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Oslo University Hospital and The University of Oslo

Oslo University Hospital (OUH) is Norway’s largest hospital with over 20 000 employees and a budget of 20 billion NOK. The Hospital has a local function for parts of Oslo's population. It has a regional function for the inhabitants in the South-Eastern Norway Regional Health Authority, and it also has a large number of national functions. The Hospital is responsible for the majority of medical research and education of health personnel in Norway.

The University of Oslo (UiO) is Norway’s largest research and educational institution with 28 000 students and 7 000 employees. Professional breadth and internationally recognized research environments make UiO an important contributor to society. The Faculty of Medicine was established in 1814 and works for progressive education, research and dissemination for the patients’ and society’s best interests.

From Division Director Eva Bjørstad

Being the largest hospital in Norway, Oslo University Hospital provides highly specialized health care services to the citizens of Oslo and the Southeast health region. In addition, the Hospital has a nationwide responsibility for a number of national and multi-regional assignments. The Division of Clinical Neuroscience encompasses the fields neurology, neurosurgery, physical medicine and rehabilitation, neurorehabilitation and neuropsychiatry. The proximity to patients and their medical issues are the cornerstones for the research conducted at our Hospital, and the research is aimed at improving patient care. High ethical standards ensure the confidentiality and our goal is to continuously improve diagnostics, treatment and management for all our patients.

Research activity at the Division of Clinical Neuroscience

The Division’s research activity is organized into 15 different research groups covering a broad range of basic, clinical and epidemiological research with an overall aim to improve patient care with emphasis on diagnostic, therapeutic and preventive measures. Most group leaders have a combined position at Oslo University Hospital and the University of Oslo. In total the Division has 19 Professors, 5 Associate Professors, several postdoctoral fellowships and PhD students, administrative staff and technical staff. The Division has an advisory research board that in 2017 consisted of: Professor and Head of Research John-Anker Zwart, Division Director Eva Bjørstad, Senior Consultant Morten Lossius, Professor and Senior Consultant Eirik Helseth, Senior Consultant Mona Skjelland, Senior Consultant Nada Andelic, Senior Physial Therapist Slawomir Wojnuisz, Quality and healthcare adviser Hege Hammer and Administrative Manager Agnete Hager. In 2017 there were in total 184 registered peer reviewed publications and 17 PhD dissertations.

Eva Bjørstad
Division of Clinical Neuroscience (NVR)
Organizational Chart

Division Director
Eva Bjarstad

HR Manager
Line Benedicte Nyborg
CEO
Princilla Nkasingize
Staff

Head of Research
John-Arne Ovass

Administrative Manager
Agnes Hagen
Staff

Dept. of Neurology
Espen Kistad

Dept. of Physical Medicine and Rehabilitation (includes Summaled - the UiO line)
Cecilia Berg

Dept. of Neurosurgery
Nils Ola - Aberndsen

Dept. of Psychosomatic Medicine
Ira Herlau

Dept. of Refractory Epilepsy
Greta Almåsbak

Dept. of Neurorehabilitation
Bjørnar Haavard

*UiO employee(s)
Rehabilitation after trauma

Group Leader
Nada Andelic, MD/PhD, Researcher, Dept. of Nursing Science, UiO
(nada.andelic@medisin.uio.no) / OUH (nadand@ous-hf.no)

Group members
- Cecilie Røe, Professor, UiO
- Erik Bautz-Holter, Professor emeritus, UiO
- Helene Lundgaard Søberg, PhD, Senior researcher, OUH
- Unni Sveen, Professor, PhD, OUH
- Tonje Haug Nordenmark, PhD, Postdoc, OUH
- Marit V. Forslund, PhD, postdoc, UiO
- Tanja Karic, PhD, UiO
- Torgeir Hellstrøm, PhD, UiO
- Ingerid Kleveland, PhD fellow, OUH
- Mari S. Rasmussen, PhD fellow, UiO
- Emilie I. Howe, Cand Psych, PhD fellow, UiO
- Knut-Petter S. Langlo, PhD fellow, UiO
- Elin Western, PhD student
- Ida Maria Borgen Henriksen, PhD student, UiO
- Cathrine Buaas Tverdal, Mphil, UiO
- Sidsel Fjelltun, project coordinator, OUH

Associated group members
- Line Preede, MS research program, UiO

Research profile and aims
The research group generates knowledge about the mechanisms and consequences of trauma, patient care, trends and challenges in treatment and rehabilitation including the patients’ healthcare needs. The main research focus is traumatic brain injuries (TBIs). The research conducted by this group is multidisciplinary and collaborative, where collaboration between genetics, intensive medicine, neurosurgery, neuroradiology, neuropsychology and rehabilitation has been established over the last 10 years. By combining the perspectives and methods of basal, clinical and health care service research, we may provide unique knowledge on the consequences of injuries, how to organize effective patient care and improve the functional outcomes after injuries.

The main aims are:
1. To better understand the mechanisms, course and consequences of TBI and multiple traumas by using translational research strategy.
2. To develop and build evidence based efficient protocols for the rehabilitation implementation.
3. To strengthen existing and initiate new national and international research collaborations on trauma/TBI research.
Main ongoing projects

- **Center-TBI (Collaborative European NeuroTrauma Effectiveness Research in TBI).** Principal investigator at the Oslo University Hospital Study Site of Center-TBI Nada Andelic
  - The course of functional recovery after moderate-to-severe TBI (5, 10 and 20 years after injury). In collaboration with Sunnaas Rehabilitation hospital. Principal investigator Nada Andelic, Researchers: Torgeir Hellstrøm, Emilie I. Howe. Marit Forslund
  - The family as a resource for improved patient and family functioning after traumatic brain injury. A randomized controlled trial of a family centered intervention. Principal investigator Helene L. Søberg, PhD fellow Mari S. Rasmussen
  - The effect evaluation of combined cognitive and vocational interventions after mild-to-moderate traumatic brain injury: a randomized controlled trial and qualitative process evaluation. Principal Investigator: Nada Andelic, Phd fellows: Emilie I. Howe, Knut-Petter S. Langlo
  - Traumatic brain injury; needs and treatment options in the chronic phase. A randomized controlled community-based intervention. Principal investigator: Cecilie Røe, PhD fellow Ida M. Borgen Henriksen
  - OSU6162 in the treatment of fatigue and other neuropsychological sequelae after aneurysmal subarachnoidal hemorrhage - a double-blind, randomised, placebo-controlled study. Principal investigators Angelika Sorteberg, Tonje Haug Nordenmark. PhD fellow Elin Western

Other projects

- **Vestibular Rehabilitation for Patients with Dizziness and Balance Problems after Traumatic Brain Injury.** In collaboration with OsloMet – Oslo Metropolitan University. Principal investigator Helene L. Søberg; PhD fellow Ingerid Kleffelgård
  - Global functioning and quality of life 5 and 10 years after aneurysmal subarachnoid hemorrhage. Principal investigator Tonje Haug Nordenmark
  - Morphological brain damage and functional impairment following mild traumatic brain injury. Principal investigators Cecilie Røe and Nada Andelic; PhD Torgeir Hellstrøm
  - Transitions in rehabilitation: Biographical reconstruction, experiential knowledge and professional expertise. In collaboration with OsloMet. Investigators from OUH Helene L. Søberg and Unni Sveen
  - Effect of adapted physical activity and goal-setting on physical and mental health. In collaboration with Beitosølen Health Sport Center. Principal investigators Cecilie Røe and Erik-Bautz Holter, fellow Line Preede

**Funding**

- European Union’s Seventh Framework Programme for Research and Development
- Norwegian Research Council
- Norwegian Extra Foundation for Health and Rehabilitation
- University of Oslo
- Oslo University Hospital
Most important national and international collaborators

National
- Oslo Traumatic Brain Injury Outcome and Rehabilitation Research Network (OBIOR-research network)
- Hospitals in the South-East Region including Sunnaas Rehabilitation Hospital
- The Norwegian University Hospitals
- OsloMet - Oslo Metropolitan University
- Department of Vocational Rehabilitation, Norwegian Labor and Welfare Administration, Oslo, Norway - NAV
- Universities of Oslo, Bergen, Trondheim and Tromsø

International
- Karolinska, Uppsala, Umeå and Salgrenska University Hospitals, Sweden
- Copenhagen University Hospital and Hammel Rehabilitation and Research Centre, Denmark
- Virginia Commonwealth University, Richmond, US
- BioCrues Health Research Institute, Spain
- University of California, San Diego, CA, USA
- University of Gottingen, Germany
- CENTER-TBI collaborators across the European hospitals/universities

Scientific production of the research group in 2017

Peer reviewed original research articles: 17

Other publications: 10

Selected publications:


Painful musculoskeletal disorders

Group Leader
Cecilie Røe, Professor, Head of Dept of Physical Medicine and Rehabilitation, UiO
(cecilie.roe@medisin.uio.no) / OUH (cecilie.roe@ous-hf.no)

Research profile and aims
The research unit generates knowledge regarding diagnostics, treatment and rehabilitation of painful musculoskeletal conditions. The main focus is on neck, back and shoulder conditions. The research is multidisciplinary, and collaboration with basal, clinical and health care service milieus established. Based on the framework of the International Classification of Functioning, Disability and Health (ICF) and the biospsychosocial model, interaction between the genetic and other basal disease mechanisms with psychosocial, personal and environmental factors are studied regarding the course of pain, functioning and participation. Furthermore, developing and evaluating treatment models in prospective and randomized studies, aiming to improve functioning and return to work are focus areas.

The main aims are:
• To understand the mechanisms, course and consequences of painful musculoskeletal conditions.
• To develop and evaluate treatment models for painful musculoskeletal conditions.

Group Members
- Erik Bautz-Holter, Professor emeritus, UiO
- Siri Bjorland, PhD student, UiO
- Jens Ivar Brox, Professor, UiO
- Kaia Beck Engebretsen, PT, PhD, OUH
- Marte Heide, PhD student, UiO
- Aasne Hoksrud, PhD, OUH
- Marianne Bakke Johnsen, PhD, OUH
- Niels-Gunnar Juell, MD, OUH
- Synnøve Kvalheim, PhD student, UiO
- Elisabeth Kvalvaag, PhD student, UiO
- Aurora Lie Moen, PhD student, UiO
- Kjersti Myhre, PhD, OUH
- Marianne Mørk, PhD student, OUH
- Line Preede, Research line student, UiO
- Elina Schistad, PhD, postdoctoral student Pain Medicine, UiO
- Sigrid Skatteboe, PhD student, OUH
- Mirad Taso, PhD student, OUH
Ongoing projects

- The long-term course of low back pain and radiculopathy. Principal investigators Cecilie Røe and Johannes Gjerstad, National Institute of Occupational health. PhD fellow Siri Bjorland
- Reliability of Modic changes. Principal investigator Elina Schistad
- Efficacy of labral repair, biceps tenodesis and diagnostic arthroscopy for SLAP lesions of the shoulder, a randomized controlled trial. Principal investigator Jens Ivar Brox. PhD fellow Cecilie Piene Schrøder
- Significance of diagnostics and effect of pressure wave treatment in addition to guided training. Principal investigator Cecilie Røe, PhD fellow Elisabeth Kvalvaag
- An investigation of neck/back and shoulder patients expectations to treatment outcome, regarding pain-reduction and functional improvements. Principal investigator Lars-Petter Granan. PhD fellow Sigrid Skattebøe
- Improving functioning and participation among persons with physical disabilities. Principal investigator Cecilie Røe. Research line student Line Preede
- Clinical course and prognostic factors for shoulder pain patients in primary and specialized care. Principal investigator Kaia Engebretsen
- Frozen shoulder- a prospective study with 4 years follow up. Principal investigator Niels Gunnar Juel
- Antibiotic treatment in patients with chronic low back pain and Modic Changes: randomized trial. Conducted by FORMI. Principal investigator in the research group Jens Ivar Brox and Elina Schistad
- A randomized controlled study of surgical versus non-surgical treatment for cervical radiculopathy. Principal investigator Jens Ivar Brox, PhD fellow Mirad Taso
- The effectiveness of radial extracorporeal shockwave therapy, standardized exercise program or usual care for patients with plantar fasciopathy. Study protocol for a double-blind, randomized, sham-controlled trial. Principal investigator Aasne Fenne Hoksrud, PhD fellow Marianne Mørk and Marte Heide.

