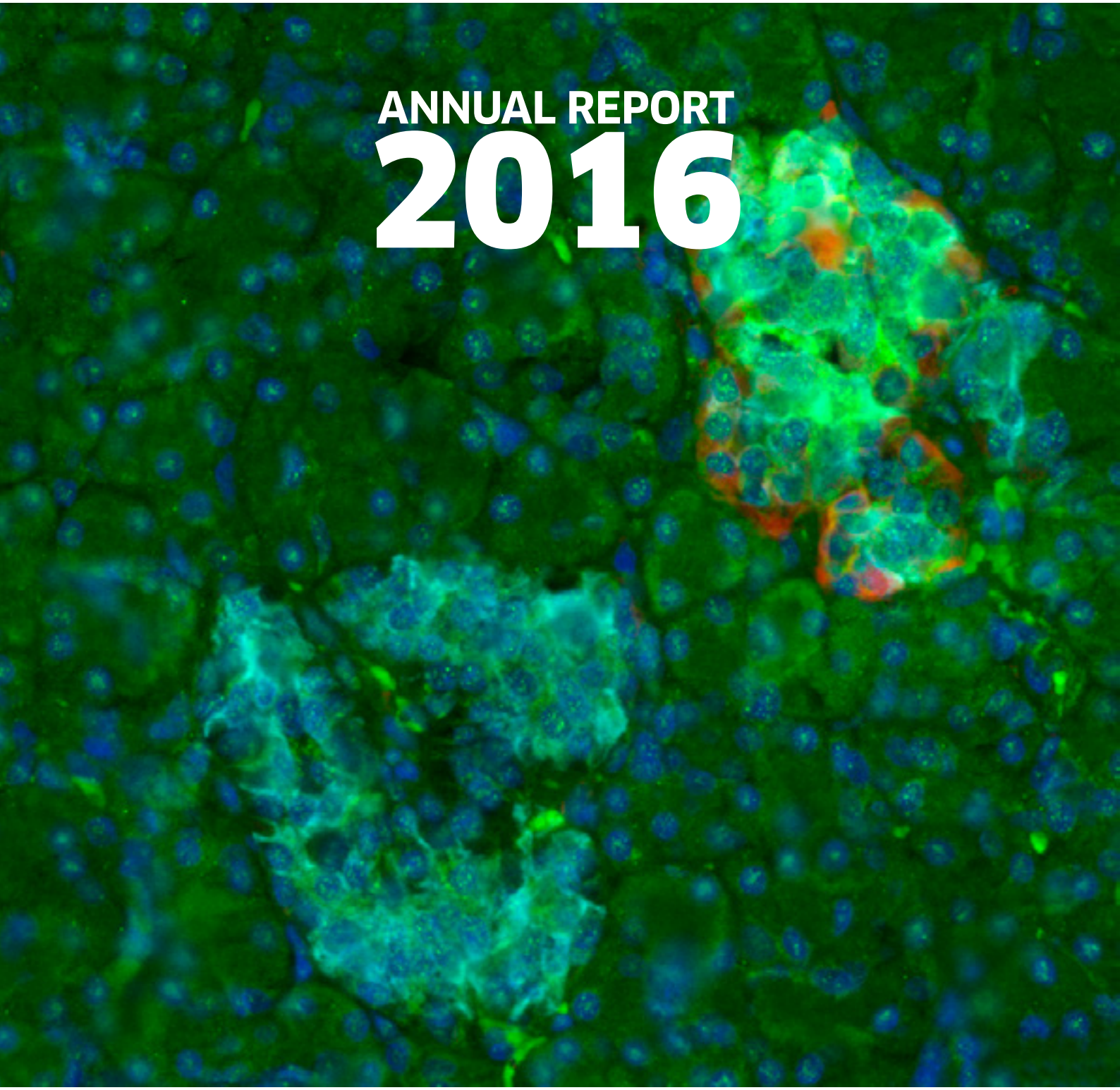
Oslo Diabetes Research Centre



ANNUAL REPORT 2016

Oslo University Hospital

UiO : University of Oslo

ANNUAL REPORT 2016
Oslo Diabetes Research Centre

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Frontpage: Cover pictures show two islets of Langerhans. Insulin: light blue. MHC class I: red. STAT 1: green. Courtesy from Prof. Noel Morgan, University of Exeter, UK.

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BENEDICTE LIE
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TORE HENRIKSEN
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FOTO: APELAND/KATRINE LUNKE

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KRISTIAN F. HANSSEN, Senior professor, MD, PhD

A TRUE TRANSLATIONAL RESEARCH CENTRE

Last year we celebrated the 25th Anniversary of our Research Centre. This year we continue to improve.

Our centre has a strong clinical basis and is the only diabetes centre in Norway covering the whole life-span of diabetes, from the foetus, through childhood and adolescence, to early and late adult life. This life-course approach to diabetes attempts to capture the complex influence of factors operating at different points in life, integrating both early-life and adult lifestyle models into a wider framework through an extensive collaboration between our ten established research group and their internal and external collaborators. With this perspective to diabetes we aim to assess how the effect of factors operating at different stages of life, from in utero to late adulthood, might accumulate and interact to determine development of diabetes and its complications later in life. Our high aim is to contribute substantially to prevent diabetes and its complications.

Our centre has 10 research groups spread throughout several divisions of the Oslo University Hospital and all three institutes of the Faculty of Medicine. Nearly hundred persons are involved, and this annual report covers most of the diabetes-related research in the Oslo area.

The 2016 publication list from our centre shows a striking and steady increase in the number and quality of publications from clinical and basic science. We continue to develop into more translational research and mechanistic studies, trying to understand the causes and pathogenesis of diabetes and its complications. This applies to both type 1 and type 2 diabetes and other rare forms of diabetes. We also bring this basic science research back to the clinic, conducting our own investigator-initiated randomized clinical trials and participating in large multi-centre trials.

Another striking trend in this annual report is the increased international collaboration. All research groups have extended their partnerships with excellent research groups in Europe and the USA. We are partners in several EU projects, e.g. in the IMI2 - EU consortium called INNODIA granted 36 million euro for type 1 diabetes research the seven years to come. This will ground the collaboration with several of the best research laboratories in Europe.

Several of our researchers play prominent roles in national and international organizations promoting education, research and improved care for patients with diabetes. They are also frequently exposed in media commenting on new diabetes research, author popular-science manuscript and educational material towards the public and play central roles in collaborating with the health care authorities and the Norwegian Diabetes Association to the benefit of people with diabetes.

Our researchers are heavily involved in national and international teaching and training in diabetes and diabetes research. We were invited to organise the ISPAD International Science School for Physicians, which was convened by our Post.doc Lars Krogvold. Eighteen young physicians and researchers from 13 countries in five continents gathered with a faculty of more than 15 experienced researchers. The week was filled with lecturers, case- and research presentations and discussions on virtually all aspects of diabetes in youth.

Our annual Oslo Diabetes Research Centre Seminar was held April 7-8 in Son, and more than 40 of our researchers had two very inter-active days with a lot of internal presentations and some invited lectures. The seminar was a great success and these yearly events bring important stimuli for further research and collaboration between the groups.

We continue attracting research funding in Norway. This year we were granted in total NOK 13 mill by the South-Eastern Norway Regional Health Author-

From our annual Oslo Diabetes Research Centre Seminar in Son, April 7-8, 2016. (Photo: Kjersti R. Normann)

ity for the coming years. We were also funded by the Extra Foundation and got an unrestricted grant from NovoNordisk. And the yearly funding from the Aker and Ullevål Diabetes Research Foundation contributes coverering the administration costs.

Thus 2016 was again a successful year for the Oslo Diabetes Research Centre. The centre is steadily improving its' international reputation. We produced about 90 international publications. In this year's annual report you may notice many publications in the highest ranked diabetes related scientific journals. In 2016 we had four Ph.D. dissertations.

