. Ole A. Andreassen became new member of National Academy of Science and Letters
Happenings 2014

Lucca seminar:

In August, the clinical group’s postdocs participated in the annual writing seminar in Lucca, Tuscany, together with the clinical research groups in Stavanger and Bergen. The seminar was the second inter-regional seminar at this location, and further strengthened our ongoing inter-regional collaborations.

Illustration: Trine Vik Lagerberg, Carmen Simonsen and Akiah Ottesen Berg (postdocs in the Clinical group) on their bikes at the Lucca seminar.

Illustration: Early Saturday morning in Lucca. Carmen Simonsen and Monica Aas at work with their colleagues from Bergen and Stavanger.


The 22nd World Congress of Psychiatric Genetics in Copenhagen.

The 22nd World Congress of Psychiatric Genetics (WCPG) took place during 12-16 October 2014, organized by a Scandinavian committee that included five of the NORMENT Core Researchers (Ole A. Andreassen, Ingrid Melle, Vidar M. Steen, Srdjan Djurovic and Stephanie Le Hellard).

NORMENT researchers were responsible for a symposium on "the interplay between genetics and early trauma in severe mental disorders" as well as a satellite symposium entitled "Leveraging Population Registries and Biobanks for Neuropsychiatric Research: Experiences from the Nordic Countries and Opportunities for the HORIZON 2020 Initiative of the European Union". In addition, NORMENT contributed significantly to the scientific program through lectures and poster presentations.

Kenneth Hugdahl received The Award for Outstanding Research (Møbius Prize) from the Research Council of Norway.

Monica Aas received 2014 NARSAD Young Investigator Grant for her studies on the effects of trauma in schizophrenia and bipolar disorders.

Srdjan Djurovic was hired as professor II, at Clinical Institute 2, University of Bergen.
NORMENT Annual Retreat took place in Oslo, September 15-16. The program consisted of plenary lectures with updates, new findings and ongoing projects, synergy workshops with project planning, as well as poster sessions.

In addition, there were presentations by our Scientific Advisory Board, who also contributed with comments and feedback. A total of 85 people participated, in an enthusiastic and interactive atmosphere, and we had a successful annual NORMENT dinner.

The conference took place at Quality Hotel Expo at Fornebu, close to the fjord with easy transportation from city center and airport.

Visiting Scientific Advisory Board (SAB)

- Michael Green
- Terry Jernigan
- Marcella Rietschel

Speakers at Annual Retreat

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Core Researchers

NORMENT has organized the research into interdisciplinary research groups with complementary expertise. Each research group is led by a senior researcher. NORMENT has eight Core Researchers.
Translational Psychiatry

Achievements in 2014:

- Actively involved in a large international consortium which led to the discovery of 108 risk genes for schizophrenia, and participated in several discoveries of common gene variants for psychiatric disorders.
- Developed new statistical tools for improved gene discovery in a range of polygenic complex disorders.
- Showed how polygenic factors are associated with diagnostic groups and brain phenotypes.
- Developed a team in translational psychiatry, focusing on immune and cardiovascular comorbidity.

Group leader:
Ole A. Andreassen,
Professor UiO, OUS

Group members:
Andrew Brown
Ingrid Dieset
Thomas Bjella
Aree Witoelar
Verena Zuber
Saurabh Srinivasan
Eva Zsuuzsanna Hoseth
Yunpeng Wang
Sigrun Hope
Eivind Bakken
Francesco Bettella
Tuomo Mikael Marttunen
Ragni Mørch
Wen Li
Martin Tesli
Nils Eiel Steen
Terje Nærland
Lars Tjelta Westlye
Daniel Quintana
Karolina Kauppi
Tobias Kaufmann
Nhut Trung Doan
Christine Lyccke Brandt
Kristina Skåtun
Ingeborg Bolstad

Ambitions for 2015:

- Finish the long range phasing of the Norwegian population, and apply this approach to severe mental illness.
- Further improve the novel biotstatistical tools, and apply them to core phenotypes in psychiatry, focusing on brain imaging and cross-disorder phenotypes.
- Integrate our “biophysical psychiatry” approach with clinical EEG measures.
- Facilitate the investigations of immune and cardiovascular comorbidity, and multimodal imaging.
Clinical Psychosis Research

Group leader:
Ingrid Melle,
Professor UiO, OUS.