Most important national and international collaborators

National
- Dept of Orthopaedics, OUH
- National Institute of Occupational Health
- Dept of Physical medicine and Rehabilitation at St Olavs Hospital / Trondheim University Hospital, University Hospital of North Norway and Haukeland University Hospital

International
- Torsten Gordh, Uppsala University, Sweden
- Juan Lu, Paul Perrin, Virginia Commonwealth University, US
- ICF Research Branch, Switzerland
- University of Munich, Switzerland
- University of Lucerne, Switzerland
Scientific production of the research group in 2017

Peer reviewed original research articles: 24

Doctoral dissertation:
Aurora Moen: Avhandling “Disc herniation, inflammatory mediators and lumbar radicular pain”. Dissertation UiO 17.02.17

Selected publications:
Bjorland, Siri; Røe, Cecilie; Moen, Aurora Lie; Schistad, Ellina Iordanova; Aqsa, Mahmood; Gjerstad, Johannes. Genetic predictors of recovery in low back and lumbar radicular pain. Pain 2017; Volum 158.(8) s. 1456-1460

Kvalvaag, Elisabeth Myrset; Brox, Jens Ivar; Engebretsen, Kaia Beck; Søberg, Helene L.; Juel, Niels Gunnar; Bautz-Holter, Erik; Sandvik, Leiv; Røe, Cecilie. Effectiveness of radial extracorporeal shock wave therapy (rESWT) when combined with supervised exercises in patients with subacromial shoulder pain: a double-masked, randomized, sham-controlled trial. American Journal of Sports Medicine 2017; Volum 45.(11) s. 2547-2554

Schistad EI, Stubhaug A, Furberg AS, Engdahl BL, Nielsen CS (2017) C-reactive protein and cold-pressor tolerance in the general population: the Tromsø Study Pain, 158 (7), 1280-1288

Funding
- The Research Council of Norway
- South-Eastern Norway Regional Health Authority
- Sofies Minde Ortopedi
- Oslo University Hospital (interaction means)
Complex epilepsy

Group Leader
Morten I. Lossius, Consultant neurologist, National Centre for Epilepsy, OUH (mortenl@ous-hf.no) and Professor, UiO (morten.lossius@medisin.uio.no)

Group Members
- Marit Bjørnvold, MD/PhD, SSE
- Cecilie Johannessen Landmark, MSc/PhD, SSE and OsloMET
- Kristin Alfstad, MD/PhD, SSE
- Karl Otto Nakken, MD/PhD, SSE
- Erik Hessen, Prof.dr.philos, SSE and UiO
- Magnhild Kverneland, MSc, SSE and UiO
- Kari Modalsli Aaberg, MD, SSE and UiO
- Hilde Karterud, Cand.san/PhD, SSE and UiO
- Antonia Villagran, MD, SSE and UiO
- Torleiv Svendsen, MD, SSE and UiO
- Silje Syrstad, Educationalist, UiO
- Oliver Henning, MD, SSE
- Sigrid Pedersen, MSc, SSE

Associated group members
- Anette Huuse Farmen, MD, Innlandet Hospital and UiO
- Marte Syvertsen, MD, Vestre Viken and UiO

Research profile and aims
Clinical research in patients with difficult-to-treat epilepsy, with particular focus on:

1. Characterization of different epilepsy syndromes (genotype/phenotype)
2. Clinical pharmacology of antiepileptic drugs
3. Different diagnostic and treatment options; EEG, pharmacotherapy, surgery, VNS, diets
4. Psychosocial, psychiatric and neurocognitive aspects
5. Psychogenic non-epileptic seizures
Ongoing projects

PhD candidates in the UiO PhD program:


Post doc:

- Silje Alvestad: “Scandinavian multi-registry study of antiepileptic drug teratogenicity: the SCAN-A study”

PhD-candidates not yet in the UiO PhD program:

- Oliver Henning: Sexuality, depression and side effects in refractory epilepsy patients. Supervisor: Morten I. Lossius

PhD-candidates in the UiO PhD program, associated to the group:


International projects:

- “EURAP study. An International Antiepileptic Drugs and Pregnancy Registry” (International concerted Action on the Teratogenesis of Anti-epileptic Drugs) (http://www.eurapinternational.org/); Silje Alvestad and Kari Mette Lillestølen, National coordinators
“E-PILEPSY” is a pan European project, with the primary aim of improving awareness and accessibility of surgery for epilepsy across different countries. Epilepsy surgery is an established treatment in the management of individuals with drug resistant focal epilepsy (http://www.e-PILEPSY.eu/); Morten I. Lossius, associated partner

“Nordic prospective observational study of outcomes after rare epilepsy surgery procedures”; Fridny Heimsdottir

“TRACE” (Transcutan VNS (t-VNS) for drug resistant epilepsy); Oliver Henning, Konstantin Kostov

“Pharmacokinetic variability, efficacy and tolerability of a new antiepileptic drug, brivaracetam”. Scandinavian project between the National Center for Epilepsy in Norway and Denmark (Filadelfia, Dianalund); Torleiv Svendsen, medical leader, Cecilie Johanne I. Landmark, project leader

“Children with refractory epilepsy and use of the newest antiepileptic drugs”. Scandinavian project between the National Center for Epilepsy in Norway and Denmark (Filadelfia, Dianalund); Margrete Larsen Burns, Marina Nikoronova, responsible in Denmark, Cecilie Johanne Landmark, project leader

“EDDI EMG triggered seizure seizure alarm”; Oliver Henning in cooperation with Danish Epilepsy Center Dianalund

“Scandinavian multi-registry study of antiepileptic drug teratogenicity: the SCAN-A study”; Silje Alvestad, post-doc, in cooperation with UiB/Haukeland


EXIST 3. Novartis (everolimus). Prot.No. CRAD001M2304: “A three-arm, randomized, double-blind, placebo-controlled study of 2 trough-ranges of everolimus as adjunctive therapy in patients with tuberous sclerosis complex (TSC) who have refractory partial-onset seizures”. International multicenter study; Marit Bjørnvold, Principle Investigator Caroline Lund

Most important national and international collaborators

National
- Prof. Eylert Brodtkorb, St. Olavs Hospital/ Trondheim University Hospital
- Prof. Erik Taubøll, OUH

International
- Prof. Torbjörn Tomson, Karolinska Institutet, Stockholm, Sweden. (“European Registry of Antiepileptic drugs and Pregnancy”)
- Professors P Ryvlin (Lyon), H Cross (London), K Braun (Utrecht), P Dimova (Sofia), S Francione (Milano), H Hećimovic (Zagreb), C Helmstaedter (Bonn), V Kimiskidis (Thessaloniki), K Malmgren (Göteborg), P Marusic (Praha), E Trinka (Salzburg), and B Steinhoff (Kork). (“The E-PILEPSY project”)
- Prof. Marina Nikoronova, Dianalund, Denmark (“Children and new antiepileptic drugs”)
- Prof. Christoph Helmstaedter Bonn University Hospital
- Prof. Kristina Malmgren, Sahlgrenska University Hospital
Scientific production of the research group in 2017

Peer reviewed original research articles: 12

Other publications: 16

Dissertations 2:

Hilde Elisabeth Nordahl Karterud: *Perceptions of illness and self in adolescents and adults with psychogenic, non-epileptic seizures (PNES)*. May 18, 2017

Silje Syrstad: *Nocturnal epileptiform activity in EEG and language skills*. Des 14, 2017

Selected publications:


Funding

- South-Eastern Norway Regional Health Authority
- Norwegian ExtraFoundation for Health and Rehabilitation
- Innlandet Hospital Trust
- The Competence Centre for Mental Delay and Epilepsy
- ADHD network research Funds
Neurovascular - Hydrocephalus Research Group

Group Leader
Per Kristian Eide, Professor, Dept of Neurosurgery, UiO (p.k.eide@medisin.uio.no)/
Head of Section, Dept of Neurosurgery, OUH (peide@ous-hf.no)

Group Members
- Brastad Evensen, Karen, PhD fellow, OUH
- Dahlberg, Daniel, PhD fellow, OUH
- Eide, Per Kristian, professor, OUH
- Eidsvåg, Vigdis A, PhD fellow, OUH
- Fric, Radek, PhD fellow, OUH
- Evju, Øyvind, PhD fellow, UiO
- Hassan, Mahdi, PhD fellow, UiO
- Karic, Tanja, PhD, OUH
- Lindegaard, Karl-Fredrik, Professor, OUH
- Lundar, Tryggve, Professor, OUH
- Meling, Torstein R, Professor, OUH
- Paulsen, Henriette, PhD fellow, OUH
- Ringstad, Geir A., Senior Consultant, PhD fellow, OUH
- Slettebø, Haldor, Senior Consultant, OUH
- Sortberg, Angelika, dr.med., OUH
- Sorteberg, Wilhelm, dr.med., OUH
- Stanisic, Milo, dr.med., OUH

Research profile and aims
The research group focuses on clinical and translational neurosurgical research within the fields of neurovascular disease and cerebrospinal fluid disorders.

1. Cerebrovascular disorders. Cerebral hemodynamics. Focus on intracranial aneurysms and subarachnoid hemorrhage, including neurointensive monitoring and outcome.
2. Brain Monitoring. Several projects study intracranial pathophysiology with a strong focus on intracranial pressure and arterial blood pressure dynamics, and cerebral autoregulation.
3. Hydrocephalus. Studies focus on the pathophysiology of hydrocephalus and alterations in pressure dynamics in hydrocephalus and other brain water disorders. Translational research has been initiated to study molecular-genetic mechanisms of hydrocephalus and diseases involving disorders in brain water homeostasis. Clinical studies focus on outcome of treatment of hydrocephalus. Studies on imaging of CSF circulation.
Ongoing projects

- Pathophysiology by cerebral abscesses
- Pathophysiology of hydrocephalus and abnormal brain pressure
- Pathophysiology of subarachnoid hemorrhage and subdural hematomas
- Outcome of treatment of subarachnoid hemorrhage, vascular compression syndromes, stroke and hydrocephalus
- Bleeding Risks of cerebral aneurysms
- Rehabilitation after subarachnoid hemorrhage
- Diagnostic Imaging by disturbances in the cerebrospinal fluid circulation
- Non-invasive monitoring of intracranial pressure

Most important national and international collaborators

National
- Simula, UiO
- Physical medical dept, OUH
- Dept of Radiology, OUH
- Interventional Centre, OUH
- Dept of Informatics, UiO
- Dept of Mathematics, UiO
- Dept of Neurology, OUH
- Trauma Clinic, OUH
- Sunnaas Rehabilitation Hospital
- Institute of Basic Medical Sciences, UiO

International
- University of Gothenburg, Sweden (Prof. Hansson)

Scientific production of the research group in 2017

Peer reviewed original research articles: 21
Invited lectures at international congresses:>15

Doctoral dissertation:
Frič R The pathophysiology of Chiari malformation type I with respect to static and pulsatile intracranial pressure. Institute of Clinical Medicine, Faculty of Medicine, University of Oslo, ISBN 978-82-8377-141-1. Dissertation December 15th 2017.