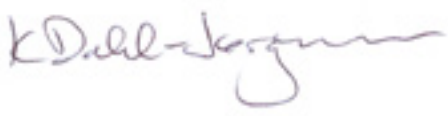
Ivar A. Eide: *Marine n-3 polyunsaturated fatty acids in renal transplantation.*

Thea Anine Strøm Halden: *Post-transplantation diabetes mellitus in renal transplant recipients; diagnosis, pathophysiology and treatment.*

Lars Krogvold: *The pathogenesis of type 1 diabetes – lessons from pancreatic biopsies in the Diabetes Virus Detection Study (DiViD).*

Afaf Sahraoui: *Targeting islet inflammation; the key to preventing β-cell loss in islet transplantation.*

We thank and acknowledge them, and are looking forward to include many of them for further research within our centre.



Knut Dahl-Jørgensen (signature)
CHAIRMAN PROFESSOR DR. MED.

LEADER	WORK PLACE	RESEARCH AREA	E-MAIL
Knut Dahl-Jørgensen (Chairman)	**Pediatric Department, Oslo University Hospital**	**Diabetes in children and adolescents, etiology of type 1 diabetes, complications**	knut.dahl-jorgensen@medisin.uio.no
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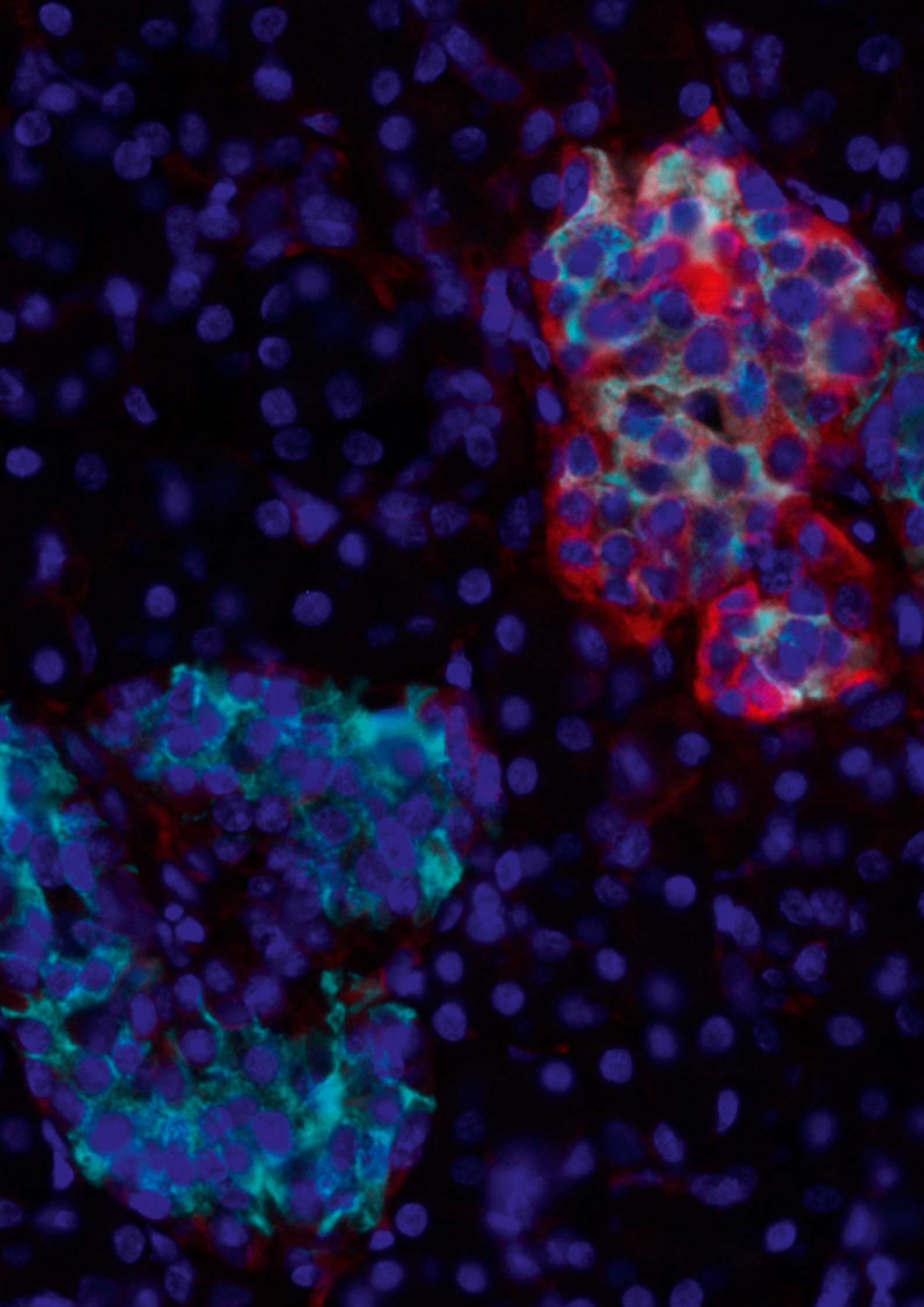

Research Group: CHILDHOOD DIABETES
Group Leader: Professor Knut Dahl-Jørgensen

Research focus:

The group has four main research areas. The first is the etiology and prevention of type 1 diabetes and autoimmune diseases, especially focusing the role of viruses and the interaction with the immune system in pancreatic and thyroid tissue samples. The last years we have succeeded in detecting a low grade persistent enterovirus infection in the insulin producing pancreatic islets of patients with newly diagnosed type 1 diabetes, and also in the thyroid of patients with newly diagnosed Graves' Disease. This strongly indicates that viruses are important for the development of autoimmune diseases.

The DiViD study has got worldwide attention for its unique collection of pancreatic biopsies in live young adult patients at the onset of type 1 diabetes. We have signed material transfer and research collaboration contracts with 15 international, highly recognized laboratories, and we recently arranged group meetings in Miami in conjunction with the nPOD meeting (www.jdrf.org) to discuss the results and the next steps. Much focus has been on the role of enteroviruses, the insulitis and the role of the innate immune system. The last year we have identified several viral "footprints" in the pancreatic islets. We also detected that 43% of the T-cells in the inflamed islets (insulitis) were "resident T-cells", indicating a previous viral infection. So the evidences for a role of viruses in triggering and driving the process killing the beta-cells are steadily increasing. We were granted NOK 9 mill from the Health Region South East to start a Scandinavian multicentre, randomized trial (The DiViD Intervention Trial) to study the effect of antiviral treatment aiming to preserve endogenous insulin production at diagnosis, as measured by C-peptide. In addition to standard mixed meal tolerance tests, we will perform filterpaper blood tests for C-peptide monitoring at home.

The second research area of our group is diabetes late complications. We have long term clinical studies on microvascular complications and the influence of glycemic control and advanced glycation. Recently the risk of early atherosclerosis in childhood onset type 1 diabetes has been the focus in several of our studies, with measurement of vessel wall thickness (IVUS, IMT, MRI) and vessel elasticity, and biochemical markers, as well as clinical data and risk factors. Martin Heier is now a postdoc in San Francisco as part of the EU Scientia Fellow Program, studying HDL Cholesterol function. The 10 years follow up of the prospective study "Atherosclerosis in Childhood Diabetes" will start in 2017. This will also include eye examinations and assessment of retinal vessel calibre. The project aim to develop a new risk score for CVD in childhood onset type 1 diabetes.

In our large, nationwide clinical studies, now as part of the Childhood Diabetes Registry, we focus on important issues as intensified insulin treatment and pumps, diabetic nephropathy, diet, physical activity, quality of life and psychosocial problems and eating disturbances (together with Skrivarhaug's Group).

Projects:

Etiology and prevention of type 1 diabetes and autoimmune diseases:

1. Diabetes Virus Detection Project (DiViD).
2. Diabetes Virus Detection and Intervention trial (DiViDInt).
3. Genetic studies of the importance of copy-number polymorphism in the development of type 1 diabetes.
4. Viruses, genetics and autoimmunity in thyroiditis. A biopsy study.
5. Virus in autoimmune diseases.