Group members:
Trine Vik Lagerberg
Jannicke Fjæra Andresen
Idun Huflåtten
Camilla Bakkalia Büchmann
Carmen Simonsen
Erlend Gardsjord
Monica Aas
Mari Nerhus
Ann Færden
Petter Andreas Ringen
Akiah Ottesen Berg
Levi Rostad Kvitland
Marit Haram
Nasrettin Sömnez
Tiril Østefjells

Achievements in 2014:

- The main focus for the research group is the Centre’s Aim # 4 – the study of how genetic and environmental factors influence course and outcome in psychotic disorder.
- The main focus in 2014 has been on the effect of environmental risk factors and gene x environment interactions on cross sectional outcome, with a focus on early trauma, migration and cannabis. This work is done in close collaboration with other CR groups (in particular molecular genetics, structural imaging and Neurocognition) with several publications.
- We have also finished the protocol for a long-term follow-up study of first episode patients.

Ambitions for 2015:

- In December 2014 we received additional external funding to launch the long-term follow-up.
- The ambition for 2015 is to start out the first wave of follow-ups.
- In addition, we will continue the work on short-term effects of environmental risk factors, including studies on interactions with polygenetic risk scores in collaboration with other CR groups in the Centre.
Psychiatric Molecular Genetics

Achievements in 2014:

- Several translational studies listed in Research aims/deliverables published and/or submitted
- Inclusion of samples for stem cells project and building up stem cells infrastructure
- 3 new postdocs recruited
- New national /international collaborations established

Ambitions for 2015:

- Produce and further characterize induced pluripotent stem cells and induced neurons
- Continue with disease modelling using stem cell and cell cultures
- Continuation of translational projects, including deeper molecular characterization and molecular phenotyping
- Continuation of work at international collaboration (eg. CNV ENIGMA, PGC BD, …)

Group leader: Srdjan Djurovic, Professor OUS, UiB.

Group members:
Lavinia Athanasiu
Ida Elken Sønderby
Lars Hansson
Elin Inderhaug
Matthieu Vandenberghhe
Agata Impellizzeri
Christian Melbø-Jørgensen
Kristine Kjeldal
Malik Mumtaz Hussain Taqi
Brain Imaging, Cognition

Achievements in 2014:

- First study on the relationship between temporal and frontal lobe glutamate concentrations and PANSS hallucination scores published.
- We have started the analysis of fMRI and DTI data from the first wave of BP2 patients, with a focus on correlations with auditory hallucinations.
- We have developed a new smartphone app for sampling of symptom-data in real-time, collaboration with Oslo CRs.

Ambitions for 2015:

- Finish data analysis of the first wave BP2 patients, especially mapping the temporal characteristics of auditory hallucinations.
- Run a first test of iPod app for sampling of data on frequency and duration of auditory hallucinations, collaborations with Oslo and Finland.
- First attempt to analyze already acquired GABA neurotransmitter concentrations from the same brain areas as glutamate, and run against the fluctuations of auditory hallucinations in the course of a day.
- Finish analysis of BAVQ data from 420 patients, collected in Norway, Australia, and UK.

Group leader:
Kenneth Hugdahl, Professor
UiB

Group members:
Josef Bless
Maiken Brix
Alex Craven
Gerard Dwyer
Lars Ersland
Liv Falkenberg
Renate Grüner
Marco Hirnstein
Erik Johnsen
Bjørg Kocbach
Kristiina Kompus
Galyna Kovalchuk
Rune Kroken
Else-Marie Løberg
Susanne Passow
Igne Sinkevicute
Karsten Specht
Neurocognition

Achievements in 2014:

- Completed data collection for cognitive remediation study and social cognition PhD project.
- Completed cognitive and functional outcome protocol for long-term follow-up study of first episode patients.
- PhD completed: Longitudinal neurocognitive trajectories in first-episode psychosis: Relationships between illness severity and cognitive course.
- Two PhDs recruited to project on genetics of attention and effort in healthy controls.
- The group has contributed to approximately 20 papers that were published in 2014.

Ambitions for 2015:

- Writing up of cognitive remediation study, social cognitive post-doc project and longitudinal first treatment bipolar study.
- Contribute to first wave of data collection for long-term follow-up study.
- Continue development of new computerized scoring software for social and emotional processing in psychosis.
- Startup of data collection project on genetics of attention and effort in healthy controls.

