

UiT

THE ARCTIC
UNIVERSITY
OF NORWAY

DOCTORAL DEGREES 2017

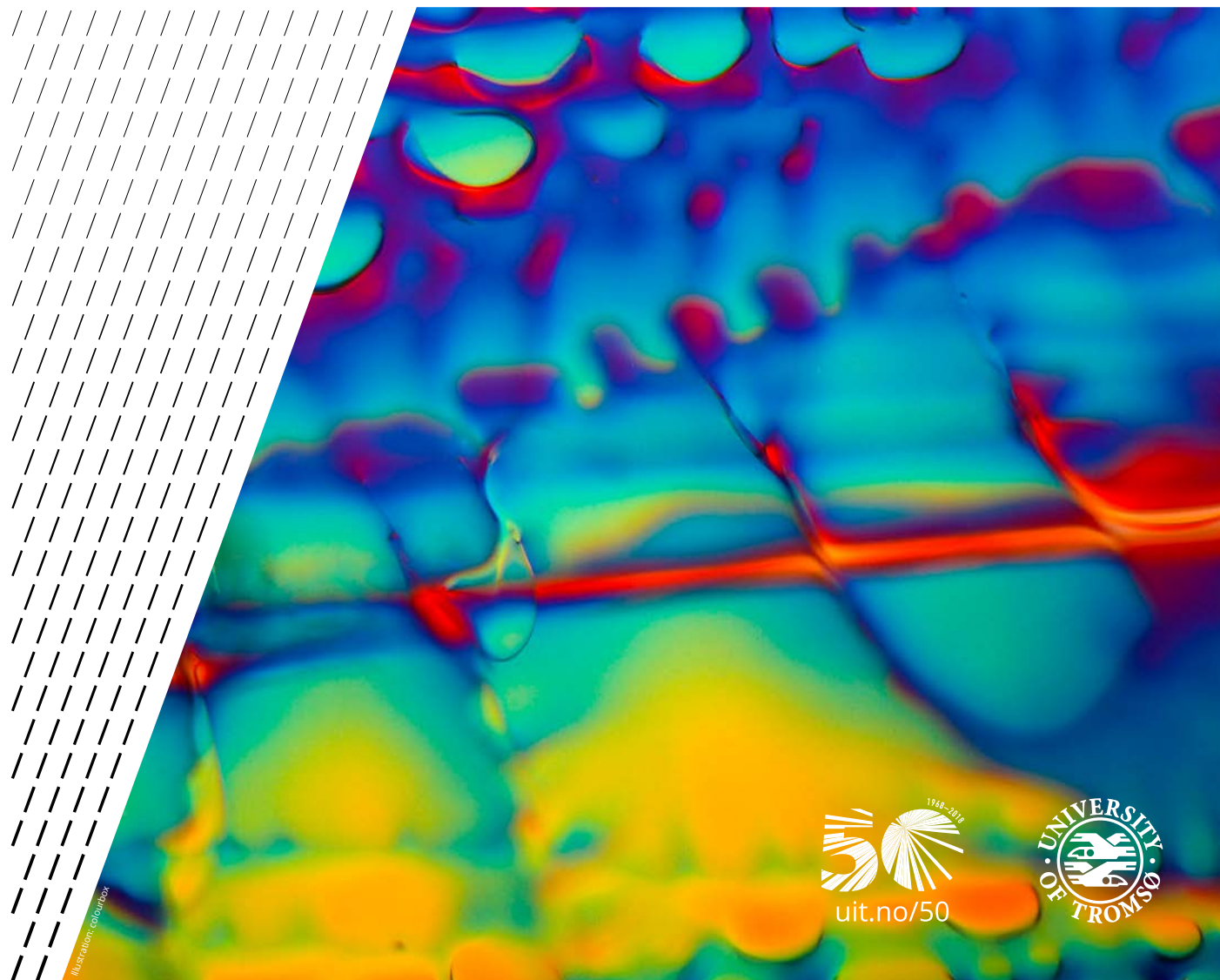


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118 new doctoral degrees in 2017

A total of 118 doctoral degrees were awarded at UiT The Arctic University of Norway in 2017. 76 candidates defended their doctoral thesis in the spring semester, and 42 in the autumn semester. This represents a 13 % increase compared to 2016 (104 new doctors).

70 women and 47 men defended their doctorate at UiT in 2017. 47 of the doctors came from 20 different countries outside of Norway.

In 2017, six of the university's eight faculties offered PhD programmes ¹. The number of doctors were distributed as follows (2016 in parenthesis):

Faculty of Health Sciences: 55 (43)

Faculty of Science and Technology: 22 (17)

Faculty of Humanities, Social Sciences and Education: 17 (20)

Faculty of Biosciences, Fisheries and Economics: 20 (22)

Faculty of Law: 3 (2)

Faculty of Engineering Science and Technology: 1 (0)

General information about doctoral degrees

A doctoral degree is the highest academic degree awarded by Norwegian educational institutions.

The doctoral degree qualifies the candidate for research work of high academic level and for other work in the community requiring scientific insight. In order to be admitted to a PhD programme, it is a prerequisite that the student has completed a Master's degree or a programme of professional study.

The PhD studies are financed either by grants from UiT, the Research Council of Norway or other external funding sources. The PhD programme is a three-year full-time programme. Some scholarships are for four years, where the doctoral thesis constitutes 75% and other work, teaching, etc., amounts to 25%. Students are admitted to a doctoral degree programme. Many of the students are affiliated with a research school. Doctoral degrees organised in this way are the most common. This leads to the degree of Philosophiae Doctor (PhD).

It is also possible to work outside an organised doctoral programme and attain the degree of Doctor Philosophiae (Dr.philos). The Dr.philos. degree is an independent degree without supervision and organised training. The degree is achieved after evaluation of a scientific dissertation, disputation and trial lectures.

In 2017, 117 candidates attained the PhD degree and 1 attained the Dr.philos degree.

Most thesis are published in Munin, which is UiT's digital knowledge archive. Some of them were not ready when this brochure is printed. You can search for the candidate's name on <http://munin.uit.no>. Read more about research at UiT on www.uit.no/forskning

¹ The Faculty of Athletics, Tourism, and Social welfare (discontinued 31.12.2017) and the Faculty of Fine Arts do not currently offer PhD programmes.

Doctoral degrees in 2017 at UiT The Arctic University of Norway

Kazi Asraful Alam

Philosophiae doctor

Studies on selectivity determinants of protein kinase inhibitor binding

Protein kinases are involved in many essential cellular processes, and are regulated in a dynamic manner. Protein kinase deregulation can lead to a variety of diseases, including cancer and diabetes. Protein kinase A (PKA) has been a prototype to study the entire family, including for studies in drug discovery research. However, the high sequence similarities in the kinase domain of protein kinases hinders the development of target-specific inhibitors. In this work, the researchers use a combination of several biophysical methods to investigate the properties of PKA, PKA based surrogate kinases, the cancer target Aurora kinase, including especially their interactions with inhibitors. This work advances the understanding of how subtle aspects of flexibility, water structure and chemical interactions determine inhibitor binding kinetics and energetics. Such detailed understanding is required for truly effective structure-based drug design.

Page link to thesis: <http://hdl.handle.net/10037/11195>

Faculty of Science and Technology
Department of Chemistry
9.6.2017

Maisoon Alhamidi

Philosophiae doctor

Limb Girdle Muscular Dystrophy Type 2I: A Molecular Study of Fukutin-Related Protein

Muscle dystrophies are a large group of inherited muscle disorders causing wasting of the skeletal muscles. Muscle dystrophy patients lose their ability to use their affected muscles as the disease progresses and they become gradually more disabled. Limb Girdle muscle dystrophies (LGMD) affect primarily the proximal muscles. As of today, mutations in 32 genes cause 34 subtypes of LGMD. LGMD type 2I has a high prevalence in the Northern

European population. LGMD2I is caused by mutations in the Fukutin-Related Protein (FKRP) gene. Little is known about the properties of FKRP. The researchers have investigated the relationship between the clinical severity in LGMD2I patients and the histopathological and molecular alterations in muscle sections. By employing a repertoire of biomolecular techniques, they have investigated some of FKRP's characteristics such as its intracellular localization and its quaternary structure. Finally, they have identified an FKRP interacting protein, plectin, which is deficient in LGMD2Q. Although this finding requires further investigation, it might lead to a better understanding of the pathophysiology involved in both these LGMD subtypes.

Faculty of Health Sciences
Department of Clinical Medicine
21.6.2017

Ingrid Munthe Alm Andersen

Philosophiae doctor

Pathophysiological aspects of heart failure with emphasis on the cardiorenal interplay

The main focus of this research has been a frequent and deadly condition affecting the heart and the kidney, called the cardiorenal syndrome, which affects millions of people worldwide. The mechanisms of this condition are not fully understood, and new insights are necessary in order to find new treatment. To investigate mechanisms of disease, three different large animal models have been used, principally to induce kidney and heart dysfunction. The researchers found that mild renal dysfunction is associated with changes in the heart, the vascular and renal system, as well as in hormonal systems. Furthermore, a novel potential therapeutic agent has been developed based on the findings of the studies, and tested in a large animal model. This drug showed protective renal and cardiac effects. The findings have significant clinical implications, as mechanisms of cardiorenal syndrome have been further elucidated, and led to the design of potential new therapies for this frequent condition.

Faculty of Health Sciences
Department of Clinical Medicine
12.6.2017

Ole Fredrik Linnemann Andorsen

Philosophiae doctor

Self-reported musculoskeletal complaints: Prevalence, risk factors, and mortality

Based on data from the Tromsø Study, this thesis describes some key issues regarding the epidemiology of longstanding musculoskeletal complaints (MSCs). Firstly, it provides estimates on how common MSCs are in a general population (including those who never seek medical advice for their MSCs). It further describes the distribution of MSCs by severity and by the characteristics of those who suffer from MSCs. The thesis also provides insight on health factors (both modifiable and non-modifiable) that may predict presence of MSCs later in life. The thesis elaborates consequences of longstanding MSCs, which have not been well described. Although pain and stiffness in the musculoskeletal system can have a great impact on daily life, such as the ability to continue working, it does not increase individual mortality risk. In sum, the thesis increases our understanding of MSCs in an epidemiological perspective.

Page link to thesis: <http://hdl.handle.net/10037/11415>

Faculty of Health Sciences
Department of Community Medicine
30.6.2017

Elena Artamonova

Philosophiae doctor

Mass cultivation of some common cold-water diatoms (Bacillariophyceae): lipids vs. growth conditions

The present study was aimed at investigating northern diatoms as sustainable sources of omega-3 fatty acids

widely used and now much needed in salmon aquaculture as well as ingredients to be used in nutraceuticals in the human diet. As known, fish oil is currently the main source of physiologically requisite fatty acids such as eicosapentaenoic (EPA) and docosahexaenoic acids (DHA). Due to the rapid increase of aquaculture production volumes and the world population in the recent decades, the problem of omega-3 lipid deficiency has attracted increased attention in recent years. Northern cold-water microalgae of the diatom group (Bacillariophyceae) are, in this context, potential candidates, due to their high growth rates and phylum-characteristic high content of omega-3 fatty acids, particularly EPA. Therefore, in the present study the northern cold-water diatoms were investigated in terms of their lipid and fatty acid composition. Moreover, the effects of different cultivation parameters (light, temperature, CO₂/pH) on lipogenesis were studied. The results of the current research demonstrated that temperature decrease together with moderate light intensities may trigger accumulation of the polyunsaturated fatty acids (including physiologically requisite EPA) in diatom species. Furthermore, total lipid content and production of certain PUFAs in a diatom cell may be enhanced by means of CO₂ aeration.

Page link to thesis: <http://hdl.handle.net/10037/10300>

Faculty of Biosciences, Fisheries and Economics
The Norwegian College of Fishery Science
27.2.2017

Derk Frederik Matthaus Avenarius

Philosophiae doctor

The Paediatric Wrist; Normal Age-Related appearances on Magnetic Resonance Imaging and Radiographs. Follow up of a Healthy Cohort

A total of 89 healthy children were recruited from Tromsø. All children had a radiograph and an MRI of the left wrist taken, while 74 met for a follow-up study. Both examinations showed that all children had numerous



findings that could mimic different diseases seen in children. Joint fluid was seen in half of the children, as well as bone marrow oedema-like changes in at least one of the carpal bones. It was shown that the number of bony irregularities increased with age, and that bone marrow oedema-like changes were found in different areas as compared to the initial examination. It occurred on both sides of a joint and in close relation to ganglion cysts. One or more ganglion cysts were found in a quarter of the children included. In conclusion, bony irregularities, bone marrow oedema-like changes, and ganglion cysts can represent normal findings and should not be interpreted as disease without additional markers for disease being present.

Page link to thesis: <http://hdl.handle.net/10037/11702>

Faculty of Health Sciences
Department of Clinical Medicine
27.10.2017

Allison Michelle Bailey

Philosophiae doctor

The fate of a key Arctic copepod in future ocean acidification: Integrating molecular, organismal, and evolutionary thinking in the face of climate change

This thesis examines the effects of projected levels of ocean acidification on the physiology of a key component of the Arctic marine ecosystem, the copepod *Calanus glacialis*, using molecular, organismal, and evolutionary methodologies to investigate the effects of low pH throughout its lifespan, in combination with other stressors and across geographically distant sub-populations. Young stages of the copepod, potentially the most sensitive, were tolerant to realistic pH levels for future ocean acidification: the nauplii developed successfully from egg to naupliar stage N6 at all four pH treatments investigated. Gene expression N6 nauplii supported the organismal-level tolerance observed, indicating only mild gene expression and no stress response to low pH. However, detrimental effects were found in the young copepodite stages, which indicated an energetic cost at low pH. Differences in this response between geographically distant, and potentially genetically isolated sub-populations showed that those that lived in a low pH environment tolerated it better, indicating that *C. glacialis* may be able to alleviate these detrimental effects over time. *C. glacialis* populations face a myriad of environmental changes driven by global warming and ocean acidification in the Arctic, and while they may experience declines due to the interactions of these multiple stressors, they likely will not experience declines primarily due to ocean acidification.

Page link to thesis: <http://hdl.handle.net/10037/10963>

Faculty of Biosciences, Fisheries and Economics
Department of Arctic and Marine Biology
5.5.2017



Jens Petter Bakkehaug

Philosophiae doctor

Novel inotropic strategies for treating acute heart failure: A large animal study on cardiac function and energetics

Acute heart failure (AHF) is a disease with a mortality ranging from 5 to 40% depending on severity, despite modern revascularization techniques after acute myocardial thromboembolism. This study investigates two new concepts of treating AHF. In paper 1, the combination of dobutamine and ivabradine (D+I) in a porcine model of stunning AHF was investigated. Ivabradine attenuated the chronotropic effect of dobutamine, and increased stroke volume (SV) to pre-ischæmic values with neutral cardiac efficiency (CE). In theory, by increasing diastolic filling time. In paper 2, metabolic and haemodynamic effects of the new myosin-activator omecamtiv mecarbil (OM) in a pig- and a mouse-model was evaluated. Reduced CE was found in both healthy and ischaemic pigs, combined with increased ejection fraction without increase in SV. In the

mouse model, Bakkehaug and his colleagues found that the reduced efficiency could be explained by increased myosin ATPase activity. In paper 3, they wanted to compare the effect of D+I and OM on left ventricular diastolic function in severe AHF in pigs. The results showed increased ejection fraction by OM and D+I, but only D+I increased SV. This is in part explained by severely impaired early diastolic function by OM (increased Tau, reduced dP/dtmin and reduced ventriculo-atrial pressure difference).

Page link to thesis: <http://hdl.handle.net/10037/10951>

Faculty of Health Sciences
Department of Medical Biology
16.2.2017

Elisabeth Valmyr Bania

Philosophiae doctor

Educational Footprints and Psychosocial Factors in Multicultural Contexts in Arctic Norway: A Cohort and Registry Data Study among Sami and Non-Sami Students, 2003–2012

The educational process from educational aspirations reported in lower secondary school, the non-completion of upper secondary school and completion of tertiary education among Sami and non-Sami students in Arctic Norway is the topic of this thesis. The main aim was to explore how psychosocial, mental health and educational factors contribute to this process in different sociocultural contexts. The cross-sectional data from The Norwegian Arctic Adolescent Health Study (NAAHS) was conducted among 10th graders in lower secondary school in Northern Norway; Nordland, Troms and Finnmark county in 2003–2005. Of the total cohort of 5877 lower secondary school students, 4881 responded (RR=83%). Data from the NAAHS study was merged, with registry data from 3987 adolescents who gave their consent for merging registry data. This study suggests that in egalitarian Norway less privileged young adults *have the same rate of completing education* as their better off peers. However, mental health symptoms and disorders along with residency are

associated with non-completion of upper secondary school and tertiary education.

Page link to thesis: <http://hdl.handle.net/10037/10289>

Faculty of Health Sciences
Department of Clinical Medicine
17.2.2017

Julia Beilfuss

Philosophiae doctor

Vitamin D and its implication on inflammation and genomics. The data from the Tromsø Study and the U.S. National Health and Nutrition Examination Survey

In the observational study based on 10,118 non-smokers from the sixth Tromsø Study, a significant negative association between serum 25(OH)D and high-sensitive CRP (hs-CRP) was found. However, in a smaller cohort of subjects with prediabetes (n=511), there were no significant correlations between serum 25(OH)D and hs-CRP. Moreover, 5 years supplementation with 20 000 IU cholecalciferol per week did not result in significant reduction in serum hs-CRP levels, as compared with subjects receiving placebo. In another RCT, 1 year supplementation with 20 000 IU or 40 000 IU cholecalciferol resulted in lowering of interleukin 6 (IL-6), but not hs-CRP and tumor necrosis factor- α . In another large observational study, based on NHANES cycles 2001-2002, the researchers demonstrated the significant positive association between serum 25(OH)D and LTL, but only in middle-aged adults (i.e. age 40-59 years). The findings were independent of other risk factors for LTL shortening (e.g. age, race/ethnicity, BMI, intake of sugars and calories, physical activity, etc). These findings might provide the biological plausibility on vitamin Ds action on carcinogenesis and other age-related conditions. In conclusion, the results of the study indicate an association between serum 25(OH)D levels and levels of certain proinflammatory cytokines and markers of carcinogenesis and aging, but supplementation with cholecalciferol for as long as 5 years did not show a beneficial effect of vitamin

D. This means that the clinical impact of the associational findings remains unclear.

Page link to thesis: <http://hdl.handle.net/10037/11812>

Faculty of Health Sciences
Department of Clinical Medicine
24.11.2017

Margrete Berdal

Philosophiae doctor

Wound healing in diabetes: An intervention study in db/db mice

Diabetes is a disease with increasing occurrence and a characteristic that the sugar content in the blood is too high. High blood sugar is harmful to the body and can cause chronic complications if not treated. One such complication is impaired wound healing, which may lead to amputations when wounds do not heal. Different



types of cells are required for wounds to heal, including macrophages. Macrophages release growth factors into the wound, which promote the healing process. Studies demonstrate that macrophage function is impaired in diabetes. Diabetic macrophages release smaller amounts of growth factors than in humans and animals without the disease. Experiments have shown that beta glucans improve macrophage function. The researchers studied the effects of beta glucan and growth factors on wound healing. Diabetic mice were applied with either beta glucan or growth factors onto the wound. Wound healing was improved by both treatments. Research in animals is important to elucidate potential causes of impaired wound healing in diabetes. Researchers worldwide also use the mouse model as included in the experiments. These studies contribute to new knowledge about this model.