Selected publications:


Funding
- South-Eastern Norway Regional Health Authority
- European Union
Oslo Neurosurgical Outcome Study Group (ONOSG)

Professor Eirik Helseth, MD/PhD, Consultant neurosurgeon, Dept of Neurosurgery, Oslo University Hospital (eirik.helseth@ous-hf.no) and Professor of Neurosurgery, Faculty of Medicine, University of Oslo (eirik.helseth@medisin.uio.no)

Torstein Meling, MD/PhD, Consultant neurosurgeon, Dept of Neurosurgery, Oslo University Hospital (tmeling@ous-hf.no), Associate Professor of Neurosurgery, Faculty of Medicine, University of Oslo and Assistant Professor, Institute of Psychology, University of Oslo (t.r.meling@medisin.uio.no)

Group Members

- Petter Brandal, MD/PhD, OUH
- Bjarne Lied, MD/PhD, Oslofjordklinikken
- Tom Børge Johanesen, MD/PhD, OUH
- David Scheie, MD/PhD, Rigshospitalet, Copenhagen, Denmark
- Mads Aarhus, MD/PhD, OUH
- Einar Vik-Mo, MD/PhD, OUH
- Charlotte Halvorsen, MD, PhD fellow, OUH
- Hege Linnerud, MD/PhD, OUH
- Markus Wiedmann, MD/PhD, OUH
- Jon-Terje Ramm-Pettersen, MD/PhD, OUH
- Pål Rønning, MD/PhD, OUH
- Benjamin Lassen, MD, PhD fellow, OUH
- Marton König, MD, PhD fellow, Faculty of medicine, UiO
- Tor Brommeland, MD/PhD, OUH
- Ali Rizvi, MD, PhD fellow, OUH
- Christina Teisner Høstmælingen, MD, PhD fellow, OUH
- Cathrine Buaas Tverdal, registrar and researcher
- Ola Fougner Skaansar, medical student, UiO
- Ingar Naess, medical student
- Guro Jahr, MD
- Michele Da Broi, MD

Research profile and aims

Main focus on surgical complications and outcome after surgery for:

- Intracranial tumors
- Intraspinal tumors
- Outpatient spinal surgery
- Neurotrauma
Ongoing projects

- Intraspinal tumors — Surgical management
- Cervical trauma — Epidemiology and Surgical management
- Traumatic Brain Injury — Epidemiology and management
- Intracranial tumors — Epidemiology, imaging and management

PhD projects

- Skull base tumors - Marton König
- CNS lymphomas – Guro Jahr
- Intracranial meningiomas – Michele Da Broi
- Intraspinal Tumors – Charlotte Halvorsen
- Odontoid fractures – Ali Rizvi
- Subaxial fractures - Christina Teiner Høstmælingen

PhD dissertations 2017

- Pål Rønning – TBI
- Ben Heskestad – TBI
- Hege Linnerud – Cervical fractures
- Markus Wiedmann – Brain Tumor Epidemiology

Funding

South-Eastern Norway Regional Health Authority

Scientific production of the research group in 2017

Peer reviewed original research articles: 25

Invited lectures at international congresses: 27

Selected publications:


**Research profile and aims**

The Vilhelm Magnus Laboratory (VML) is a section within the Department of Neurosurgery focusing on translational research: exploration of the biology underlying neurosurgical conditions with an ambition of making contributions to novel treatments. Research efforts during the last 15 years have been concentrated on stem cells from the adult human brain and brain cancer. The studies on brain cancer are focused on glioblastoma (GBM) which is both the most frequent and most deadly brain cancer (median survival in unselected series ≈10 months).

**Aims:**

- To characterize cell types and cellular mechanisms in GBMs with special attention on GBM stem cells (GSCs)
- To develop therapeutic strategies against GCSs
- To characterize human brain stem cells and develop cell types for treatment of neurodegenerative disorders
Ongoing projects

Background
Fifteen years ago we showed for the first time that stem cells from the adult human brain could differentiate into functional neurons, and that it was possible to generate a small nervous system with numerous neurons that fired action potentials and communicated via synapses, from a single stem cell harvested from the adult human brain (Moe et al Brain, 2005;128:2189-99, Westerlund et al Exp Cell Res. 2003; 289:378-83, Moe at al Neurosurgery 2005;56:1182-8).

Simultaneously we started to grow cells from GBMs. A population of cells from these tumors turned out to have stem cell-like properties. We showed that a GBM only can be transferred from one animal to another by transplantation of cells from the GSC subpopulation, in keeping with other results indicating that it is this subpopulation that is responsible for recurrence, growth and drug resistance. We have therefore characterized GSCs quite extensively (Varghese et al Neurosurgery. 2008;63:1022-33; Vik-Mo et al,Neuro Oncol, 2010 Dec;12:1220-30, Vik-Mo et al, Exp Cell Res, 2011 Apr 15;317:1049-59, Joel et al,Dev Dyn, 2013;242:1078-93, Sandberg et al,Exp Cell Res, 2013 15;319:2230-43, Fayzullin et al Exp Cell Res. 2016 10;349:199-213, Mughal et al, Neoplasia. 2018;20(643-656).

Development of a stem cell-based vaccine in patients with brain cancer:
We developed the first clinical protocol that targeted stem cells in a solid tumor by transducing dendritic cells from patients with their own GBM mRNA. This significantly improved clinical outcome. Almost one out of four of the patients are still alive. Vik-Mo et al, Cancer Immunol Immunother. Vik-Mo et al 2013;62:1499-509.
The responders have a median survival of 7 years and are still recurrence free. A randomized trial of the vaccine was certified by all required authorities and started in the spring of 2018. Our intention in the current study is also to clarify why some patients respond and others do not; by in-depth studies of individual tumors and treatment responses.

Individualized systems medicine strategy to target GSCs in patients with recurrent glioblastoma:
In collaboration with our partners at the Finnish Institute for Molecular Medicine, we are combining the novel technical possibilities of high-throughput screening and deep sequencing with our established know-how on patient specific tumor stem cell cultures. Exploring a panel of 525 drugs established in clinical use, as well as drugs in early-phase development, at five different concentrations, we have screened stem cells from individual tumors for drug sensitivity. The approach has been coined Individualized Systems Medicine. This study has shown that GBMs from individual patients are very heterogeneous with respect to drug sensitivity. A manuscript has been submitted for publication.
A clinical trial where we treat patients based on the result from this screening has been planned and applications to relevant authorities are being sent.

Coordinated undermining of survival paths with nine repurposed drugs (CUSP9) and temozolomide in patient-derived GBM samples:
A major barrier to effective treatment in glioblastoma is the simultaneous activity of multiple survival and growth-promoting mechanisms. A conceptually new treatment approach has emerged focusing on coordinated blockade of the native survival paths of GBMs. The coordinated blockade is
undertaken by nine clinically well-known and repurposed drugs concomitant with the cytotoxic and standard of care, temozolomide, in a drug cocktail termed CUSP9. We have evaluated the in vitro efficacy of CUSP9 in patient-derived GBM samples using clinical relative drug concentrations across several different experimental cell assays. The coordinated approach has demonstrated a broad efficacy among several patient samples and experimental cell assays, and as the drugs have well-known safety profiles the results are intriguing for translation to patient treatment. A manuscript has been submitted for publication.

**Characterization of invasive GCSs at the single cell level:**
Glioblastomas are characterized by diffusely infiltrative growth. To investigate the invasive properties of glioblastoma cells we film cells while they invade into rodent brain slices or 3D-biomatrixes using time-lapse microscopy. We have identified subpopulations of cells with different invasive potentials. These cells display specific movement patterns and morphology. This is part of a PhD project where the last paper has been submitted and the thesis is expected to be submitted in 2018.

**Molecular targeting of cancer stem cells in glioblastoma:**
By performing a systematic comparison of gene expression in adult human neural stem cells and GSCs, we have identified differentially expressed genes that may have the potential as new and specific targets for treatment of glioblastoma. Our results from exploring several of these genes and pathways in-depth, suggest a functional role for the Wnt signaling pathway, PBK and NAT12/NAA30 in GBM. As a strategy to more efficiently and directly identify targets that are likely to trigger a therapeutic response, we are currently focusing on genetic high throughput loss-of function screening as tools to identify both individual and shared target hits in patient derived GSC cell cultures.

**Most important national and international collaborators**

<table>
<thead>
<tr>
<th>National</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gunnar Kvalheim, OUH</td>
<td>Krister Wennerberg, Markus Perola, Finnish</td>
</tr>
<tr>
<td>Steinar Aamdal, OUH</td>
<td>Institute for Molecular Medicine, Finland</td>
</tr>
<tr>
<td>Gustav Gaudernack, Targovax</td>
<td>Aki Laakso, Emilia Gaa-Paavola, Töölö Hospital, Helsinki, Finland</td>
</tr>
<tr>
<td>Stefan Krauss, OUH</td>
<td>Rainer Glass, LMU, München, Germany</td>
</tr>
<tr>
<td>Ola Myklebust, OUH</td>
<td>Krishna Bhat and Frederick Lang, MD</td>
</tr>
<tr>
<td>Petter Brandal, OUH</td>
<td>Anderson Cancer Center, Houston, USA</td>
</tr>
<tr>
<td>Elsa Lundanes, UiO</td>
<td>Winston Hide, Harvard University, MA, USA</td>
</tr>
<tr>
<td>Steven Wilson, UiO</td>
<td></td>
</tr>
</tbody>
</table>
Scientific production of the research group in 2017

Peer reviewed original research articles: 1

Dissertations:

Mughal AA. “Identification and validation of potential therapeutic molecular targets in glioblastoma initiating cells and characterization of the invasive phenotype of GBM – Where are the tumor cells and how can they be targeted?” PhD thesis 2017.