Diabetes late complications:

6. Atherosclerosis in Childhood Diabetes – a population-based, prospective study.
7. Long term vascular changes in type 1 diabetes – Clinical aspects and biological markers – 30 years follow-up of the Oslo Study.

KNUT DAHL-JØRGENSEN

8. Advanced glycation of proteins and vascular complications in childhood diabetes.
9. Diabetic nephropathy: Hypertension and microalbuminuria in Norwegian children with type 1 diabetes.

Clinical diabetes:

10. Collaboration with the Norwegian Childhood Diabetes Registry (see page 30). A nationwide prospective population-based study for research and quality improvement by means of benchmarking.
11. Dietary intake, meal pattern and physical activity in children and adolescents with type 1 diabetes.
12. Diabetes in body and mind. The theory of the specific psychological processes in type 1 diabetes.
13. 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.
14. Eating disturbances in childhood diabetes.
15. Childhood diabetes and celiac disease – a population based study.

Obesity and type 2 diabetes:

16. Pathways contributing to childhood weight development and overweight in Norway. Sub-study of the Mother and Child National Cohort.

Achievements 2016

Detection of a low grade persistent enterovirus infection in the insulin producing islets of Langerhans at diagnosis of type 1 diabetes. In depth description of the insulitis at diagnosis by detection of "resident T-cells" as a prominent feature of the insulitis. Detection of several viral "footprints" in the islets of Langerhans at diagnosis.

Ambitions 2017

Start a randomized controlled multicenter trial of antiviral treatment in newly diagnosed type 1 diabetes patients aiming to maintain and restore endogenous insulin production.

GROUP MEMBERS

KNUT DAHL-JØRGENSEN
Professor, MD, PhD

HANS JACOB BANGSTAD
Professor, MD, PhD

JON HAUG, DR. PHILOS
Clinical psychologist

KARI ANNE SVEEN
MD, PhD (together with Tore Julsrud Berg and Kristian Hanssen's Group)

HANNA DIS MARGEIRSDOTTIR
MD, Pediatrician, PhD, postdoc

JAKOB LARSEN
MD, Pediatrician, PhD, postdoc

MARTIN HEIER
MD, Pediatrician, PhD, postdoc

LINE WISTING
Master Degree Psychology, PhD, postdoc

DAG HELGE FRØISLAND
MD, Pediatrician, PhD, postdoc

SARA HAMMERSTAD
MD, PhD, Endocrinologist

UNNI METTE KØPP
MD, Pediatrician, PhD, postdoc

LARS KROGVOLD
MD, Pediatrician, PhD, postdoc

HILDEGUNN STYVE BORKAMO
MD, Pediatrician, PhD student (together with Skrivarhaug Group)

Research Group: TYPE 2 DIABETES AND METABOLISM
Group Leader: Kåre I. Birkeland

Research focus

Our focus is on clinical epidemiological studies, observational studies and randomized clinical trials in subjects with obesity, prediabetes, gestational diabetes, metabolic syndrome and type 2 diabetes. We design and conduct our own studies, but also participate in international multi-center studies, both researcher initiated and studies sponsored by pharmaceutical companies, (phase II-IV studies). Several of our researchers are also engaged in mechanistic studies and translational research in collaboration with different laboratories.

Our long-term aim is to contribute to prevention and better treatment of diseases related to overweight and physical inactivity, primarily type 2 diabetes and its complications. To achieve this, we search for etiological factors in disease development through hypothesis-generating epidemiological and observational studies and seek to test the hypotheses in mechanistic and randomized, controlled clinical trials. We aim to present our results in internationally well recognized scientific journals and at relevant national and international meetings. We also engage ourselves in communication to lay audience to increase knowledge about ours and others research findings. We collaborate closely and partly overlap with Anne Karen Jenum's group on the STORK-Groruddalen studies and with Tore Henriksen's/Jens Bollerslev's group on the STORK-Rikshospitalet studies.

Our special focus for the coming years is large register-based epidemiological studies in type 2 diabetes, gestational glucose metabolism and pregnancy outcomes, and diabetes in immigrants.

KÅRE I. BIRKELAND

Projects

1. The DAPHNE-, DISCOVER- and DIAFLU studies are large epidemiological register studies of type 2 diabetes in Norway. We are also involved in a substudy of HUNT 2 and 3 focusing on anthropometric indices and subsequent risk of cardiovascular events.
2. A genetic/epigenetic sub-project under the STORK and STORK-Groruddalen studies.
3. The 4B study: The effect of bariatric surgery on bone marrow fat and glucose metabolism in morbid obese subjects with and without type 2 diabetes.
4. Subprojects under the MyoGlu-study – A controlled, intervention study of high-intensive exercise training in subjects with abnormal glucose tolerance and controls.
5. The HypoAlert-study – An experimental study of subjects with type 1 diabetes and hypoglyce-

GROUP MEMBERS

KÅRE I. BIRKELAND
Professor, MD, PhD

HANNE LØVDAL GULSETH
MD, PhD

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Associate Professor, PhD

CECILIE WIUM
MD, PhD, consultant

CHRISTINE SOMMER
PhD

CHRISTIN W. WAAGE
PhD student

INGVILD HØGESTØL
MD, PhD student

ANNE-PERNILLE OFSTAD
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KIRSTI BJERKAN
MSc

GØRIL VINJE
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GRO BOZELIJN
research nurse

ANNE KAREN JENUM
Professor, MD, PhD

LINE SLETNER
MD, PhD, postdoc

GUNN-HELEN MOEN
MSc, PhD student

ELISABETH QVIGSTAD
MD, PhD, consultant

mia unawareness to test new hypoglycemia alert devices using hypo- and euglycaemic glucose clamp techniques.

6. The FIBERDIA – a randomized controlled trial of the effects of probiotica on incretin responses in type 2 diabetes.
7. 10 year follow up of subjects after bariatric surgery with focus on the prevalence of diabetes and metabolic risk factors.
8. Several multi-center phase II, III and IV clinical trials in collaboration with the pharmaceutical industry.

Ambitions 2017-18

- To publish at least 10 papers each year from the group, also aiming for some in the highest ranked journals.
- To better communicate and present our research to the non-scientific community.
- To recruit and obtain financial support for at least 1 new PhD or Post.doc each year and for one large research project.

Research Group: DIABETIC LATE COMPLICATIONS
Group Leaders: Tore Julsrud Berg and Kristian F. Hanssen

Research focus

Epidemiology and mechanisms of late complications. The mechanism by which hyperglycaemia is so deleterious to large and small blood vessels is basically unknown. A leading hypothesis is that glycation (the chemical reaction between glucose or intracellular metabolites of glucose and proteins) and subsequent rearrangements (Advanced Glycation Endproducts AGE's) is a main culprit. We have developed unique assays for different AGE's (CML, hydroimidazolone and Glucosepane) in blood and previously shown that serum AGE is associated with, and predicts coronary heart disease in type 2 diabetes. Furthermore, that serum AGE is associated with microvascular complications.

Projects

1. Advanced glycation end products 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. Study of the relationship to glycation.

2. Coronary and glomerular morphology in kidney transplants. Long term study in two contrasting groups. PI: Trond G. Jenssen together with Svein Kolset, Institute of Nutrition.
   Study the effect of long-term normoglycaemia vs. hyperglycemia 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 which received combined kidney-pancreas grafts and has obtained perfect normoglyacemia over the same period of time (HbA1c 4.5-5.5%). 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.

3. The DIALONG study: A study of long-term survivors with more than 45 years of type 1 diabetes. A large clinical and biochemical study focusing on macrovascular disease and skin and joint complications. Collaborators within the Oslo University Hospital and the US. Three students are now doing their PhD/Dr Phil work in this study and one PhD student is using the study as a part in her PhD. Preliminary results are high prevalence of adhesive capsulitis and shoulder arthrosis.