Page link to thesis: <http://hdl.handle.net/10037/11251>

Faculty of Health Sciences
Department of Clinical Medicine
9.6.2017

Mikkel Berg-Nordlie

Philosophiae doctor

Fighting to be Heard – in Russia and in Sápmi. Russian Sámi representation in Russian and pan-Sámi politics, 1992-2014

This thesis constitutes a study of Russian Sámi representation in Russian and pan-Sámi politics during the period 1992-2014. It contributes to the study of Sámi political history by exploring the systems for Russian Sámi representation that have been established and disestablished during the period under analysis, and the conflicts that have taken place over the organization of Russian Sámi representation. The thesis takes an interest in analysing the degree of representativeness inherent in various models for Russian Sámi representation, and the effect of pan-Sámi networking on Russian Sámi politics. By addressing this task, the thesis furthermore serves the function of accounting for the background, establishment,

and conflicts surrounding the movement for a Russian Sámi Parliament that appeared during the period under analysis.

Page link to thesis: <http://hdl.handle.net/10037/11405>

Faculty of Humanities, Social Sciences and Education
Department of Archaeology, History, Religious Studies and Theology
15.9.2017

Amarnath Bhide

Philosophiae doctor

The effect of hypoxaemia on fetal cardiac function

Placenta supplies nutrients and oxygen to the fetus. Placental dysfunction can lead to impaired fetal growth or even death. Detection of inadequate oxygen supply to the fetus, and delivery timing are challenging. Normally functioning heart is essential for survival. The purpose of this work was to study the effect of oxygen deprivation on fetal heart function. A drug called Sildenafil (popular by the name Viagra) is potentially useful to improve the function of a defective placenta. In this research we also obtained information on the effect of this drug on the unborn baby's heart function.

The researchers used pregnant sheep model and used ultrasonography (safe for the mother and the baby) to study the function of the baby's heart. The researchers found that insufficient oxygen supply altered heart function. They found two types of measurements to change with lack of oxygen. These will be useful to refine tests used in complicated human pregnancies. This research has the potential to save lives of unborn babies.

Page link to thesis: <http://hdl.handle.net/10037/11324>

Faculty of Health Sciences
Department of Clinical Medicine
1.8.2017

Zambarlal Babab Bhujabal

Philosophiae doctor

FKBP8 and the autophagy-inducing Class-III PI3K Complex Roles of LIR dependent interactions

Autophagy (Greek for “self-eating”) is a renovation process in cells, breaking down its own unhealthy components. The components to be degraded are collected into a double membrane vacuole known as an ‘autophagosome’ which delivers its content for destruction in the lysosome. Mitochondria are the “power stations” of cells that produce energy. However, like an old “diesel engine”, they may also produce toxic radicals that damages the cell. The damaged mitochondria are degraded by a selective autophagy process called mitophagy. The thesis work is carried out in the Molecular Cancer Research Group. It focuses on mitophagy, and identifies a new protein, FKBP8, which cooperates with the autophagosomal membrane protein LC3A to carry out mitophagy. In addition, it was found that ATG14, Beclin-1 and VPS34 of the Phosphatidylinositol kinase complex bind to the autophagosomal membrane protein GABARAP, positioning them for autophagosome formation.

Page link to thesis: <http://hdl.handle.net/10037/11695>

Faculty of Health Sciences
Department of Medical Biology
22.9.2017

Helen Brandstorp

Philosophiae doctor

Training interactions in local teams: Using critical participatory action research to explore context-based learning

During emergencies, patients often have challenging and complex needs which local, interprofessional health care teams must address. Norwegian regulations mandate training in emergency primary care. The researchers aimed thus to explore and improve in situ team training. In Alta,



Photo: Helen Brandstorp

since 2007, local personnel have continually arranged such monthly training sessions anchored in their own competence and context. Over a 3.5-year period, they explored patient participation, leadership as interaction, and local learning processes. One year of participatory observation was conducted, followed by analyses by an interprofessional group and then local follow-up focus group discussions on each theme. Analyses revealed a dominance of language that objectified the simulated patients and participating professionals. The teams practiced both designated and distributed leadership with shifts in leadership modes coinciding with situational changes requiring specific competencies. Additional guiding principles included: a commitment to the task at hand; taking responsibility for patients and colleagues; and a perception of calmness as an indicator of good

teamwork. The participants discussed a wide range of topics constitutive for learning and a patient safety culture, and made social and structural improvements. The flexible structure of the training model mirrors the complexity of medicine and provides space for the participants' own sense of responsibility.

Page link to thesis: <http://hdl.handle.net/10037/10149>

Faculty of Health Sciences
Department of Community Medicine
9.1.2017

Xuan Bich Bui

Philosophiae doctor

Economic analysis of Marine Protected Areas: Bioeconomic Modeling and Economic Valuation Approaches

Marine protected areas (MPAs) are often established for conservation objectives. Benefits provided by MPAs exceed pure biodiversity conservation as they may include contributions to social and economic benefits of local communities. MPAs may provide a management tool for sustainable fisheries and/or solving conflicts of interests between users of marine resources. It is of value to analyze and understand how implementation of an MPA can give different benefits to the economy and society. This thesis attempts to analyze some of the benefits of MPAs in specific situations. It describes how an MPA can be used as a management tool to solve economic conflicts between *bruke users of a marine area*. An integrated bioeconomic model is developed for analyzing the impacts of an MPA on aquaculture-fisheries interactions. Benefits from MPA-based tourism activities are derived using the discrete choice experiment method. The empirical analysis is applied to the NTB MPA in Vietnam. The total benefits of the coexistence of multiple activities, i.e. fisheries and tourism, affected by MPAs are analyzed and discussed. The combination of a bioeconomic model and non-market valuation techniques is the approach for this study. Data from the anchovy purse seine fishery in Khanh Hoa

province and tourism activities related to the NTB MPA are applied for the empirical analysis.

Page link to thesis: <http://hdl.handle.net/10037/10946>

Faculty of Biosciences, Fisheries and Economics
The Norwegian College of Fishery Science
5.4.2017

Sylvia Ighem Chi

Philosophiae doctor

Mitochondrial Group I introns in Hexacorals

Mitochondrial genes ND5 and COI in corals and sea anemones contain complex group I introns capable of self-splicing from the precursor RNA molecules. ND5 intron is present in all sequenced species, while COI intron is absent in a few species. Both introns are complex in containing protein-coding genes within their structures and thus are expected to influence mitochondrial function. While COI intron mostly encode a homing endonuclease gene known to facilitate its movement, ND5 intron is unique in harboring from two to 16 essential mitochondrial genes within its splice sites. Molecular biology study of corals and sea anemones is largely focused on mitogenome sequencing for taxonomy; however, limited attention is given to mitochondrial transcriptomes and intervening introns. Here, the researchers examined complete mitochondrial genomes and corresponding transcriptomes of different corals and sea anemones, and investigated the mode of processing of encoded ND5 and COI intron RNAs. They found all mitochondrial genes expressed and intervening group I introns removed during RNA maturation of ND5 and COI genes. Among several interesting findings, the first case of a natural metazoan mitochondrial plasmid-like DNA was reported, and an unconventional RNA processing of a natural group I intron, the giant mitochondrial ND5 intron, through back-splicing.

Faculty of Health Sciences
Department of Medical Biology
14.9.2017

Bente Christensen

Philosophiae doctor

User's role in the making and scaling of an Information Infrastructure for Health Care based on the openEHR specification - A socio-technical perspective on the introduction of a new standard for Electronic Health Records

Modern Electronic Patient Records (EPR)s take on infrastructural dimensions in that they encompass many systems and are used by thousands of users in different hospitals. This study has followed the development of a novel EPR which is going to be adopted in most hospitals in Norway. Through extensive participatory observation and interviews, the efforts of the users in the making and scaling of the new EPR have been identified. The researchers have identified new tasks and new roles resulting from the particular technology chosen for the new system. This knowledge may have a great impact on how the implementation project should be organized and run to have the best chances of success.

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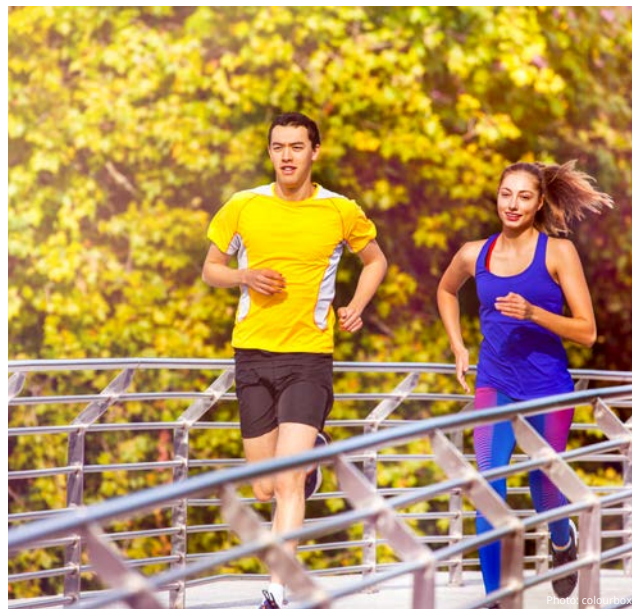
Faculty of Health Sciences
Department of Clinical Medicine
11.12.2017

Tore Christoffersen

Philosophiae doctor

The influence of birth weight, childhood fractures and lifestyle factors on peak bone mass in Norwegian boys and girls between 15-18 years of age. The Tromsø Study, Fit Futures

The main aim of this thesis was to investigate the influence of birth weight and length, childhood fractures and lifestyle factors like physical activity on the accumulation of bone mass among Norwegian adolescents. Fit Futures is an expansion of the population-based Tromsø Study.



In 2010/2011 approx. 1000 first-year upper secondary school students in Tromsø and surrounding municipalities attended a health survey. Hip and total body bone mineral content (BMC), bone mineral density (BMD) by Dual-energy X-ray absorptiometry (DXA), weight and height were measured and information about lifestyle was collected. All fractures in the cohort were retrospectively recorded from the local hospital and information on birth parameters were collected from the Medical Birth Registry of Norway. Through childhood, fractures were registered among 35% and 31% of boys and girls, respectively. Higher levels of physical activity (PA) in adolescence were associated with increased levels of BMD and BMC, suggesting that participation in PA is of major importance to PBM. Birth weight and length were positively associated with BMC at all measured sites. However, these associations were attenuated when adjusting for change in size and lifestyle factors during adolescence. The researchers could not confirm that childhood fracture is an early marker of skeletal vulnerability as the association between a previous fracture and bone outcomes appeared

inconsistently across levels of physical activity and sex.

Page link to thesis: <http://hdl.handle.net/10037/11750>

Faculty of Health Sciences
Department of Health and Care Sciences
22.11.2017

Jesper Dahl

Philosophiae doctor

Maternal Anti-HLA Class I Antibodies in Connection with Pregnancy and Neonatal Thrombocytopenia – a Cause for Concern? Clinical Characteristics and Antibody Analysis of Retrospective and Prospective Populations

The mother's immune system can target the fetus during pregnancy, and this can potentially cause bleedings in the fetus or newborn. In the current thesis, the researchers have looked at a specific type of antibody that is common



also during normal pregnancies, and investigated its relation to a low platelet count in the newborn, as well as other indicators of newborn health. They found that the children of mothers with these antibodies often had severely low platelet counts and low birth weight, and that the outcome was worse in children of mothers with more antibodies. However, Dahl and his colleagues could not be certain that the antibodies were the only cause of what was found, and further research will be necessary before any definitive conclusions can be drawn.

Page link to thesis: <http://hdl.handle.net/10037/11495>

Faculty of Health Sciences
Department of Medical Biology
8.9.2017

Laurea Magistrale Roberto Di Remigio

Philosophiae doctor

The Polarizable Continuum Model Goes Viral!

Synergistic theoretical and experimental approaches to challenging chemical problems have become more and more widespread. However, studying chemical phenomena in complex environments, where the molecule of interest can interact with a large number of solvent molecules or residues in a protein, remains challenging, especially when high accuracy is required for the prediction of exotic and novel molecular properties. The efforts in achieving the insight needed to understand and predict the physics and chemistry of such complex systems is presented, based on the development of the polarizable continuum model for solvation. While the solute is described by a quantum mechanical method, the surrounding environment is replaced by a structureless continuum dielectric. The mutual polarization of the solute-environment system is described by classical electrostatics. The researchers show how the inclusion of environment effects for relativistic and nonrelativistic quantum mechanical Hamiltonians, arbitrary order response properties and high-level electron correlation methods can be transparently derived and implemented. PCMSolver, the open-source application

programming interface, can provide continuum solvation functionality to any quantum chemistry software: continuum solvation goes viral.

Page link to thesis: <http://hdl.handle.net/10037/10786>

Faculty of Science and Technology
Department of Chemistry
16.1.2017

Rachel Issa Djesa

Doctor philosophiae

Cultural communication and understanding as a tool to prevent female circumcision

(*Kulturell kommunikasjon og forståelse som redskap i forebygging av kvinnelig omskjæring*) Through the use of action research and filming, this study investigated how Somali women, one of the groups that practice female circumcision, and Norwegian health workers working to prevent the practice, influence each other while interacting on and dealing with the issue of female circumcisions in the Norwegian city of Tromsø. The study seeks to answer the following question: Why is it difficult to prevent female circumcision? In the thesis, Djesa refers to different prevention practices she participated in, the communication challenges that arose between different stakeholders and strategies used to solve these challenges. The study discusses the opportunities for prevention created in the cultural encounter. Postcolonial theoretical perspectives and cultural-historical activity theory were used to address conflicts and often implicit power-related inequalities. Fellowship gained, in and around common activities, creates the important balance between the different cultures where increasing understanding led to more openness and curiosity towards the unknown and foreign culture. By creating conditions that led to establishment of a “third space”, i.e. a space where intercultural communication can take place, opportunities for cultural change and exchange were created and could enable changes to take place.

Page link to thesis: <http://hdl.handle.net/10037/10286>

Faculty of Humanities, Social Sciences and Education
Department of Social Sciences
17.2.2017

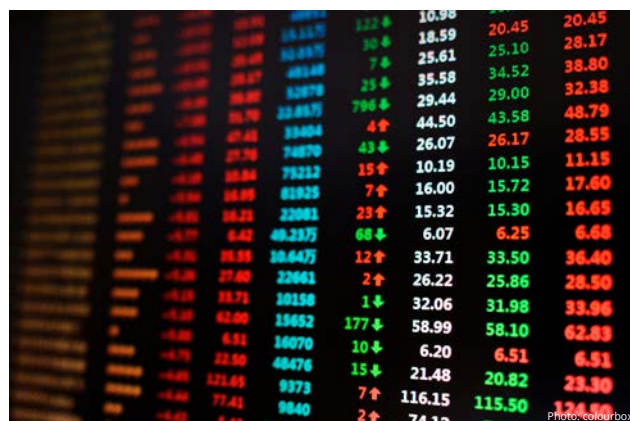
Thi Hong Minh Dinh

Philosophiae doctor

Topics on market microstructure and asset pricing using intraday data from the Oslo stock market

What drives asset prices in the financial market? How can we predict these prices? Finding the relationship between different factors or between different variables could help to answer these questions. Firstly, links between asset pricing models and other market microstructure variables can be used to investigate sources to explain asset prices. Secondly, rapid changes in the microstructure of the financial market in which investors can trade with high frequency have provided a platform for researchers to examine the relationship between microstructure variables in high frequency trading.

Using high frequency data from the Oslo stock market, this thesis focuses on empirical research examining variables that could drive asset prices based on asset pricing models and market microstructure variables. The results of the research confirm that a combination of the traditional asset



pricing models and market microstructure variables, and the interaction between market microstructure variables, can help to explain asset prices. Furthermore, it is suggested that the scope of these findings can be expanded to predict these prices. Explaining and predicting asset prices is not only extremely important for investors who wish profit from their investments, but also for policy makers and regulators who contribute to the design of efficient financial markets, and to the stability of the economy as a whole.

Page link to thesis: <http://hdl.handle.net/10037/11295>

Faculty of Biosciences, Fisheries and Economics
School of Business and Economics
23.8.2017

Gunstein Christoffer Egeberg

Philosophiae doctor

The measurement of traditional and cyber forms of bullying and harassment

Children and adolescents do not always perceive bullying in the same manner as adults. The often referred to four bullying criteria, negative actions, repetition/duration, intentions and imbalance of power, are not necessarily included when young people define bullying. The study investigates this phenomenon and even the way bullying is being measured by researchers. The validity of research into bullying relies heavily on a shared perception of what constitutes the phenomenon as quantitative prevalence studies are highly important in the field. Beside pointing to well-known challenges for measuring bullying, the first steps towards new and improved measures are taken. The core idea is to rely less on the bullying criteria and more on perceived severity of the experiences of the victims, regardless of whether a clear imbalance of power exists or not, or if the actions were clearly intended. Instead an impact measure, e.g. related to mental health or quality of life, could be used to separate less severe harassment from more severe incidents.

Page link to thesis: <http://hdl.handle.net/10037/10287>

Faculty of Humanities, Social Sciences and Education
Department of Education
15.2.2017

Astrid Margrethe Anette Eriksen

Philosophiae doctor

“Breaking the silence.” Interpersonal violence and health among Sami and non-Sami- a population-based study in Mid -and Northern Norway

This doctoral thesis is based on a sub-study of the SAMINOR 2 Questionnaire Survey. The results show that Sami ethnicity is a risk factor for any lifetime interpersonal violence for both genders, except for sexual violence among men. The results remained significant after adjusting for socio- economic and demographic factors, as well as for alcohol consumption. A robust and positive correlation was found between childhood violence and indicators of mental disorders, as well as chronic pain in adulthood. The association between childhood violence and adult chronic pain was weaker and turned out to be non-significant among Sami men. A higher level of psychological distress and more symptoms of PTS were found among the Sami than the non-Sami. Childhood violence was found to mediate some of these ethnic differences in mental health problems. Moreover, a consistent association between childhood violence and mental health problems and chronic pain in adulthood indicates that childhood violence represents an important risk factor for poorer health in adulthood, irrespective of ethnicity. In clinical practice, addressing childhood violence should be more focused and part of the diagnostic process for patients with adult mental health problems and unexplained chronic pain.

