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Board for Aker and Ullevål Diabetes Research Fund

- Knut Dahl-Jørgensen, Professor dr.med.
- Kristian F. Hanssen, Professor dr.med.
- Erik Schultz, MBA
- Per M. Thorby, Consultant

Board for Oslo Diabetes Research Centre

- Beth Tyrdal, Research secretary
- Kåre Birkeland, Professor dr.med.
- Knut Dahl-Jørgensen, Professor dr.med.
- Kristian F. Hanssen, Professor dr.med.
- Anne-Marie Aas, Clinical nutritionist Ph.D.
- Anne-Marie Aas, Clinical nutritionist Ph.D.

Collaborating partners

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- Cathrine Brunnborg, Statistician, Centre for Clinical Research
- Helene Holm, Midwife/Diabetes nurse, Dep of Obstetrics and Gynecology
- Peter Kierulf, professor dr.med. (Em), Dep of Clinical Biochemistry
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- Mario Gaarder, Department of Radiology
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- Erik Thorsby, Professor dr.med., Institute of Immunology
- Siri Vangen, Consultant dr.med., Centre for Women’s health
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- Haakon Stenseth, M.D., Dep Radiology
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- Christian A. Drevon, professor dr.med.
- Per Ole Iversen, professor dr.med.
- Svein Olav Kolset, professor dr.philos.
- Hilde Nøbb, professor
- Margareta Wandel, professor
- Lena Grønning-Wang, Ph.D.

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- Odd Erik Johansen, dr.med.

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- Sidsel Graff-Iversen, researcher Ph.D.
- Kjersti Skjold Rønningen, Professor dr.med.
- Wenche Nystad, Ph.D.

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- Bjørgulf Clausen, professor dr.med.
- Akhtar Hussain, professor dr.philos.

Norwegian School of Sports Science
- Roald Bahr, professor dr.med.
- Sigmund Andersen, professor dr.philos

Lillehammer University College
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Bergen University College
- Marit Graue, Ph.D., Assoc. professor

University of Northern Norway
- Svein Ivar Melgren, professor dr.med., Dep of Neurology

Sunnmøre sykehus
- Nils Hjeltnes, consultant dr.med.

Others
- Jacob R. Larsen, M.D. Ph.D., Medical Director

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- Prof Timmothy Lyons, Oklahoma University, Oklahoma, USA
- Prof Alicia Jenkins, University of Melbourne, Australia
- Prof Johnny Ludvigsson, Linköping University, Sweden
- Prof Mikael Knip, Helsinki University, Finland
- Prof Heikki Hyöty, University of Tampere, Finland
- Prof Ian W. Lipkin, Columbia University, NY, USA
- Prof John Todd, University of Cambridge, UK
- Fiemming Poicot, Jim McGuire and Jens Nerup, Steno Diabetes Centre, Copenhagen, Denmark
- Prof John Gerich, Rochester NY, USA
- Prof Michael Stumvoll, Tübingen, Germany
- Prof John Todd, University of Cambridge, UK
- Prof Vincent Monnier, CWRU, Cleveland, Ohio, USA
- Prof Michael Stumvoll, Tübingen, Germany
- Prof Ashimina Mitrakou, Athens, Greece
- Prof Timon van Haelten, Holland
- Prof Ole Schmitz, Aarhus, Denmark
- Prof Allan Flyvbjerg, Aarhus, Denmark
- Prof Steve Chadban, Sydney, Australia
- Prof Olle Korsgren, Uppsala, Sweden
2009 – an exciting year for the Research Centre

We have simplified the annual report as we have a new website: www.oslodiabetes.no. 2009 did turn out to be a fine year for Oslo Diabetes Research Centre. We had two dissertations from the Institute of Medical Genetics:

- Marit Bjernvold “Candidate gene studies in type 1 diabetes and other immune-mediated diseases.”
- Anne Blomhoff: “Genetic predisposition to autoimmune diseases”

These theses are very modern: They compare the genetic signature of the different autoimmune diseases. The different endocrine autoimmune diseases have a lot in common and a comparison can lead to new insights. We now know more than 40 genes that predispose to type 1 diabetes. In general, genetics in diabetes are moving very fast these days and we are discovering new and surprising facts: Rare mutations contribute to common diseases.