Selected publications:
Movement Disorders

Group Leader
Espen Dietrichs, MD/PhD, Professor and Head of Dept of Neurology, UiO
(espen.dietrichs@medisin.uio.no) / OUH (espen.dietrichs@ous-hf.no)

Group Members
- Victoria Berge, MD
- Silje Bjerknes, MD
- Kari Anne Bjørnarå, MD PhD (Vestre Viken)
- Marion Ingeborg Boldingh, MD PhD
- Ahmed Elsais, MD PhD
- Erik Eriksen, MD
- Jan Christian Frich, Prof MD PhD
- Vidar Gundersen, Prof MD PhD
- Sandra Pilar Henriksen
- Morten Andreas Horn, MD PhD
- Zafar Iqbal, PhD
- Emilia Kerty, Prof MD PhD
- Jeanette Koht, MD PhD (Vestre Viken)
- Nadja Anette Myrvik Kvernmo, MD
- Sven Olav Løstegaard
- Angelina Hatlø Maniaol, MD PhD
- Lasse Pihlstrøm, MD
- Trine Haug Popperud, MD
- Siri Lynne Rydnning, MD
- Inger Marie Skogseid, MD PhD
- Chantal M.E. Tallaksen, Prof MD PhD
- Mathias Toft, Prof MD PhD
- Iselin Marie Wedding, MD PhD
- Margrete Langmyhr

Research profile and aims
Our research aims at mapping the clinical expression, natural progression and treatment of movement disorders and neuromuscular disorders, as well as their causes (genetic disposition, environmental factors, and pathophysiological mechanisms).

Clinical research is performed at both sites of Department of Neurology, i.e. at Rikshospitalet (The National Hospital) and at Ullevål University Hospital. Laboratory research is performed in the Neuroscience Research Unit in our new facilities at Domus Medica IV, close to Rikshospitalet. Our Department is the secondary referral center for all neurology in Oslo (mainly at Ullevål), and the tertiary referral center for neurology in the South-East Health Region of Norway (which includes one
half of the Norwegian population). In addition, we have different national functions, including deep brain stimulation (DBS) for movement disorders and other conditions (shared with St. Olav’s Hospital).

**Ongoing projects**

Our research group studies movement disorders and neuromuscular disorders. We have projects with focus on, e.g., Parkinson’s Disease, dystonia, tremors, ataxia and other cerebellar diseases, hereditary spastic paraparesis, Huntington’s Disease, and myasthenia gravis. These include clinical research as well as laboratory research/translational research.

**Most important national and international collaborators**

<table>
<thead>
<tr>
<th>National</th>
<th>International</th>
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</thead>
<tbody>
<tr>
<td>Division of Surgery and Clinical Neuroscience, UiO (Internal collaboration, joint academic and laboratory)</td>
<td>FIGHT-MG, a collaboration of leading neurologists and researchers within Myasthenia Gravis research in Europe Sponsored by EU. FP7 Grant 242210</td>
</tr>
<tr>
<td>The other university hospitals in Norway</td>
<td>LUMC, prof J.J.G.M Verschuuren</td>
</tr>
<tr>
<td>Vestre Viken Hospital Trust</td>
<td>P. Bernasconi, Department of Neurology IV, Neuromuscular Diseases and Neuroimmunology, Fondazione Istituto Neurologico «Carlo Besta», Milan, Italy</td>
</tr>
<tr>
<td></td>
<td>COURAGE-PD consortium (consortium studying risk factors for Parkinson’s disease, participants from 10 European countries)</td>
</tr>
<tr>
<td></td>
<td>Genetic risk factors for Parkinson’s disease in Scandinavia (Umeå, Lübeck/Denmark, Göteborg, Linköping, Bergen/Stavanger)</td>
</tr>
<tr>
<td></td>
<td>GEO-PD (consortium with participants from 25 countries)</td>
</tr>
<tr>
<td></td>
<td>Prof Ole Andreassen, UiO, DemGene - Genetics by Dementia</td>
</tr>
<tr>
<td></td>
<td>European networks for ataxia and hereditary spastic paraparesis (HSP)</td>
</tr>
</tbody>
</table>

**Funding**

Among others:
- European Union
- The Research Council of Norway
- South-Eastern Norway Regional Health Authority
- Norwegian ExtraFoundation for Health and Rehabilitation
Scientific production of the research group in 2017

Peer reviewed original research articles: 26

Selected publications:


Cerebrovascular Research Group, OUH/UiO

Group Leader
David Russell, Professor, Dept. of Neurology, UiO (david.russell@medisin.uio.no) / Consultant, OUH (drussell@ous-hf.no)

Group Members
- Christian Lund, MD,PhD, OUH
- Mona Skjelland, MD,PhD, OUH
- Anne Hege Aamodt, MD,PhD, OUH
- Karolina Ryeng Skagen, MD,PhD fellow, OUH
- Mahtab Zamani, MD/PhD fellow
- Azhar Abbas, MD,PhD fellow, OUH
- Kjersti Johnsrud, MD/PhD fellow
- Maren Hylen Ranhoff, MD/PhD fellow
- Kristine Stø, MD/PhD fellow

Research profile and aims
The main goal is to conduct high-quality cerebrovascular research leading to new knowledge and hopefully better treatment of stroke patients. The research group will promote and facilitate the use of the European Cerebrovascular Research infrastructure (ECRI) for the completion of large national and international stroke studies.

Ongoing projects
- The Unstable Carotid Artery Plaque Study (UCAPS)
- The Norwegian Pediatric stroke Study (NPSS)
- The Norwegian Acute Stroke Prehospital Project (NASPP)
- The Norwegian Atrial Fibrillation and Stroke Study (NAFS)
- The Norwegian Vascular Dementia and Atherosclerosis Study (NVDAS)
- Advanced ultrasound methods for identification of carotid plaque instability
- Oslo Acute Revascularization Stroke Study (OSCAR)
- The Gut bacteria, Atherosclerosis and Ischemic Stroke Study

Most important national and international collaborators

National
- Prof. Lars Thomassen, Haukeland University Hospital
- Norwegian Air Ambulance Foundation (NLA)

International
- Prof. L Csiba, University of Debrecen Medical School, Hungary
- Prof. N Bornstein, Tel Aviv Sourasky University Medical Centre, Israel
Scientific production of the research group in 2017

Peer reviewed original research articles: 10

Selected publications:


Funding
- South-Eastern Norway Regional Health Authority
- The Research Council of Norway
Epilepsy Research Group – Department of Neurology

Group Leader
Erik Taubøll, Professor, Dept. of Neurology, UiO (erik.tauboll@medisin.uio.no) / OUH (erik.tauboll@ous-hf.no)

Group Members
- Kjell Heuser, Postdoc, OUH
- Agnes Balint Bjørke, PhD fellow, OUH and Vestre Viken Hospital Trust
- Sigrid Svalheim, MD/PhD, OUH
- Toni Berger, MD/PhD fellow, OUH
- Line Bedos Ulvin, MD, OUH
- Monika Mokol, PhD fellow, Østfold Hospital Trust
- Dag Aurlien, Consultant, Stavanger Univ Hospital
- Alba Gonzalez; Ph.D. fellow, OUH
- Helle Hermann, PhD fellow, OUH
- Ellen Molteberg, MD, PhD fellow
- Line Sveberg, MD/PhD, OUH
- Ketil Berg Olsen, MD, OUH and Østfold Hospital Trust
- Leif Gjerstad, MD/PhD Professor, OUH/UiO, Prof. emeritus

Associated Group Members
- Cecilie Nome, Elective research student, UiO; TLE
- Erlend Nagelhus, MD/Ph.D, Professor, UiO and OUH
- Rune Enger, Postdoc, OUH/UiO
- Kaja K Selmer, Group leader, Dep of Clinical Genetics, OUH/UiO
- Erik Ropstad, professor, NMBU

Research profile and aims
The Epilepsy Research Group has been active for more than 20 years. Our research is currently focussed on three main areas:

1) Epilepsy-Translational Research. This focuses on research on temporal lobe epilepsy (TLE) through genetic, basic, and clinical studies. The project leader is Kjell Heuser. The main project concerns studying the role of the brain's glial cells in the development and exacerbation of epilepsy (epileptogenesis). The initial studies are basic research using epilepsy models. In addition, larger patient trials are used in which the clinical, radiological (MRI), and neuropsychological development of TLE is monitored over time.
2) “Gender issues”, endocrinology and long-term effects of epilepsy treatments (AEDs and ketogenic diet). The project leader for AEDs is Sigrid Svalheim. “Gender issues” has been an important area of research for the group over many years, with many PhD theses. The current major focus is studying the long-term side-effects of AEDs on hormones, immunology, haematology and bone health. The group also conducts basic research in zebra fish in collaboration with prof. Erik Ropstad and his research group at the Norwegian University of Life Sciences (NMBU), Department of Production Animal Clinical Sciences. Project leader for ketogenic diet is Erik Taubøll. Based on the material from a large study on the effect of ketogenic diet in adults with epilepsy performed at the National Center for Epilepsy in collaboration with Dep of Clinical Genetics OUS, Division of Clinical Nutrition UiO and Dep of Neurology we will now look into possible endocrine effects of the diet. PhD candidate is MD Ellen Molteberg, Senior consultant at the National center for Epilepsy.

3) Epilepsy and cardiology / SUDEP (sudden unexpected death in epilepsy patients). The project leader is Dag Aurlien who is presently based at Stavanger University Hospital. The project is a collaborative venture between Oslo University Hospital (OUH) and Stavanger University Hospital. There is a close collaboration with profs Kristina Haugaa and Thor Edvardsen, Department of Cardiology, OUH.

In addition to these three main areas of research, the group also has interests in deep brain stimulation (DBS) in epilepsy, ketogenic diets for adults, and status epilepticus.

Ongoing projects

• Can the brain's glial cells be a point of attack for novel AED treatments? This is a major project in which, among other approaches, a mouse model is being used to investigate how epilepsy arises and evolves over time. The main question is how glia cells behave during the development and worsening of epilepsy, and whether these changes can be affected by various drugs such as AEDs, anti-inflammatory drugs, drugs that affect intracellular cell signalling etc. The project was funded by the European Science Foundation until 2014, and is now funded by EU grant, 722053, Marie S Curie from nov 2017. It is also connected to the European EU Era-Net project, BRIE (Brain, Glia, Inflammation and Epilepsy) were Kjell Heuser is the leading Norwegian scientist BRIE.

• Is epilepsy a progressive disease? This is a long-term study that focuses on changes in the clinical, radiological and neuropsychological picture in patients with temporal lobe epilepsy. Comprehensive investigations are conducted on patients with newly diagnosed temporal lobe epilepsy at various time points over a 10-year period. The project is supported by Health and Rehabilitation with PhD candidate until 2018.

• Deep brain stimulation (DBS) in epilepsy. In this study patients with hard-to-treat epilepsy are treated with DBS using a blinded study design. This project was supported by Health and Rehabilitation until the end of 2017.
• Long-term effects of AEDs. Patients starting treatment with the AEDs levetiracetam and lamotrigine will be followed prospectively for two years in terms of immunological, hormonal, and haematological adverse reactions, and possible changes in bone health. The data will be collected through interviews, questionnaires, blood tests, and bone density measurements. In addition, experimental studies in zebrafish will be performed on possible changes in gene expression after AED exposure. These experiments are done in collaboration with NMBU. This project is supported with a 50 % PhD student from Østfold Hospital.

• Epilepsy and cardiology. It has become increasingly clear that several epilepsies are channelopathies, as are many cardiac arrhythmias, and are associated with many of the same channels and ions. The relationship between particular generalized epilepsies and cardiac arrhythmias as long QT syndrome (LQTS) will be studied. This is also of central importance for understanding sudden unexpected death in epilepsy (SUDEP). We will also study the impact of several years of epilepsy on cardiac function. This project is supported by The South-Eastern Norway Regional Health Authority with a PhD student until the end of 2018.