Page link to thesis: <http://hdl.handle.net/10037/11290>

Faculty of Health Sciences
Department of Community Medicine
16.6.2017

Thor Eirik Eriksen

Philosophiae doctor

The limits of positive certainty. A philosophical exploration of different approaches to the understanding of being human, using the problematic issue of medically unexplained symptoms as the point of departure

(*Positiv visshet i grenseland. En filosofisk utforskning av menneskeforståelser med utgangspunkt i problemfeltet medisinsk uforklarte symptomer*). This thesis deals with the issue of medically unexplained symptoms (MUS), which provides an opportunity for broad philosophical exploration: a) it reveals that certain limits for medical science are on the verge of being reached; b) it relates to a wealth of medical/scientific knowledge that is as likely to prove to be misleading as to be instructive; and, c) it reveals that the medical/scientific answers to the question of what this problem is, and also raises questions as to what and how human beings are. The project is philosophically grounded in that pondering philosophical questions and theories has fuelled the exploration. It is guided by the matter at hand (den Sachen selbst). It concerns quaternary prevention, meaning that the project challenges medicalization/ healthism in an attempt to prevent the suffering that may result from having too much knowledge or information regarding pathology, diseases and diagnoses. It is ethically founded in that it seeks to protect human dignity, even in the face of the inevitable tension between, on the one hand, a desire to control, explain, determine and predict, and, on the other hand, the need to open up to and reflect upon the ineradicable ambivalence and uncertainty that are also characteristic of human life. The project's articles aim to reopen an inquiry into the nature and understanding of the human being and of being human.

Faculty of Humanities, Social Sciences and Education
Department of Philosophy
15.9.2017

Harald Øverli Eriksen

Philosophiae doctor

Combining Satellite and Terrestrial Interferometric Radar Data to Investigate Surface Displacement in the Storfjord and Kåfford Area, Northern Norway

Radar remote sensing of unstable slopes is becoming a standard method. A radar is an active instrument that is capable of operating day and night, independent of weather conditions. Satellite radar systems allow regular monitoring of large areas on the Earth's surface. By combining repeated satellite- or ground-based radar observations, it is possible to detect precise terrain displacements in the line-of-sight of the radar. However, the displacement will be underestimated if the true surface displacement differs from the radar line-of-sight. This can make interpretation difficult. By combining satellite- and ground-based radar observations from different geometries, it is possible to provide information about direction and magnitude of surface deformation. This improves understanding of active surface processes such as rockslides and rock glaciers on landform-scale, and the large spatial coverage allows investigating relations between displacement and geomorphology on landscape-scale.

Page link to thesis: <http://hdl.handle.net/10037/11679>

Faculty of Science and Technology
Department of Geosciences
10.10.2017

Elin Anita Fadum

Philosophiae doctor

Adolescents and self-harm. A study of factors associated with suicide and use of health care services following self-harm in national representative populations of Norwegian adolescents

Self-harm is common in adolescents, and is strongly associated with mental health problems and suicide. Still, few of those who self-harm receives treatment; many

of those who died in suicide had no hospital contacts registered prior to their death. This thesis used data recorded in Norwegian governmental health registers, as well as data collected in a nationwide school survey carried out in Norway, to study risk factors for suicide and factors associated with the use of health services following self-harm in adolescents. The main findings were that major mental health problems in adolescence were associated with suicide. But the risk of suicide was also elevated in a group of well-functioning young men who had minor mental health problems that were assessed as not needing treatment. Among adolescents who were hospitalized for medication poisoning, females were in the majority and females were more often than males re-hospitalized for this condition. Adolescents who lived outside densely populated areas reported less help and treatment following self-harm than adolescents living in the city centres, but this association was only present in those who self-harmed without suicide intent.

Page link to thesis: <http://hdl.handle.net/10037/10291>

Faculty of Health Sciences
Department of Community Medicine
11.1.2017

Sabina Fattah

Philosophiae doctor

Systematic reporting of pre-hospital medical management in major incidents. Identifying needs, a suggested solution and assessing implementation

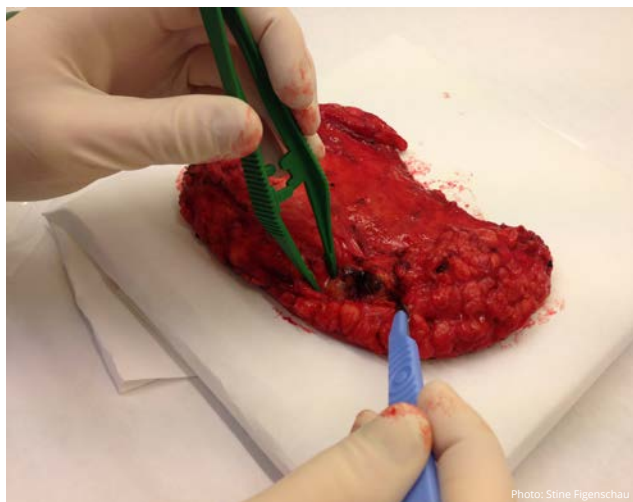
Major incidents put Emergency Medical Services to the test daily across the globe. Given the impact of major incidents on human lives and society, reporting should be standardised so that comparative analyses of incidents can be performed and learned lessons identified. The aim of this thesis was to contribute to such reporting. A systematic review was performed to identify existing major incident reporting templates. Due to the lack of a suitable template, expert opinion was utilised to create a novel template for reporting pre-hospital major incident medical



management. A study was conducted to identify users' experiences with the template and it was revised according to feedback. Later a template for reporting Helicopter Emergency Medical Services response to major incidents was developed using expert opinion. Both templates are freely available on www.majorincidentreporting.net. The main challenge has been recruiting reports. Given the relatively short timeframe in which the template has been available, there is reason to remain optimistic about the chances of further implementation of the reporting site and thus conducting more studies in the future.

Page link to thesis: <http://hdl.handle.net/10037/11256>

Faculty of Health Sciences
Department of Clinical Medicine
16.6.2017



Stine Figenschau

Philosophiae doctor

Inflammation in breast cancer. Immune cell infiltration and tertiary lymphoid structures in the tumor microenvironment.

The development of tertiary lymphoid structures (TLS) within the tumor microenvironment is believed to be a consequence of antigen challenge during anti-tumor responses. In this thesis, the researchers studied the intratumoral formation of TLS in a cohort of 290 breast cancer patients who underwent surgery at the University hospital of Northern Norway (UNN). Tumor-localized TLS were detected in one-third of the specimens and associated with abundant immune cell infiltration and higher histological grade. Further, deregulated transcripts were quantitatively compared in clinical tumor biopsies containing TLS with adjacent normal breast tissue by RNA sequencing analyses. Expression profiles of molecules important for lymphocyte trafficking were identified, including chemokines and ICAM-1. Consequently, *Figenschau and her fellow researchers* investigated the immunoreactivity and expression pattern of ICAM-1 in tumor specimens and normal breast tissue as well as

neoplastic cell lines. The findings showed that ICAM-1 was upregulated in more aggressive subtypes of breast cancer and its expression was inducible by well-known proinflammatory cytokines, regardless of hormone receptor status and metastatic potential of the cells.

Faculty of Health Sciences
Department of Medical Biology
21.4.2017

Åse Florholmen-Kjær

Philosophiae doctor

The metabolism of Acetaminophen after partial hepatectomy – in aspect of glutathione homeostasis. An experimental swine model

The leading hypothesis is that the liver has an abundant ability to maintain glutathione homeostasis after partial hepatectomy, resulting in an unaltered hepato-protective capacity when administrating acetaminophen postoperative. The aim of this thesis has therefore been to monitor the metabolism of acetaminophen after partial hepatectomy in an in vivo swine model, in aspect of alterations in glutathione homeostasis and formation of the hepatotoxic NAPQI. The results show maintained glutathione levels in the liver remnant, without signs of accumulated NAPQI when acetaminophen is administrated. These results indicate that maintained glutathione stores in the swine liver remnant prevent acetaminophen to cause drug-induced hepatotoxicity when administrated postoperative. Therefore, the results can bridge experimental findings to future clinical practice and thereby contribute to establishing safe guidelines for administrating the drug after partial hepatectomy.

Faculty of Health Sciences
Department of Clinical Medicine
6.10.2017



Photo: colourbox

Ane Schwenke Fors

Philosophiae doctor

Investigations of summer sea ice with X and C-band multi-polarimetric synthetic aperture radar (SAR)

Arctic sea ice is changing with climate change. To better understand the observed changes, new and improved methods for monitoring of sea ice are required. This thesis explores possibilities and limitations in use of Synthetic Aperture Radar (SAR) for summer sea ice investigations. SAR transmits microwaves towards the sea ice, and registers the returned radiant energy. This information is used to construct images of the sea ice. This thesis compares SAR images with ground and helicopter-borne measurements of sea ice. The work reveals that SAR images of summer sea ice can be segmented into segments representing different sea ice types. Knowledge about how different sea ice properties influence SAR images is needed to identify the sea ice type of each segment. The study

shows that information about two such properties, sea ice surface roughness and melt pond fraction, partly can be retrieved from SAR imagery. The results confirm that high resolution polarimetric SAR images and integration of meteorological data can increase the sea ice information gain during melt season.

Page link to thesis: <http://hdl.handle.net/10037/10723>

Faculty of Science and Technology
Department of Physics and Technology
17.3.2017

June Thorvaldsen Forsberg

Philosophiae doctor

Clinical implications of placebo analgesia - The role of individual differences in fear and genetics in clinical practice

Can a sugar pill reduce pain? Yes, if we expect a sugar pill to be an analgesic drug, the brain can reduce pain in the absence of drugs, i.e. placebo analgesia (PA). How effective is PA and how does it work? PA is due to both neurobiological and psychological mechanisms and is found to be highly effective to reduce clinical pain. Thus, Forsberg and her fellow researchers have considered clinical implication of PA. The present thesis presents three experimental studies and a meta-analysis. The researchers investigated how fear of pain (FOP) and genetics influence PA, and whether the effect of placebo treatment on healthy individuals could be transferred to patients. The studies suggested that FOP reduce PA and identified genetic markers for both FOP and PA. Further, more studies with patients showed pain relief compared to healthy individuals. Thus, the results from experiments have relevance for clinical practice. Assessing FOP and genetics could be valuable for optimizing the pain treatment outcome for each patient.

Faculty of Health Sciences
Department of Psychology
3.11.2017

Hege-Beate Fredriksen

Philosophiae doctor

Origins and impacts of spatial and temporal long-range dependence in the climate system

This thesis focuses on statistical analyses of Earth surface temperatures, and how we can construct simple temperature models with the same properties as observations. The part of the temperature fluctuations that reflects natural variability is often well described by a property called long-range dependence. The main reason for this is the large thermal inertia of the oceans. Oceans require more heat and a longer time to heat up compared to the atmosphere, resulting in slow temperature variations with long correlations, ranging up to many decades or even centuries. A model for global temperature is constructed by separating the ocean into a few interacting boxes forced by an energy imbalance at the surface. The output closely resembles natural temperature variations if forced by random weather variability. If forcing the same model by an increase in greenhouse gases, the temperature continues to increase due to past emissions, for a long time into the future.

Page link to thesis: <http://hdl.handle.net/10037/11847>

Faculty of Science and Technology
Department of Mathematics and Statistics
27.11.2017

Elia Dolores Gabarron Hortal

Philosophiae doctor

Social media and sexual health – New arenas for information on sexually transmitted infections and promotion of healthy sexual behavior

Several hundred million people contract sexually transmitted infections every year worldwide. Especially young people are at great risk of infection. Social media has already surpassed two billion users. Its large coverage gives potential for reaching a huge amount of the population in a very short time and thus makes these networks valued spaces to promote sexual health.

However, we do not know if the use of social media for sexual health promotion could result in better health outcomes. Reviews analysing the effect of health promotion interventions delivered through social media have reported small and moderate effects on behaviour change while pilot studies show positive effects on self-reported outcomes. To increase knowledge on how sexual health is promoted through social media, Gabarron reviewed publications from academics and non-governmental organisations. She found that around 25 percent of the studies have positive findings. However, better study designs are needed. In addition, Gabarron presents a case study where she used social media to promote sexual health among North-Norwegian youngsters. Two observational studies showed that people have an interest for sexual health topics, they discuss it in the social media, and they search for information in these media at specific moments. Sexual health promotion studies with stronger study designs, delivered through the precise social media channel, and during the appropriate moment, will show all the benefits that these media can have on health promotion.

Page link to thesis: <http://hdl.handle.net/10037/11236>

Faculty of Health Sciences
Department of Clinical Medicine
5.5.2017

Sumit Ganguly

Philosophiae doctor

Ligand Noninnocence In Manganese, Iron, and Cobalt Corroles

The red color of blood (hemoglobin) and the green color of leaves (chlorophyll) both result from different forms of a ring-shaped molecule called porphyrin, which can bind a metal atom at its center. That metal atom is iron in the case of hemoglobin and magnesium in the case of corroles. In his work, Ganguly has constructed slightly tighter molecular rings called corroles and inserted three different elements – manganese, iron, and cobalt – at their centers. As a result of tighter binding between the ring and the metal atoms, these artificial constructs exhibit quite different properties than

the natural porphyrins. There are already indications that a number of these molecules act as catalysts for a variety of processes of great societal importance such as the generation of hydrogen from water. The expectation is that the insights he has obtained will lead to significantly better catalysts than what is available today.

Page link to thesis: <http://hdl.handle.net/10037/11848>

Faculty of Science and Technology
Department of Chemistry
30.11.2017

Silje Gaupseth

Philosophiae doctor

How to Be a Heroic Explorer in a Friendly Arctic: A Chronotopic Approach to Self-Representation in Vilhjalmur Stefansson's The Friendly Arctic: The Story Five Years in Polar Regions (1921)

This dissertation deals with the exploration account *The Friendly Arctic: The Story of Five Years in Polar Regions* (1921), written by Canadian-American anthropologist and explorer Vilhjalmur Stefansson (1879-1962). Stefansson's story is based on his experiences during the Canadian Arctic Expedition, which traversed and mapped stretches of ocean and land in the Canadian Arctic in the years 1913-1918. The methodological and theoretical approach of the study is largely based on Mikhail Bakhtin's concept of the chronotope, which is combined with relevant concepts and analytical approaches from narrative theory and method. In order to understand Stefansson's narrative self-representation in *The Friendly Arctic*, the study contends, two interdependent – and potentially conflicting – chronotopes that give form to his narrative must be examined: a friendly Arctic chronotope and a quest chronotope, which combine elements of plot and character, story and discourse. Against this background, the self-representation of Stefansson as Arctic explorer (basing his characteristic explorative techniques on Inuit knowledge) may sometimes be seen as ambivalent, and there is a similar tension in the narrative representation

of his friendly Arctic. The study is of relevance to the field of travel and exploration literature, and is influenced by recent work on Arctic discourses.

Page link to thesis: <http://hdl.handle.net/10037/10216>

Faculty of Humanities, Social Sciences and Education
Department of Language and Culture
3.2.2017

Olga Vikhammer Gran

Philosophiae doctor

Venous thromboembolism and cancer

Venous thromboembolism (VTE) is a common complication in cancer, and may also be the first sign of an underlying malignancy. All four papers in this thesis use the Tromsø Study and paper II uses the Scandinavian Thrombosis and Cancer cohort, which is comprised of data from 3 large Scandinavian cohorts. The researchers found a joint effect between two SNPs in the F5 gene and cancer on the risk of VTE. The risk of VTE has traditionally thought be to highest in the first 6 months after cancer diagnosis, however, after accounting for mortality, the risk of VTE was equal in the 6 months before and after a cancer diagnosis. This suggests that cancer itself is a major contributor to the VTE risk, rather than cancer treatment. Gran and her fellow researchers found that occult cancer-related incident VTE was associated with a higher rate of VTE recurrence than overt cancer and non-cancer related VTE. Patients with occult cancer-related incident VTE had more prothrombotic and advanced cancers. Most VTE recurrences were not cancer treatment related as they occurred before a cancer diagnosis. D-dimer levels >5000 ng/ml at incident VTE were associated with a higher risk of cancer at 1 and 2 years. Patients with higher D-dimer levels had more advanced cancers at diagnosis and higher mortality rates.

Page link to thesis: <http://hdl.handle.net/10037/11258>

Faculty of Health Sciences
Department of Clinical Medicine
27.6.2017

Julie Cornelius Grenvald

Philosophiae doctor

Understanding winter patterns of zooplankton Diel Vertical Migration (DVM) in a high Arctic fjord (Kongsfjorden, Svalbard)

Recent Arctic studies contradict the long-held paradigm of winter quiescence and document activity levels in the marine food web even during the darkest months of winter. A phenomenon that has attained considerable attention is patterns of Diel Vertical Migration (DVM) of zooplankton during the polar night. Why do organisms migrate in a seemingly constant dark environment? This PhD thesis is aimed at examining the general patterns on DVM during the polar night in Svalbard waters, with a main aim of identifying which species are in fact migrating and why they conduct these energetically costly migrations. The results show that polar night DVM is a complex phenomenon, and involves several migration patterns. Zooplankton net sampling, in parallel with acoustics, revealed that krill were the dominant species behind migratory patterns. Molecular and electrophysiological experiments showed that ambient light levels rather than endogenous genetic control governed winter migration patterns.

Page link to thesis: <http://hdl.handle.net/10037/10964>

Faculty of Biosciences, Fisheries and Economics
Department of Arctic and Marine Biology
9.5.2017

Ulrike Grote

Philosophiae doctor

Calanus glacialis and C. finmarchicus in a warming Arctic Implications of increasing temperature at the individual and population level

Seawater temperatures are increasing in the Arctic due to global warming. This will have implications for organisms that cannot regulate their body temperature, such as

copepods. Copepods can store high amounts of energy in form of lipids, which makes them important prey items for many other animals. In this thesis, Grote investigated the effects of temperature on the feeding, egestion, respiration and egg production of two different copepods, *Calanus glacialis* and *C. finmarchicus*. While *C. glacialis* is common in Arctic shelf seas, *C. finmarchicus* is smaller and occurs mainly in the warmer North Atlantic. The results show that *C. glacialis* is much more sensitive to temperature. Modelling the effects of increasing temperature indicates that *C. finmarchicus* abundance will increase in the Barents Sea. *C. glacialis* abundance will increase until seawater temperatures reach 5-6 °C and decrease at higher temperatures, likely affecting organisms depending on energy rich food negatively.

Page link to thesis: <http://hdl.handle.net/10037/10739>

Faculty of Biosciences, Fisheries and Economics
Department of Arctic and Marine Biology
21.3.2017

Njål Gulbrandsen

Philosophiae doctor

Diagnostics of Ion Beam and Current Free Double Layer in Helicon Plasma Devices with Expanding Magnetic Field

In a vacuum chamber, an argon plasma is created using a radio frequency source connected to an expansion chamber. Using an expanding magnetic field, a potential drop is set up between the source and the expansion chamber. This potential drop, sometimes called a current-free double layer, will accelerate the argon ions toward the expansion chamber where they reach velocities of around 10 km/s. The main focus of this project has been the diagnostics of these ion beams using the two different techniques. The first technique is using gridded electrostatic probes, called Retarding Field Energy Analyzers, to measure the kinetic energy and flux of the beam. The second technique is using a laser measurement method called Laser Induced Fluorescence to measure

the velocity of the ions. These two types of diagnostics are compared.