Group leader:
Kjetil Sundet, Professor UiO

Group members:
Torill Ueland
Anja Vaskinn
Thomas Espeseth
Vilja Bidtnes
Kristoffer Grimstad
Tale Moldstad
Beathe Haatveit
Christine Demmo
Jens Marius Halvorsen
June Lystad
Tone Hellvin
Structural MRI

Achievements in 2014:

- Continued search for biological and environmental correlates/effects to brain neuroanatomical changes.
- Reported hippocampal subfields reductions in severe psychoses and how perinatal asphyxia is related with limbic structures in bipolar disorder.
- New biomarkers: NMDA receptor antibodies, viral serology.
- Longitudinal neuroimaging – 1-year follow-up finished.
- Participated in genetic and imaging genetics consortia for large scale association discovery. Investigate for consistency of MR measures across scanners.
- Scandinavian multisite translational study on adolescent psychosis now comprises three sites (UiO and Karolinska Institutet and recent up-start in Bergen)

Ambitions for 2015:

- Detail the characterization of brain phenotypes and clinical symptoms, use of stimulants and pharmacological agents.
- Implement use of app for sampling symptom-data in real time together with Hugdahl Bergen group.
- Characterize clinical sample for early trauma, infection exposure and NMDA autoimmunity and search for association with genetic risk scores and brain phenotypes.
- Expand adolescent early-onset psychosis to more Scandinavian sites.

Group leader:
Ingrid Agartz, Professor UiO

Group members:
Kristine Engen
Tiril Pedersen Gurholt
Cecilie Bhandari
Hartberg
Unn Kristin H. Hauvik
Elisabeth Lange
Vera Lonning
Lynn Mørch-Johnsen
Stener Nerland
Ragnar Næsåg
Kjetil Nordbo
Jørgensen
Thorny Olafsdottir
Runar Smelror
Erik Jönsson
Convergent functional genomics

Achievements in 2014:

- Implemented new statistical tools for gene-based association analysis and allelic heterogeneity.
- Identified genes and groups of genes implicated in cognition and brain imaging traits, both in NORMENT-grounded studies and through participation in international consortia.

Ambitions for 2015:

- Further develop gene-based studies for allelic heterogeneity between psychiatric disorders and relevant traits.
- Finely map and characterize in silico the implication of a few genomic loci associated with schizophrenia.
- Develop epigenetic studies for the characterization of human-specific methylated regions in complex traits and gene by environment influence in psychiatric traits.
- Characterize the differential methylation induced by cannabis exposure.

Group leader:
Stéphanie le Hellard, Professor UiB

Group members:
Niladri Banerjee
Carla Fernandes
Sudheer Giddaluru
Tatiana Polushina
Anne Kristin Stavrum
Ghazal Zakeri
Animal Models

Achievements in 2014:

- Identified genes and groups of genes implicated in cognition and brain imaging traits, both in NORMENT-grounded studies and through participation in international consortia.
- Implemented methods for analysis of human whole exome and whole genome sequencing data, and identified novel disease genes.
- Established long-acting formulation of antipsychotic drugs as a new approach for modelling metabolic adverse effects.

Ambitions for 2015:

- Further explore the genetics and functional genomics of schizophrenia-associated genes involved in lipid metabolism, immunity and synaptic signaling
- Establish and improve experimental animal models for studying brain myelination and long-term effects of antipsychotic drugs
- Further develop strategies and methods for human gene annotation

Group leader:
Vidar M. Steen, Professor
UiB

Group members:
Hans-Richard Brattbakk
Jorunn S Bringsli
Inger H Duus
Kari M Ersland
Carla Fernandes
Rita Holdhus
Marianne Navdal
Silje Skrede
Christine Stansberg
Tomasz Stokowy
International Cooperation

The research requires close cooperation with leading research environments, both national and international. The researchers are participating in a series of international networks, and have several bilateral research programs with international institutions, both in the European Union and in USA.

In addition to this, the Centre works actively to recruit excellent researchers internationally.

The Centre facilitates the exchange of staff between the participants and international collaborators. In 2014 we had 3 post docs abroad, and 4 international guest researchers were associated with the Centre.

International Guest Researchers
Anders M. Dale and Wes Thompson, UCSD, USA; Sven Cichon, Basel, Switzerland; Frank Larøi, Liege, Belgium.