The research centre has discovered that gestational diabetes is much more common in Oslo than previous thought. New data from the STORK STUDY and STORK Groruddalen (Henriksen and Jenum) have found that among pregnant women of Norwegian extraction about 10% have gestational diabetes according to the WHO criteria! These are really surprising numbers given that we thought that about 1-2% had gestational diabetes! The reason(s) for this increase is not obvious although body mass is part of the answer. The research groups are investigating this in detail and there are a lot of data to be analyzed. This will have large consequences for the care of pregnant women also in Norway given that small increases in blood glucose in pregnancy have been shown to be deleterious for the baby (HAPO study). This is truly translational research.

Vitamin D research is gearing up and a large randomized study in type 2 diabetes is underway at the research centre. Vitamin D in pregnancy is also covered.

Type 1 diabetes is still increasing also in Norway. In the Lancet the recent incidence 15-year incidence data collected by 20 population-based registries (our registry included) in 17 countries were used to estimate rates of increase in geographical regions in Europe. The prediction is that between 2005 and 2020, new cases of type 1 diabetes in European children younger than 5 years will double and that the prevalence of cases in those who are younger than 15 years will increase by 70%. We still do not know what factors initiate the autoimmune process, but our research centre has several new and important projects in this field (see the individual research groups).

The quality of care for young people with diabetes is still an important question and The Norwegian Childhood Diabetes Registry affiliated with the research centre (see report) has established a superb system to implement quality improvements in the care. The research in late complications especially in diabetic heart, kidney, retinal and neuropathy is going well (see reports). There is a lot of research going on in the different research groups (see reports).

Seminars and symposia

Our interim seminar, Solstå, had nutrition as a main topic. Nutrition is becoming more and more important in todays societies and critical important for type 2 diabetes. Ulf Riserus from Uppsala discussed “Metabolic syndrome and lipids – where are we today? And lipids in the diet and prevention of type 2 diabetes”.

Furthermore, we had a debate between Fedon Lindberg and Anne-Marie Aas on what we need to know in the future about low carb diet. We all agreed that low carb is one but only one option in the treatment of diabetes.

We had two larger symposia i 2009: the one was “challenges in type 1 diabetes” where some of Europe’s foremost researchers about type 1 diabetes in children and adolescence participated. Mikael Knip from Helsinki covered among other topics if virus is a pathogenic factor or an innocent bystander in the etiology of type 1 diabetes. New aspects of continuous blood glucose monitoring were discussed by Thomas Danne from Hannover. We all hope that this new technology will become “mature” in the near future to help our patients. The motivational aspects of diabetes in children were covered by Ragnar Hansa from Uddevalla. The pediatricians have been excellent in writing international guidelines and more importantly, implementing them! This topic was covered by Peter Swift from Sheffield. The symposium celebrated Knut Dahl-Jørgensen’s 60 year’s birthday.

The second symposium covered Diabetic nephropathy, still a major problem in diabetes. Per-Henrik Groop from Helsinki discussed new markers and hypotheses on the pathogenesis of diabetic nephropathy. He is also on track to discover new genes of importance for diabetic nephropathy. Peter Rossing from Steno Diabetes Centre in Copenhagen gave an updated lecture on treatment in diabetic nephropathy and Trond Jenssen from our research centre discussed advanced diabetic kidney disease. Ulla Berg and Nina Perrin from Stockholm discussed morphological changes in the kidney in young persons with type 1 diabetes; a topic studied in depth by Hasse Bangstad previously. This symposium celebrated Hasse’s 60 year’s birthday.