Page link to thesis: <http://hdl.handle.net/10037/11633>

Faculty of Science and Technology
Department of Physics and Technology
18.9.2017

Martin Iversen Hagve

Philosophiae doctor

Postoperative insulin resistance - metabolic alterations and therapeutic approaches

All patients undergoing surgery go into a temporary state similar to diabetes during the first days to weeks after the operation; the so-called “diabetes of injury”, where the body does not respond normally to the hormone insulin. The state is known as postoperative insulin resistance (insulin resistance after surgery) and increases the length of hospital stay as well as the likelihood of complications after surgery. This work aimed to make a surgical model in pigs to further examine the underlying reasons for this, and tested strategies to prevent insulin resistance after surgery. The studies showed that the mitochondria, the main energy centre in the body’s cells, burn sugar more slowly after surgery, and that they release more so-called oxygen radicals, two events that could cause the insulin resistance. The researchers also show that by taking a beverage containing a high amount of sugar before surgery, the body improves its response to insulin. By regulating blood sugar with the hormone GLP-1 during an operation, insulin resistance was prevented. This work sheds light to why insulin resistance after surgery occurs, and the positive results of preventive strategies have implications for how it is treated in patients.

Faculty of Health Sciences
Department of Clinical Medicine
28.8.2017

Sigurd Mathiesen Hald

Philosophiae doctor

The prognostic impact of immune-related markers in non-small cell lung cancer

Lung cancer is the leading cause of cancer-related deaths worldwide. The immune system can both promote and inhibit lung cancer development, but much is unknown regarding the expression of different immune cells in lung cancer tissues and their influence on prognosis. The researchers have investigated the expression of multiple immune cells and immune-related molecules in patients treated with surgery for non-small cell lung cancer, which is the most common form of lung cancer. *Hald and his fellow researchers* found that increased expression of specific immune cells and related molecules, such as CD8 and LAG-3, in non-small cell lung cancer tissues is associated with longer patient survival. Ultimately, if confirmed in larger trials, the research may allow us to more accurately predict prognosis for lung cancer patients and aid doctors in selecting appropriate treatments.

Page link to thesis: <http://hdl.handle.net/10037/11255>

Faculty of Health Sciences
Department of Clinical Medicine
15.6.2017

Charmain Danielle Hamilton

Philosophiae doctor

Challenges for ice-associated top trophic Arctic animals in a changing climate

The movement, behaviour and spatial overlap of ringed seals, polar bears and ivory gulls were investigated using data from biotelemetry devices in order to study the impacts of the shift in the sea-ice regime that occurred in Svalbard, Norway, in 2006. These species are linked; polar bears kill ringed seals and ivory gulls scavenge on polar bear kills. Ringed seals spent more energy foraging following the sea-ice collapse. Coastal polar bears spent less time near glacier fronts in the summer after the sea-ice



collapse, leading to a decrease in spatial overlap between coastal polar bears and ringed seals. All three species travelled to the offshore marginal sea-ice zone in the Barents Sea to forage. The main spatial overlap areas for these species occurred north of the 50% sea-ice contour. Further deterioration of sea-ice conditions and ongoing glacier retreat will have consequences for these three species in Svalbard, which will have ramifications for the wider Arctic marine and terrestrial ecosystems.

Page link to thesis: <http://hdl.handle.net/10037/11969>

Faculty of Biosciences, Fisheries and Economics
Department of Arctic and Marine Biology
17.2.2017



Ann Kristin Hansen

Philosophiae doctor

Biology of signalling receptors in human articular chondrocytes. Implications for chondrogenesis and cartilage repair.

Osteoarthritis (OA), characterised by painful and dysfunctional joints, is a major challenge since no treatments that halt or reverse the disease are available. Using human cartilage from knee replacement surgeries and cells from chondrocyte transplantations, the researchers investigated cell-signalling receptors in the context of OA and generation of new cartilage tissue. They found that cartilage has receptors for the inflammatory mediator leukotriene B₄, but the mediator had no effect on chondrocyte functions *in vitro*. Hansen and her colleagues established that the chondrocyte has both the

vitamin D receptor and the enzyme that activates vitamin D, suggesting a local effect of vitamin D in cartilage. However, they found no beneficial effects of vitamin D during *in vitro* experiments. Measuring cell-surface receptors involved in regulation of cartilage tissue synthesis could not predict cartilage formation abilities, but protein measurements pointed to an enzyme involved in collagen organisation as a potential biomarker.

Page link to thesis: <http://hdl.handle.net/10037/11814>

Faculty of Health Sciences
Department of Clinical Medicine
5.12.2017

Abul Ahsan Md Mahmudul Haque

Philosophiae doctor

Decentralized Orchestration of Open Services- Achieving High Scalability and Reliability with Continuation-Passing Messaging

An ever-increasing number of web applications are providing open services to a wide range of applications. Whilst traditional centralized approaches to service orchestration are successful for enterprise service-oriented systems, they are subject to serious limitations for orchestrating the wider range of open services. Dealing with these limitations calls for decentralized approaches. However, decentralized approaches are faced with a number of challenges, including the possibility of loss of dynamic run-time states that are spread over the distributed environment. This thesis presents a fully decentralized approach to orchestration of open services. The flow-aware dynamic replication scheme supports both exceptional handling, failure of orchestration agents and recovers from fail situations. During execution, open services are conducted by a network of orchestration agents which collectively orchestrate open services using continuation-passing messaging. The performance study showed that decentralized orchestration improves the scalability and enhances the reliability of open services. The orchestration approach has a clear performance advantage

over traditional centralized orchestration as well as over the current practice of web mashups where application servers conduct the execution of the composition of open web services. Finally, in the empirical study, the researchers presented the overhead of the replication approach for service orchestration.

Page link to thesis: <http://hdl.handle.net/10037/11979>

Faculty of Science and Technology
Department of Computer Science
14.12.2017

Eirik Eriksen Heen

Philosophiae doctor

Endogenous sharing of knowledge

This thesis investigates the willingness of firms to cooperate on Research and Development (R&D). The main findings are that firms are less willing to cooperate on R&D when the firms face tough market competition. It is not just competition that plays a role, but also initial asymmetry between firms. If one firm is ahead of the others in terms of technology or knowledge, the leading firm will be less willing to agree to cooperate on R&D. Allowing for a side payment being transferred from the lagging firm to the leading one makes the leading firm more willing to cooperate. One way that seems to lead to both high R&D and incentive to cooperate is to prevent firms from entering into R&D exchange before investment in R&D has taken place. The threat of one firm “out running” the other, keep both investing, and as long as the firms invested fairly equally, they wished to cooperate by agreeing ex post to share their knowledge.

Page link to thesis: <http://hdl.handle.net/10037/11807>

Faculty of Biosciences, Fisheries and Economics
School of Business and Economics
13.12.2017

Beate Hegge

Philosophiae doctor

Molecular Studies of PAX6 Functions in Cancer Cells, and Identification of the Glucocorticoid Receptor as a Novel Interaction Partner

PAX6, a transcription factor relevant for normal embryo development, is also responsible for gene regulation and changes in cell behavior in cancer cells. Transcription factors are proteins that bind to DNA and turn genes on or off. The genes that are turned on in cells determine the function of the cell, and when gene expression is misregulated it can cause cancer. Some tumors (cancers) have high levels of PAX6 and some have low levels, or no PAX6 at all. However, the exact function of PAX6 in tumor cells is not known. The researchers have generated two different cancer cell lines deficient in PAX6 expression, where one originates from pancreatic cancer and the other from brain (glioblastoma). These cell lines are used as model systems, and novel genes regulated by PAX6 are identified. The results showed that removal of PAX6 changes the cell's ability to proliferate (increase in number), migrate (move to another place) and respond to chemotherapeutic treatment. Importantly, Hegge and her colleagues discovered that PAX6 can bind to and work together with another transcription factor, namely the Glucocorticoid receptor (GR). GR is activated by glucocorticoids that are used frequently in cancer treatment, so the molecular mechanisms identified for the PAX6/GR interaction may be of relevance for patients with PAX6 positive tumors with regard to glucocorticoid treatment in the future.

Page link to thesis: <http://hdl.handle.net/10037/12153>

Faculty of Health Sciences
Department of Pharmacy
3.11.2017

Morten Heide

Philosophiae doctor

The influence of product, contextual and individual characteristics on food evaluation

The overall objective of this thesis is to provide insights with regard to how characteristics of the product, the context and the individual relate to consumer evaluation of food products. The data analysis in this thesis consists of 3 main methodologies: Structural equation modelling, cluster analysis and conjoint analysis. This thesis contributes to the understanding of how food preparation influences how consumers evaluate food products. How satisfied consumers are with preparation of a food product is an important determinant of how consumers evaluate food products, and including the preparation phase in product development can enable the developer to better tailor the products to the consumers' needs and wants. This thesis demonstrates the importance of segmenting consumers based either on how they evaluate different products or individual characteristics. The findings can be used by relevant stakeholders to develop products and marketing strategies.

Page link to thesis: <http://hdl.handle.net/10037/11680>

Faculty of Biosciences, Fisheries and Economics
School of Business and Economics
4.11.2017

Jørn Erik Henriksen

Philosophiae doctor

Cultural meeting and identity in coastal Finnmark in early historical times. Interpretations based on archaeological analyses of multi-room houses.

(Kulturmøte og identitet på Finnmarkskysten i tidlig historisk tid. Tolkninger basert på arkeologiske analyser av mangeromstuffer). A total of 35 multi-room houses dated to ca. 1250-1650 AD on 23 different sites are examined, from North Troms to the west, to the Pechengafjord,

Russia, to the east. The houses represent building complexes with 3 to 20 “rooms” connected by entrances/ corridors enclosed by a common exterior wall. Most focus is devoted to the period ca. 1250-1450 AD. What characteristics did the architecture of the Multi-Room houses have? What local and external prerequisites for the establishment and use of the Multi-Room were effective? Conclusions on both central issues are based on 1) a new historical situation where external actors dwelled on the northernmost coast of Norway on a more permanent basis, and 2) a context characterized by rivalry between Norwegian/Western Nordic and Russian interests, where trade and taxation of the Sami was central. The closest contemporary counterparts of the multi-room house are found within North Atlantic tradition, but the excavation results also revealed Russian/Karelian and presence of local Sami actors. The Multi-Room houses are thus interpreted as a material expression of cultural hybridization that took place in the meetings between different cultural groups in the medieval north.

Page link to thesis: <http://hdl.handle.net/10037/10222>

Faculty of Humanities, Social Sciences and Education
Department of Archaeology, History, Religious Studies and Theology
17.2.2017

Astrid Marie Holand

Philosophiae doctor

On how wants and ideas write the law: The inversion of the territorial limit law in 1992.

(Hvordan nød og nye ideer skaper nye lover: Speilvingingen av sjøgrenseloven i 1992). Common law is not written on stone tablets. Au contraire. Legislation reflects society's changing needs and world views. This becomes remarkably evident in times of change. The thesis' case is the 1992 revision of Norwegian fisheries legislation. Until then, landings of fish catches from foreign vessels in Norwegian harbors were prohibited. When NEA cod became less abundant in the late 1980s, the legitimacy of this rule



Photo: Astrid M. Holand

came into question. Using theories from innovation and resilience studies, both rooted in Schumpeter's ideas of creative destruction, Holand tells a tale of outdated rules, of adaptive capacity, and of local agents promoting legislative change to access resources. A central finding is that in this case top-down and bottom-up processes worked together to allow for foreign landings. Using a triple-bottom-line perspective, Holand also finds that while Norwegian fisheries policy used to be strongly anchored in social concerns, during the past 30 years environmental and market concerns have become dominant.

Page link to thesis: <http://hdl.handle.net/10037/10099>

Faculty of Biosciences, Fisheries and Economics
The Norwegian College of Fishery Science
13.1.2017

Ralph Høibakk

Philosophiae doctor

Solutions to some problems related to Diophantine equation, power means and homogenization theory

Finding integer solutions to algebraic equations is a branch of mathematics that has attracted mathematicians since ancient times. The fascination stems from both the apparent ease of problem formulation, the complex and deep search for solutions and the unexpected and often beautiful formulation of an answer. We know from Pythagoras that the equation $x^2 + y^2 = z^2$ has infinitely many integer solutions where we can give m and n any integer value. Andrew Wiles has recently proved that Fermat's last conjecture, $x^n + y^n = z^n$ has no integer solutions for $n > 2$. The origin of the thesis is a problem that, in different forms, has been contemplated by mathematicians since Newton's time. In order to find integer solutions to all lines and line segments in a geometric structure called The Crossed Ladders Problem, the challenge is to determine if there are integer solutions to a set of four simultaneous second degree equations. Surprisingly, there are infinitely many integer solutions to these four equations, and they can be presented in a compact form somewhat similar to the formulation of integer solutions to the Pythagorean equation shown above. Further examination of the Crossed Ladders diagram revealed that it harboured hidden properties that lent itself to the study of averages and of composite materials where the effective conductivities are power means of the local conductivities.

Faculty of Engineering Science and Technology
Department of Computer Science and Computational Engineering
19.5.2017

Ragnhild Barclay Håkstad

Philosophiae doctor

Interaction and mutuality in physical therapy for preterm infants and their parents

In this project, the researchers have investigated physical therapy for preterm infants and their parents during the first year post-hospital discharge. Based on observations of therapy sessions and interviews with physical therapists (PT) and parents, they discovered how the PTs' interactional skills can promote infant development and support parents in their new caregiver role. The PT's merging of therapeutic actions with the infant's play engagement facilitates motor improvements. When the parents get to be involved in the therapeutic work, they can discover their infant's capacities and skills. Therefore, PTs and parents need to work together in their exploration of how to engage the infant in playful motor learning. By this, the PT can teach the infant and parents new ways to interact, through which the infant can practice and develop new motor skills in daily life. These connections between interaction, play and learning must be known and integrated in PTs' work with children and parents.

Page link to thesis: <http://hdl.handle.net/10037/11254>

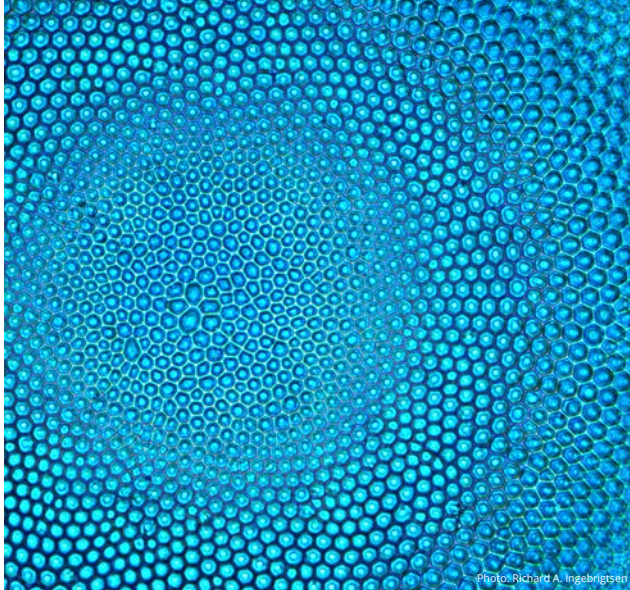
Faculty of Health Sciences
Department of Health and Care Sciences
15.6.2017

Richard André Ingebrigtsen

Philosophiae doctor

Bioactivity in arctic marine diatoms - Biomass from mass cultivated diatoms, influence of cultivation conditions on bioactivity and analysis of bioactivity in bulk plankton samples

Marine microalgae are considered to be a promising source of new bioactive compounds with therapeutically relevant activity. However, very few compounds from marine diatoms are so far described, despite the group's immense



diversity and ecological importance in all oceans. The aim of this study was to evaluate the biodiscovery potential of diatoms and plankton. To achieve this, the researchers harvested bulk biomass at sea in addition to isolating strains of northern marine diatoms. The isolates were mass-cultivated with various conditions and the resulting biomass from mass cultivations and field sampling was tested in several therapeutically relevant bioassays such as anticancer, antibacterial, antibiofilm, etc. Ingebrigtsen and his colleagues found therapeutically relevant bioactivity in all species and field samples investigated, and variation in bioactivity profiles between species, cultivation conditions of isolates and field sampling areas (for bulk samples).

Faculty of Biosciences, Fisheries and Economics
The Norwegian College of Fishery Science
14.6.2017

Jonas Jakobsen

Philosophiae doctor

The Claims of Freedom: Habermas' Deliberative Multiculturalism and the Right to Free Speech

This thesis analyzes and discusses Jürgen Habermas' political philosophy, focusing on his theories of multiculturalism and deliberative democracy. Jakobsen applies Habermas' framework to a particular question, namely how we should justify and use free speech in culturally diverse democracies. The first part of this question (how to justify free speech) pertains to how we should justify constitutional free speech as political philosophers. Here, Jakobsen advocates robust free speech guarantees, based on a reading of Habermas' normative theory of (reflexive, political, and private) freedom. Jakobsen argues that legal regulations of hate speech (i.e. racist speech) may be legitimate, but not regulations of blasphemy and religious offense. The second part (how to use free speech) pertains to the citizens' use of free speech in culturally diverse contexts, and thus transcends the focus on mere legality. Here, the researcher argues that the same concern with freedom that justifies free speech as a constitutional right also limits free speech - in a pragmatic and moral sense. The pragmatic sense refers to how hate speech and misrecognition harm the social preconditions for freedom, in particular the freedom of members of weak or marginalized groups. The moral sense in which freedom limits freedom refers to norms of equal recognition that guide (or should guide) public deliberation between persons who respect each other as free and equal.

Page link to thesis: <http://hdl.handle.net/10037/10962>

Faculty of Humanities, Social Sciences and Education
Department of Philosophy
21.4.2017

Tomasz Jarymowicz

Philosophiae doctor

Democratic Deliberation in the Context of Deep Pluralism and Mass Democracy: A Case for an Epistemic Idea of Public Reason

This thesis aims to answer the question of how citizens should talk to each other about matters of public interest in the context of deep pluralism and mass democracy. Jarymowicz makes a case for a strong moral basis of equal respect as a guiding norm in democratic deliberation. This is to make sure that democratic procedure can be judged according to whether the preferences and interests of all the affected are reflected in democratic outcomes for good reasons. A deliberative account of a public dialogue appreciates the fact of deep pluralism and mass democracy given that it has this promising epistemic element in it. However, this element is too weak to make a non-trivial difference in comparison with pure proceduralism. Jarymowicz argues there should be a procedure based on a substantive and procedural idea of equal respect. The substantive dimension of equal respect is transformed into a moral standard whose task is to increase the possibility for democracy to give epistemically better results. The procedural part of equal respect ensures that this moral principle is not perfectionist. The researcher also makes a case for a deliberative activism within a deliberative system. Such activism combines deliberative capacity with contestation, which allows it to reconcile equal respect with the conditions of mass democracy and deep pluralism. This way moral principle of equal respect is put into a systemic context.