4. Prospective study of pre-eclampsia in pregnant type 1 diabetes. In collaboration with research groups in Australia and US.

Achievements 2016

- Completion of data collection in the DIALONG study.
- Two years postdoc Scientia Fellow research grant for Kari Anne Sveen.
- Partial funding for one Dr Phil student from the Sophies Minde ortophaedic research fund.

Ambitions 2017

- Final funding for one PhD student in the DIALONG study coronary heart disease.
- Funding for one PhD student in the DIALONG study quality of life.

GROUP MEMBERS

TORE JULSRUD BERG
Associate Professor, MD, PhD

KRISTIAN F. HANSSEN
Senior Professor of Medicine (Endocrinology), MD, PhD

KARI ANNE SVEEN
MD, PhD

BENTE K. KILHOVD
Consultant, PhD

DAG FOSMARK
Consultant, MD, PhD (Department of Ophtalmology)

MARTIN HEIER
MD, PhD (together with Dahl-Jørgensens group)

HANNA DIS MARGEIRSDOTTIR
MD, PhD (together with Dahl-Jørgensens group)

MILIAM PEPAJ
PhD

KRISTINE B. HOLTE
MD, PhD student

NIELS GUNNAR JUEL
MD, research fellow

ANNE KARIN MOLVÆR
RN, research nurse

TORE J. BERG

KRISTIAN F. HANSSEN

Research Group:
CHILDHOOD DIABETES AND DIABETES EPIDEMIOLOGY

Group Leader:
Geir Joner

Research focus
Diabetes epidemiology, causes of type 1 diabetes and prevention, diabetes complications and mortality. Special emphasis on risk factors for type 1 diabetes using epidemiological approaches, including studies of infectious, dietary and other environmental factors, and potential gene-environment interactions. Research to prevent complications and premature death by studying of risk factors is also central in the group's work. The long-time goal is to reduce the incidence of type 1 diabetes in children and reduce the impact of complications of diabetes in children that already have the disease. The most important source for research is the Norwegian Childhood Diabetes Registry with biobank with > 90% of new cases of diabetes below 15 years included, the MOBA-study with biobank and other registers.

Projects
1. The PAGE study (Prediction of Autoimmune diabetes and celiac disease in childhood by Genes and perinatal Environment): Studies of risk factors for type 1 diabetes and for celiac disease in The Norwegian Mother and Child Cohort (MOBA) linked to the Norwegian childhood diabetes registry (PI: Lars Chr. Stene).
2. Biomarkers for intrauterine environment and risk of childhood diabetes. Sera from 30 000 pregnant women linked to diabetes registry to identify women whose children later developed type 1 diabetes selected for biomarker studies, dietary and infectious (PhD Ingvild S Sørensen).
3. Mortality in a nationwide, population-based cohort of childhood-onset type 1 diabetes in Norway. PhD-project by Vibeke Gagnum, MD.

4a. Cardiovascular and end-stage renal disease in type 1 diabetes with onset before 15 years of age and long duration.

4b. Nephropathy and hypertension in type 1 diabetes with onset before 15 years of age and long duration.

Achievements 2016
The project "Cardiovascular disease and end-stage renal disease in type 1 diabetes with onset before 15 years of age and long duration" has been funded for a PhD student from the Extra foundation.

We obtained funding from the South-Eastern Norway Regional Health Authority for postdoc Nicolai Lund-Blix "Early nutrition and risk of islet autoimmunity and type 1 diabetes."

The PAGE-study is in steady progress, several analyses have been completed and publications are in progress.

The PhD students Vibeke Gagnum and Nicolai Lund-Blix have submitted their theses.

Ambitions 2016-2017
To be a leading group in epidemiological studies on genetic and environmental risk factors in the etiology of type 1 diabetes in children and adolescents.
To publish exciting scientific results from the PAGE study.
To start the study: Cardiovascular disease and end-stage renal disease in type 1 diabetes with onset before 15 years of age and long duration. Long-term follow up of incident cases of type 1 diabetes 1973-2016 in The Norwegian Childhood Diabetes Registry.

FOTO: ØYSTEIN H. HORGMO, UIO

GROUP MEMBERS

GEIR JONER
Professor, MD, PhD

LARS CHRISTIAN STENE
PhD, senior researcher

TORILD SKRIVARHAUG
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GERMAN TAPIA
PhD, researcher/postdoc

VIBEKE GAGNUM
MD, PhD student

INGVILD MENES SØRENSEN
MD, PhD, paediatric endocrinology

NICOLAI LUND-BLIX
cand. scient, PhD student

GEIR JONER

Research Group:
DIABETES AND RELATED HEALTH ISSUES IN PRIMARY CARE

Group Leader:
Anne Karen Jenum

ANNE KAREN JENUM

Research focus

We apply a life course approach in our research into the causation, care and prevention of type 2 diabetes and cardiovascular complications, especially when studying social and ethnic differences in health. The group members have a diverse professional background, facilitating synergies and convergence in research. Our group has two main areas of research, both originating from observations in primary care of the epidemic of diabetes, its different faces and the need to develop culturally sensitive interventions due to the demographic transition in Norway to a multiethnic country:

1) *The Diabetes Care group* – working with the epidemic of type 2 diabetes, its complication and the quality of diabetes care in a multiethnic society and strategies for prevention.
2) *The Mother and Child Health group* – working with the developmental origin of health and disease, not least type 2 diabetes and gestational diabetes, in a Norwegian mother, father and child multiethnic cohort.

We have performed cross-sectional and cohort studies, qualitative studies, a RCT using new technology, and are involved in developing culturally sensitive interventions in primary care. Through 2016 we have included new members, increased the number of subprojects and further strengthened our international collaboration.

Projects

1. *The STORK-Groruddalen cohort study* of 823 pregnant women from multiethnic women, investigates the role of ethnicity and a range of environmental determinants on the prevalence and development of gestational diabetes (GDM), intrauterine growth and development and neonatal birth weight and anthropometric measures, *http://www.med.uio.no/helsam/forskning/prosjekter/stork-groruddalen/*. Data was collected from 2008 to 2011. We have so far developed 11 PhD projects, covering gestational diabetes and related maternal health issues, as well as neonatal body composition and fetal and childhood growth. Six PhD students using data from this cohort have finished their dissertations, two in January 2017 (Kåre Rønn-Richardsen, Christin Wiegels Waage). Line Sletner and Christine Sommer have received post-doc grants. Five PhD projects for general practitioners by the Norwegian Medical Association are still ongoing (Åse Ruth Eggemoen, Nilam Shakeel, Ingun Toftemo, Marthe-Lise Næss-Andresen, Birgitta Skavoll). We have now started the detailed planning of a follow-up study after 9 years of mothers and children.
2. *Cardiovascular disease, diabetes and ethnicity, and the quality of diabetes care* in a multiethnic general practice population. After Anh Thi Tran's thesis on this subject in 2014, we have, together with a multiregional Norwegian research group, set up a large study in primary care and in collaborating hospitals (ROSA 4). Data collection started in January 2015, was finished in March 2016 and covers about 11 500 patients in five counties: Oslo, Akershus, Rogaland, Hordaland and Nordland. Tran has now a postdoc grant to work with ethnicity and gender, and one new PhD student (Kjersti Nøkleby) has started working with issues related to the collaboration between primary care and hospitals for patients in need for shared care.
3. *The Norwegian study in Renewing Health:* Stimulating self-management in patients with type 2 diabetes mellitus through tele-care with the Few Touch application and health counseling - a randomized controlled trial, is an EU-funded project, with the Norwegian study developed by Faculty of Health Sciences, Oslo and Akershus University College of Applied Sciences, The Oslo and Akershus University College. Two PhD students (Astrid Torbjørnsen and Heidi Holmen) plan to submit their theses in 2017.