Organization of diabetes research and clinical work in the Oslo area

We are developing our organization by starting a strategic discussion on Oslo Diabetes Research Centre. Furthermore, we have applied the medical faculty to start a research school in diabetes and metabolism.

The diabetes research in Oslo University Hospital is organized through Oslo Diabetes Research Centre which is a thematic organization. This is a robust and flexible organization. However, the clinical work in adult diabetes in Oslo University Hospital (OUH) is going through a difficult transitional phase. The regional health Authority, Helse Sør-Øst, has decided to move a large part of clinical work to other hospitals and organization of adult diabetes care in the future has not been decided yet. This is a challenge and a robust plan for diabetes care localized in one teaching hospital with sufficient space is very much needed and must be a high priority for the top administration of this mammoth called OUH.

Major funding

Regional Health Authority (Helse Sør-Øst), Oslo University Hospital, Medical Faculty University of Oslo (thematic area) Aker and Ullevål Diabetes Research Fund, Norwegian Research Council, EU grants, Juvenile Diabetes Foundation.

Leader Work place Research Area Email

Knut Dahl-Jørgensen (vice-chairman) Pediatric Department, Oslo University Hospital Diabetes in children and adolescents, etiology of type 1 diabetes, complications knut.dahl-jorgensen@medisin.uio.no

Geir Joner Pediatric Department, Oslo University Hospital Epidemiology and etiology of type 1 diabetes, complications, mortality geir.joner@medisin.uio.no

Kåre I. Birkeland Dep. Of Endocrinology, Oslo University Hospital Prevention and treatment of type 2 diabetes k.i.birkeland@medisin.uio.no

Jens Bollerslev/ Tore Henriksen Oslo University Hospital, And Obstetrics Pregnancy and diabetes jens.bollerslev@rikshospitalet.no tore.henriksen@rikshospitalet.no

Trond Jenssen Oslo University Hospital, Department of Nephrology Diabetic nephropathy trond.jenssen@rikshospitalet.no

Kristian F. Hanssen Chairman Professor dr.med.
the relationship between complications and biochemical markers of complications.

B. Glycation in the arterial wall. We are studying glycation modification in the arterial wall in athrosclerosis with and without diabetes by western analysis, immunohistochemistry and LC MS/MS (mass spectrometry). We have already discovered some modifications in the wall that might be involved in the increased propensity to atherosclerosis in diabetes.

C. Advanced glycation of proteins and vascular complications in childhood diabetes (together with Dahl-Jørgensen’s group). Prospective study of early markers of atherosclerosis in a large group of adolescents with type 1 diabetes and controls its relationship to glycation.

D. Coronary and glomerular morphology in kidney transplants. Long study in two contrasting groups. Pr. Trond O. Jensen Study the effect of long-term normoglycaemia vs. hyperglycaemia on changes in the coronary arteries and the renal function and structure in type 1 diabetes patients. Two groups of patients with type 1 diabetes are studied, one group transplanted with a single kidney (HbA1c 8-8.5%), the other who received combined kidney-pancreas grafts and has obtained perfect normoglycaemia over the same period of time (HbA1c 4.5-5.5%).

- To investigate proteoglycans and glycosaminoglycans which are important components of the filter network of the basement membrane
- To explore proteoglycans (syndecan-1) and macrophage transcription factors (Id-1) in blood samples as markers of early kidney changes
- Advanced Glycation Endproducts (AGE, CML, hydroimidazolone) by immunohistochemistry in the glomerulus and in serum samples to test the hypothesis that glycation markers can predict the development and progression of late complication (specifically early diabetic nephropathy and coronary heart disease)

E. A long term randomized, double blind controlled study of Benfotiamin (vitamin B1) in type 1 Diabetes A two year study with neurography as the primary endpoint.