Page link to thesis: <http://hdl.handle.net/10037/11168>

Faculty of Humanities, Social Sciences and Education
Department of Philosophy
19.6.2017

Mary Katherine Jones

Philosophiae doctor

Perceptions, Persuasion & Power. The textual shaping of Spitsbergen (Svalbard), 1895-1920: an international view

Texts about Spitsbergen (Svalbard) published in European scientific journals between 1895 and 1920 – the final quarter-century of this Arctic region's status as a no man's land – sometimes served a political purpose as well, reflecting the national culture and territorial ambitions of their time. Creating a bibliographical database of these texts and examining their contents and form has helped to identify trends in the international communication of scientific findings and political developments in the region through the choice of language of publication and changes in the overall perception of this Arctic region. In some cases, texts became tools of persuasion in the pursuit of sovereignty, industrial power and national historical legitimacy, which over time would shape the region textually, both in terms of which texts were published and what the publications were intended to portray.

Page link to thesis: <http://hdl.handle.net/10037/11431>

Faculty of Humanities, Social Sciences and Education
Department of Archaeology, History, Religious Studies and Theology
21.6.2017

Sigfrid Kjeldaas

Philosophiae doctor

Nature Writing as Contact Zone: Western and Inuit Perspectives on Landscape and Animals in Barry Lopez's Arctic Dreams

This dissertation investigates Barry Lopez's *Arctic Dreams: Imagination and Desire in a Northern Landscape* (1986) from an arctic perspective, and how it presents arctic landscapes and animals. It reads Lopez's text in the traditions of North American nature writing and arctic exploration literature, and looks at how scientific and



Romantic ideas and representations of the region meet in this text. If we read *Arctic Dreams* in terms of a contact zone in which these perspectives engage in creative dialogue with each other and with Inuit perspectives on the natural environment, new aspects of this classic text emerge, along with new visions of the arctic. Lopez's arctic becomes a lively and social space in which animals and humans coexist within all-encompassing relationship networks that bridge the worlds of nature and culture. In *Arctic Dreams*, Lopez combines scientific information with Romantic aesthetics in order to evoke this more social and material understanding of arctic landscapes, while at the same time exposing to us the values and limitations of these two different forms of representation. Lopez's text reworks the nineteenth-century Romantic aesthetic of the arctic natural sublime into a twentieth-century ecological sublime. This reflects the environmental thrust of *Arctic Dreams* which, throughout its sustained reflections on the Arctic, challenges Western culture's instrumental and reductive perspectives on animals in particular and the natural world in general.

Page link to thesis: <http://hdl.handle.net/10037/11704>

Faculty of Humanities, Social Sciences and Education
Department of Language and Culture
10.11.2017

Truls Tunby Kristiansen

Philosophiae doctor

Norwegian society as a community capable of collective action – Failure and institutional change following the July 22 terrorist attacks

(*Det norske samfunnet som handlingsdyktig fellesskap – Svikt og endring etter 22. juli-terroren*). This dissertation investigates the aftermath of the terrorist attacks in Norway on July 22, 2011, and asks how Norwegian society dealt with the realization of readiness and protection failure. The realization prompts action towards avoiding failure in the future, and the dissertation develops a systems-theoretical model of society as a community capable of collective action, to capture this process. Through analyses of four empirical cases – the failure of the authorities to secure the government buildings in Oslo, the police's failure in protecting the people on Utøya, the failure in constructing a national memorial site, the mass media's failure in providing an ethically sound news coverage and public sphere around the events – the dissertation shows how failure may be a starting point for processes of designing new institutions to ensure better problem solving in the future, and how this process is shaped by a fundamental conflict between individual and collective rationality.

Page link to thesis: <http://hdl.handle.net/10037/11799>

Faculty of Humanities, Social Sciences and Education
Department of Social Sciences
27.11.2017

Monica Evelyn Kvande

Philosophiae doctor

Incipient changes in ICU patients' clinical conditions – signs, nurses' assessment and the dialogue between nurses and physicians

The aim of this study was to explore the phenomenon of becoming aware of incipient changes in the conditions of ICU patients. Furthermore, the study explored the



dialogue between nurses and physicians regarding the clinical status of patients and the prerequisites for an effective and accurate exchange of information. This study included close observations and in-depth interviews with ICU nurses and focus group discussions with ICU nurses and physicians. Nurses formed images of patients composed of signs (of changes in a patient's condition) that were sensory, measurable, and manifested as the mood of the nurse. Care situations and following patients through shifts are essential for nurses to perceive these signs. Nurses understand each patient's situation and foresee clinical eventualities through a sensitive and attentive way of thinking and working. Nurses should be aware of their essential role in conducting ongoing observations of patients and their right to be included in decision-making processes. Accurate and effective dialogue between nurses and physicians requires the physicians' willingness to listen to and include the nurses' observations and concerns in decision-making processes.

Page link to thesis: <http://hdl.handle.net/10037/11248>

Faculty of Health Sciences
Department of Health and Care Sciences
9.6.2017

Lars-Henrik Larsen

Philosophiae doctor

"Navigare necesse est". Bio Environmental implications of shipping in the European Arctic

Global warming is leading to the Arctic sea ice melting. This eases both destination traffic to and from the European Arctic, and transit shipping through the Arctic. The study looks into the bio-environmental implications of shipping in the Arctic, illustrated by a scenario where a well prepared journey takes an unwanted turn, the vessel grounds and loses its propulsion fuel (Marine Diesel Oil) and its cargo. This event provides the input to modelling of the spread of hydrocarbon contaminants (PAH) through a shallow water Arctic marine ecosystem. The modelling exercise is supported by data on accumulation and excretion of PAH in a key predator of the ecosystem, generated through laboratory experiments. Data measured at an actual spill of diesel in the Arctic are also entered into the model. Shipping in a future warmer Arctic will include navigation during the polar night, a period poorly covered by biological data. The study presents data on polar night fish feeding activity from five years of January sampling in the waters off Svalbard, indicating high biological activity and potentially similar vulnerability of the ecosystem during the polar night as during the light part of the year.

Page link to thesis: <http://hdl.handle.net/10037/11079>

Faculty of Biosciences, Fisheries and Economics
Department of Arctic and Marine Biology
8.6.2017

Lill Sissel Sverresdatter Larsen

Philosophiae doctor

Speaking on behalf of the person with dementia in home-based care. A qualitative study of collaboration between formal and family caregivers in Sami and Norwegian municipalities

To meet the challenges resulting from the prevalence

of dementia, the Norwegian authorities have promoted improved collaboration between home and health care providers, users' involvement and continuity of care. This study's primary objective was to contribute to the body of knowledge regarding how formal and family caregivers described and reflected on collaboration in home-based dementia care. The research field is rural multi-ethnic municipalities in northern Norway, and the study relies on data from 18 in-depth interviews with formal (11) and family caregivers (7) and from brief fieldwork in which two dementia teams were followed over two days. The analytical strategy is a mix of thematic analysis and use of the positioning triad to help explore how ethnic affiliation, user involvement and continuity of care concepts influenced formal and family caregivers' collaboration. Taken together, three articles and the metaphor of a 'collaboration mosaic' indicate how collaboration is negotiated and practiced in home-based care. The study shows potential barriers to collaboration and further how these barriers can be substantial in terms of both formal and family caregivers' perception of healthcare services and thus with regard to the offer and utilization of such services.

Page link to thesis: <http://hdl.handle.net/10037/11485>

Faculty of Health Sciences
Department of Health and Care Sciences
8.9.2017

Johanna Laue

Philosophiae doctor

Managing exacerbations of chronic obstructive pulmonary disease – An investigation of treatment decisions from a primary care perspective

A main goal in care for chronic obstructive pulmonary disease (COPD) is early and adequate treatment of acute exacerbations. The researchers conducted a systematic review of COPD guidelines and two qualitative interview studies with COPD patients and general practitioners (GPs) to investigate treatment decisions for antibiotics

and oral corticosteroids, and for hospitalization in primary care, respectively. Overall, Laue and her colleagues found that managing worsening symptoms is challenged considerably by medical uncertainty, and that purely clinical criteria are of limited help for making differentiated treatment decisions. COPD patients eligible for self-treatment emerged as fearful of the medications' side-effects and would therefore hesitate starting treatment due to their uncertainty. A dysfunctional patient-physician relationship emerged as a main barrier to help-seeking. GPs, being overall worried about having overseen a severe illness, tended to apply a "better safe than sorry" approach to their treatment decisions. Knowing their patients as people emerged as a helpful tool to interpret the often diffuse symptoms, and to make more differentiated treatment decisions. Moreover, GPs regarded a reliable local healthcare infrastructure to ensure monitoring and quick response to deterioration as important to apply a more restrictive approach to their treatment decisions. Overall, the findings of this thesis support a collaborative approach to management of COPD exacerbations that is grounded on a trustful patient-physician relationship and a well-organized primary care infrastructure.

Page link to thesis: <http://hdl.handle.net/10037/10949>

Faculty of Health Sciences
Department of Community Medicine
24.3.2017

Gunhild Lerstad

Philosophiae doctor

Endocrine-related factors and risk of venous thromboembolism

There is limited knowledge concerning the association between levels of blood sugar, thyroid stimulating hormone (TSH), vitamin D, calcium, parathyroid hormone (PTH) and risk of venous thromboembolism (VTE). The present thesis investigates these associations in cohorts with participants from the Tromsø Study. Impaired glucose metabolism was not associated with future risk of VTE.

High and low levels of TSH, an important regulator of metabolism, were associated with a moderately increased VTE risk. Vitamin D levels were not associated with VTE risk. PTH is a key hormone in the regulation of calcium in the blood. The researchers found that neither calcium nor PTH were associated with risk of VTE. However, both high calcium and PTH levels increased the risk of VTE by 78% compared to normal levels. The findings add further insight into the association between hormone-related factors and VTE, but more studies are still needed.

Page link to thesis: <http://hdl.handle.net/10037/11252>

Faculty of Health Sciences
Department of Clinical Medicine
31.5.2017

Caroline Lind

Philosophiae doctor

Bidirectional association between arterial and venous thrombosis

This thesis aimed to investigate the potential link between venous thromboembolism (VTE, i.e. deep vein thrombosis (DVT) and pulmonary embolism (PE)) and arterial cardiovascular diseases (CVD, i.e. myocardial infarction (MI) and ischemic stroke) in a general population. MI was associated with a transient increased risk of VTE and explained 6% of the PEs in the population. VTE was associated with increased risk of arterial CVD in all women and men < 65 years, and explained 1% of the arterial CVDs in the population. Family history of MI (FHMI) was a risk factor for both MI and VTE. The association between FHMI and VTE applied to unprovoked deep vein thrombosis and was not explained by atherosclerotic risk factors or MI. VTE was associated with plaque progression in subjects with carotid plaques, but not with carotid plaque formation. Chronic inflammation did not mediate the association between VTE and carotid plaque progression. Based on the findings, there appears to be a bidirectional and transient association between VTE and arterial CVD. Family history of MI is a shared risk factor

for VTE and MI, and atherosclerosis may partly mediate the link between VTE and future arterial CVD.

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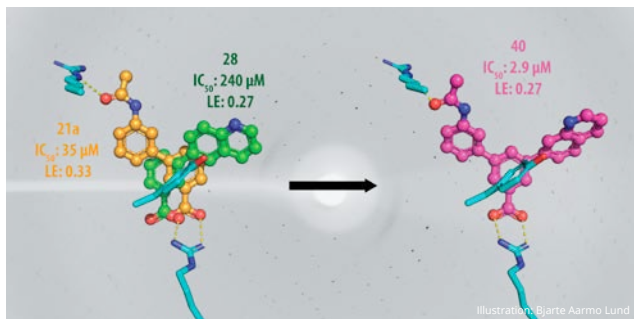
Faculty of Health Sciences
Department of Clinical Medicine
22.6.2017

Bjarte Aarmo Lund

Philosophiae doctor

The OXA-class of β -lactamases. A structural view on antibiotic resistance

Antibiotic resistance is a topic that concerns everyone, and the 2050 deaths due to antibiotic resistant bacteria may surpass the number of deaths due to cancer. The OXA-class of antibiotic resistance enzymes is a formidable threat. This project aims to understand antibiotic resistance enzymes at an atomic scale and to develop molecules that may inactivate OXA enzymes responsible for antibiotic resistance. The researchers studied OXA-class of antibiotic resistance enzymes, which makes bacteria resistant to important antibiotics including the carbapenem meropenem. The main method was protein crystallography. In order to identify new inhibitors, molecules that disrupts the OXA-48 enzyme activity, *Lund and his fellow researchers* screened a library of 490 small molecules by combining biophysical and biochemical methods. Based on three-dimensional structural information from protein and inhibitor interactions, over 50 new compounds were synthesized, and the researchers characterized inhibitor properties towards OXA-48. They determined more than 40 complexes of OXA-48 bound to new compounds, enzymatically characterized the new OXA-436 enzyme and determined three-dimensional structures of OXA-181 and OXA-245. Results from these studies have expanded the knowledge on how OXA-class enzymes contribute to antibiotic resistance crisis, the work on developing new compounds, active as inhibitors against OXA-48 lays a foundation for new inhibitor drugs, and understanding of antibiotic resistance at the atomic level.



Page link to thesis: <http://hdl.handle.net/10037/11441>

Faculty of Science and Technology
Department of Chemistry
1.9.2017

Unn Sollid Manskow

Philosophiae doctor

Caregivers to patients with severe traumatic brain injury. A national prospective study on caregiver burden, life satisfaction and health care experiences

The background for this thesis was that severe traumatic brain injury (TBI) often has huge consequences for the patient and their family for a long time after the injury. The objective was to assess caregiver burden and life satisfaction over time, and predictors of burden, and develop a validated tool to assess family members' in-hospital health care experiences. The method was a Norwegian prospective cohort multicenter study. A structured questionnaire was completed by 122 caregivers to patients with severe TBI. The Family Experiences of in-hospital Care Questionnaire (FECQ-TBI) was developed. The results showed a moderate to high caregiver burden was reported up to 2 years post injury, with a significant increase in burden and a lower life satisfaction over time. Poor social network, loneliness and taking care of a patient with low functioning were significant predictors of a high burden. The FECQ-TBI was developed and validated,

extracting six subscales all with Cronbach's alpha coefficients > 0.80, confirming the internal consistency. Hypothesis testing supported construct validity. The study reported a considerable caregiver burden up to 2 years post injury. The FECQ-TBI showed good psychometric properties and construct validity. The results may have clinical implications as improved family-centered acute and rehabilitative care and a long-term follow-up can prevent the perceived caregiver burden over time.

Page link to thesis: <http://hdl.handle.net/10037/11388>

Faculty of Health Sciences
Department of Clinical Medicine
24.2.2017

Luis Marco-Ruiz

Philosophiae doctor

Semantic and Perceptual Models for Clinical Decision Support Systems

The current vision of healthcare is evolving in directions towards the secondary use of health data for producing new evidence, rapidly assimilating new knowledge, including the patient as an active component in decision-making and developing communication strategies to coordinate different areas of health care, among others. The work in these directions heavily relies on the appropriate use of different technologies. Among these technologies, Clinical Decision Support Systems (CDSS) implement validated evidence as computable artefacts that enable access to medical knowledge at the point in time when it is needed to make a decision about a person's health. The current context of medicine sets high demands in aspects such as interoperability to enable the use of EHR data in CDSS, the need to establish communication challenges to include the patient as an active component in decision making, collaborative learning and sharing CDSS across institutional borders. This thesis addresses some of these challenges, particularly previous conceptual computerized decision support frameworks. The thesis postulates a CDSS environment where different models interact to enable

1) secondary use of data for CDSS, 2) CDSS semantic specification and 3) effective patient-CDSS interaction. The methods and developments presented are framed in the context of the CDSS. The data are combined with epidemiology information from regional Laboratory Information Systems to provide patients a list with the likelihoods of the diseases that may be affecting them.

Page link to thesis: <http://hdl.handle.net/10037/11436>

Faculty of Health Sciences
Department of Clinical Medicine
5.5.2017

Vår Mathisen

Philosophiae doctor

User participation in district psychiatry – in an interactional theoretical perspective. The practice of “user participation in common rooms and handovers

(Brukermedvirkning i distriktspsykiatriske sentre – et interaksjonsteoretisk perspektiv. Praktisering av “brukermedvirkning” i fellesrom og rapporter). Professionals have a responsibility to involve patients in treatment decisions. The purpose of this study was to gain knowledge of how professionals practice and organise user participation as part of everyday work in inpatient wards in district psychiatric centres (DPCs) in Norway. The context of the project was the common rooms in the wards, in addition to reports and meetings. The empirical data involved fieldwork at three inpatient wards in different DPCs, 12 individual interviews with professionals and a focus group interview with eight professionals. In light of the results in the study, reports and meetings may be understood as necessary conditions for patients' existence, by distributing their participation statuses based on how professionals construct patients. The results also show that rigid practice of ward rules and procedures seems to limit patient autonomy, suppressing individual initiatives, needs and opportunities for participation in decision making. This PhD project reveals the need to define and develop expectations in order to distinguish between milieu

therapy and user participation or the creation of good interaction situations. The project shows that the above dilemmas and challenges constrain the practice of user participation in reports and meetings as well as in everyday life in DPC inpatient wards.

Page link to thesis: <http://hdl.handle.net/10037/10990>

Faculty of Health Sciences
Department of Health and Care Sciences
28.4.2017

Helena Kling Michelsen

Philosophiae doctor

Seasonal and spatial dynamics of meroplankton in a sub-Arctic fjord with additional focus on larvae of the invasive red king crab

The objectives of this thesis were to increase our understanding on the seasonal and spatial dynamics of meroplankton in sub-Arctic waters and identify the environmental variables responsible for these dynamics. The potential role of meroplankton in the pelagic was investigated by identifying their numerical contribution to the zooplankton community. Finally, the temporal and spatial dynamics of red king crab larvae was investigated to see how larvae are timed with favorable environmental variables in Norwegian waters. The study area, the sub-Arctic Porsangerfjord, Norway (70 – 71 °N), has a productive benthic community and was recently invaded by the red king crab. It displays strong gradients in environmental variables and therefore represents an ideal field laboratory for investigating aspects of meroplankton dynamics.

Page link to thesis: <http://hdl.handle.net/10037/11779>

Faculty of Biosciences, Fisheries and Economics
Department of Arctic and Marine Biology
7.12.2017

Davide Michetti

Philosophiae doctor

Surface properties tune thermal adaptation of enzymes - Computational studies of endonuclease A

The endonucleases A from *Aliivibrio salmonicida* (VsEndA, cold-adapted) and *Vibrio cholerae* (VcEndA, warm-adapted) have been studied in this work. The goal was to compare these two systems, in order to find structural differences that could explain the mechanism of cold adaptation in the psychrophilic EndA. The data collected in the study suggest that surface properties enable VsEndA to adapt to low temperatures.

Page link to thesis: <http://hdl.handle.net/10037/11153>

Faculty of Science and Technology
Department of Chemistry
26.4.2017

Sergey Minor

Philosophiae doctor

Dependent Plurals and the Semantics of Multiplicity

The main focus of this thesis is the concept of multiplicity, and its representation in the semantics of natural language. Human languages possess a variety of means to convey the notion of a multitude of objects being involved in a particular situation, e.g. number marking on nouns, numerals such as 'three' and 'five', and quantificational items such as 'each' and 'all'. The aim of the thesis is to develop a formal semantic framework to account for the interaction between these classes of linguistic items, based primarily on elicited and freely occurring data from English. The general picture that emerges from this investigation is that natural language semantics involves three distinct levels at which the notion of multiplicity can be represented. This approach allows us to explain the semantic contrast between singular quantifiers, e.g. 'each' and 'every', and plural quantifiers, e.g. 'all' and 'most', on the one hand, and between the plural number feature and numerals, on the other.