ANNE KAREN JENUM
Professor, MD, PhD, MPH

LINE SLETNER
MD, PhD, postdoc

PER LAGERLØV
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ANH THI TRAN
MD, PhD, postdoc

BJØRN GJELSVIK
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CHRISTINE SOMMER
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KÅRE RØNN-RICHARDSEN
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CHRISTIN WIEGELS WAAGE
PhD

NILAM SHAKEEL
PhD student

ÅSE RUTH EGGEMOEN
PhD student

INGUN TOFTEMO
PhD student

MARTHE-LISE NÆSS-ANDRESEN
PhD student

ASTRID TORBJØRNSEN
PhD student

BIRGITTA SKAVOLL
PhD student

WALAA METWALLY ALI ABDALAAH ABUELMAGD
PhD student

ELIAS NOSRATI
(Cambridge)

KJERSTI NØKLEBY
PhD student

ANAM SHAKIL
(Master 2014)

4. *The need for drug information about diabetes among Pakistani females in Norway.* A qualitative study about the need for drug information about diabetes among Pakistani and other non-western women in Norway, originating from School of Pharmacy, Faculty of Mathematics and Natural Sciences (PhD student Walaa Metwally Ali Abdalaah Abuelmagd).
5. *Follow-up after 16 years of the Romsås in Motion study.* Together with partners at Sogn og Fjordane University College, Faculty of Teacher Education and Sports, we have applied for linkages with several Norwegian Health Registers to study the incidence of cardiovascular disease and diabetes.
6. *Innovative Prevention Strategies for type 2 Diabetes in South Asians Living in Europe* (InPreSD-SA) - a coordinated effort to target the excessive risk for T2D in South Asian populations in Europe. This multinational collaboration was initiated by Prof K Stronks, The Netherlands, AMC, Amsterdam, with partners in Edinburgh, Glasgow, India and Norway (Jenum and B Kumar). The aim of this project is to build on the findings of recent trials in order to accelerate knowledge production and the process of implementation of research findings by bringing together European experts. The focus will be on dietary behavior and physical activity. We plan to conduct in-depth analyses of the findings from relevant interventions studies with particular focus on the behavioural strategies employed (WP 4 – to be delivered by Norwegian partners). Furthermore, we will critically evaluate dietary goals employed in current behavioural interventions. The findings will specify HOW to support South Asian people in the uptake and maintenance of a healthy diet and WHAT to focus on. This is an EU-funded three year project on the Topic - Innovation to prevent and manage chronic diseases.

Achievements 2016

Our group was extended by three more members (Esben Selmer Buhl, Elias Nosrati and Kjersti Nøkleby). We have published 10 papers, mostly related to subproject 1, and seven papers are in press or submitted. Line Sletner is now on a one year visit to our collaborators in Southampton, UK, and has received funding for four more years as a researcher. We have achieved funding for one new PhD student (Kjersti Nøkleby). Two PhD students submitted their theses. AK Jenum has worked much with the EU project EuroDHYAN (The InPreSD-SA study), mostly together with Idunn Brekke and the other partners, with several papers in progress.

Ambitions 2017-2018

Beside the planned progress of the PhD and postdoc projects based on the STORK Groruddalen study, we will put much effort into the detailed planning of a follow-up study of mother and children for a start early in 2018, if funded. First, we will perform a qualitative study to better understand what motivates women and their children to participate, and a feasibility study to test recruitment strategies and logistics. We are currently working on several papers based on the ROSA 4 study, and Jenum will be strongly involved together with partners in the EU-project. She will also contribute as a member of the publication committee of the International Prediction of Pre-eclampsia IPD Collaborative Network (IPPIC). Through collaborations with our partners in India, UK, The Netherlands, Sweden, Denmark and Finland, our international network will be further strengthened in 2017-2018, facilitating more high quality research related to diabetes and ethnicity, applying a life course perspective.

Research Group: DIABETES AND PREGNANCY
Group leaders: Tore Henriksen and Jens Bollerslev

Research focus

The nutritional and environmental conditions under which an individual develops from the one cell stage at conception to birth is now known to have major impact on the future health of the newborn child. Inadequate nutrition in this very early (fetal) period of life increases the risk of cardiovascular diseases, diabetes, overweight and certain cancers.

The research group "The maternal-fetal unit: Metabolic, nutritional, neuroendocrine and vascular interactions" investigates how fetal developmental conditions are formed by studying how maternal nutritional, metabolic and pathogenic factors interact with the placenta. Our research group has recently established a new sampling method that enables us to perform such investigations in a novel way.

The association between the developmental condition of the fetus and future health of the newborn is conceptualized in the term DOHaD (Developmental Origins of Health and Disease or "The Barker hypothesis"). As pointed out in recent international surveys the most effective way of preventing major cardiovascular diseases, diabetes and some forms of cancer is to optimize the developmental environment of the fetus and of early childhood. A variety of factors may influence the condition under which a fetus develops, including maternal obesity and other malnutritional states, infections, preeclampsia with placental dysfunction and exposure to toxic compounds. Worldwide maternal obesity has now become a main risk factor for pregnancy complications and fetal development. In Norway around 20% of young women (mothers to be) are now obese (BMI >30 kg/m2), and obesity has surpassed smoking as a risk factor in pregnancy.

The reason that obesity has adverse effects on pregnancy is primarily not high BMI per ce, but the profound changes in metabolism, endocrinology and inflammation that accompany adiposity. The result is obesity-induced metabolic dysfunction that has large impact on the environment in which the fetus develops. Many of the factors that may cause adverse fetal environments are preventable. However, in order to establish effective preventive measures it is fundamental to understand how a fetus may become exposed to inadequate nutrition and other adverse developmental conditions.

Projects

1. STORK-Rikshospitalet

The STORK cohort focuses on nutritional, metabolic, neuroendocrine and vascular aspects of the maternal-fetal interaction during development and growth of the fetus.

Two new projects have recently been started based on the STORK cohort.

1. Healthy and unhealthy overweight in pregnancy: A longitudinal study of metabolic status and body mass index (BMI) in relation to pregnancy complications.
   The STORK cohort enables us to analyze subgroups of obese pregnant women with respect to the relation between metabolic profiles and pregnancy outcome. This project is highly relevant in terms of selecting obese women for special pregnancy follow up.

2. Does hypercholesterolemia in pregnancy influence short- and longterm risk for cardiovascular disease in offspring by modulating markers of disease?

The atherosclerotic process is driven by increased cholesterol levels in combination with an enhanced inflammatory response. Hypercholesterolemia is primarily lifestyle induced or it may be caused by a genetic disposition such as familial hypercholesterolemia (FH). Women with FH have been shown to experience very high levels of plasma lipids, in particular LDL cholesterol and they develop a prothrombotic and proinflammatory phenotype during pregnancy compared to non-hypercholesterolemic women. The significance of elevated cholesterol levels and prothrombotic "in utero" environment in relation to markers of risk in offspring has not been thoroughly investigated. The Barker hypothesis suggests that the risk of cardiovascular disease in adult life may be determined by an adverse environment before birth. This project aims to generate new knowledge about


TORE HENRIKSEN


JENS BOLLERSLEV

the effect of hypercholesterolemia during pregnancy and to elucidate if this is associated with increased levels of markers of risk in their offspring.

2. The STORK placenta-study

Transfer of nutrients from mother to fetus

The nutritional and environmental conditions under which an individual develops from conception to birth is now known to have major impact on the future health of the newborn child. In particular, inadequate nutrition in this very early (fetal) period of life may increase the risk of cardiovascular diseases, diabetes, overweight and certain cancers. Other environmental factors, including toxic compounds, may have long term consequences for the developing individual also in absence of structural malformation. Therefore, developmental origins of diseases have become a major conceptual framework and early life intervention is emerging as a primary objective in prevention of diseases. In fetal life placenta, which is situated between the mother and the fetus, is the organ that governs the environmental conditions of the developing fetus. Virtually all substances have to pass this "check-point" before reaching the fetus. The fundamental role of placenta in fetal development is therefore now increasingly acknowledged. Accordingly, our research group has recently developed a new method to study how maternal nutritional, metabolic and pathogenic factors interact with the placenta (The 4 vessel sampling method). The method is novel in a global perspective, and enables us to study the placenta in vivo by analyzing blood and tissue samples from arterial and venous vessels both on the maternal and fetal side. We have currently obtained blood samples from 170 mother-fetus pairs which is almost twice what we considered realistic at the start of the project.