• Status epilepticus. The aims of the study are: 1) to give a retrospective overview of a Norwegian adult SE cohort treated at OUH over a period of seventeen years, including epidemiological and etiological data. 2) to perform a quality control of the treatment of SE given in our hospital. 3) to investigate the factors associated with refractoriness and outcome in our cohort. MD Line Bedos Ulvin is PhD candidate in this project. Supervisors are Erik Taubøll, Ketil Berg Olsen and Kjell Heuser.

Most important national and international collaborators

National
- Dept. of Cardiology, OUH
- National Centre for Epilepsy
- Stavanger University Hospital
- Østfold Hospital
- Institute of Basic Medical Science, Glia cells research group (GLIALAB), UiO

International
- Institute of Cellular Neurosciences, Medical Faculty, University of Bonn, Germany (Prof. C. Steinhäuser)
- University of Innsbruck, Austria (Prof. G. Luef)

Scientific production of the research group in 2017

Peer-reviewed original research articles: 1
Other publications: 8 abstracts
Invited lectures at international congresses:


Selected publications:

Funding
- Health and rehab, 2 PhD students
- The South-Eastern Norway Regional Health Authority, 1 PhD
- EU grant, 722053, Marie S Curie programme, 1 PhD
Multiple Sclerosis (MS)

Group Leader
Hanne Flinstad Harbo, Professor and consultant of Neurology (MD/PhD/MHA), Department of Neurology. Oslo University Hospital (OUH) and Institute of Clinical Medicine, University of Oslo (UiO) (h.f.harbo@medisin.uio.no/ uxhahb@ous-hf.no).

Group Members
- Hanne Flinstad Harbo, MD/PhD/MHA, Professor, OUH/UiO
- Elisabeth Gulowsen Celius, MD/PhD, Professor, OUH/UiO
- Tone Berge, MSc/PhD, researcher OUH, Ass. prof., OsloMet – Oslo Metropolitan University
- Steffan D. Bos-Haugen, MSc/PhD, researcher, UiO
- Daniel Rinker, PhD, OUS (from December 2017)
- Pål Berg-Hansen, MD/PhD, engagement ass. professor UiO and consultant OUH
- Gro Owren Nygaard, MD/PhD, OUH
- Sigrid Aune de Rodez Benavent, MD/PhD fellow, Department of Ophthalmology, OUH/UiO
- Ingvild Sørøm Leikfoss, MSci/PhD, UiO
- Pankaj K. Keshari, MSci/PhD fellow, OUH (until dissertation May 2017)
- Anna M. Eriksson, MSci/PhD fellow, UiO
- Ina S. Brorson, MSci/PhD fellow, OUH
- Einar August Høgestøl, MD/PhD fellow, UiO
- Cecilia Smith Simonsen, MD/PhD fellow, Drammen Hospital/OUH
- Heidi Øyen Flemmen, MD/PhD fellow, Skien Hospital/OUH
- Fernanda Kropf Correia, BSc, Masterstudent, UiO (MatNat, Until Master exam in November)
- Ingrid Mo, BSc, Masterstudent, UiO (MatNat, Until Master exam in November)
- Åshild Skardhamar, MD/PhD fellow (application in preparation), OUH

Associated Group Members
- Marte Wendel Gustavsen, MD/PhD, Skien Hospital
- Stine Marit Moen, MD/PhD, Head of research and development, MS-Center, Hakadal
- Piotr Sowa, MD/PhD fellow, Department of Radiology, OUH

We have this year had 7 medical students connected to our group, writing student theses:

Research profile and aims
Multiple Sclerosis (MS) research group at the Department of Neurology, OUH and UiO, aims to identify characteristics and susceptibility factors of MS, and to contribute to a better understanding of the disease and development of better treatments. We perform genetic, immunological, clinical, epidemiological, environmental, MRI and translational studies of MS in collaboration with national and international research partners and networks.
Ongoing projects

∙ Sigrid Aune de Rodez Benavent, PhD fellow: A longitudinal cohort study of ophthalmologic biomarkers correlated with neurodegeneration in early MS. (OUH D-position Department of Ophthalmology) Supervisor: Elisabeth G. Celius, Co-supervisors: Emilia Kerty, Bruno Laeng and Liv Droslum

∙ Tone Berge, researcher, Ingvild Sørøm Leikfoss (Senior Engineer): Vitamin D responsive regulation of susceptibility genes for autoimmune diseases. In collaboration with Professor Lisa Barcellos at the University of California, Berkeley (Peder Seather Grant held by Harbo/Barcellos and grants from Fritz and Ingrid Nilsens legat held by Berge)

∙ Steffan Daniel Bos, researcher: Identification of molecular mechanisms and biomarkers of Multiple Sclerosis (MS-biomarkers) – RNA sequencing of CD4+ and CD8+ T cells as potential biomarkers of MS phenotypes. (NFR researcher project grant held by Harbo)

∙ Anna M. Eriksson, PhD fellow: Identification of molecular mechanisms and biomarkers of Multiple Sclerosis (MS-biomarkers) – molecular characterization of DEXI and other MS susceptibility genes (NFR researcher project grant held by Harbo). Supervisor: Tone Berge, Co-supervisors: Hanne F. Harbo and Steffan D. Bos

∙ Ina S. Brorson, PhD fellow from 1.12.15 (UiO grant held by Harbo): Defining and characterizing molecular pathways in multiple sclerosis. Supervisor: Steffan Bos, Co-supervisors: Hanne F Harbo and Tone Berge

∙ Einar August Høgestøl, PhD fellow from 1.12.15: MRI- and other biomarkers in multiple sclerosis. (NFR researcher project grant held by Harbo). Supervisor: Hanne F Harbo, Co supervisor: Lars T Westlye and Gro O Nygaard

∙ Daniel Rinker, Post Doc from December 2017: Integrating genetic and MRI data in multiple sclerosis

∙ Cecilia Smith Simonsen, PhD fellow (OUH-Drammen grant): Predictors for disease susceptibility and disease progression in Multiple sclerosis, Supervisor: Elisabeth Gulowsen Celius, Co supervisors: Stine Marit Moen and Kari Anne Bjørnerå

∙ Heidi Øyen Flemmen, PhD fellow (Skien grant): Socioeconomic factors as predictors for disease susceptibility and disease progression in Multiple sclerosis, Supervisor: Elisabeth Gulowsen Celius, Co supervisor: Pål Berg-Hansen

∙ Åshild Skardhamar, MD, PhD fellow: Fatigue in Multiple Sclerosis. Supervisor: Elisabeth Gulowsen Celius


∙ Ingrid Mo (Master project): Identifying protein interaction partners for DEXI – encoded by the multiple sclerosis associated dexamethasone-induced gene, DEXI. Supervisor Tone Berge (completed November 2017)

∙ Tone Berge, collaboration with Professor Frode Berven at the University of Bergen; Mass spectrometry analyses of immune cells in multiple sclerosis (Funded through a grant from Biogen Idec to Berge)

∙ Ingvild Sørøm Leikfoss (Senior engineer), Anna M. Eriksson: CLEC16A and other candidate genes
- Hanne F Harbo, Steffan D. Bos, Elisabeth G Celius. MS chip study, collaboration with IMSGC (Harbo Oslo PI)
- Hanne F Harbo, Steffan D. Bos, Elisabeth G Celius. Exome chip study, collaboration with IMSGC. (Harbo Oslo PI)
- Hanne F Harbo, Steffan D. Bos, Pål Berg-Hansen, Mona Beyer: BorrSci study, lead from Kristiansand (South-Eastern Norway Multi- Regional Health Authority grant)
- Hanne F Harbo, Steffan D. Bos, Pål Berg-Hansen, Tone Berge, Ingvild S Leifoss, Elisabeth G Celius Mona Beyer: MultipleMS - partner in EU Horizon 2020-prosjekt (Harbo Oslo PI)
- Hanne F Harbo, Einar A Høgestøl, Sigrid de Rodez Benavent, Steffan Bos, Tone Berge, Elisabeth G Celius, Mona Beyer: Sys4MS- Biotek 2021/NFR Project. (Harbo Oslo PI)
- Einar A Høgestøl, Steffan D. Bos, Hanne F Harbo: MYO Project. With Prof Pierre Gourraud, Nantes. NFR support for travel. NFR-Aurora travel grant (Harbo Oslo PI)
- Elisabeth G. Celius, Mona Beyer, Piotr Sowa, Tobias Granberg: Neuroprotective effects of alemtuzumab in patients with MS in a clinical setting
- Cecilia Smith simonsen, Astrid Edland, Elisabeth G. Celius: Effekt av FAMPYRA® på gange, syn, kognisjon, fatigue og vannlating hos pasienter med multiple sklerose
- Elisabeth G. Celius, Pål Berg-Hansen, Stine Marit Moen and SINTEF: AutoActive :Tools and Methods for Autonomous Analysis of Human Activities from Wearable Device Sensor Data (SINTEF PI)
- Elisabeth G. Celius, Stine Marit Moen/MS-Centre Hakadal and SINTEF: Digital oppfølgning og støtte for personer med multippel sklerose (MS-DOS)
- E.G.Celius, P. Berg-Hansen, Kamila Rasova, Prague, Czech republic, Sunnaas, Hakadal MS-Centre, Kysthospitalet Stavern,HiOA :Physiotherapy in the Czech Republic and Norway. Project funded by EU

MS research group OUS-Uio photo 2018 at Domus Medica 4, Uio:
From left: Synne Brune (PhD student, MD), Gro Owren Nygaard (MD, PhD), Sigrid A. de Rodez Benavent (consultant of ophthalmology, PhD student, MD), Stine Marit Moen (consultant of neurology, MD, PhD, Head of research and development MS-Centre Hakadal), Einar August Høgestøl (PhD student, MD), Tone Berge (Ass.Professor at OsloMet – Oslo Metropolitan University and researcher at OUS, MSc, PhD), Heidi Øyen Flemmen (consultant of neurology, PhD student, MD), Pål Berg-Hansen (Ass.professor, PhD and consultant of neurology, MD.), Hanne F. Harbo (professor, consultant of neurology and group leader, MD, MHA, PhD), Cecilia Smith Simonsen (PhD student, MD), Daniel Rinker (Post Doc, PhD), Elisabeth Gulowsen Celius (consultant of neurology, Professor and project leader, MD, PhD), Anna Marie Eriksson (PhD student, Msc), Ina Skara Brorson (PhD student, MSc), Ingvild Særum Leifoss (Senior engineer, PhD, Msc), Steffan Daniel Bos (post doc, PhD, MSc), Maite Larrañaga Fernandez (Erasmus Bachelor Student).
### Most important national and international collaborators