Group members:
- Kari Anne Sveen, Ph.D. student
- Terje Lund, Ph.D.
- Bente K. Kihovd, Consultant dr.med.
- Tore J. Berg, Consultant dr. med.
- Peter Torjesen, Ph.D.
- Martin Heier, Ph.D. student (together with Dahl-Jørgensens group)
- Miliam Pepaj, Ph.D.
- Dag Fosmark, Consultant dr. med.

Research focus:
The group has four main research areas. The first is the ethiology and prevention of type 1 diabetes and autoimmune diseases, especially focusing the role of viruses and the interaction with the immune system in pancreatic tissue samples. We now start a GAD intervention trial with in debt mechanistic studies. The second area is diabetes late complications. We have long term clinical studies on micro vascular complications and the influence of glycemic control and advanced glycation. Recently the risk of early atherosclerosis in type 1 diabetes has been the focus in several of our studies, with measurement of vessel wall thickness (IVUS and IMT) and vessel elasticity, and biochemical markers, as well as clinical data and risk factors. In our large, nationwide clinical studies, now as part of the Childhood Diabetes Registry, we focus on important issues like intensified insulin treatment and pumps, diet, physical activity, quality of life and psychosocial problems.

Projects:
- Ethiology and prevention of type 1 diabetes and autoimmune diseases:
  1. Diabetes Virus Detection Project
  2. Nordic Diabetes Prevention Trial
  3. Disease eliciting T cell epitopes in type 1 diabetes
  4. Genetic studies of the importance of copy-number polymorphism in the development of type 1 diabetes
  5. Viruses, genetics and autoimmunity in thyroiditis. A biopsy study

Diabetes late complications:
- Atherosclerosis in Childhood Diabetes
- Long term vascular changes in type 1 diabetes – Clinical aspects and biological markers – 27 years follow-up of the Oslo Study
- Advanced glycation of proteins and vascular complications in childhood diabetes

Clinical diabetes:
- Norwegian Childhood Diabetes and Quality project (NCDQ) - a nationwide prospective population-based study for research and quality improvement by means of benchmarking
- Dietary intake, meal pattern and physical activity in children and adolescents with type 1 diabetes
- Diabetes in body and mind. The theory of the specific psychological processes in type 1 diabetes
- Children and adolescents with diabetes - present state and future possibilities - A population-based study of factors affecting competences and treatment results in children and adolescents with type 1 diabetes
- Childhood diabetes and celiac disease – a population based study
- Serotonin receptor mutations, psychological state and metabolic control in childhood diabetes
- A systematic, nationwide study of diabetes team resources in paediatric departments

Obesity and type 2 diabetes:
- Pathways to social inequalities in childhood weight development and overweight in Norway. Sub-study of The Mother and Child National Cohort
- Advanced glycation of proteins and vascular complications in childhood diabetes

Group members:
- Hans-Jacob Bangstad, Consultant physician dr.med.
- Project: Diabetic nephropathy in children and adolescents. Microalbuminuria, hypertension and putative risk factors in the Norwegian pediatric patients
Ph.D. students:
- Hanna Dis Margeirsdottir, M.D., pediatrician
- Jon Haug, Psychologist, Project 11
- Lars Krogvold, M.D., pediatrician
- Kari Anne Sveen, M.D., physician
- Dag Helge Freisland, M.D., pediatrician
- Martin Heier, M.D., pediatrician
- Sara Hammerstad, M.D., endocrinologist
- Ingvild Ellingsrud, specialist nurse. Project 7
- Siv Janne Kummernes, R.N., diabetes specialist. Project 8
- Marie D. Tonga, medical student
- Tonstad, Prof. Lene Frost-Andersen
- Gun R. Njølstad (Bergen) and Prof. Dag E. Undlien
- Hanna Dis Margeirsdottir, M.D., pediatrician
- Geir Joner