Preeclampsia

Factors originating in placenta are a sine qua non in development of pregnancy induced hypertension (preeclampsia). "The 4 vessel sampling method" offers also a unique opportunity to study that placenta derived factors that induce hypertension during pregnancy. Many of these factors act on the maternal vascular endothelial cells and we have found that in women with preeclampsia, there is increased release of the antiangiogenic factor sFlt from placenta, whereas the proangiogenic factor PlGF shows decreased release.

3. The Norwegian Fit for Delivery (NFFD)

Overweight and obesity have become increasingly prevalent in Norway over the last two decades, also among women of childbearing years. It is now estimated that approximately 20% of all Norwegians are overweight. According to the North Trøndelag population study, the incidence of BMI>30 among women aged 25-30 has increased from 4% during the 1980´s to 12% during the 1990´s.

This is a randomized clinical trial that examines whether a combination of dietary counselling and supervised exercise groups affects pregnancy outcomes, including gestational weight gain (GWG), birth weight, proportion of macrosomic newborns, and use of operative deliveries.

4. SOFUS

SOFUS cohort study studies psychological stress among parents to be who have become to know that their unborn child has a developmental anomaly. The endpoints which are compared to a control group include psychometric and endocrine variables in the mother and circulatory parameters in the fetus.

5. Stork-3

The fetal liver is central in the energy use and metabolism of nutrients during fetal development. This project studies how blood flow in the umbilical vein (coming from placenta) is (re-)distributed between the liver and heart (ducus venosus) at different stages in the fetal development.

Achievements 2016

To have established a, on global basis, unique and large databaseof 170 mother-fetus pairs. To have established a close co-operation with University of Colorado Anschutz Medical Campus, Denver, USA (professor Thomas Jansson and professor Theresa Powel with dr Trond Michelsen as postdoc there 2016/17). For the first time to have demonstrated

Research Group: DIABETES AND PREGNANCY
Group Leaders: Tore Henriksen and Jens Bollerslev

in vivo increased release of sFlt from the human placenta into the maternal circulation. To have shown that maternal plasma cholesterol during pregnancy is associated with plasma cholesterol in their offsprings at school age. To have received funding for one more fellow.

Ambitions 2017-2018

To expand the testing in a human in vivo setting of the current, mainly experimentally based, concepts of placental nutrient transport and metabolism.

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Research Group:
DIABETIC NEPHROPATY
AND TRANSPLANTATION

Group Leader: Trond Jenssen

TROND JENSSEN

Research focus

Cardiovascular disease and diabetes after organ transplantation.

Pancreas and islet cell transplantation.

Molecular and morphological changes in the diabetic kidney.

Islet cell transplantation – optimalization of islet isolation, islet function and clinical outcome.

Projects

1. Posttransplant diabetes mellitus (PTDM). Occurrence, Pathogenesis, Risk factors, Follow-up and Treatment (Trond Jenssen).
2. Studies on endothelial function and dysfunction in posttransplant diabetes, and after normalization of glycemia with pancreas transplantation (Trond Jenssen and Svein Olav Kolset).
3. Beta cell replacement therapy (pancreas and islet transplantation).
   a. Long-term development of diabetic and non-diabetic complications (Trond Jenssen and Svein O. Kolset).
   b. Surgical and medical prerequisites for successful outcome of pancreas and islet graft function (Trond Jenssen, Rune Horneland and Hanne Scholz).
4. Metabolic risk factors for kidney graft and patient survival in renal transplant patients (Trond Jenssen).
5. Islet cell transplantation – optimalization of islet isolation, islet function and clinical outcome (Hanne Scholz).
6. Endogenous repair/regenerative medicine using the non-endocrine compartment of the pancreas (Hanne Scholz).
7. Use of adipose tissue-derived mesenchymal stem cells in diabetes (Hanne Scholz).
8. Molecular changes in transplanted kidneys with emphasis on morphometry, basement membrane and proteoglycans (Svein O. Kolset).
9. Extracellular matrix changes due to hyperglycemia and inflammations in human endothelial cells (Svein O. Kolset).

At present (2016/2017) 6 PhD candidates are directly involved in the projects. The group published 27 papers in peer reviewed journals in 2016.

The islets research group is responsible for human islet isolation from deceased donors for clinical islet transplantation in type 1 diabetes patients with brittle diabetes. The research group has a clear translational approach with projects ranging form clinical islet studies, islet biology studies, and experimental islets and cell transplant studies in small animal models. Dr. Scholz was invited speaker at the 26th International Congress of The Transplantation Society (TTS), Hong Kong. The group presented abstracts at the 6th EPITA Winter Symposium & 34th AIDPIT Workshop, Igls, Austria, and 13th National Stem Cell Networking Conference, Oslo. The glycobiology group (professor Svein O Kolset) is internationally one of the leading research groups on proteoglycan/endothelial biology and physiology. The organ transplantation group (professor Trond Jenssen) is in the research front on postransplant diabetes mellitus, as well as clinical outcomes on beta cell replacement therapy (pancreas and islet transplantation). Professor Jenssen has in 2016 been an invited speaker at several international meetings, including the TTS meeting in Hong Kong, Aug 2016 (see above) and the ESOT Diabesity Meeting in Sitges, Dec 2016.

Achievements 2016

Ongoing research grants are upheld. A new postdoc (Thea Halden) has initiated a project on the role of renal glucose transporters and SGLT2 inhibition in the transplanted kidney in patients with posttransplant diabetes mellitus (PTDM). We have also launched an investigator-initiated randomized placebo controlled trial on SGLT2 inhibition in PTDM patients. Results have also been published on the role of inflammatory markers and inflammatory monocytes in diabetic nephropathy. Three candidates defended their thesis in 2016: Afaf Sahraoui, MD: "Targeting islet inflammation; the key to preventing β-cell loss in islet transplantation" (supervisor: Scholz). Ivar A.

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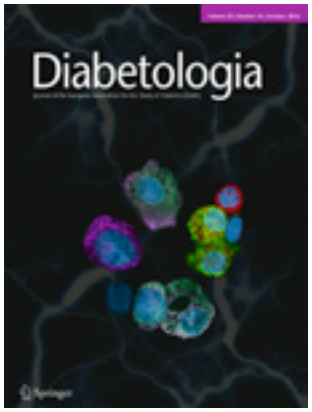
Eide, MD: "Marine n-3 polyunsaturated fatty acids in renal transplantation" (supervisor: Jenssen). Thea A. Halden, cand.pharm: "Post-transplantation diabetes mellitus in renal transplant recipients. Diagnosis, pathophysiology and treatment." (supervisor: Jenssen).

Ambitions 2017-18

Two of the candidates will finish their PhD thesis with scheduled defence in the 2nd quarter of 2017. Microdissection studies on tubular cells from transplanted kidneys will be undertaken (glucose transport studies). The RCT on SGLT2 inhibition in patients with PTDM is to be completed in 2017-18. We have obtained kidney biopsies from normo- (pancreas recipients) and hyperglycemic diabetes patients. These biopsies will be subjected to proteomics analyses to analyse for differences with regard to expression of matrix and inflammation relevant markers (Svein O. Kolset). Our goal is to provide new markers for early kidney changes. Survival outcomes and success rate of single pancreas transplantation will for the first time be published from our center. Results from the ORENTRA trial (omega-3 substitution in renal transplant recipients and graft function) will be published. A biobank for mesenchymal stem cells is being established for the possible treatment of early type 1 diabetes (Hanne Scholz).