<table>
<thead>
<tr>
<th>National</th>
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<tbody>
<tr>
<td>- Mona Beyer and Rigmor Lundby, Dept. of Radiology, OUH</td>
<td>- Lisa Barcellos, University of California, Berkeley, US</td>
</tr>
<tr>
<td>- Benedicte A. Lie, Dept. of Medical Genetics, OUH /UiO</td>
<td>- Stephen Sawcer, University of Cambridge, UK</td>
</tr>
<tr>
<td>- Kristine Walhovd and Anders Fjell, Dept. of Psychology, UiO</td>
<td>- Jorge Oksenberg, University of California, San Francisco, US</td>
</tr>
<tr>
<td>- Anne Spurkland, Institute of Basic Medical Sciences, UiO</td>
<td>- Sergio E. Baranzini, University of California, San Francisco, US</td>
</tr>
<tr>
<td>- Bettina Kulle Andreassen, Cancer Registry, Norway</td>
<td>- Pablo Villolslada, Hospital Clinic of Barcelona, Spain</td>
</tr>
<tr>
<td>- Emilia Kerty, Dept. of Neurology, OUH/UIO</td>
<td>- Steve Francis, University of California, San Francisco, US</td>
</tr>
<tr>
<td>- Liv Drolsum, Dept. of Ophthalmology, OUH/UIO</td>
<td>- Anders Dahle, University of California San Diego, US</td>
</tr>
<tr>
<td>- Ole A. Andreassen and Lars T. Westlye, Dept. of Psychiatry, OUH/UIO</td>
<td>- Soheil Damangir and Gabriela Spulber, Karolinska Institute, Stockholm, Sweden</td>
</tr>
<tr>
<td>- Camilla Stoltenberg, Norwegian Institute of Public Health</td>
<td>- Jan Damoiseaux, Dept. of Neurology, Canisius Wilhelmina Hospital, Nijmegen, the Netherlands</td>
</tr>
<tr>
<td>- Inger Johanne Bakken, Norwegian Institute of Public Health</td>
<td>- Joost Smolders, Dept. of Neurology, Canisius Wilhelmina Hospital, Nijmegen, the Netherlands</td>
</tr>
<tr>
<td>- Odd Stokke Gabrielsen, Section for Biochemistry and Molecular Biology, UiO</td>
<td>- B. Wilhelm, Steinbeis Transfer-Centre for Biomedical Optics and Function Testing, Tübingen, Germany</td>
</tr>
<tr>
<td>- Greger Abrahamsen, Division of Anatomy, Molecular Immunology (MOLIMMUN), UiO</td>
<td>- Nordic MS genetics consortium (Hillert, Olsson, Kockum, Oturai, Sørensen, Saareala)</td>
</tr>
<tr>
<td>- Vibeke Sundvold Gjerstad, Division of Anatomy, Molecular Immunology (MOLIMMUN), UiO</td>
<td>- International MS Genetics Consortium (Adrian Ivinson, Stephen Sawcer, Stephen Hauser, An Goris)</td>
</tr>
<tr>
<td>- Trygve Holmøy, Dept. of Neurology, Akershus University Hospital</td>
<td>- Helen Tremlett, Dept of Neurology, Vancouver, Canada</td>
</tr>
<tr>
<td>- Torbjørn Rognes, Section for Biomedical Informatics, Dept. of Informatics, UiO</td>
<td>- Pierre Antoine Gourraud, Hôpital St-Jacques - CHU de Nantes, France</td>
</tr>
<tr>
<td>- Nils Inge Landrø and Bruno Laeng, Dept. of Psychology, UiO</td>
<td>- Tobias Granberg, Karolinska, Stockholm, Sweden</td>
</tr>
<tr>
<td>- Ole Landsverk, Dept of Pathology, KLM, OUH</td>
<td>- Prof. Kamila Rasova, University of Prague, Czech Republic</td>
</tr>
<tr>
<td>- K.B Nilsen and L. Etholm, Dept. of Neurophysiology, OUH</td>
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<tr>
<td>- Kjell-Morten Myhr and Jan Aarseth, Haukeland University Hospital</td>
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<tr>
<td>- Atle Bjørrnerud, Dept. of Physics, Intervention Centre, UiO/OUH</td>
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<tr>
<td>- Frode Berven, Dept. of Biomedicine, University of Bergen</td>
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</tr>
</tbody>
</table>
Scientific production of the research group in 2017

Doctoral dissertations:


Master thesis dissertations:
Fernanda Kropf Correia, November 9, 2017: Molecular characterization of TAGAP- a GTPase-activating protein encoded by a multiple sclerosis susceptibility gene. Supervisor Tone Berge

Ingrid Mo, November 7, 2017: Identifying protein interaction partners for DEXI – encoded by the multiple sclerosis associated dexamethasone-induced gene, DEXI. Supervisor Tone Berge

Selected publications:


Funding
- South-Eastern Norway Regional Health Authority
- The Research Council of Norway
- University of Oslo
- European Commission: EU Horizon 2020
- European Commission/The Reserarch Council of Norway: Sys4MS - Biotek 2021
- Norwegian Extra Foundation for Health and Rehabilitation
- South-Eastern Norway Multi- Regional Health Authority grant
- Unrestricted research grants from Novartis, Biogen, Genzyme, Forsberg and Aulie, and Ingrid and Fritz Nilsen, UNIFOR
- The Peder Sather Foundation
- Odd Fellow Foundation
Invited lectures at international congresses:

- Elisabeth G. Celius: Lemtrada. Portugese Neurology Meeting, Portugal 26.5.17
- Elisabeth G. Celius: Con AHST. Nordic Neuroimmunology meeting Stockholm 2.3.17
- Hanne F Harbo: Nordic Neuroimmunology meeting Stockholm 2.3.17: Genetic and mitochondrial disorders mimicking MS
- Hanne F Harbo: NeuroMI 2017 International Symposium Personalised Medicine in Multiple Sclerosis 15.9.17: Genetics and genomic in MS
- Hanne F Harbo together with Mona K Beyer: MAGNIMS meeting, Milan 15.11.17: MS studies in Oslo
- Hanne F Harbo: PACTRIMS, Vietnam, 23.11.17: From Genetic Association to Functional Studies in MS

Hosting of meetings – invited guests:

- June 20th: Sys4MS Oslo meeting. Professor Villoslada, Barcelonea Spain and the Sys4MS consortium
- September 8th: MS genetics-recent progress. Professor Stephen Sawcer, Cambridge, UK 17
- September 21st: Research seminar: CT and MRI in brain diseases. Key note speaker: Professor Maria Rocca, Milan, Italy
- November 13th: Work shop in bioinformatics. Brook Rhead, Berkeley, California, USA
- November 22nd: Nytt om MS-forskning ved Oslo universitetssykehus – meeting open to the public with presentations from our group
- December 5th: The MS Dash-board and MYO projects. Professor Pierre A Gourraud, Nantes, France

Social media:

- The research group has it’s own designated Facebook page named “Multippel Sklerose Forskningsgruppen Oslo”, currently with 198 followers. Here we keep our followers updated on our current ongoing research projects, as well as international MS research and dissemination activities concerning our research group
- We also have our own homepage at both the Oslo University Hospital and the University of Oslo, which we update on a regular basis
- In association with the Multiple MS project, we also manage both the Facebook page and Twitter account to promote the project in social media
Pain Conditions

Group Leader

John-Anker Zwart, Professor, Dept. of Neurology, Head of Research, Division of Clinical Neuroscience, UiO (j.a.zwart@medisin.uio.no) / OUH (uxzwjo@ous-hf.no)

Group Members

- Ellen Jørum, Professor, UiO/OUH
- Kjersti Storheim, PhD/Associate Professor, OUH/OsloMet
- Astrid Lunestad, Research coordinator
- Britt Andenes, MD/PhD fellow, UiO
- Ingrid Fjeldheim Bånerud, Msc/Administrative, OUH
- Olaf Fjeld, MD/PhD fellow, UiO/OUH
- Håvard Furunes, MD/PhD fellow, UiO
- Margreth Grotle, Professor, OUH/HioA
- Maren Hjelle Guddal, Msc/PhD fellow, UiO
- Alf Inge Hellevik, MD/PhD fellow, OUH/NTNU
- Ingrid Heuch, MD/Senior researcher, OUH
- Synne Øien Stensland, MD/ Postdoctoral fellow, OUH
- Marianne Bakke Johnsen, PhD/Postdoctoral fellow,UiO
- Kristin Ørstavik, MD, PhD/ Senior consultant, OUS
- Inge Petter Kleggetveit, MD/Postdoctoral fellow, OUH
- Ida Løchting, Msc/PhD fellow, UiO
- Kristian Bernhard Nilsen, MD/Associate Professor, OUH
- Linda M. Pedersen, PhD/Postdoctoral fellow, OUH
- Vibeke Siewers, Research coordinator, OUS
- Jarle Sundseth, MD/PhD fellow, UiO/OUS
- Markus Wiedmann, MD/PhD fellow, UiO/OUH
- Monica Wigemyr, Msc/Research coordinator, OUH
- Bendik Winsvold, MD/Postdoctoral fellow, OUH
- Lars Christian Haugli Bråten, MD/PhD fellow, UiO/OUS
- Maria Dehli Vigeland, Msc/PhD fellow, UiO/OUH
- Sigrid Børte, MD/PhD fellow, UiO/OUH
- Eira Ebbs, Msc/Research coordinator, OUH
- Amy Mitchell, Msc/Research coordinator, OUH
- Marie Udneseter Lie, Msc/Research coordiantor, OUH
- Espen Saxhaug Kristoffersen, MD/PhD, associate professor
- Elena Petriu, PT / Master student
- Marie Skovli Pettersen, Master student
Research profile and aims

The main focus of the research group is to generate research based knowledge on mechanisms, prevention and treatment of pain in the musculoskeletal- and nervous system.

Ongoing projects

- The Acute Low-Back Pain Study. Clinical, neurophysiological and genetic risk factors
- Genetic risk variants in migraine and cardiovascular disease. The Gene HUNT study
- Risk factors for anterior cruciate ligament injuries in Norwegian adolescents and young adults: (the ACL/HUNT studies)
- Genetic and environmental causes of migraine, a large-scale family-based analysis
- Early risk factors for migraine. The young-HUNT study
- Familial hemiplegic migraine in Norway
- The AIM-study (Antibiotics In Modic changes); antibiotic treatement of chronic low-back pain with Modis changes, a randomised double blind multicenter placebo controlled trial
- Epigenetic and molecular biomarkers in chronic low back pain and Modic changes. A case-control study
- The HUNT OsteoArthritis study (the HOA-study)
- Lumbar disc prosthesis versus multidisciplinary rehabilitation in chronic back pain and localized degenerative disc. Long term follow-up of a randomized multicentre trial
- The NORwegian Degenerative spinal STENosis-trial (the NORDSTEN-study)
- Physical activity and sport participation during adolescence and musculoskeletal complaints in adulthood. A population based cohort study
- Spinal surgery in Norway. Trends, costs and regional differences
- The Norwegian Cervical Arthroplasty Trial. The NORCAT study. A prospective, single blinded, randomized, controlled multicenter study
- Risk factors for development of chronic pain after hospitalization for acute low back pain and/or sciatica (RUKSAR)
- Clinical and genetic aspects of neuropathic pain (CiINGNeuP)
- Conditioned pain modulation with respect to different test pain stimuli (CPM2TS)
- Physical activity, chronic low back pain and other musculoskeletal complaints, is there a causal relationship? The HUNT study
- Childbirths, hormonal factors and low back pain - a prospective epidemiological survey
- A Comparison of Anthropometric Measures for Assessing the Association between Body Size and Risk of Chronic Low Back Pain: The HUNT Study
- Back Pain in Elderly (BACE). A prospective cohort study of older people visiting primary care with a new episode of back pain
- Genetic risk factors for development of Pain – The Tromsø Study
- All-In-HUNT, genetic assessment of neurological and psychiatric disorders
- Targeting low back pain and comorbidity in primary care – a plan for a prospective study aimed to increase treatment effects in back pain (pilot project, NFR)
Most important national and international collaborators