Scientific Advisory Committee
NORMENT has established an Advisory Committee of external scientific researchers. Their tasks are as follows:

- 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.
- Contribute by giving an annual lecture at postgraduate level.
- Take an active part in NORMENT's annual Meetings.
- Participate in preparing an annual written evaluation with SWOT analysis.
- Provide advice to the NORMENT leadership in strategic decisions.
New employees 2014

- Anne-Kristin Stavrum, Ph.D in Bio-informatics, UiB
- Matthieu Vandenberghhe, Ph.D Postdoctoral fellow
- Aasa Widoar, Ph.D Postdoctoral fellow
- Niladri Banerjee, Master in Sciences, UiB
- Ingrid Díezet, Ph.D. Associate Professor
- Budiheer Giddaluru, Ph.D in Biomedicine, UiB
- Erik Johnsen, Leader of the Norwegian-associated Bergen Psychosis Project
- Ida Ilene Schendery, Ph.D Postdoctoral fellow
- Erik Gunnar Jonson, Professor
- Agata Impellizzeri, Ph.D. Postdoctoral fellow
- Tuomo Mikael Marttunen
- Seyran Kahlili, Consultant
- Frank Larøi, Psychologist and Professor, UiB
- Jeanette Haasløv, Admin., Consultant
- Anna Lina Andersson, Clinical psychologist, Ph.D Student
- Mark Muntaz Hussain Tag Scientist
- Runar Smelror, Scientific assistant
- Lise Christin Neborn, Scientific assistant
- Wen Li, Scientist
- Neil Tilly, Stan, Ph.D in Medical Imaging Postdoctoral fellow
- Daniel Quintana, Ph.D in Psychology, Postdoctoral fellow
- Tone Helvik, Ph.D in Psychology
- Dag Alnes, Ph.D Student
- Solie R. Amsand, Ph.D. Postdoctoral fellow
- Tor Johannes Helleland, IT assistant
- Nina Chung Mathiesen
- Sunniva Grimsrud
- Mathenee Kristiansen Johre
NORMENT Staff

Senior scientists, Professors and Associate Professors
Erik Gunnar Jönsson, Professor
Erik Johnsen, Professor II
Ingrid Dieset, Associate Professor
Jan Ivar Ressberg, Professor II
Lars Ersland, Scientist, MR-physicist
Lars Tjelta Westlye, Associate Professor
Renate Grünér, Associate professor, MR physicist
Rene Westerhausen, Senior Scientist
Thomas Espeseth, Associate Professor
Unn Haukvik, Associate Professor

Research Fellows
Beathe Haatveit, MSc
Camilla Büchmann, Cand.psychol.
Carla Fernandes, MSc
Christine Demmo, Cand.psychol.
Christine Lycke Brandt, MSc
Dag Alnæs, Cand.psychol.
Elisabeth Lange, Cand.med.
Erlend S. Dærum, Cand. med.
Erlend Gardsjord, Cand.med.
Eva Hoseth, Cand.med.
Geneviève Richard, MA-psychol.
Helene Barder, Cand.psychol.
Ingeborg Bolstad, MSc
Jannicke Fjæra Anderssen, Cand.psychol.
Kjetil Nordbø Jørgensen, Cand.psychol.
Kristina Skåtun, MSc
Levi Kvittland, Cand.psychol.
Liv Falkenberg, MSc
Luiz Goulart, Cand.med.
Lynn Mark Johnsen, Cand.med.
Maiken Brix, Cand.med.
Mari Nerhus, Cand.med.
Marit Haram, Cand.med.
Morten Mattingsdal, MSc
Nathalia Zak, Cand.med.
Niladri Banerjee, MSc
Saurabh Sinivasan, MSc
Siren Tennessen, Cand.psychol.
Thorny Olafsdottir, Cand.med.
Tiril Østefjells, Cand.psychol.
Vera Lonning, Cand.med.

Post docs
Akiah Ottesen Berg, PhD in Psychology
Andrew Brown, PhD in Biostatistics
Anja Vaskinn, PhD in Psychology
Anne Kristine Stavrum, PhD in Informatics
Carmen Simonsen, PhD in Psychology
Cecilie Bhandari Hartberg, PhD in Medicine
Daniel Quintana, PhD in Psychology
Francesco Bettela, PhD in Biostatistics
Ida Sønderby, PhD in Molecular Genetics

Kari M. Ersland, PhD in Biomedicine
Karolina Kauppi, PhD in Medicine
Kristina Kompus, PhD in Psychology
Lavinia Athanasiu, PhD in Molecular Genetics
Martin Tesli, PhD in Medicine
Monica Aas, PhD in Psychology
Nhat Trung Doan, PhD in Medical Imaging
Silje Skrede, PhD in Biomedicine
Sudheer Giddaluru, PhD in Biostatistics
Tatiana Polushina, PhD in Applied mathematics
Tobias Kaufmann, PhD in Psychology
Tomasz Stokowy, PhD in Bioinformatics
Tone Helvin, PhD in Psychology
Torbjørn Elvsåshagen, PhD in Medicine
Trine Vik Lagerberg, PhD in Psychology
Verena Zuber, PhD in Biostatistics
Yunpeng Wang, PhD in Biostatistics