Project 1
Nina Øverby Ph.D., dietician
Project 1,
Stig Tollefsen, PhD.
Marie D. Tonga, medical student
·
Ingvild Ellingsrud, specialist nurse. Project 7
·
Siv Janne Kummernes, R.N., diabetes specialist. Project 8
·
Marie D. Tonga, medical student
·
Tonstad, Prof. Lene Frost-Andersen
- Gun R. Njølstad (Bergen) and Prof. Dag E. Undlien

Projects: 6, 8, 9, 10, 13
- Hanna Dis Margeirsdottir, M.D., pediatrician
- Geir Joner

Group leader:
Geir Joner

Group name: Geir Joner’s research group

Research focus:
Etiology, epidemiology and prevention of childhood onset diabetes and its complications

1. Projects:
Prospective study of diabetes in children and adolescents in Norway.
Study ongoing since 1989 collecting data on all newly-diagnosed cases of diabetes 0-17 years in Norway. Personal, clinical data and biological samples for studies on the etiology of diabetes, gene-environment interaction, clinical course, complications, mortality and QL. All data included in the nationwide Norwegian Childhood Diabetes Registry. PI: Prof. Geir Joner, Co-PI: Prof. Pål R. Njølstad (Bergen) and Prof. Dag E. Undlien (Oslo). Collaborators: Lars Chr. Stene and Torild Skrivarhaug (Oslo).

Ph.D.-project: Nested case control study on the effect of omega-3 fatty acids, with D and viral markers in pregnant women on the risk of 11d in the offspring. Linking the Norwegian Childhood Diabetes Registry with a biobank with sera from a cohort of 30 000 pregnant women. Ph-student Ingvild Menes Sørensen, PI: Geir Joner, Co-PI: Lars Chr. Stene. Collaborators: Prof. Anne Eskild and Prof. Pål Jenum, Prof. Heikki Höyty (Turku).

Co-PI: Geir Joner. Collaborators in clinical endocrinology, pathology and forensic medicine.

A case-control study of early diet, genes, and development of type 1 diabetes (T1D).

4. Pregnancy outcome in families with type 1 diabetes.
PhD-project. A study on pregnancy complications, malformations, premature and prenatal mortality in families where the mother or father has 11d. Record-linking between the Norwegian Childhood Diabetes Registry and the Medical Birth Registry of Norway. Ph-student Ingvild Eidem (MD). PI: Lars Chr. Stene. Collaborators. Prof. Tore Henrikset, Prof. Kristian F. Hansen and Siri Vangen, MD, PhD.

5. Clinical characteristics/detailed description of phenotype of newly diagnosed children with diabetes;
1000 newly diagnoses cases from the Norwegian Childhood Diabetes Registry – study of classification based on HLA, auto antibodies and clinical data. PI: Geir Joner. Co-PI: Torild Skrivarhaug, MD, PhD. Collaborators: Prof. Dag Undlien, Lars Chr. Stene, Prof. Pål R. Njølstad, Marit Bjørnvo.

PhD-project. Nested case control study on the effect of omega-3 fatty acids, with D and viral markers in pregnant women on the risk of 11d in the offspring. Linking the Norwegian Childhood Diabetes Registry with a biobank with sera from a cohort of 30 000 pregnant women. Ph-student Ingvild Menes Sørensen, PI: Geir Joner, Co-PI: Lars Chr. Stene. Collaborators: Prof. Anne Eskild and Prof. Pål Jenum, Prof. Heikki Höyty (Turku).

7. The MIDIA-study.
The MIDIA-study, a prospective cohort study initiated at the NIPH in 2001. Newborns have been screened for HLA genes conferring risk for type 1 diabetes and enrolled for follow-up if carrying the high-risk genotype. Follow-up with serial blood samples for islet autoantibody testing and identification of biomarkers, as well as with very frequent stool samples for molecular identification of infections. The aim is to identify internal viral infections as risk factors for 11d in children.