National
- University Hospital of North Norway (UNN)
- Drammen Hospital
- St. Olavs Hospital/Trondheim University Hospital
- Østfold Hospital
- Haukeland University Hospital
- Stavanger University Hospital
- The National Institute of Occupational Health (STAMI)
- Norwegian University of Science and Technology (NTNU)
- OsloMet

International
- Leiden University Medical Centre (LUMC), the Netherlands
- Broad Institute of MIT and Harvard, Boston, US
- Institute for Molecular Medicine (FIMM), Finland
- University of Helsinki, Finland
- University of Oxford, UK
- Keele University, UK
- University of Odense, Denmark
- The low-back pain consortium
- The headache genetics consortium
- Erasmus MC, Rotterdam, the Netherlands

Scientific production of the research group in 2017

Peer reviewed original research articles: 26

PhD 2017:
- Markus Wiedmann: “Height and body mass index and risk for primary tumours of the central nervous system” – dissertation 19 June 2017
- Marianne Bakke Johnsen: “Leisure time physical activity and smoking as potential risk factors for severe hip and knee osteoarthritis. The HUNT Study” - dissertation 28 June 2017

Master thesis:
- Elena Petriu: “Reliability of two different conditioning pain modulation paradigms”
Selected publications:


Funding
- South-Eastern Norway Regional Health Authority
- The Research Council of Norway
- The Norwegian Fund for Post-Graduate Training in Physiotherapy
- UiO
- OUH
Brain plasticity and neuropsychiatry

Group Leader

Torbjørn Elvsåshagen; M.D., PhD, postdoctoral research fellow; Department of Neurology, OUH (telvsaha@ous-hf.no) and Norwegian Centre for Mental Disorders Research (NORMENT), UiO (torbjorn.elvsashagen@medisin.uio.no)

Research profile and aims

Our group conducts research in the fields of adult brain plasticity and neuropsychiatry. Plasticity – the capacity for change – is increasingly recognized as an intrinsic property of the adult brain and may play important roles in the etiologies and treatments of neurological and psychiatric illnesses. Neuropsychiatry recognizes that the brain and mind are one, that mental illnesses are disorders of the brain, and that psychiatric symptoms are commonly found in neurological disorders. One important goal of neuropsychiatric research is to bridge the gap between neurology and psychiatry.

Among the main aims of our current research are:

1. To examine whether structural and functional brain plasticity are core characteristics of the human sleep-wake cycle
2. To increase our understanding of how novel schizophrenia- and bipolar disorder-associated genetic variants affect synaptic function and plasticity
3. To investigate whether adult hippocampal neurogenesis can be measured using magnetic resonance spectroscopy (MRS)
**Ongoing projects**

- Sleep-wake-dependent brain plasticity in health and depression
- Genes, synaptic function, and stem cells in bipolar disorder, schizophrenia, and autism spectrum disorder: from pathophysiology towards personalized medicine
- *In vivo* measurements of adult hippocampal neurogenesis using MRS
- Brain plasticity and psychobiology in bipolar II disorder and borderline personality disorder
- G-protein genotypes and associations with anxiety and depression in the HUNT Study
- Studies of genotype-phenotype interactions in the 3q29 microdeletion syndrome
- Neuropsychiatry and coping in heart and lung transplantation
- Non-invasive human LTP-like plasticity – examining robustness, functional significance and clinical utility of a novel biomarker
- Mapping and modulating brain networks in severe mental illness: towards new targets for therapeutic non-invasive brain stimulation

**Most important national and international collaborators**

<table>
<thead>
<tr>
<th>National</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Prof. Ole A. Andreassen, NORMENT, UiO/OUH</td>
<td>- Ass. prof Ana Andraeza, Dept. of Psychiatry,</td>
</tr>
<tr>
<td>- Prof. Erik Jönsson, NORMENT, UiO</td>
<td>University of Toronto, Canada</td>
</tr>
<tr>
<td>- Prof. Srdjan Djurovic, NORMENT, UiO</td>
<td>- Prof. and Chair Trevor Young, Dept. of</td>
</tr>
<tr>
<td>- Ass. prof. Lars T. Westlye NORMENT, UiO</td>
<td>Psychiatry, University of Toronto, Canada</td>
</tr>
<tr>
<td>- Prof. Bjørn Bjørvatn, Norwegian Competence Center for Sleep Disorders, Bergen</td>
<td>- Prof. Eus van Someren, Netherlands Institute</td>
</tr>
<tr>
<td>- Dr. Stine Knudsen, C. of Exp. For Neurodevelopmental Disorders and Hypersonnias, OUH</td>
<td>for Neuroscience, Amsterdam, the Netherlands</td>
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<tr>
<td>- Prof. Espen Dietrichs, Dept. of Neurology, OUH/UiO</td>
<td>- Ass. prof. Mirjana Maletic-Savatic, Baylor</td>
</tr>
<tr>
<td>- Prof. Guttorm Haugen, Dept. of Obstetrics and Gynecology, OUH/UiO</td>
<td>College of Medicine, Houston, USA</td>
</tr>
<tr>
<td>- Prof. Ragnhild Emblem, Dept. of Pediatric Surgery, OUH/UiO</td>
<td>- ENIGMA group (Enhancing NeuroImaging Genetics</td>
</tr>
<tr>
<td>- Prof. Sigmund Karterud, Dept. for Personality Psychiatry, OUH/UiO</td>
<td>through Meta-Analysis)</td>
</tr>
<tr>
<td>- Prof. Lars Gullestad, Dept. of Cardiovascular Medicine, OUH/UiO</td>
<td>- EURONET-SOMA: European Research Network on</td>
</tr>
<tr>
<td>- Prof. Arne E. Vaaler, NTNU, BRAIN: Bipolar research and innovation network</td>
<td>somatoform disorders; group leader: Prof.</td>
</tr>
<tr>
<td>- Prof. Hilde Nilsen, Dept. of Molecular Biology (EpiGen), UiO</td>
<td>Bernd Löwe, Uni Hamburg-Eppendorf, Abt. Für</td>
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<tr>
<td>- Prof. Jan Ivar Røssberg, OUS/UiO</td>
<td>Psychotherapie und Psychosomatische Medizin,</td>
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<tr>
<td>- Prof. Gaute Einevoll, NMBU/UiO</td>
<td>Germany</td>
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Scientific production of the research group in 2017

Peer reviewed original research articles: 33

Invited lectures at international congresses:

Research grants:
South-Eastern Norway Regional Health Authority. Sleep-wake-dependent brain plasticity in health and depression, ~3.4MNOK, PI: A. Bjørnerud

Selected publications:


Cognitive Health in Trauma and Disease (CHTD)

Group Leader
Ira Ronit Hebold Haraldsen, MD/PhD, Psychiatrist, OUH (i.haraldse@ous-hf.no)

Group Members
- Vebjørn Anderson, BSc, Technician, OUH
- Aksel Erichsen, MD, PhD-candidate, OUH
- Christoffer Hatlestad, cand.psychol., PhD-candidate, OUH
- Kjersti Gulbrandsen, MNSc, Clinical Nurse Specialist, OUH
- Reidar Jessen, cand.psychol., PhD-candidate, OUH
- Syed Nuruddin, VetMD, OUH
- Patrick Riss, PhD, Chemist, OUH/UiO
- Uta Sailer, PhD, Senior Researcher, OUH/UiO
- Helle Stangeland, MSc, Clinical Research Coordinator, OUH
- Stefan Sutterlin, PhD, Psychologist, OUH/HiØF
- Maren Øglænd Torjusen, Research Assistant, OUH
- Linn Cesilie Tovås, Research Assistant, OUH
- Slawomir Wojniusz, PhD, Physiotherapist, OUH/Oslo MET

Research profile and aims
We want to understand how and why physical trauma and somatic disorders affect cognitive functions and brain health. Our aim is to contribute to improved prevention, diagnosis and treatment of neuropsychiatric and neuroendocrinological diseases through high-quality research.

We are interested in how physical trauma and somatic disorders affect the central nervous system.

The CHTD group conducts research in the following areas:

- Healthy aging and neurodegenerative disease
- Non-reproductive, cognitive functions of gonadotropin releasing hormone (GnRH) and its receptor (GnRHR)
- Sex differences in brain function

We are currently trying to learn more about how diverse somatic disorders affect cognitive health, especially during puberty and aging. Because of our team’s hands-on experience with basic science methods, as well as our clinical experience, we are able to take part in several translational research projects. Our methods range from microscopy and immunohistochemistry, to molecular imaging by
positron emission tomography and radiochemistry, to MR imaging and electrophysiological neuropsychological testing.

We are an international group of researchers that come from a variety of different educational backgrounds, including medicine, psychology, physiotherapy, nursing and biological science. Our multidisciplinary approach to brain-behavior relations allows us to conduct research across various systems and cognitive levels; from molecules to cells to cognitive systems to behaviors.

Ongoing projects

- Development of a Novel F18-PET tracer for early diagnosis of Alzheimer Dementia
- Novel risk factor assay for Alzheimer’s disease-Multi-parametric quantification of HPG/HPT-axis dysfunction
- Cognitive impairment and cerebral metabolism in diabetes mellitus, and recovery with pancreas transplantation
- Does the gut hormone ghrelin act as a general reward enhancer?
- Effectiveness of somatocognitive therapy for the treatment of provoked localized vestibulodynia (the Pro-LoVe study)
- Gender dysphoria in adolescents – a qualitative study
- Gender dysphoria: Worldwide exacerbation, prevalence, and the impact of GnRH treatment on brain development; an investigation in a human and animal model (CONOS)

Most important national and international collaborators

<table>
<thead>
<tr>
<th>National</th>
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<tbody>
<tr>
<td>- Kåre Inge Birkeland, OUH</td>
<td>- Els Elaut, Belgium</td>
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<tr>
<td>- Atle Bjørnerud, OUH</td>
<td>- Griet De Cuypere, Belgium</td>
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<tr>
<td>- Tor Endestad, UiO</td>
<td>- Guy T’Sjoen, Belgium</td>
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<tr>
<td>- Trond Jenssen, OUH</td>
<td>- Susanne Cerwenka, Germany</td>
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<td>- Jo Klaveness, UiO</td>
<td>- Timo O. Nieder, Germany</td>
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<tr>
<td>- Pål Gunnar Larsen, OUH</td>
<td>- Hertha Richter-Appelt, The Netherlands</td>
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<tr>
<td>- Per Magnus, FHI</td>
<td>- Peggy Cohen-Kettenis, The Netherlands</td>
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<tr>
<td>- Mahmood Reza Amiry Moghaddam, UiO</td>
<td>- Neil Evans, Glasgow, Scotland</td>
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<tr>
<td>- Dag Erlend Olberg, NMS</td>
<td>- Jane Robinson, Glasgow, Scotland</td>
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<tr>
<td>- Mona-Elisabeth Revheim, OUH</td>
<td>- Fernando Maestu, Madrid, Spain</td>
</tr>
<tr>
<td>- Erik Ropstad, Norwegian School of Veterinary Science (NVH)</td>
<td>- Ernesto Pereda, Madrid, Spain</td>
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<tr>
<td>- Thor Audun Saga, NMS</td>
<td>- Walter Bockting, New York, USA</td>
</tr>
<tr>
<td>- Thomas Schreiner, OUH</td>
<td>- Anne-Kristin Solbakk, OUH</td>
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<tr>
<td>- Anne-Kristin Solbakk, OUH</td>
<td>- Jan Solberg, Invento2</td>
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<tr>
<td>- Erik Taubøll, UiO</td>
<td>- Reidun Torp, UiO</td>
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<td>- Reidun Torp, UiO</td>
<td>- Erik Taubøll, UiO</td>
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<td>- Anne-Kristin Solbakk, OUH</td>
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<td>- Jan Solberg, Invento2</td>
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</table>
Scientific production of the research group in 2017