Page link to thesis: <http://hdl.handle.net/10037/10529>

Faculty of Humanities, Social Sciences and Education
Department of Language and Culture
23.3.2017

Ekaterina Mishchenko

Philosophiae doctor

Antibacterial and anti-biofilm activity of novel marine natural product mimics

The world needs new medicines that can fight antibiotic resistant bacterial infections complicated by bacterial biofilms. Novel treatment solutions may be found in nature. In this project, the researchers focused on antibacterial activity of approximately 50 molecules that were made synthetically and mimic variants of marine natural compounds. They used an interdisciplinary workflow with multi-step screening against human pathogenic bacteria, including drug-resistant clinical isolates, to identify promising molecules. Some of the active compounds killed bacteria primarily by destroying the essential bacterial membrane. Selected compounds were evaluated for the induction of antibiotic resistance development *in vitro*. Further, Mishchenko and her colleagues identified compounds with anti-biofilm activity, using two types of *Staphylococcus epidermidis* biofilms and



studied phenotypic variation of biofilms within one strain of *S. epidermidis*. Molecules characterized in this study are promising “starting points” for further development of antibacterial drugs.

Page link to thesis: <http://hdl.handle.net/10037/12105>

Faculty of Biosciences, Fisheries and Economics
The Norwegian College of Fishery Science
20.1.2017

Kai Ivar Müller

Philosophiae doctor

Telemedicine in the treatment of headache

Headaches are one of the most common complaints among humans as well as the most frequent reason for patients seeking health-care. For geographical reasons, headache patients in Northern Norway have variable accessibility and availability to proper specialist care. Few headache specialists and poor access to care may lead to misdiagnosis, suboptimal treatment and inconvenience with follow-up plans for headache patients. The researchers want to compensate for conditions, and designed a non-inferiority randomized controlled trial in an attempt to demonstrate whether there are differences in outcome of neurologic consultations depending on assessment method; telemedicine versus traditional in-person headache visits. *Müller and his fellow researchers* investigated endpoints of different aspects, and compared telemedicine to traditional visits in patient satisfaction, treatment efficacy, safety and feasibility. They assessed headache patients' acceptability of telemedicine, and evaluated the cost savings. The results showed that most headache patients accept telemedicine, and are satisfied with the consultation type. Virtually all endpoints in the trial indicated that specialist headache visits via telemedicine is non-inferior to traditional in-patient visits. Telemedicine is considered a good alternative for most patients with non-acute headache referred to a secondary neurology department.

Page link to thesis: <http://hdl.handle.net/10037/11871>



Faculty of Health Sciences
Department of Clinical Medicine
12.12.2017

Dilip Narayanan

Philosophiae doctor

Structural determinants of ligand binding to ATP dependent enzymes: Studies of Protein Kinase and Heat Shock Protein 70

This project describes basic chemical research on protein-ligand interactions, using important cancer treatment targets as model enzymes. This research is intended to expand basic knowledge about the mechanisms of chemical recognition used by enzymes and enable the design of new and improved therapeutic inhibitors. The first part of this work, which includes two published articles and one submitted manuscript, analyzes inhibitor interactions in central tyrosine protein kinases involved in cancer, including Abl (a leukemia target) and EGFR (a lung cancer target). These analyses optimize approaches to identify new inhibitors with possibly enhanced protein kinase inhibition profiles to prevent the development of drug resistance. Another manuscript describing the geometric variability of the central amino acid of

the protein kinases which are often involved in the development of drug resistance. The second part analyzes the binding site for ATP and possibly inhibitors of another enzyme class involved in cancer, a “heat shock protein”. Key technologies used in this project are chemical synthesis, enzyme purification, crystallography, SPR spectroscopy and molecular modelling.

Page link to thesis: <http://hdl.handle.net/10037/11147>

Faculty of Science and Technology
Department of Chemistry
7.4.2017

Tan Thi Nguyen

Philosophiae doctor

Microbial community variation in an Arctic shelf seafloor. Biogeographic and anthropogenic influences

The main objective of this thesis was to assess how microbial communities were distributed in an Arctic shelf seafloor across geographic separation and anthropogenic impact by using next generation sequencing approaches. The results showed that the bacterial community compositions in the uppermost sediment layer close to the drilling site were significantly different from those of unaffected areas. The bacterial groups most conspicuously associated with the community change were representatives of the orders Clostridia and Desulfuromonadales and the class Mollicutes. These are candidates as microbial bioindicators of the spatial extent and persistence of drilling waste discharge. The effects of drilling waste discharges on bacterial composition were observable in a 100 m radius around the well. The drilling waste caused oxygen depletion in the upper sediment layer in close proximity to the offshore drilling site.

Page link to thesis: <http://hdl.handle.net/10037/10950>

Faculty of Biosciences, Fisheries and Economics
The Norwegian College of Fishery Science
21.4.2017

Toril Sørheim Nilsen

Philosophiae doctor

Change and predictors of rate of change in the treatment of children and adolescents with emotional disorders: A naturalistic observational study in two child and adolescent mental health services in Norway

The goals of this dissertation were to evaluate the rate of change, and associations between demographic and clinical characteristics and rate of change, for children and adolescents with anxiety and/or depression ($n = 84$) who had been treated within two Child and Adolescent Mental Health Services (CAMHS) in the North of Norway. A literature review (paper 1) found that higher levels of baseline symptomatic severity were associated with worse outcome in depression treatment studies. None of the demographic variables were found to consistently predict or moderate treatment outcome across studies. Paper 2 showed a statistically significant improvement per month during outpatient treatment, that change rates during active assessment/treatment were larger than during the waitlist period for the clinician-rated scores, and that only a small proportion of the subjects had statistically reliable and clinically significant improvement. Paper 3 reported that children and adolescents with a diagnosis of depression had statistically significantly higher symptom severity levels at baseline and significantly lower change rates as compared to youths with an anxiety disorder. In sum, the results of these studies point to the importance of tracking change during CAMHS treatment, studying change through different approaches and from the viewpoint of different informants. Focusing on prognostic factors for change is also an important further venue.

Page link to thesis: <http://hdl.handle.net/10037/11076>

Faculty of Health Sciences
Department of Psychology
15.5.2017

Velina Ninkova Ninova

Philosophiae doctor

“Now That We Have Development”: Change, Resilience and Education for the Omaheke Jul’hoansi

The case study focuses on a group of Jul’hoansi and the impact of the Namibian government’s development initiatives to turn them into small-scale subsistence farmers on a resettlement farm. The thesis also explores the relationship between the Jul’hoansi as an indigenous minority and the State through the prism of formal education. Both questions examine top-down development initiatives in the context of unequal power relations and seek to explain the rationale behind the Jul’hoansi’s responses to them. The thesis offers an in-depth ethnographic description of the Omaheke Jul’hoansi living in the resettlement farm of Skoonheid and the changes they have experienced over the past several decades. Kinship continues to be the single most important organizational principle in their society. Hunting and gathering continue to play a role both in terms of diet supplementation and identity formation for many. Education is problematic for the majority of Jul’hoan children, especially beyond the level of primary education. Discriminating attitudes and practices rooted in old-time colonial constructions of the San as “people from the bush” further undermine the process. The thesis follows a well-established tradition of examining how well-intended development is sabotaged by lack of communication and understanding of the core values of the parties involved.

Faculty of Humanities, Social Sciences and Education
Department of Social Sciences
26.10.2017

Jon Viljar Norvik

Philosophiae doctor

Uric acid and adiponectin in cardiovascular disease

Uric acid is constantly produced in the body, and too much may inflict gout. Adiponectin is a hormone produced by fat

tissue, and is involved in numerous metabolic processes. This project used data from the Tromsø surveys to study the roles of uric acid and adiponectin in cardiovascular disease. Norvik and his colleagues found that high uric acid levels predicted the development of elevated blood pressure and elevated fasting glucose in overweight, but not normal-weight, people. The researchers also discovered that people with diastolic dysfunction (stiff hearts that do not relax properly) on echocardiography, had higher risk of death and stroke with increasing uric acid levels. Additionally, they found an association between low adiponectin levels and the presence of diastolic dysfunction in women, but not in men. Elevated uric acid levels are easily treatable if it proves to be a risk factor for cardiovascular disease. Why low adiponectin is associated with diastolic dysfunction in women only warrants further research.

Page link to thesis: <http://hdl.handle.net/10037/11237>

Faculty of Health Sciences
Department of Medical Biology
20.4.2017

Stian Olsen

Philosophiae doctor

Mechanisms of Host Plant Infection by the Parasitic Angiosperm Cuscuta

Plants of the genus *Cuscuta* lack true leaves and roots and possess little or no photosynthetic ability. These highly adapted parasitic plants develop specialized infection organs called haustoria that grow into the tissue of a host plant and establish connections through which the parasite acquires water and nutrients. The rigid walls surrounding plant cells present a major challenge for the *Cuscuta* haustorium during its host-invasive growth. In this thesis, the cell wall aspect of host tissue penetration was investigated. Cell wall compositions and wall-localized enzyme activities in both parasite and host were found to be altered during infection. A screen for *Cuscuta* genes whose expression levels were increased upon the onset



Photo: Stian Olsen

of haustorium development identified several cell wall-related genes that could promote the detected wall changes. Among these, the xyloglucan endotransglucosylases/hydrolases (enzymes modifying the cell wall component xyloglucan) were also found to be secreted from the haustorium and inhibitor studies indicated that their activity could be essential for host invasion.

Page link to thesis: <http://hdl.handle.net/10037/10958>

Faculty of Biosciences, Fisheries and Economics
Department of Arctic and Marine Biology
12.5.2017

Yvonne Pasing

Philosophiae doctor

Effects of Vitamin D on the Human Transcriptome, Proteome and Metabolome – Results from One Case-Control Study and Three Randomized Controlled Trials

Vitamin D, also called the sunshine vitamin, is a fat-soluble steroid hormone which is mainly produced in the skin upon sun exposure. Vitamin D deficiency is probably a widespread pandemic affecting approximately 40% of the European population. It is well known that vitamin D plays a major role in calcium metabolism and bone mineralization, and that insufficient vitamin D intake can lead to skeletal diseases like rickets in children and osteomalacia in adults. Furthermore, vitamin D deficiency was linked to obesity, cardiovascular disease, diabetes mellitus, infectious and immunological diseases and several types of cancer, but the functions of vitamin D in the human body are not yet fully understood. Using state-of-the-art bioanalytical methods, the researchers aimed to detect changes in the human gene expression, and on the global protein and metabolite levels in study participants receiving either vitamin D or placebo. The results indicate effects of vitamin D supplementation on the immune system, oxidative stress response, programmed cell death and reproduction. They could confirm that vitamin D is stored in adipose tissue and possibly redistributed from adipose tissue when serum levels are low. In addition, vitamin D had an influence on important cellular processes like oxidative phosphorylation, glycogen and carbohydrate metabolism, protein transport, amino acid metabolism, cell structure and morphogenesis.

Faculty of Health Sciences
Department of Clinical Medicine
10.2.2017

Marianne Hagensen Paulsen

Philosophiae doctor

Synthetic mimics of antimicrobial peptides - Synthesis and biological studies of novel synthetic mimics of antimicrobial peptides

Antibiotic resistance is now considered one of the most imperative global healthcare problems. The development of new antimicrobial drugs is therefore essential to the survival of modern medicine in combination with more restricted use of existing drugs. In this thesis a novel set of compounds based on three different amphipathic scaffolds have been synthesized mimicking antimicrobial peptides. The new compounds showed promising antimicrobial activity against clinical isolates of multi-resistant bacteria. A selection of these were also highly promising candidates for further drug development.

Faculty of Health Sciences
Department of Pharmacy
5.4.2017

Erna-Elise Paulsen

Philosophiae doctor

Immunological markers in non-small cell lung cancer (NSCLC)

The immune system plays an important role in cancer, and tumor-infiltrating immune cells can either inhibit or promote tumor progression. To improve cancer patient survival, we need to increase knowledge of the immune response in cancer. Paulsen's research group collected tissue from 536 patients surgically treated for non-small cell lung cancer and detected immune molecules by immunohistochemistry. The researchers found that patients with high levels of cytotoxic (killer) and memory T-cells in tumors had a lowered risk of recurrence and death from lung cancer. Checkpoint molecules are "brakes" which turn off T-cells as part of the normal regulation of immune responses. This can be exploited by cancer cells, and drugs blocking this mechanism show great promise.

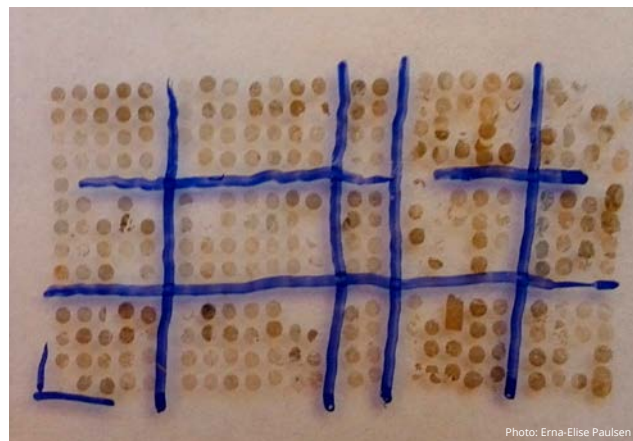


Photo: Erna-Elise Paulsen

Interestingly, they found that patients with high levels of checkpoints had improved survival, probably because an active immune response is necessary to fight tumors. The results may be used to improve treatment decision-making for lung cancer patients.

Page link to thesis: <http://hdl.handle.net/10037/10335>

Faculty of Health Sciences
Department of Clinical Medicine
17.2.2017

Edvard Pedersen

Philosophiae doctor

A Data Management Model For Large-Scale Bioinformatics Analysis

In this dissertation, the researchers examine the challenge of data management, particularly how existing bioinformatics analysis pipelines can reduce the runtime and hence the cost of analysis through a better data management approach. The approach used bridges the gap between these by providing a simple file-based interface that makes it simple to integrate workflows using legacy tools with modern distributed databases and data

processing frameworks. They show the need for such a system through an evaluation of the tools of a bioinformatics pipeline that is provided as a data analysis service. The results show that the runtime of many of the most computationally intensive tools in the pipeline scale approximately linearly with input data size, so that runtime can be reduced by limiting the volume of data. The researchers evaluate the implementation of the FDDM model using synthetic- and application benchmarks. The results show that the implementation stores data efficiently with regards to storage space, and retrieves data quickly. One can therefore increase the speed of updates by up to 14 times. The researchers integrate GeStore with three different workflow managers to demonstrate how popular workflow managers can easily use the FDDM approach.

Page link to thesis: <http://hdl.handle.net/10037/10944>

Faculty of Science and Technology
Department of Computer Science
18.1.2017

Achim Randelhoff

Philosophiae doctor

Vertical nitrate fluxes in the Arctic Ocean

The growth of small organisms floating in the ocean surface provides food to bigger marine animals and helps remove carbon from the atmosphere. This so-called phytoplankton needs light to grow, but also nutrients. In the Arctic Ocean, both are scarce due to sea ice, which blocks sunlight, and weak upward mixing of new nutrients. It is not clear which of these two factors is currently limiting the productivity as few large-scale estimates of vertical nutrient fluxes have existed previously. Randelhoff and colleagues participated in a number of expeditions to the Arctic Ocean onboard icebreakers to measure nitrate concentrations, a key nutrient, and how fast it is being mixed upward. They found that strong stratification, i.e. the ability of the water to resist vertical mixing, leads to weak nitrate fluxes and overall very limited nutrient availability. Therefore, even when summer sea ice at some point melts completely due to climate change,

large areas of the Arctic will probably not support more marine life than they do now.

Page link to thesis: <http://hdl.handle.net/10037/10948>

Faculty of Science and Technology
Department of Physics and Technology
16.3.2017

Mads Skytte Rasmussen

Philosophiae doctor

Roles of LIR-dependent interactions in processing and phosphorylation of ATG8 family proteins

Autophagy (Greek for “self-eating”) is a mechanism of the cell that degrades unnecessary or dysfunctional components. These components are recognized by the autophagic machinery and gathered inside structures known as autophagosomes. The autophagosomes later fuse with lysosomes degrading the components, allowing for recycling of the molecular building blocks of the components. Core to the process of autophagy is the ATG8 family of proteins involved in the formation, maturation and fusion of the autophagosome. Before the ATG8s can join the autophagic process, a small C-terminal part of the ATG8s needs to be cleaved off, the protease responsible for this cleavage is ATG4B. In this thesis, the role of a novel binding region of ATG4B (LIR) and its importance in the processing of the ATG8 family of proteins is explored. Based on a crystal structure showing the LIR interaction of ATG4B with ATG8, a number of binding assays are used to determine the important residues of the LIR of ATG4B. Loss of the LIR region on ATG4B is shown to cause a severe reduction in the protease activity of ATG4B. Inside cells, the LIR of ATG4B is further shown to be important for the stability of certain ATG8s, thus the LIR is not only important for the cleavage activity of ATG4B, but also for the ability of ATG4B to stabilize cellular ATG8s. Furthermore, the effect of phosphorylations of either ATG4B or ATG8s are explored.

Faculty of Health Sciences
Department of Medical Biology
18.8.2017

Espen Mikal Robertsen

Philosophiae doctor

META-pipe – Distributed Pipeline Analysis of Marine Metagenomic Sequence Data.

Robertsen and his fellow researchers have developed a metagenomic analysis pipeline coined META-pipe. This software uses distributed computer systems to utilize extensive hardware resources and is accessible through a standalone web portal. Using this public analysis resource, researchers can make sense of their environmental samples with minimal effort. The researchers have evaluated META-pipe through two biological use cases, both in terms of performance scalability and biological results. The first one is a pilot project in collaboration with the European Bioinformatics Institute, where our pipeline is compared with theirs, and refined based on an evaluation. In the second use case, the researchers apply artificial neural nets to alleviate the burden of submitting metadata for users of metagenomic public resources, based on supervised training. Both use cases demonstrate the process of developing state-of-the-art analysis resource and refining it through evaluation. META-pipe is a deliverable to the ELIXIR infrastructure and will continue to expand and evolve in years to come.

Page link to thesis: <http://hdl.handle.net/10037/11180>

Faculty of Science and Technology
Department of Chemistry
19.5.2017

Maria Madalena Afonso Rolhas Fernandes das Neves

Philosophiae doctor

The Legal Framework for Norway's External Energy Trade and Investment Relationships

This thesis provides a holistic, systematic and critical examination of the key legal framework supporting Norway's external energy investment relationships – relationships within the umbrella of the European Economic Area (EEA), the



European Free Trade Association (EFTA), the World Trade Organization (WTO), and of Bilateral Investment Treaties (BIT). Subsequently, the thesis also discusses potential reforms to that framework where shortcomings exist. This entails not only looking at specific instruments, such as new model BITs and the Energy Charter Treaty, but also engaging in broader discussions examining the international legal context within which the choice of those instruments must be made. For this reason, the thesis also delves, even if only briefly, into the issues of convergence of international trade and investment law, the future of international investment agreements, and global governance for energy. As a contextual basis for the legal analysis, the thesis also explains the importance of energy and energy investments for Norway, Norway's energy policy, and Norway's reasons for making some important legislative choices concerning the energy sector.