Extended case-finding in the Norwegian Childhood Diabetes Registry. PI: Kjersti Skjold Rønningen, NIPH. Collaborators: Lars Chr. Stene, Geir Joner and others.

8. The MO-BA-DIA-study.
The Norwegian Mother and Child Cohort - Sub study on diabetes. The MoBa database is established with data and biological samples from mother and child in pregnancy and by time of delivery (approx. 1000 pregnancies). This unique database will be linked to the Norwegian Childhood Diabetes Registry to study environmental risk factors and gene-environment interactions related to 11d with nested case-control design. PI: Lars Christian Stene, Co-PI: Geir Joner. Collaborators: Prof. Per Magnus, NIPH and others.

Study on children and adolescents included in “The Oslo Adiposity Intervention Study” including markers of metabolic syndrome and insulin resistance and effect of intervention on BMI z-score and biochemical markers. Ph-student. Magnhild P. Kolsgaard, PI. Geir Joner. Collaborators: Prof. Dag Undlien, Lars Ratterstel, MD, PhD, Prof. Serena Tonstad, Prof. Lene Frost-Andersen

Group members:
- Lars Christian Stene, Ph.D., epidemiologist, senior researcher
- Torild Skrivarhaug, M.D., Ph.D., senior physician and Director of The Norwegian Childhood Diabetes Register
- Ingvild Menes Sørensen, M.D., Ph.D.-student
- Ingvild Eidem, M.D., Ph.D. student
- Magnhild Pollestad Kolsgaard, clinical nutritionist, Ph.D.-student

The Norwegian Mother and Child Cohort - Sub study on diabetes. This is the first time The Norwegian Prescription Database at the National Institute of Public Health project are linked with the purpose to give information about incidence of childhood onset type 1 diabetes and completeness of The Norwegian Childhood Diabetes Registry. Newborns have been screened for HLA genes conferring risk for type 1 diabetes and enrolled for follow-up if carrying the high-risk genotype. Follow-up with serial blood samples for islet autoantibody testing and identification of biomarkers, as well as with very frequent stool samples for molecular identification of infections. The aim is to identify internal viral infections as risk factors for 11d in children.

Extended case-finding in the Norwegian Childhood Diabetes Registry. PI: Kjersti Skjold Rønningen, NIPH. Collaborators: Lars Chr. Stene, Geir Joner and others.

The Norwegian Mother and Child Cohort - Sub study on diabetes. The MoBa database is established with data and biological samples from mother and child in pregnancy and by time of delivery (approx. 1000 pregnancies). This unique database will be linked to the Norwegian Childhood Diabetes Registry to study environmental risk factors and gene-environment interactions related to 11d with nested case-control design. PI: Lars Christian Stene, Co-PI: Geir Joner. Collaborators: Prof. Per Magnus, NIPH and others.

The aim of this project is to study the epidemiology of different forms of diabetes and to classify incident cases on the basis of family history, clinical data, C-peptide, auto antibodies and HLA-genes. The aim of this project is to study the epidemiology of different forms of diabetes and to classify incident cases on the basis of family history, clinical data, C-peptide, auto antibodies and HLA-genes.

The aim of this project is to study the epidemiology of different forms of diabetes and to classify incident cases on the basis of family history, clinical data, C-peptide, auto antibodies and HLA-genes.

This is a sub study of The Norwegian Childhood Diabetes Registry assessing competencies and coping: factors affecting functional and dysfunctional behavior in children and adolescents with diabetes.

A systematic nationwide study of diabetes team resources in paediatric departments.

A national, population based study of the double diagnosis of celiac disease and type 1 diabetes.

The aim is to investigate the relationship between type 1 diabetes and celiac disease and to explore the extent of symptoms, treatment and quality of life.
Diabetes in children, a global comparative study.
This study will be carried out in Norway, USA, Australia, Canada and India. The aim of this study is to assess 1) the difference in epidemiology of type 1 and type 2 diabetes, 2) the differences in treatment, treatment guidelines and key clinical outcome data in different paediatric departments in these countries.