Research Students
Claire L. Poppy, MA psychology
Hanne Smevik, MA psychology
Natalia Tesli, MA cognitive science
Nina C. Mathiesen, MA psychology
Syneve Kamey, research student in medicine
Inger Duus, research student in medicine

Other Research Personell
Galyna Kovalchuk, MA, Research Assistant
Ghazal Zakeri, Research assistant
Idun Bernadotte Huflatten, Cand Psychol
Kristoffer Grimstad, Cand.psychol.
Martina J. Lund, MA psychology
Tale Moldestad, Cand Psychol.
Vilja Bidnese, Cand.psychol.
Christin Melbø-Jørgensen, MSc
Malik Mumtaz Hussain Taqi, PhD

Technical and Administrative Positions
Alex Craven, Research technician
Bilal Safdar, Economist
Cecilie Evjen, Lab Assistant
Christine Stånsberg, Senior Engineer
Eivind Bakken, Head Nurse
Elin Inderhaug, Biomedical Engineer
Gerard Dwyer, Research Technician
Hans-Richard Brattbakk, Chief Engineer
Jeanette Haatveit, Admin. Consultant
Jorunn Bringsli, Chief Engineer
Kate Eli Frøland, Senior Executive Officer
Kristine Kjeldal, MSc
Lars Johan Hansson, MSc
Lena Stabell, Psychiatric Nurse
Line Gundersen, Nurse
Marianne Navdal, Lab Engineer
Ragnhild Bettina Storli, Admin. Consultant
Rita Holdhus, Chief Engineer
Runar Kristiansen, Database Assistant
Tanzeela Parveen, Medical Secretary
Thomas Bjøløe, Database Consultant
Vegard K. Lillevoll, IT Engineer
Øyvind Rustan, Scientific Assistant
Activities 2014

Visits Abroad

Post doc Andrew Brown holds a 50% position at the Sanger Institute (a genomics and genetics research institute), UK.

Post doc Yunpeng Wang is a visiting post doc Multimodal Imaging Laboratory (MMIL), UCSD, USA: Prof Anders M. Dale

PhD Student Dag Ainaes, Post doc Tobias Kaufmann and Associate Professor Lars T. Westlye visited the FMRIB Centre, University of Oxford, in November.

Post doc Silje Skrede, March 20 – April 30: research stay in the lab of prof. Miguel López, CIMUS, University of Santiago de Compostela, Spain.

Post doc Martin Steen Tesli visited Institute of Psychiatry, King's College London, in June


Visits from Abroad

SCID, PANSS and DSM-V workshop – Joseph Ventura, UCLA. He visited us in March 2nd-7th.

European Bipolar Research Network (ENBREC) – from Paris, France visited us May 19th.

NORMENT Scientific Advisory Committee: Terry Jemigan (San Diego, USA), Michael Green (Los Angeles, USA) and Marcella Rietschel (Mannheim, Germany) visited in September for NORMENT’s annual gathering.

Professor Anders M. Dale, Multi-Modal Imaging Laboratory at University of California, San Diego visited us from September 2-19 2014.

Associate Professor Alex Hoischen (Radboud University Medical Center, the Netherlands) visited us for two weeks in March and August 2014.

International Cooperation

University of Oxford, UK: Prof Steve Smith, Dr Eugene P Duff, Dr Evangelos Roussos, Dr Gwen Douaud

Multimodal Imaging Laboratory, UCSD, USA: Prof Anders M. Dale, Prof Wes Thompson

Max Planck UCL Centre for Computational Psychiatry and Ageing Research, Berlin, GE: Dr Douglas G. Garrett

deCODE, Iceland: Dr Hreinn Stefansson, Dr Omar Gustafsson

Laboratory of Neuro Imaging Keck School of Medicine, University of Southern California, USA: Dr Derrek Hibar, Prof Paul M Thompson

University of Copenhagen, DK: Associate professor Randi Starrfelt, Professor Thomas Werge

Brain Innovation BV, Maastricht, NL: Dr Ralph Brecheisenl.

International Consortium on Hallucinations Research (ICHR), coordinated from University of Western Australia.


University of Oxford, UK. Angela Vincent immunity, Guy Goodwin bipolar disorder.

Psychiatric Genomics Consortium (PGC). Pat Sullivan UNC, USA, John Kelsoe UCSD, USA, Mick O'Donovan Cardiff, UK.


Institute of Psychiatry. London, UK. Robin Murray, E. Vassos, M. DeForti, Psychosis research
Selected presentations 2014

International presentations:

“Trauma, Mental Health, and Undocumented Migration.” Post doc Akiah O. Berg. European Society for Trauma and Dissociation (ESTD) Conference, March, Copenhagen.