Faculty of Law
24.02.2017

Sarah Andrea Roth

Philosophiae doctor

MicroRNAs and Drug Resistance in Neuroblastoma

Neuroblastoma is the most common diagnosed tumor in infants. Resistance to anticancer agents is a major cause of treatment failure. To develop new anticancer drugs, we need to understand how this tumor become drug resistant. MicroRNAs, small RNA molecules found in all tissues, are involved in virtually all cellular processes. The understanding of biological and molecular aspects of microRNA-mediated drug resistance in neuroblastoma may provide exciting opportunities for therapy of aggressive tumors. This study aims to identify microRNAs that contribute to drug resistance in neuroblastoma. Furthermore, it focuses on the value of microRNAs as a therapeutic option for neuroblastoma. The researchers demonstrated that the expression level of the microRNA miR-193b increases during the course of anticancer therapy in neuroblastoma. Functional studies validated that elevated levels of miR-193b increase resistance of neuroblastoma cells to diverse conventional anticancer drugs. However, they found that miR-193b alone effectively suppressed neuroblastoma cell growth. This effect was observed in all neuroblastoma cell lines tested, and independent of many important risk factors. Importantly, the data suggest that miR-193b as a monotherapy or in combination with targeted therapy may be a promising strategy to treat neuroblastoma resistant to conventional anticancer agents.

Faculty of Health Sciences
Department of Clinical Medicine
3.2.2017

Mona Birgitte Rydningen

Philosophiae doctor

Sacral neuromodulation and injection of bulking agents for faecal incontinence and concomitant pelvic floor dysfunction

The aim was to investigate treatment with sacral neuromodulation (SNM) and injection of bulking agents (Permacol®) for faecal incontinence (FI) in women with a history of obstetric anal sphincter injuries (OASIS). Method: Consecutive women with severe FI following OASIS went through a three-week percutaneous nerve evaluation (PNE) period (Paper 1). The women with a successful PNE, defined as 50 % reduction of weekly FI episodes, were randomly assigned to SNM or Permacol® (Paper 2). SNM for combined FI and urinary incontinence (UI) was explored in paper 3. Outcomes were evaluated with questionnaires, St Mark's score for FI and ICIQ-UI-SF for UI. Results: Fifty-six of the 63 (89%) women had a successful PNE. Efficacy was related to concomitant UI ($p=0.046$) and body mass index ($p=0.03$). The extent of sphincter defect was unrelated to efficacy ($p=0.1$). The reduction in the St. Mark's score between baseline and 6 months was 11.2 (SD 5.3) in the SNM group ($n=30$) versus 2.3 (SD 5.0) in the Permacol® group ($n=26$), resulting in a difference of 8.9 (95% CI 6.1-11.7, $p<0.0001$) in favour of SNM. The reduction in ICIQ-UI-SF score was 5.8 (95% CI 3.7-8.0, $p<0.001$) and in the St Mark's score 10.6 (95% CI 8.6-12.7, $p<0.001$) in the 37 women treated with SNM for FI. Conclusion: SNM was superior to Permacol® in the treatment of FI and concomitant UI. Outcome was unrelated to the extent of the sphincter defect.

Page link to thesis: <http://hdl.handle.net/10037/11077>

Faculty of Health Sciences
Department of Clinical Medicine
12.5.2017

Hild Rønning

Philosophiae doctor

Police and discretion - A study of police officers' discretion in order service, in light of the legal framework

(Politi og skjønn – En studie av politibetjeners skjønnsutøvelse i ordenstjeneste, sett i lys av de rettslige rammer). The aim of this thesis is to investigate police officers' discretion in order service and how their practices relate to judicial boundaries, and what implications this might have for the citizens' legal protection. The thesis builds on empirical material collected through observation of police officers' handling of situations when on patrol, followed by interviews with the officers, focusing on questions regarding their handling of relevant situations. In addition, documentation of their conduct of authority has been collected. An account of the judicial boundaries for a selection of areas within the police's patrol service is presented. Findings regarding what kinds of assessment police officers make within these areas is described, related to questions regarding forms of procedure, intervention in situations regarding order, what means are used in the intervention and whether presumed punishable actions are reported. Subsequently, the police officers' discretion related to the aforementioned judicial boundaries is discussed. Finally, the police officers' formal competence and the immediate quality assurance of their conduct of authority is dealt with.

Page link to thesis: <http://hdl.handle.net/10037/11808>

Faculty of Law
24.11.2017

Alejandro Salgado Flores

Philosophiae doctor

Gut metagenomics in relation to diet and methanogenesis in arctic herbivores

Enteric methane (CH₄) from ruminants, a by-product from gut microbial digestion, constitutes a substantial

source of man-related CH₄ emissions. It also represents an energy loss to the animal that may be important during energetically restrictive conditions. The diet of reindeer, muskoxen, and rock ptarmigans include plants with toxic plant secondary metabolites (PSMs), which may depress methanogenesis. In this PhD thesis, the researchers studied the microbial bases for CH₄ metabolism in these arctic herbivores in relation to methanogenesis and diets high in PSMs, using molecular biology techniques. Reindeer fed lichens (high in PSMs) and muskoxen feeding on late autumn pastures housed methanogens associated with low CH₄ emissions. Other factors apart from PSMs contents may account for the presence of these methanogens. Muskoxen and ptarmigans possessed a diverse gut microbiota specialized in the degradation of their respective diets.

Page link to thesis: <http://hdl.handle.net/10037/11080>

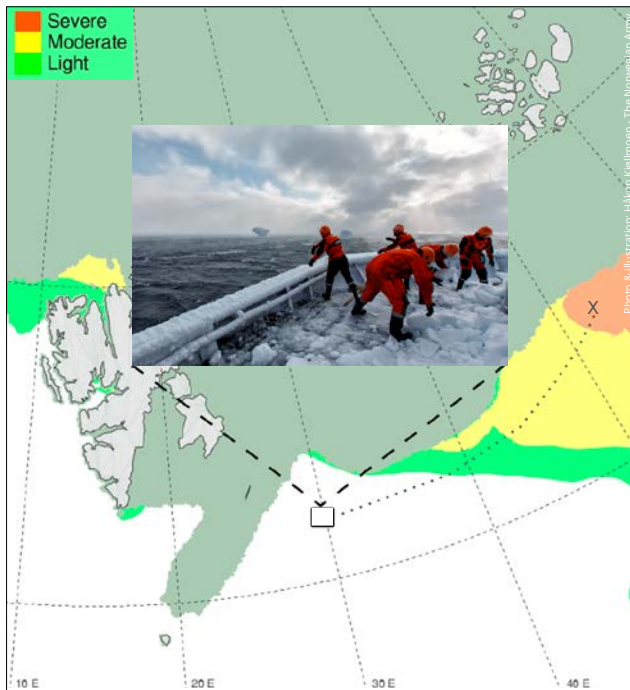
Faculty of Biosciences, Fisheries and Economics
Department of Arctic and Marine Biology
1.6.2017

Eirik Mikal Samuelsen

Philosophiae doctor

Prediction of ship icing in Arctic waters - Observations and modelling for application in operational weather forecasting

This study presents and utilises icing data obtained from ship observations in Arctic-Norwegian waters supplemented with high-resolution reanalysis data. A completely new icing model has been developed. Verification of this Marine Icing model for the Norwegian Coast Guard (MINCOG) and comparison with currently-applied methods in operational weather forecasting reveals higher accuracy of MINCOG compared to the other methods. Furthermore, the study stresses the importance of including wave information separately into marine-icing models rather than incorporating it in the wind-speed parameter. A major finding of the study is that nature dictates an upper limit to the degree of icing that may arise



from wave-ship interactions, since high waves and very low air temperatures rarely coexist. It is also highlighted that the inclusion of snow may be important for ship icing to occur, and that icing ensues most frequently during cold-air outbreaks from the ice. In addition, when a more general approach is applied to the icing problem, a prediction method utilising the temperature at 850 hPa provides a potential for forecasting icing several days or weeks ahead in time. The prediction models presented in this study may be incorporated in an ensemble prediction system (EPS) providing the officer of a ship an early warning about the risk of icing and the probability of an expected growth rate of icing.

Page link to thesis: <http://hdl.handle.net/10037/11801>

Faculty of Science and Technology
Department of Physics and Technology
20.11.2017

Anne-Sofie Sand

Philosophiae doctor

Overweight, body size perceptions, lifestyle changes and health concerns in young adults. The Tromsø Study, Fit Futures. A combined approach using qualitative interviews and a population-based cross-sectional study

The purpose of the study was to gain knowledge about overweight and lifestyle issues in young adults and especially young women. Increasing rates of overweight makes it important to find strategies for weight management. The study was performed by combining interviews with young women and data from measurements and questionnaire used in the youth survey Fit Futures, part of the Tromsø Study. The researchers found presence of motivation for lifestyle changes, but the young women experienced a substantial focus on appearance rather than health. Obstacles for a better lifestyle when leaving their parental home were described, mainly as high costs and knowledge gap regarding healthy food. Overweight, body size confusion and dissatisfaction were widespread in both genders, but not related to self-perceived health. This is not easily explained.

The results indicate that a more relaxed focus on appearance, better health education and lower costs for healthy food and sports activities in this stage of life are needed. Combining research methods holds a potential for expanding knowledge in the field.

Page link to thesis: <http://hdl.handle.net/10037/11664>

Faculty of Health Sciences
Department of Health and Care Sciences
13.10.2017

Adriana Eva Sardi Sulvarán

Philosophiae doctor

Biomonitoring and risk assessment tools to manage impact of diesel oil in tropical coastal habitats

The risk of oil pollution, either through produced water discharges, accidents or other diffuse sources, has increased as the world's economy has expanded. In this work, Sardi Sulvarán evaluated the response of subcellular biochemical markers —biomarkers— as potential indicators of exposure to oil contamination and determined if tolerable concentration thresholds generated from temperate and Arctic species are applicable to the tropical region. For that, a baseline of biomarker values in different species was established and the response of biomarkers characterized in the lab and in the field following oil exposure. Differences in the response of biomarkers and in the species' sensitivity to oil were identified. As part of the conclusions, the researcher proposes the best species and measures for biomonitoring purposes, and provides recommendations to adapt risk-assessment strategies for the Paranaguá Estuarine System, in Southern Brazil, a beautiful coastal system of economic and ecologic importance, home of very diverse habitats and exotic species.

Page link to thesis: <http://hdl.handle.net/10037/11169>

Faculty of Science and Technology
Department of Chemistry
5.5.2017

Tone Mari Seppola-Edvardsen

Philosophiae doctor

Embodied uncertainty - Exploring sensorial and existential dimensions of everyday life after cancer

This thesis investigates the illness experiences and care-seeking processes of former cancer patients as they take place in daily life and social relations in Norway. It builds on ethnographic fieldwork carried out between January

2014 and January 2015, and the main data collection method was repeated interviews with eight participants during one year. The thesis contributes to the field of cancer with enhanced knowledge of how the cancer experience may influence the way bodily sensations are interpreted and handled. It provides insight into the process of regaining everyday health competence, in the light of a changed health situation after cancer. It makes a contribution to sensorial anthropology in showing how cancer patients perceive and interpret bodily sensations within a context of memories and fear of cancer. It also shows how regaining everyday health competence is possible with new contextualization, built on knowledge of normal late effects after cancer treatment, and the experience gained from living within a 'new normal'. The thesis sheds light on how social relations and everyday life is handled in a context of worries and uncertainties after cancer. All these findings may have general relevance for other severe or chronic illnesses that have the potential to impact life in similar ways. In addition, the thesis shows how the sensorial is an important component of empathy and intersubjective understanding, as well as an important aspect and tool in the study of illness experiences.

Page link to thesis: <http://hdl.handle.net/10037/12162>

Faculty of Health Sciences
Department of Community Medicine
14.11.2017

Ekaterina Sharashova

Philosophiae doctor

Decline in resting heart rate, its association with other variables, and its role in cardiovascular disease; The Tromsø Study

The Tromsø Study shows that over the last decades resting heart rate (RHR) declined in a population of Tromsø by approximately 10 beats per minute. The study also shows that resting heart rate and long-term changes in resting heart rate predict future risk of cardiovascular disease and death. From 1986 to 2008 resting heart rate declined in

Tromsø by approximately 9 bpm in men and 12 bpm in women irrespective of age. To a high extent, the decline in RHR was independent of other cardiovascular risk factors: less than one-fifth of the decline was associated with favorable changes in blood lipids, blood pressure, physical activity, smoking, body mass index, and blood pressure treatment. This downward trend in RHR can be considered favorable as an elevated RHR was associated with increased risk of myocardial infarction and death in both sexes, with increased risk of atrial fibrillation in men and ischemic stroke in women. Men who kept their resting heart rate at low levels through adulthood were at lower risk of myocardial infarction and death compared to all the other resting heart rate trends. Though Sharashova and her colleagues did not study whether people with moderate and high resting heart rate would benefit from heart rate lowering interventions, resting heart rate levels and individual trends can be monitored and used for risk assessment and prognosis.

Page link to thesis: <http://hdl.handle.net/10037/10992>

Faculty of Health Sciences
Department of Community Medicine
10.2.2017

Audun Sivertsen

Philosophiae doctor

Mobile genetic elements causing plasticity in E. faecium

Vancomycin-resistant Enterococcus faecium (VREfm) are feared within health-care institutions as they may cause serious infections, primarily in immunocompromised patients, that may be difficult to treat. This dissertation focus on VREfm and their ability to develop resistance through horizontal gene transfer (HGT). Sivertsen and his colleagues have analyzed VREfm outbreaks in Sweden and Norway, and found that this bug may be a future health risk to Scandinavian health care institutions.

The diagnostic tools used presently in clinical microbiological labs are not able to catch all types of VREfm, as our work show. This has detrimental

consequences for surveillance, diagnosis and treatment of infections with VREfm. The researchers propose genotypic methods such as whole-genome sequencing as appropriate measures to improve analysis of VREfm.

They have also analyzed the movement of mobile genetic elements (MGEs) through molecular methods such as PFGE, as well as sequencing with short- and long read technologies, and have found that MGEs cause great potential for recombination and HGT of genes which may have clinical relevance. In our work, the researchers repeatedly see that vancomycin resistance development is largely driven by MGEs and HGT, and that MGEs are able to stack within each other and increase the genetic variation in E. faecium.

Page link to thesis: <http://hdl.handle.net/10037/10953>

Faculty of Health Sciences
Department of Medical Biology
24.3.2017

Susann Skagseth

Philosophiae doctor

Mutational, structural and inhibitory investigations of metallo-β-lactamases involved in antibiotic resistance

Bacteria has acquired genes enabling them to express enzymes called metallo-β-lactamases (MBLs) that break down a wide variety of antibiotics, creating multi-resistant bacteria. In her thesis, Skagseth has studied some of the MBL enzymes in order to get a broader understanding of how they work. Selected amino acids have been replaced in the enzymes, their new activity tested, and the structure investigated. Knowledge of which amino acids are important for their ability to break down antibiotics can be used to create inhibitory compounds (inhibitors) for blocking the enzymes activity. The inhibitors may contribute to restore the function of antibiotics, and can be used together with antibiotics in treatments to fight these multi-resistant superbugs. A goal is to develop inhibitors that can block a broad spectrum of enzymes. The results have shown that the selected amino acids are

residue determinants, they affect antibiotic specificity of the MBL enzymes studied. The inhibitors investigated showed promising effect specifically on one enzyme, and not of other enzymes examined. The developed inhibitors can provide a starting point for further compound optimization for targeting a broader spectrum of enzymes.

Page link to thesis: <http://hdl.handle.net/10037/10724>

Faculty of Science and Technology
Department of Chemistry
16.2.2017

Espen Waage Skjeflo

Philosophiae doctor

Harnessing Innate Immunity – Complement and TLR Inhibition in Experimental Models of Gram Positive and Polymicrobial Bacteremia and Sepsis

Sepsis is a syndrome of life-threatening organ malfunction caused by a dysregulated host response to infection. The complement, kallikrein/kinin, coagulation and fibrinolysis plasma cascade systems as well as the TLR system recognize and initiate the immediate responses to infection and thus play an important role in the development of sepsis. In this regard, the ubiquitous TLR co-receptor, CD14, as well as C5 have been identified as upstream, bottle-neck targets to attenuate the response to infection. *S. aureus* is the most common cause of Gram-positive sepsis whereas *E. coli* is the most common cause of Gram-negative sepsis. Both bacteria activate complement and coagulation, and are recognized by TLRs in human whole blood, triggering the release of inflammatory cytokines, markers of coagulation activation and markers of leukocyte activation. In turn, combined inhibition of complement and CD14 efficiently reduced these responses to *S. aureus* and *E. coli* in a human, whole blood model. Furthermore, in a randomized, controlled trial of combined CD14 and C5 inhibition (treatment) versus saline (control) in porcine polymicrobial sepsis, treatment significantly improved survival. Preemptive, combined inhibition of CD14 and C5 thus emerges as a potential anti-inflammatory regimen in

both *S. aureus* and *E. coli* bacteremia.

Page link to thesis: <http://hdl.handle.net/10037/11749>

Faculty of Health Sciences
Department of Clinical Medicine
28.11.2017

Tine Degerstrøm Stenvold

Philosophiae doctor

The impact of audit oversight in Norway: International collaboration and audit quality

One of the most important tasks of the audit profession is to act in the public interest. For that reason, the public should be able to be confident that professional bodies always have the public interest in mind when exercising judgements. Supervisory bodies, such as the Financial Supervisory Authority of Norway and The Public Company Accounting Oversight Board in the US, collaborate on this task. The creation of new oversight system and international collaboration is to restore public trust in audited financial statements after many financial scandals in the beginning of this century. The auditor is required to plan the audit so material misstatements due to error or fraud are detected. One possible solution is to incorporate forensic specialists in the audit process to do this.

Page link to thesis: <http://hdl.handle.net/10037/11406>

Faculty of Biosciences, Fisheries and Economics
School of Business and Economics
22.9.2017



Photo: Mari Hildung, Perspektivet Museum

Hanne Hammer Stien

Philosophiae doctor

Photography in the foreground. Photo documentation and the use of images in cultural history museums

(*Fotografi i forgrunnen. Fotodokumentasjon og bruk av bilder i kulturhistoriske museer*). After the Second World War, photo documentation became a more important scientific tool within cultural history museums. By examining photographs featured in the exhibitions Moments (1997) and Russian Current (2007), produced by Tromsø Museum and Perspektivet Museum in Tromsø respectively, this thesis discusses the position

and function of photography in contemporary cultural history museums. The turn towards photography within museums is part of a broader turn towards images; in particular, artistic interventions have become common in cultural history museums over the past ten years. With this in mind, the final chapter of the thesis discusses what happens when the distinction between artistic and cultural historical presentations at cultural history museums is blurred. By pointing to a specific understanding of the visual turn, this thesis argues that ideally, or even radically, a recognition of the image in a broad sense puts the image at the core of the museum experience and the production of meaning itself.