Selected for monthly cover picture for the October issue in the journal Diabetologia 2016 (publication Halvorsen B et.al)

Research Group:
IMMUNOGENETICS OF AUTOIMMUNE DISEASES

Group Leaders:
Benedicte A. Lie

Research focus
Our main research focus is to identify and functionally characterize genetic factors that predispose to type 1 diabetes and other autoimmune diseases. The genetic risk factors have to a large extent been connected to gene expression and gene regulation of immune cells. To get a deeper understanding of such aspects, we are studying different layers of genomic information; e.g. transcriptome, methylation and microRNA across a wide specter of immune cells both from blood and thymus. These regulatory profiles are investigated against autoimmune genetic risk loci (revealed through genome-wide association studies), and analysed against response to treatment.

Projects
1. Characterization of the transcriptome of various immune cells in thymus and profiling of expression of tissue restricted autoantigens.
2. Exploring genetic, epigenetic and environmental risk factors, and their interactions, in rheumatoid arthritis, an autoimmune disease sharing many risk factors with type 1 diabetes.
3. Epigenetic profiling of immune cells from rheumatoid arthritis patients and their correlation with treatment response.
4. Quantification of the expression levels of HLA alleles, the main genetic determinant for autoimmune diseases, on different immune cells from thymus and blood.

Achievements 2016
- Characterize the transcriptome of antigen-presenting cells from thymus and unraveled the expression profile of risk genes for type 1 diabetes and other autoimmune diseases.
- Explored the expression of autoantigens and their splice variants from various thymic antigen-presenting cells.
- Revealed that patients with coexisting type 1 diabetes and celiac disease are more similar to type 1 diabetes patients in their distribution of HLA class II alleles.
- Described the genetic sharing and heritability of immune-mediated diseases.

Ambitions 2017-2018
- Characterize the transcriptome of T cell subsets from thymus and blood to unravel the expression profile of risk genes for type 1 diabetes and other autoimmune diseases.
- Quantitatively measure the expression of different HLA alleles, including type 1 diabetes susceptibility and protective variants, in thymus.
- Discover epigenetic signatures (methylation and miRNA) of different immune cells and the influence of methotrexate treatment on the methylation patterns.
- Test the hypothesis that the immune system is involved in the development of myalgic encephalopathy and chronic low back pain, based on our knowledge from immune genetic studies of established autoimmune diseases like type 1 diabetes.

BENEDICTE A. LIE

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FOTO: ØYSTEIN H. HORGMO, UIO

Research Group:
BIOMARKERS IN ENDOCRINOLOGY AND METABOLISM

Group Leader:
Jens P. Berg

Research focus
One of the research aims in our group is to increase our understanding of the mechanisms leading to and the metabolic consequences of increased blood glucose by studies of small molecule metabolite profiles (metabolomics). Projects at the Hormone Laboratory study the mechanisms leading to β-cell dysfunction and aim to identify adequate biomarkers to assess changes in β-cell health and function. In addition we focus on the use, quality control, and interpretation of measures of glycemic control such as HbA1c and glycated albumin.

Projects
1. Prediction of early metabolite biomarkers in serum of autoimmune diabetes.
2. Biomarkers of pancreatic β-cell mass.
3. Studies of metabolic profiles in gestational diabetes.
4. Posttranslational modification of proteins and late complications of diabetes.

Achievements 2016
We have presented a number of novel vitamin D-regulated proteins that may contribute to a better understanding of the reported beneficial effects of vitamin D on pancreatic β-cells. From the MIDIA study we have shown that plasma levels of several small, polar metabolites changed with age during early childhood, independent of later islet autoimmunity status and sex. Breastfeeding was associated with higher levels of branched-chain amino acids, and lower levels of methionine and 3,4-dihydroxybutyric acid.

Ambitions 2017-2018
Continue studies of proteomic analysis of insulin secreting cells.

Establish and perform studies of clinical samples to evaluate the performance of additional markers of glucose homeostasis such as glycated albumin, fructosamine and 1,5-anhydroglucitol.

JENS P. BERG

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Research Group:
THE NORWEGIAN CHILDHOOD DIABETES REGISTRY (NCDR)

Group leader: Torild Skrivarhaug

Research focus

The main research focus in this population-based, nationwide childhood-onset diabetes registry:

1) Epidemiology in childhood-onset diabetes, focusing on incidence, prevalence, classification of childhood-onset diabetes in Norway, ethnicity and long-term complications and mortality.
2) Quality in childhood diabetes care – a nationwide prospective population-based study for research and quality improvement by means of benchmarking.
3) Clinical childhood diabetes, especially focusing on quality of life (PROM), diabetes treatment, co-morbidity, eating disorders, the transition from paediatric to adult diabetes care, and patient reported outcome measure (PREM).

Ongoing studies

1. Mortality in childhood-onset type 1 diabetes (T1D). All-cause mortality, SMR, causes of death, relationship between socioeconomic status and mortality in T1D.
2. Co-morbidity in children and adolescents with T1D. Assessing competencies and coping; factors affecting functional and dysfunctional behaviour in children and adolescents with T1D.
3. Assessing metabolic control in the transition between pediatric and adult diabetes care, a collaboration between NCDR and the Norwegian adult diabetes registry.
4. How do young people with T1DM experience transition from pediatric to adult health care?
5. Classification of childhood-onset diabetes in Norway. To assess the epidemiology of different forms of diabetes and to classify incident cases on the basis of family history, clinical data, C-peptide, autoantibodies and HLA-genotypes.
6. The incidence of severe hypoglycaemia in children with T1D in Norway and in the Nordic countries.
7. The PAGE study (Prediction of Autoimmune diabetes and celiac disease in childhood by Genes and perinatal Environment).
8. Hypoglycemia in children and adolescents with T1D. To determine the prevalence of IAH (Impaired Awareness of Hypoglycemia). Population-based, nationwide study.
9. International HbA1c benchmarking in T1D: Do we need HbA1c variation in addition to average Hb1Ac values? International joint project.
10. Prevalence of monogenic diabetes in NCDR estimated by targeted deep sequencing. Treatment implications?
11. The EURODIAB collaborative group established in 1988, 44 centers representing most European countries and Israel. To study the epidemiology of childhood-onset T1D in Europe.
12. How to implement HrQoL measures in Nordic childhood diabetes registers – Implementing Disabkids as a routine screening tool.
13. Obesity and BMI index standard deviation score in children with type 1 diabetes in the Nordic countries.
14. Cardiovascular disease and end-stage renal disease in type 1 diabetes with onset before 15 years of age and long duration.
15. Development and validation of a Norwegian PREM tool for children with T1D and their parents.

TORILD SKRIVARHAUG

16. Incidence of diabetes ketoacidosis at the onset of childhood T1D in the Nordic countries in the period 2010-2014.
17. Long-Term Sulfonylurea Response in KCNJ11 Neonatal Diabetes (SuResponsKIR)
18. EU-IMI 2. NCDR is part of the INNODIA consortium. Started November 1st, 2015.

At present 3 PhD students and 1 postdoc are directly involved in the projects.

Achievements 2015

Dissertations 2016; Siri Carlsen "The use of HbA1c as a quality indicator in diabetes care – analytical and clinical aspects".

Conducted a national survey of life quality in children with diabetes using Hypokids, a validated PROM (Patient Reported Outcome Measure).

We have developed a validated PREM (Patient Reported Experience Measure) for NCDR.

Ambitions 2017-2018

Two of the candidates will finish their PhD thesis in 2017, and one in 2018.

To implement a national survey (2017) of life quality in children with diabetes using Disabkids, a validated PROM (Patient Reported Outcome Measure). To publish data on incidence of severe hypoglycemia in children with T1D in Norway. To implement a national PREM survey in 2017. To conduct a national study to improve results in diabetes care using NCDR in an improvement collaborative.

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FOTO: FREDRIK NAUMANN/FELIX FEATURES


VAC
insulin

THESIS 2016

IVAR A. EIDE. Marine n-3 polyunsaturated fatty acids in renal transplantation, University of Oslo 2016.

THEA ANINE STRØM HALDEN. Post-transplantation diabetes mellitus in renal transplant recipients; diagnosis, pathophysiology and treatment, University of Oslo 2016.