“Neurocognitive decrements are present in intellectually superior schizophrenia.” Post Doc Anja Vaskinn. Schizophrenia International Research Society, Cognition Satellite meeting. Florence, Italy.

“MR in psychiatry” Professor Ingrid Agartz. World Congress of the World Association of Dynamic Psychiatry, St Petersburg, Lecture, MR in psychiatry, St Petersburg, Russia.

“The relation between antipsychotic medication history and ten-year outcome in first episode psychosis”. Professor Ingrid Melle, 9th Early Intervention in Psychosis Conference, Tokyo, Japan.

“Perception of sounds that do not exist” Professor Kenneth Hugdahl, Keynote speaker Nordic Network Conference on Sounds, Music, and the Brain, Helsinki, June.

“GWAS identifies common variants associated with pharmacokinetics of psychotropic drugs” Post doc, Lavinia Athanasiu, SCNP, Copenhagen.

“Childhood Trauma as Risk Factor in Psychotic Disorders- in Search of Mechanisms” Post doc Monica Aas. The 4th Biennial Schizophrenia International Research Society Conference, Florence, Italy.

“Hypothalamus-pituitary-adrenal axis function in psychosis and high risk for psychosis.” Post doc Monica Aas. 44th ISPNE Conference, Sex and Gender Across the Lifespan. Montreal, Canada.

“Additive association between childhood trauma and bdnf val66met on volume of hippocampal subfields- exploring the role of BDNF RNA.” Post doc Monica Aas, 22nd World Congress of Psychiatric Genetic, Copenhagen, Denmark.

“Can new psychiatric genetics findings facilitate drug target identification?” Professor Ole A. Andreassen, SCNP Copenhagen, Denmark.

“Beyond Bonferroni: Large Scale Inference for Complex Disorders” Professor Ole A. Andreassen, Lecture WCPG October 13.

“The Interplay between Genetics and Early Trauma in Severe Mental Disorders”. Professor Stephanie Le Hellard. Discussant, selected symposium. XXIInd World Congress of Psychiatric genetics, Copenhagen, Oct. 12-16.


“Indications of a dose - response relationship between cannabis use and age at onset in bipolar disorder.” Post doc Trine Vik Lagerberg, 16th Annual Conference of the International Society for Bipolar Disorders, South Korea, Seoul.

National dissemination:


“Hvordan går det med personer med psykoselidelser over tid - Hvor mange blir friske?” Post doc Carmen Simonsen, i regi av Fagforbundet, Gaustad sykehus - December.

“Heart rate variability in psychiatric Illness.” Post doc Daniel S. Quintana. Modum Bad Hospital, Oslo, Norway.

“Hvorfor tidlig behandling? Kliniske implikasjoner av en moderne psykoseforståelse” Professor Ingrid Melle, Bergen tidlig psykose symposium, Bergen.
"Neurocognition and occupational functioning in schizophrenia spectrum disorders" PhD Student June Lystad, Norsk Forum for Nevropsykiatri, Oslo

"Kognitiv trening og arbeid". PhD Student June Lystad. Verdensdagen for psykisk helse, Oslo University College, Oslo.

"White matter meeting: everything you need and want to know about white matter" Post doc Kari Ersland, 06-07.02. Trondheim, Norway

"New technology in hallucinations research – app methods" Professor Kenneth Hugdahl, Seminar Speaker Nansen Neuroscience Network Meeting, Oslo

"Nevropsykologi og kognitive funksjoner. Implikasjoner for behandling og oppfølgning ved psykiske lidelser". Professor Kjetil S. Sundet, Emnekurs i nevropsykiatri, LiPS (Leger i Psykiatrisk Spesialisering), Bergen.


"Cannabis use in early bipolar disorder" Phd Student Levi Røstad Kvitland Norsk forum for nevropsykiatri, Oslo.

"Affektive lidelser - diagnose, symptom og underliggende mekanismer". Professor Ole A. Andreassen. Nasjonal konferanse akuttpsykiatri Oslo 14. februar

"Forkortet livslengde ved psykoser. Årsaker og intervensioner". Professor Ole A. Andreassen. Tidlig Psykose Symposium 2014, Bergen 2. juni


"Metabolske bivirkninger av antipsykoetiske medikamenter" Post doc Silje Skrede, Norsk forening for rus- og avhengighetsmedisin (Nfram), Bergen.