Ethnicity and diabetes in the Nordic countries.
This project is collaboration between the Nordic Childhood Diabetes Registries (Sweden, Denmark, Iceland and Norway). The aim is to assess if ethnicity is an independent factor influencing metabolic control in children and adolescents with type 1 diabetes residing in Nordic countries.

Group members:
- Ann Kristin Drivvoll, statistician
- Siv Janne Kummernes, Research nurse
- Knut Dahl-Jørgensen, Professor dr.med.
- Group members: type 1 diabetes residing in Nordic countries.

Research focus:
- Childhood Diabetes Registries (Sweden, Denmark, Ethnicity and diabetes in the Nordic countries.
- Treatment, treatment guidelines and key clinical outcome data in different paediatric departments in Australia, Canada and India.

Research topics:
- The aim of this study will be to carry out a comparative study of type 1 diabetes and type 2 diabetes, 2) the differences in treatment, treatment guidelines and key clinical outcome data in different paediatric departments in these countries.

Group leader: Dag Undlien
Group name: Diabetes genetics group, Department of medical genetics, Oslo University Hospital

Research focus:
- Genetics and epigenetics of type 1 diabetes and other immune-mediated diseases. Genetics of obesity.

Projects:
- Epigenetics of immune mediated diseases
- Genetics and epigenetics of asthma
- Genetics of Addison’s disease.

Group members:
- Beate Skinningsrud, Ph.D. student
- Kristina Gervin, Ph.D. student
- Gregor Griffilain, Ph.D., postdoc
- Monica Cheng Munthe-Kaas, M.D., Ph.D., postdoc
- Hanne Akselsen, Research engineer
- Kristin Brandal
- Hanne Hjorthaug
- Teresia Wangensteen, Ph.D.

Vision:
- To make a significant contribution to the understanding of type 2 diabetes, both to lessen the burden of disease for people with diabetes and to prevent more people from getting type 2 diabetes.

Research focus:
- Epidemiology, etiology, pathogenesis, prevention and treatment of type 2 diabetes.

Research facilities:
- The Diabetes Research Laboratory at the Department of Endocrinology at Oslo University Hospital is a clinical research laboratory with expertise and facilities for eu- and hyperglycemic clamp examinations, oral and intravenous glucose tolerance testing, meal challenges, indirect calorimetry and muscle and fat biopsies. We have close collaboration with the Analytical and Research divisions of the Hormone Laboratory that have a broad range of analytical methods e.g. immunoassay, HPLC, GC-MS, LC-MS and molecular biology.

Projects:
- The main projects at present are:
  1. The STORK-Groddalen study, a study of 800 pregnant multiethnic women investigating the effect of ethnicity and a range of environmental determinants on the prevalence of gestational diabetes (GDM), intrauterine growth and development and birth weight and anthropometric measures in the children.
  2. The DIVINE – a prospective, randomized, controlled trial of high dose D-vitamin supplementation in subjects with type 2 diabetes evaluating the effect on insulin sensitivity and a range of related outcomes.

Other important projects include genetic and functional studies of the Liver-X-receptor and its interaction with other nuclear receptors, a follow-up study of women with previous GDM and a comparative study of younger adults with type 2 diabetes from Norway and Pakistan. We also participate in several multicenter pharmacological intervention studies in subjects with type 2 diabetes.

We have published several studies this year where we have further dissected the MHC-linked genetic predisposition to type 1 diabetes. We have found that at least four additional risk factors exist in the MHC, including HLA-B, near HLA-G, near HLA-DPB1, near AIF1 and in the extended class I region. Hence the genetic contribution to type 1 diabetes from this major genetic determinant, harboring numerous immune genes, is both multifactorial and complex.