LARS KROGVOLD. The pathogenesis of type 1 diabetes – lessons from pancreatic biopsies in the Diabetes Virus Detection Study (DiViD), University of Oslo 2016.

AFAF SAHRAOUI. Targeting islet inflammation; the key to preventing β-cell loss in islet transplantation, University of Oslo 2016.

PUBLICATIONS 2016

International publications:

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INTERNATIONAL INVITED LECTURES / ORAL PRESENTATIONS / POSTER PRESENTATIONS:

Invited lectures:

Dahl-Jørgensen K. The pathogenesis of type 1 diabetes - virus involved? Lessons from the DiViD Study. The 52nd EASD Annual Meeting, 12-16 September 2016, Munich, Germany.

Jenssen, T. New Insights into the diagnosis of PTDM. 26th International Congress of the Transplantation Society. 18-23 August 2016, Hong Kong.

Jenssen, T. PTDM, a risk factor cardiovascular disease? Diabesity in renal transplantation, 2-3 December 2016, Sitges, Spain.

Krogvold L. Detection of a viral footprint in the pancreatic islets of newly diagnosed T1D patients: Results from the DiViD study. 42nd Annual Conference of the International Society for Pediatric and Adolescent Diabetes, 26-29 October, Valencia, Spain.

Scholz, H. Auto/Allo Islet Transplant. 26th International Congress of the Transplantation Society. 18-23 August 2016, Hong Kong.

Oral presentations:

Birkeland KI, Bodegard J, Persson F, Knudsen ST, Furuseth K, Thuresson M, Lindh A, Nilsson PM, Alvarsson M, Jørgensen ME, Gulseth HL, Søndregaard J. Primary care management of T2DM in Denmark, Norway and Sweden: a long term observational study. The 52nd EASD Annual Meeting, 12-16 September 2016, Munich, Germany.

Eckardt K, Porteymour S, Hjorth M, Lee S, Langleite TM, Holen T, Jensen J, Birkeland KI, Drevon CA. Dual specificity phosphatase 5 and 6 are oppositely regulated in human skeletal muscle by acute exercise. The 52nd EASD Annual Meeting, 12-16 September 2016, Munich, Germany.

Gagnum V, Stene LC, Leivestad T, Joner G, Skrivarhaug T "End-stage renal disease in patients with childhood-onset type 1 diabetes diagnosed during 1973-2012". 42nd Annual Conference of the International Society for Pediatric and Adolescent Diabetes, 26-29 October 2016, Valencia, Spain.

Sommer C, Gulseth HL, Jenum AK, Sletner L, Thorsby PM, Birkeland K. Influence of soluble leptin receptor on risk of gestational diabetes in a multi-ethnic population. The 52nd EASD Annual Meeting, 12-16 September 2016, Munich, Germany.

Eggemoen ÅR, Jenum AK, Mdala I, Knutsen KV, Lagerløv P, Sletner L. Is vitamin D deficiency in pregnancy associated with birth weight and other anthropometric measures? WONCA Europe Congress 2016, 15-18 June 2016, Copenhagen, Denmark.

Poster presentations:

Gagnum V, Stene LC, Leivestad T, Joner G, Skrivarhaug T. Diabetes complications and alcohol are important causes of death in individuals diagnosed with type 1 diabetes in late adolecence and young adulthood: long-term follow-up. The 52nd EASD Annual Meeting, 12-16 September 2016, Munich, Germany.

Gulseth HL, Ruiz PL-D, Bakken IJ, Strøm H, Birkeland KI, Håberg SE, Stene LC. Decreasing incidence of type 2 diabetes in Norway 2009-2014. The 52nd EASD Annual Meeting, 12-16 September 2016, Munich, Germany.

Høgestøl IK, Paschalis EP, Gamsjaeger S, Hassler N, Shabestari MG, Gulseth HL, Mala T, Klaushofer K, Eriksen EF. Effects of roux-en-Y gastric bypass surgery on bone quality: a pilot study. European Calcified Tissue Society, 14-17 May 2016, Rome, Italy.

Persson F, Bodegard J, Birkeland KI, Furuseth K, Thuresson M, Lindh A , Nilsson PM, Jørgensen ME, Gulseth HL, Søndregaard J, Knudsen ST, Alvarsson M. HbA1c and second line glucose lowering drug initiation in Denmark, Norway and Sweden: an observational study comparing T2DM management in primary care. The 52nd EASD Annual Meeting, 12-16 September 2016, Munich, Germany.

Ruiz PL-D, Gulseth HL, Bakken IJ , Strøm H , Birkeland KI, Åberg SE, Stene LC. No increased incidence of type 1 diabetes under 40 years 2009-2014 in Norwegians and immigrants. The 52nd EASD Annual Meeting, 12-16 September 2016, Munich, Germany.

Sletner L, Jenum AK. Newborn size according to the Intergrowth21st standards in a multi-ethnic population. 3rd International Conference on Nutrition and Growth, 17-19 March 2016, Vienna, Austria.

Sommer C, Gulseth HG, Jenum AK, Sletner L, Thorsby PM, Birkeland, KI. Influence of soluble leptin receptor on risk of gestational diabetes in a multi-ethnic population. The 52nd EASD Annual Meeting, 12-16 September 2016, Munich, Germany.

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Toftemo I, Lagerløv P, Jenum AK, Sletner L. Growth patterns in children aged 0-5 years in a cohort of multi-ethnic preschool children: identifying children at risk of developing overweight and obesity. 19th Nordic Congress of General Practice, 16-18 June 2016, Gothenburg, Sweden.

Toftemo I, Lagerløv P, Jenum AK , Sletner L. Ethnic differences in prevalence of overweight in preschool children in Norway. 3rd International Conference on Nutrition and Growth 17-19 March 2016, Vienna, Austria.

NATIONAL INVITED LECTURES / ORAL PRESENTATIONS /POSTER PRESENTATIONS:

Invited lectures:

Dahl-Jørgensen K. Tertiær forebygging av type 1 diabetes - intervensjon for å påvirke patogenesen etter sykdomsdebut (DiViD Intervention trial). Diabetesforbundets forskningskonferanse, 28-29 April 2016, Gardermoen, Norway.

Krogvold L. Hva har pankreasbiopsier lært oss om årsak og forebygging av type 1 diabetes?. Diabetesforbundets forskningskonferanse, 28-29 April 2016, Gardermoen, Norway.

Stene LC. Tidlig ernæring og T1D i store kohorter. Diabetesforbundets forskningskonferanse, 28-29 April 2016, Gardermoen, Norway.

Hanne L. Gulseth og Lars C. Stene. Hvor mange har diabetes i Norge? Presentasjon på Oslo Diabetes Forskningssenters møte, 7-8 April 2016, Son, Norway.

Skrivarhaug T. Type 1 diabetes in Tajikistan. Experience from a Life for a Child/ ISPAD training in Tajikistan. The Sundvollen-Symposium, 10 February 2016, Sundvollen, Norway.

Skrivarhaug T. The transfer from child to adult with type 1 diabetes. Diabetes meeting, Novo Nordic, 2 June 2016, Oslo, Norway.

V. Gagnum. Type 1 diabetes, more than a question of life quality? End stage renal disease, mortality and causes of death. The Pancreas TX Meeting, RH, 3 November 2016, Oslo, Norway.

Oral presentations:

T. Skrivarhaug, S.J. Kummernes, A.K. Drivvoll. Results from the Norwegian Childhood Diabetes Registry 2014. Helse- og kvalitetsregisterkonferansen, 10 March 2016, Oslo, Norway.

Eggemoen ÅR, Falk RS, Knutsen KV, Lagerløv P, Sletner L, Birkeland KI, Jenum AK. Vitamin D deficiency and supplementation in pregnancy in a multiethnic population-based cohort. 6th European Conference on Migrant and Ethnic Minority Health (EUPHA-MEMH), 23-25 June 2016, Oslo, Norway.

Poster presentation:

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