# Disputations 2014

<table>
<thead>
<tr>
<th>Candidate</th>
<th>Title</th>
<th>Supervisors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aina Holmén, Cand. psychol.</td>
<td>&quot;Neurocognition in early-onset schizophrenia with a particular focus on executive function&quot;</td>
<td>Bjørn Rishovd Rund, Ingrid Melle</td>
</tr>
<tr>
<td>Torbjørn Elsvåshagen, Cand. med.</td>
<td>&quot;A study of cortical structure and plasticity in bipolar II disorder.&quot;</td>
<td>Ulrik Fredrik Malt, Ole A Andreassen</td>
</tr>
<tr>
<td>Liv Eggset Falkenberg, MSc.</td>
<td>«Neuronal underpinnings of healthy and dysfunctional cognitive control».</td>
<td>Kenneth Hugdahl, Rene Westerhausen</td>
</tr>
<tr>
<td>Helene Barder, Cand. psychol.</td>
<td>&quot;Longitudinal neurocognitive trajectories in first-episode psychosis: Relationships between illness severity and cognitive course.&quot;</td>
<td>Kjell Sundet, Bjørn Rishovd Rund and Svein Friis</td>
</tr>
<tr>
<td>Erlend Mork, Cand. Psychol.</td>
<td>&quot;Self-harm in patients with schizophrenia; risk factors and clinical characteristics.&quot;</td>
<td>Lars Mehlum</td>
</tr>
<tr>
<td>Unni Brattlien, Cand. Med.</td>
<td>&quot;The relevance of premorbid and prodromal phases in psychotic disorders&quot;</td>
<td>Merete Øie, Ingrid Melle</td>
</tr>
</tbody>
</table>
Professor Kenneth Hugdahl at the University of Bergen gets Research Council award for excellence, Möbius Award, for his pioneering research on the brain.
http://www.forskningsradet.no/no/Nyheter/Forskningsrådet_deler_ut_tre_priser_i_dag/1254001581512?lang=no
http://www nrk.no/hordaland/far-pris-for-forsking-pa-indre-stemmer-1.12021725

Seven Norment researchers participated in the project "ENIGMA", through "The ENIGMA - Schizophrenia Working Group ".
http://enigma.ini.usc.edu/ongoing/enigma-schizophrenia-working-group/

Norwegian researchers have contributed to discover over a hundred new genetic variants that increase the risk of schizophrenia, of which 83 have not been previously described.
http://tidsskriftet.no/article/3238155
http://forskning.no/sykdommer/2014/07/over-100-schizofreni-gener-funnet

Researchers have evaluated a mobile app for self-training of auditory attention. The app is designed to test the participants' ability to focus their attention and to concentrate on one specific sound via headphones. The results show that training not only improved the participants' achievements, it also had an impact on how the brain handled the task.

Ole A. Andreassen is one of 15 new members of the National Academy of Science and Letters, Mathematics - and Natural academics class, the group of medical sciences.
http://www.dnva.no/c40213/artikkel/vis.html?tid=40214

Andres M. Dale is a visiting researcher at Norment and among the most successful Norwegians abroad in category «academia ".
http://www.aftenposten.no/spesial/Hvem-mener-du-fortjener-a-bli-karet-til-Norges-mest-fremgangsrike-7531554.html#U0m1CPmSySr

Commentator Hilde Haugsgjerd writes in Aftenposten March 2: "The journal Nature has editorialized designated the present decade to psychiatry decades. Internationally happens advances in research on the brain, about genes and the relationship between heredity and environment for mental illness. Last year opened Norwegian Centre for research on mental disorders a collaboration between the Universities of Bergen and Oslo and Oslo University Hospital."
http://www.aftenposten.no/meninger/kommentarer/Et-lite-lys-i-tunnelen-7486808.html#.UyBO03bKzIY

Ole A. Andreassen being interviewed in connection with his lecturing under NevroNor's annual conference organized by the Research Council.
http://www.forskningsradet.no/no/Nyheter/Pa_vei_inn_i_psykiatrens_tiar/1253991607534?WT.mc_id=nyhetsbrev-ForskningsradetNorsk

"Be careful with cannabis!" Cannabis probably plays a role in triggering the onset of psychotic disorders. Caution with regard to cannabis use should thus be exercised. Read the debate article to Trine Vik Lagerberg, PhD and specialist in clinical psychology, and Levi Røstad Kvitland, fellow and psychologist, Aftenposten Knowledge.
http://www.aftenposten.no/viten/Var-forsiktig-med-cannabis-7619359.html

Post doc Akiah O. Berg has written a blog post, association for intercultural psychology.
Publications 2014