Another ongoing project is to explore the genetic risk profile of patients having both type 1 diabetes and celiac disease, as these two diseases both share and have distinct predisposing genetic variants. Some shared susceptibility variants also have opposite or different risk alleles. Hence, it will be interesting to see whether the patients with both diagnoses have a more type 1 diabetes like or celiac disease like genetic risk profile.

Group leader: Benedicte Lie
Group name: Benedicte Lie group

Research focus:
- Our main research focus is to identify and characterize genetic factors which are predisposed to type 1 diabetes and other autoimmune diseases.

Projects:
- We have systematically assessed the gene expression profiles of several novel type 1 diabetes and autoimmune risk genes, identified by genome-wide association studies, in thymic tissue and correlated expression levels with risk genotypes. An association between risk variants and level of gene expression has so far been observed for CLEC16A and IRFs. We are currently expanding these studies to include evaluation of alternative transcripts, allele specific gene expression profiling and inclusion of more genes.

Projects:
The STORK study aims at finding the reasons for the increase in large babies at birth in Norway. To be born too large can have detrimental consequences for both mother and child. In addition to delivery complications, the health of the child may be affected in the long term. In a similar way as children who are born very small, children who are born large, develop more overweight, diabetes and possibly some forms of cancer in adult life compared to those who are born with normal birth weight.

The STORK study has from 2002 to 2005 prospectively followed 553 women through pregnancy and birth. They were investigated with ultrasound three times and twice with glucose tolerance test.

The STORK study showed that lack of physical activity and overweight before pregnancy increased the risk of giving birth to large babies. Lack of physical activity before pregnancy may also be a contributing factor for serious laceration during delivery. Some overweight women had normal weight babies and others had large babies. In the overweight women who delivered large babies, the fasting blood glucose levels increased during...
Diabetic nephropathy

Research focus:

Projects:
1. 10-years follow-up of type 1 diabetes patients transplanted with either single kidney grafts or simultaneous pancreas-kidney grafts
2. Mechanisms of post-transplant diabetes mellitus
3. Long-term follow-up and cardiovascular complications of patients who have developed post-transplant diabetes mellitus
4. Molecular mechanisms of diabetes nephropathy in transplanted kidneys
5. Islet cell transplantation

Group members:
- Anders Hartmann, M.D., Ph.D., Consultant/ Professor of Medicine
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Group leader: Trond Jenssen
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Publications


Birkeland KI, Gulseth HL, Drevon CA on behalf of the LIPGENE-consortium. Relationship between Vitamin D Status and insulin secretion and action assessed by the Frequently Sampled Intravenous Glucose Tolerance Test in Subjects with the Metabolic Syndrome, poster ADA 2009, New Orleans 2009.

Birkeland KI, Gulseth HL, Drevon CA on behalf of the LIPGENE-consortium relationship between Vitamin D Status and insulin secretion and action assessed by the Frequently Sampled Intravenous Glucose Tolerance Test in Subjects with the Metabolic Syndrome, poster EASD 2009, Vienna.


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Thesis:


Book chapters:


Populærvitenskap og annen formidling:

Birkeland KJ. Forskningsområdet, Diabetes (Tidsskrift for Norges Diabetesforsund, oppslag ca 35 000). Fast spalte i hvert av 7 nummer som omhandler aktuell fra diabetesforskning.

Birkeland KJ. TV 2 God morgen Norge, 12. november, intervju i forbindelse med Verdens diabetesdag.

Birkeland KJ. Kapitler i publikasjon: Nasjonale retningslinjer for diabetes.


Hanssen KF. Kapitler i publikasjon: Nasjonale retningslinjer for diabetes.


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Birkeland KJ. Forskningsområdet, Diabetes (Tidsskrift for Norges Diabetesforsund, oppslag ca 35 000). Fast spalte i hvert av 7 nummer som omhandler aktuell fra diabetesforskning.

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ANNUAL REPORT 2009