Peer reviewed original research articles: 13

Selected publications:
“Cognitive function after heart transplantation: Comparing everolimus-based and calcineurin inhibitor-based regimens”
Clin Transplant, 31 (4)
PubMed 28185318

“The Association between Work-Related Rumination and Heart Rate Variability: A Field Study”
Front Hum Neurosci, 11, 27
PubMed 28197087

“Recent Development of Non-Peptide GnRH Antagonists”
Molecules, 22 (12)
PubMed 29232843

Funding
- The Research Council of Norway – The Research Programme on Biotechnology for Innovation (BIOTEK 2021)
- South-Eastern Norway Regional Health Authority
- Throne Holst foundation
Intellectual disability and neurohabilitation

Group Leader
Bjørnar Hassel, Professor, Dept. of Neurohabilitation, OUH
(bjornar.hassel@ous-hf.no) and UiO (bjornar.hassel@medisin.uio.no)

Group Members
- Nils Olav Aanonsen, MD, OUH
- Sigrun Hope, MD, PhD, OUH
- Anne Katrin T. Holmøy, MD, OUH
- Kathrine Haggag, MD, OUS
- Jutta Rummel, MD, OUS
- Alma Sikiric, MD, OUS
- Helene Portilla, MD, OUS
- Daniel Dahlberg, MD, OUS
- Amalie Poole, Stud. med.
- Marleen van Walsem, PhD, OUS

Research profile and aims
The aim of the neurohabilitation research group is 1) to conduct research that will lead to improvement of the quality of life of persons with developmental disabilities, 2) to investigate mechanisms behind brain dysfunction and damage that leads to developmental disability.

In collaboration with the municipality of Oslo, SINTEF, and The University College of Oslo and Akershus we investigate the use of sensors for autonomic responses as a means of communication for developmentally disabled persons who are unable to express their needs.

To investigate mechanisms that underlie some forms of developmental disability we use clinical and preclinical approaches to elucidate mechanisms of toxicity of certain metabolites and microbes.

Ongoing projects
- Wearable sensors for autonomic responses as a means of communication for persons with developmental disability who lack the ability to express themselves
- Mechanisms of seizure generation and cell death during brain abscess formation, a preventable cause of developmental disability
- Mechanisms of cell death and seizure generation during formation of cystic brain tumors
- The effects on brain cells of propionic acid, a metabolite that causes cerebral dysfunction in an inborn error of metabolism
- The metabolism of fructose and its metabolite glyceraldehyde, two causes of neurodegeneration through formation of advanced glycation end products
Most important national and international collaborators

<table>
<thead>
<tr>
<th>National</th>
<th>International</th>
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<tbody>
<tr>
<td>- Cecilie Morland, HIOA/Inst. of Pharmacy, UiO</td>
<td>- Farshid Amirabdollahian, University of Hertfordshire, UK</td>
</tr>
<tr>
<td>- Frode Strisland, SINTEF – Smart sensor systems, Oslo</td>
<td>- Sergio Guillen, Mysphaera, TSB Real time location systems, Valencia, Spain</td>
</tr>
<tr>
<td>- Oslo Municipality and the burroughs of Nordstrand, Østensjø and Vestre Aker</td>
<td>- Jordi Rovirasimon, Parc Sanitari Sant Joan de Deu, Barcelona, Spain</td>
</tr>
<tr>
<td>- Erik Taubøll, Dept. of Neurology, UiO</td>
<td>- Raymond Dingedline, Emory University, Atlanta, GA, USA</td>
</tr>
<tr>
<td>- Farrukh A. Chaudhry, Inst. of Anatomy, UiO</td>
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<tr>
<td>- Torgeir Bruun Wyller, Dept. of Geriatrics, OUH</td>
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<td>- Leiv Otto Watne, Dept. of Geriatrics, OUH</td>
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<td>- Nenad Bogdanovic, Dept. of Geriatrics, OUH</td>
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<tr>
<td>- Espen Mariussen, Norwegian Defence Research Establishment, Kjeller</td>
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<tr>
<td>- Øyvind Voie, Norwegian Defence Research Establishment, Kjeller</td>
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<tr>
<td>- Frode Rise, Inst. of Chemistry, UiO</td>
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</table>

Scientific production of the research group in 2017

Peer reviewed original research articles: 3

Selected publications:


Specialized medical rehabilitation – Sunnaas
Rehabilitation Hospital

Group Leader

Johan K. Stanghelle, MD/PhD, Director of Research (johan.stanghelle@sunnaas.no)/Professor, Dept. of Physical Medicine and Rehabilitation, UiO
(j.k.stanghelle@medisin.uio.no)

Group Members

- Johan K. Stanghelle, MD/PhD, Professor, Sunnaas Rehabilitation Hospital/UiO
- Frank Becker, MD/PhD, ass Professor, Sunnaas Rehabilitation Hospital/UiO
- Grethe Månum, MD/PhD, ass Professor, Sunnaas Rehabilitation Hospital/UiO
- Emil Kostovski, MD/PhD, postdoc fellow, Sunnaas Rehabilitation Hospital/UiO
- Svend Rand-Hendriksen, MD/PhD, postdoc fellow, Sunnaas Rehabilitation Hospital/UiO
- Dag Brekke, MD/PhD, Sunnaas Rehabilitation Hospital
- Tor Haugstad, MD/PhD, Sunnaas Rehabilitation Hospital
- Anne-Kristine Schanke, PSYCH/PhD, Professor, Sunnaas Rehabilitation Hospital/UiO
- Marianne Løvstad, PSYCH/PhD, ass Professor, Sunnaas Rehabilitation Hospital/UiO
- Solrun Sigurdardottir, PSYCH/PhD, postdoc fellow, Sunnaas Rehabilitation Hospital
- Jan Egil Nordvik, PSYCH/PhD, Sunnaas Rehabilitation Hospital
- Per Ola Rike, PSYCH/PhD, Sunnaas Rehabilitation Hospital
- Sveinung Tornås, PSYCH/PhD, Sunnaas Rehabilitation Hospital
- Solveig Hauger, PSYCH/PhD, Sunnaas Rehabilitation Hospital
- Arve I. Opheim, PT/PhD, Sunnaas Rehabilitation Hospital
- Vivien Jørgensen, PT/PhD, Sunnaas Rehabilitation Hospital
- Ellen Høyer, PT/PhD, Sunnaas Rehabilitation Hospital
- Anne Lannem, PT/PhD, ass Professor, Sunnaas Rehabilitation Hospital/Norwegian school of Sport Sciences
- Kirsti Skavberg Roaldsen, PT/PhD, ass Professor, Sunnaas Rehabilitation Hospital/OsloMet/Karolinska Institute
- Birgitta Langhammer, PT/PhD, Professor, Sunnaas Rehabilitation Hospital/OsloMet
- Ellen Berg Svendby, Cand Scient/PhD, Sunnaas Rehabilitation Hospital/OsloMet
- Grace I. Romsland, RN/PhD, Professor, Sunnaas Rehabilitation Hospital/OsloMet
- Melanie Kirmess, ST/PhD, ass Professor, Sunnaas Rehabilitation Hospital/UiO
- Vegard Strøm, Cand Scient/PhD, Sunnaas Rehabilitation Hospital
- Gry Velvin, SW/PhD, Sunnaas Rehabilitation Hospital

Associated group members:

- Fin Biering-Sørensen, MD/PhD, Professor, Copenhagen University
- Katharina Sunnerhagen, MD/PhD, Professor, Gothenburg University
- Lena Hartelius, ST/PhD, Professor, Gothenburg University
- Kerstin Fugl-Meyer, SW/PhD, Professor, Karolinska Institute
- Agneta Stähle, PT/PhD, Professor, Karolinska Institute
- Helle Ploug Hansen, RN/PhD, Professor, University of Southern Denmark, Odense
- Jennie Ponsford, PSYCH/PhD, Professor, Monash University, Melbourne
Research profile and aims
Clinical and some basic research within specialized rehabilitation of patients with brain injuries, spinal cord injuries and multitrauma, and research within selected groups of seldom diagnosis.

Ongoing projects
- Follow-up of the most serious injured patients after the July 22nd attack
- Multinational studies on specialized rehabilitation for stroke patients and spinal cord injuries
- Several studies on neuropsychological consequences after brain injury
- Several studies on movement disorders and gait analysis
- Basic physiological mechanisms after spinal cord injuries
- Basic mechanisms after brain injuries (fMRI, electrophysiological functions etc)
- Several studies on patients with seldom diagnosis

Most important national and international collaborators

National
- Oslo University Hospital
- Institute of Psychology, UiO
- OsloMet
- Norwegian Sport High School
- Haukeland University Hospital
- St. Olav Hospital / Trondheim University Hospital
- University Hospital of North Norway
- Beitostølen Health Sport Center
- Hospitals in Health Region South-East

International
- Karolinska Institute, Stockholm, Sweden
- Gothenburg University, Sweden
- Copenhagen University, Denmark
- University of Southern Denmark, Odense; Denmark
- Monash University, Melbourne, Australia
- China Rehabilitation and Research Center (CRRC), China
- Rusk Institute of Rehabilitation, NY, USA
- Policlinic no2, Petrozavodsk, Karelia, Russian Federation

Associated group members (continued):
PhD Fellows/PSYCH: Kjersti Mæhlum Walle, Daniel Løke, Geneviève Richard, Knut Kolskår
PhD Fellows/RN: Anne-Stine Røberg, Anne Geard
PhD Fellows/PT: Emelie Butler Forslund, Matthijs Wouda, Linda Rennie, Anu Piira
PhD Fellows/ST: Maribeth C. Rivelsrud
PhD Fellows/OT: Anne-Marthe Sanders

Administration:
Annette M. Juelsen
Scientific production of the research group in 2017

Peer reviewed original research articles: 47

Other Publications: 20

Doctoral thesis:
Dag Brekke  
Evaluations of the project "Rapid return to work"

Sveinung Tornås  
Goal management training

Solveig Lægreid Hauger  
Clinical utility of cognitive event related potentials

Per-Ola Rike  
Critical factors for safe driving

Emelie Butler Forslund  
Falls in wheelchair users with spinal cord injury

Leonidas Lundell  
Skeletal muscle plasticity

Selected publications:
Hauger, Solveig Lægreid; Olafsen, Kjell; Schnakers, Caroline; Andelic, Nada; Nilsen, Kristian Bernhard; Helseth, Eirik; Funderud, Ingrid; Andersson, Stein; Schanke, Anne-Kristine; Løvstad, Marianne. Cognitive event-related potentials during the sub-acute phase of severe traumatic brain injury and their relationship to outcome. *Journal of Neurotrauma* 2017; Volum 34.(22) s.3124-3133

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