8. Andreassen OA, Thompson WK, Dale AM. Boosting the power of schizophrenia genetics by leveraging new statistical tools. Schizophr Bull. 2014 Jan


10. Andreou D, Söderman E, Axelsson T, Sedvall GC, Terenius L, Agartz I, Jönsson EG. Polymorphisms in genes implicated in dopamine, serotonin and noradrenaline metabolism suggest association with cerebrospinal fluid monoamine metabolite concentrations in psychosis. Behav Brain Funct. 2014 Jul


factors during adolescence associated with later development of psychotic disorders - a nested case-control study. Psychiatry Res. 2014 Mar


24. Clark KA, Helland T, Specht K, Narr KL, Manis FR, Toga AW. Hugdahl K. Neuroanatomical precursors of dyslexia identified from pre-reading through to age 11. Brain. 2014 Dec;137

25. Dahl J, Ormstad H, Aas HC, Malt UF, Bendz LT, Sandvik L, Brundin L, Andreassen OA. The plasma levels of various cytokines are increased during ongoing depression and are reduced to normal levels after recovery. Psychoneuroendocrinology. 2014 Jul


42. Haram M, Tesli M, Dieset I, Steen NE, Røssberg JI, Djurovic S, Andreassen OA, Melle I. An attempt to identify single nucleotide polymorphisms contributing to possible relationships between personality traits and oxytocin-related genes. Neuropsychobiology. 2014


50. Hirnstein M, Hugdahl K, Hausmann M. How brain asymmetry relates to performance - a large-scale
dichotic listening study. Front Psychol. 2014 Jan


(GWAS) Consortium; Wellcome Trust Case Control Consortium 2. Variability in working memory performance explained by epistasis vs polygenic scores in the ZNF804A pathway. JAMA Psychiatry. 2014 Jul


77. Reckless GE, Ousdal OT, Server A, Walter H, Andreassen OA, Jensen J. The left inferior frontal gyrus is involved in adjusting response bias during a perceptual decision-making task. Brain Behav. 2014 May;4


79. Ringen PA, Engh JA, Birkenaes AB, Dieset I, Andreassen OA. Increased mortality in schizophrenia due to cardiovascular disease - a non-systematic review of epidemiology, possible causes, and interventions. Front Psychiatry. 2014 Sep


84. Specht K, Baumgartner F, Stadler J, Hugdahl K, Pollmann S. Functional asymmetry and effective connectivity of the auditory system during speech perception is modulated by the place of articulation of the consonant- A 7T fMRI study. Front Psychol. 2014


## Funding

### Actual financing of all academic activity at the center (in thousand NOK) 2014

<table>
<thead>
<tr>
<th>Funding agreed in the contract and reported in eRapport, but there partly under different funding categories</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Own financing</td>
<td>6 807</td>
</tr>
<tr>
<td>Proceeds from partner(s) to the host institution</td>
<td>320</td>
</tr>
<tr>
<td>Internal funding from partners (in kind)</td>
<td>13 146</td>
</tr>
<tr>
<td>Research Council (SFF-grant)</td>
<td>17 500</td>
</tr>
<tr>
<td>External project funds included in the contract</td>
<td>0</td>
</tr>
<tr>
<td>Total financing of the center as agreed in the contract</td>
<td>37 773</td>
</tr>
</tbody>
</table>

### Financing projects with academic affiliation at the center

<table>
<thead>
<tr>
<th>Other project funding from the Research Council</th>
<th>8 426</th>
</tr>
</thead>
<tbody>
<tr>
<td>International project funding</td>
<td>0</td>
</tr>
<tr>
<td>Government project funding and other public financing</td>
<td>18 578</td>
</tr>
<tr>
<td>Private project funds and other private financing</td>
<td>5 640</td>
</tr>
<tr>
<td>Total funding from external projects</td>
<td>32 644</td>
</tr>
</tbody>
</table>

### Financing overall academic activity

|                                                               |       |
|                                                               | 70 417|

### Personnel resources FTEs (summarized from the Centre staff tab)

<table>
<thead>
<tr>
<th>Personnel resources FTEs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Professors, researchers etc.</td>
<td>17,0</td>
</tr>
<tr>
<td>Doctoral fellows</td>
<td>12,3</td>
</tr>
<tr>
<td>Postdoctoral fellows</td>
<td>15,0</td>
</tr>
<tr>
<td>Visiting researchers</td>
<td>0,2</td>
</tr>
<tr>
<td>Technical / adm. staff</td>
<td>13,1</td>
</tr>
</tbody>
</table>