Page link to thesis: <http://hdl.handle.net/10037/11072>

Faculty of Humanities, Social Sciences and Education
Department of Language and Culture
2.6.2017

Marius Storvik

Philosophiae doctor

Legal protection of patients' integrity in mental health care

(*Rettslig vern av pasienters integritet i psykisk helsevern*). This thesis explores the legal protection for patients after admission to inpatient mental health care facilities, specifically relating to interventions in patient physical integrity. Storvik begins by articulating the interventions to the integrity that are commonly found in the practice and procedures of mental health care facilities. Eight specific interventions are then selected for examination and the legal frameworks relating to those intervention routines are articulated. Storvik then analyses the proper practice in the intervention of physical integrity of patients as laid out by the European Convention on Human Rights (ECHR). Against the background of the ECHR, the eight specific intervention routines are then evaluated in concert with the relevant Norwegian legal framework. Storvik concludes that seven of the eight routines breach the prevailing legal standards on the patient integrity in the ECHR, and



Photo: Trude Haugseth Moe

specific relevant Norwegian sections. However, at the same time, Norwegian policy relating to the integrity in inpatient mental health care facilities has not been substantially impacted by the ECHR requirements. Storvik asserts that the practice of ECHR can best be understood against the purpose of the intervention – in that the standards of protection may change according to the purpose of the intervention, i.e. treatment or security. Storvik additionally questions the Norwegian principle of necessity (nødrett) as a sufficient legal basis in mental health institutions' interventions.

Faculty of Law
30.5.2017

Kamila Andzela Sztybor

Philosophiae doctor

Late glacial and deglacial paleoceanographic and environmental changes at Vestnesa Ridge, Fram Strait: challenges in reading methane-influenced sedimentary records

This thesis is based on four sediment cores from the western Svalbard margin from an area where methane is released from the seafloor. The study focuses on reconstructing methane seepage events in the past and climate variability in this high Arctic region with a use of benthic foraminifera. Foraminifera are single celled organisms that produce a calcareous shell that is preserved in seafloor sediments. By reading the geochemical records of the fossil shells, we can reconstruct both paleoceanographic conditions and episodes of enhanced methane flux towards the seafloor. Based on the isotopic record of the fossilized shells and associated carbonate crust, the researchers have identified massive methane release during the deglaciation 15,000-13,000 years ago. Reconstructions of paleo-seepage are important to estimate the contribution of methane to the ocean-atmosphere system, especially in the light of ongoing global warming and increasing deep-sea temperatures that are amplified in the Arctic region.

Faculty of Science and Technology
Department of Geosciences
18.1.2017

Martin Sørensen

Philosophiae doctor

The role of *Staphylococcus aureus* in allergic disease and cross-reactivity in fish allergy

This thesis aims to 1) describe the prevalence of allergic disease in adolescents and study associations between allergic diseases and *Staphylococcus aureus*, and 2) to study cross-reactivity in fish allergic children and the utility of existing and novel tests for fish allergy. Prevalence

of allergic diseases and associations to *Staphylococcus aureus* was studied in a cross-sectional study including 868 adolescents using a questionnaire and clinical examinations/laboratory tests. Cross-reactivity in fish allergy was studied with food challenges with different fish species, questionnaire and measurement of specific IgE in 35 fish allergic children. The conclusions were that *Staphylococcus aureus* carriage may play a role in disease severity, whereas sensitization to staphylococcal enterotoxins may play a role in poly-sensitization to food- and inhalant allergens and allergic multimorbidity. Cross-reactivity among fish allergic patients is common, but tolerance to some species exist in around one-third and should be identified to avoid unnecessary food restrictions. A combination of clinical history and sIgE to fish-allergen extracts and molecules may reduce the number of food challenges needed for specific diagnosis of fish allergy.

Page link to thesis: <http://hdl.handle.net/10037/11634>

Faculty of Health Sciences
Department of Clinical Medicine
29.9.2017

Rita Sørly

Philosophiae doctor

Relational insight and user involvement in the context of Norwegian community mental health care: A narrative analysis of service users' stories

User involvement is a statutory right and an instrument to ensure the protection of mental health service users' needs for care and treatment in community mental health care. In this study, 30 users in community mental health care are interviewed. The aim of the study was to investigate the users' insights into their own health and treatment, and to present possible approaches that could help to recognize and make use of the perspectives of the service users. Through a narrative analysis of the service user's stories, the study shows that insight into one's own health and treatment is a prerequisite for user involvement. Upon initial admission, the therapist and the user are placed

in a situation where the therapist is expected to measure whether the user has insight or lack insight. If the therapist and the user can participate in a common dialogue in an everyday language, the chances of promoting insight will improve. Both insight and user involvement are defined in the study as relational and dynamic processes that are conducted in dialogue with the user. This dialogue is based on a narrative practice. Findings emphasize that admissions in community mental health care constitute violation in the individual's everyday life, and narrative practice focusing on user involvement is particularly important in this context. The findings in the study are not only relevant to the community mental health care services, but are also transferable to other fields where user involvement is a key topic.

Page link to thesis: <http://hdl.handle.net/10037/10299>

Faculty of Health Sciences
Department of Health and Care Sciences
19.1.2017

Alexandros Tasianas

Philosophiae doctor

Fluid flow at the Snøhvit field, SW Barents Sea: processes, driving mechanisms and multi-phase modelling

The overall goal of the project was to understand the short-term and long-term impacts of CO₂ storage on marine ecosystems. The work mainly focused on the Snøhvit hydrocarbon field and CO₂ storage site in the Hammerfest Basin in the SW Barents Sea. The main basis consisted of an interpretation of conventional 3D and high-resolution P-Cable 3D seismic data that were used to obtain a better understanding of deep-to-shallow fluid flow. Tasianas was mainly involved in work, which concentrated on the architecture and integrity of the sedimentary cover at storage sites and in activities aiming at coordinating the development of monitoring techniques and strategies. He also contributed to the development of a framework of best environmental practices in the management of offshore CO₂ injection and storage. Methodology used throughout

the project included the use of new state-of-the-art technology, employed for an enhanced imaging of the seafloor and its sub-surface at unprecedented resolution. The primary method employed in this thesis is thus seismic interpretation of both conventional and P-Cable 3D seismic data using Schlumberger's Petrel software. Abundant and widespread fluid flow can be observed in the SW Barents Sea. The observed fluid flow features can be of various types, interpreted as gas chimneys, leakage along faults and fractures and other related features. The thesis concludes that there is no active seepage of gas in the Snøhvit area.

Page link to thesis: <http://hdl.handle.net/10037/11494>

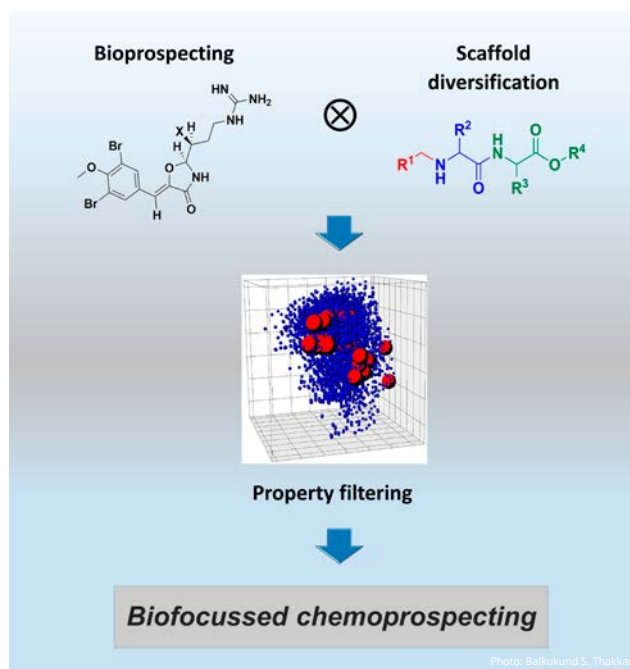
Faculty of Science and Technology
Department of Geosciences
3.7.2017

Balmukund Sureshkumar Thakkar

Philosophiae doctor

A Biofocussed Chemoprospecting Approach to Drug Discovery: Design, Synthesis and Bioactivity Screening of Diverse Biofocussed Chemical Libraries

With pharma R & D witnessing rising cost, high attrition rates and an overall decline in productivity in recent times, newer approaches are needed for more efficient early phase drug discovery. This thesis describes a new approach, "biofocussed chemoprospecting". The essence of the approach is to use diverse, yet "bio-like" compounds for efficient hit-finding, along with property filtering and optimization of qualities such as diversity of physicochemical properties, drug likeness, ease of synthesis and low cost for efficient selection of compounds. Three libraries based on biomolecules such as linear and cyclic dipeptides, and tartaric acid were designed. Virtual libraries were generated, and their physicochemical properties and drug likeness were analysed. The libraries of compounds with optimum diversity were synthesized, and multiple compounds with significant bioactivities were found. The substitution effects for cyclization reaction



were rationalized using QM methods to enable synthetic efficiency as a parameter of library design. The overall success of the approach can be attributed essentially to the efficient library design as an outcome of focus on bio-likeness and optimized diversity – the core ideas of the biofocussed chemoprospecting approach.

Page link to thesis: <http://hdl.handle.net/10037/11155>

Faculty of Science and Technology
Department of Chemistry
28.4.2017

Sunniva Katharina Thode

Philosophiae doctor

Iron dependent gene regulation and siderophore systems in Vibrionaceae

Iron uptake systems are crucial for survival of disease-causing bacteria. In bacteria, the iron sensing protein Fur is the major regulator of iron uptake systems. *Vibrionaceae* is a bacterial family with several disease-causing representatives. Using *Aliivibrio salmonicida* (cause cold water vibriosis in fish) as a model organism, Thode and her colleagues identified 296 genes that are regulated by Fur, and 32 genes that fast responding to low iron levels. The siderophore producing system were among the fastest responding genes, and is tightly regulated by Fur. The researchers have also compared gene sets coding for siderophore producing proteins and siderophore receptors in the *Vibrionaceae* family. Using bioinformatics, they identified 60 siderophore systems distributed in 42 *Vibrionaceae* species and 330 siderophore receptors in 78 *Vibrionaceae* species. Results from these studies have increased our understanding of Fur in *A. salmonicida*, which strategies it uses to survive in environments with low iron supply and have broadened the knowledge of distribution of the siderophore systems and the evolution of these within *Vibrionaceae*.

Faculty of Science and Technology
Department of Chemistry
15.3.2017

Marte Renate Thomassen

Philosophiae doctor

Occupational exposure, respiratory health and sensitisation among crab processing workers. A study among processors of king crab (*Paralithodes camtschaticus*) and edible crab (*Cancer pagurus*) in Norwegian land based crab processing plants

Workers processing seafood can develop occupational health problems. This work examined the biological

exposure in crab processing workers as well as respiratory health and sensitisation to the crab. Workers are exposed to proteins, allergens, enzymes and endotoxin in the air they breathe. Exposure levels differ between work tasks and between the plants. Workers reported respiratory symptoms, and several were sensitised to different parts of the crab. This suggests processing workers develop health problems and are at risk of developing allergy or asthma. But the crab processing workers reported less asthma and allergy than non-exposed controls. This suggests a healthy worker effect, where workers developing health problems leave the processing plants and cause an underestimation of health effects of crab processing. Better methods for monitoring occupational allergy and proper training of workers and medical staff is needed to prevent asthma and allergy among crab processing workers.

Page link to thesis: <http://hdl.handle.net/10037/11742>

Faculty of Health Sciences
Department of Community Medicine
10.11.2017

Miriam Jensen Tveit

Philosophiae doctor

In Search of Legal Transmission – Inheritance and Compensation for Homicide in Medieval Secular Law

This thesis analyses the degree of influence and loan in the secular legislation between AD 400 and 1350. It explores the legislation on the topics of inheritance and compensation for homicide in search of the transmission of law between geographical regions and over a timespan of several centuries, and investigates how secular legislation on the distribution of inheritance and on compensation for homicide was motivated. This wide perspective has adduced evidence of legal transmission between the legal cultures in Western Europe that are not traditionally compared. Medieval legal development was born out of the Roman legal tradition, but found its own way in the following centuries. Encounters between legal cultures in medieval Europe resulted in legal advisors being

inspired by the same ideology, thus producing similar legal works. In the legislation on inheritance and homicide, this thesis demonstrates a range of shared concepts in the written laws. The similarities are found in legislation regarding the larger systems of the transfer of wealth as well as the details, such as the terminology and concepts regarding rules of inheritance and homicide. The value of this extensive survey is in its broaching of traditionally demarcated historic periods, as well as its thorough investigation of law material from a large region. Thus, the thesis contributes to the available research on medieval legislation at different points in time, and discusses how existing European law influenced other secular legislative authority, either directly or conceptually.

Page link to thesis: <http://hdl.handle.net/10037/10221>

Faculty of Humanities, Social Sciences and Education
Department of Archaeology, History, Religious Studies and Theology
20.1.2017

Anna Alexandrovna Usynina

Philosophiae doctor

Risk factors of adverse pregnancy outcomes: opportunities and perspectives of a birth registry-based study

The overall aim of this thesis was to investigate associations between selected risk factors and adverse perinatal outcomes based on data from the Murmansk County Birth Registry in Russia. Maternal low education, unmarried status, overweight or obesity, alcohol abuse, as well as preterm deliveries and abortions in mother's medical history and antepartum hemorrhage and fetal growth retardation in current pregnancy associated with increased risk of perinatal mortality. Babies of underweight women were at lower risk of perinatal death. The prevalence of preterm birth ranged from 6.0% at 22-27 weeks gestation to 0.3% at 32-36 completed weeks, reaching 6.9% in total. Unmarried women, those with prior preterm birth, spontaneous or induced abortions had increased risk of preterm birth in current pregnancy. Additional risk



Photo: Andrej Lobanov

factors varied throughout pregnancy. Maternal smoking and alcohol abuse increased the risk of term small for gestational age birth. A similar effect was observed in low educated, unemployed, and underweight women.

Public health efforts should therefore focus on reducing smoking, alcohol consumption and underweight in women planning pregnancy as well as promote good nutrition in this group.

Page link to thesis: <http://hdl.handle.net/10037/10288>

Faculty of Health Sciences
Department of Community Medicine
8.2.2017

Anne Merete Vangen-Lønne

Philosophiae doctor

Ischemic stroke in a general population: Time trends in incidence, case fatality and the impact of risk factors. Time trends in incidence, case fatality and the impact of risk factors.

About 80-85% of all strokes are due to reduced blood flow to the brain (ischemic strokes). Lack of knowledge regarding how the incidence of ischemic stroke has changed across time in Norway represented a main motivation for this study. Data from the Tromsø Study provided an excellent opportunity to reveal time trends of ischemic stroke and assess the possible reasons behind these trends in a general population. The researchers found that the overall risk for suffering an ischemic stroke declined by 27% from 1995–2012 in persons aged ≥ 30 years. The combined changes in blood pressure, cholesterol, HDL, smoking, physical activity, diabetes and weight could explain 57% of the overall decrease in stroke risk from 1995–2012, with decline in average blood pressure and reduced number of smokers as the most important contributors. However, while the risk of ischemic stroke declined among the middle aged and remained stable among the eldest, an increasing trend was found in the youngest women (30–49 years).

Page link to thesis: <http://hdl.handle.net/10037/11665>

Faculty of Health Sciences
Department of Clinical Medicine
13.10.2017

Ireen Vieweg

Philosophiae doctor

Biological effects of dietary crude oil on polar cod (Boreogadus saida)

Increasing petroleum activity in Arctic waters poses the risk for accidental oil spills in these pristine waters and raises concerns about the biological effects of petroleum compounds on important marine species in the Arctic. The polar cod (*Boreogadus saida*) is a key species in the Arctic marine food web, because it channels much of the energy from lower to higher trophic levels that are represented by marine mammals and seabirds. Due to its circumpolar distribution, important ecological function in the Arctic ecosystem, and its overlapping occurrence with prospected areas for future petroleum activities, the polar cod has been suggested as a relevant indicator species for oil pollution studies in the Arctic regions. The present work investigated biological effects of crude oil on polar cod by exposing fish to environmentally relevant crude oil doses through their food during two experiments. A wide array of biomarkers was used to examine the toxic effects of petroleum compounds on biological processes that are important for the fitness of this fish species. Biological effects occurred at molecular, cellular and physiological levels after prolonged exposure, indicating that specific metabolic processes might be altered during chronic exposure. On the other hand, adult polar cod appeared to be relatively robust to environmentally relevant doses of crude oil, indicated by weak responses found in biomarkers related to the lipid homeostasis, reproduction and the antioxidant defense system of polar cod.

Faculty of Biosciences, Fisheries and Economics
Department of Arctic and Marine Biology
22.6.2017

Tatiana Wara

Philosophiae doctor

The mobile body. A physiological study of reorientation practices among Russian female migrants in Finnmark

(*Den mobile kroppen. En kroppsfenomenologisk studie av reorienteringspraksiser blant russiske kvinnelige migranter i Finnmark*). This thesis includes an introduction and three published journal articles. It explores Russian women in Finnmark building on ethnographic research (2012-2015), including data from focus group interviews, individual interviews and participant observation. It highlights gendered stories about everyday life and (lack of) belonging in the North by addressing the following question: How do female Russian migrants reorientate themselves after having settled in Finnmark? The thesis makes use of Merleau-Ponty's phenomenology of the body and an intersectional approach. It explores the participants' reorientation practices related to how they face local prejudice and hence how they engage in different forms of 'Norwegianization' processes e.g. by dressing down to fit in. It highlights how constructions of gender are interwoven in translocal 'minoritizing' and 'majoritizing' processes, and explores how the participants position themselves as 'Russian women' through stories about how they practice and transform traditions. The thesis illustrates how (re)orientations may be fruitfully viewed as practices that are constituted through the body across time and space.

Page link to thesis: <http://hdl.handle.net/10037/10193>

Faculty of Humanities, Social Sciences and Education
Department of Social Sciences
20.1.2017

Henrik Winther

Philosophiae doctor

Lie-Algebraic Approaches to Highly Symmetric Geometries

Many geometric structures have symmetries. For example, a hexagon can be rotated by multiples of 60 degrees or flipped about an axis, while a circle can be rotated by any number of degrees without changing it. The fundamental difference between these examples is that the hexagon has only finitely many symmetries, while the circle has a continuous set. The latter kind of symmetries are called Lie groups. Winther and his fellow researchers exploit the presence of such symmetries to explore and answer questions about more complicated geometries.

Page link to thesis: <http://hdl.handle.net/10037/10922>

Faculty of Science and Technology
Department of Mathematics and Statistics
24.2.2017

Reni Jasinski Wright

Philosophiae doctor

Sami tourism as "world making" practices

(*Nå er vi blitt så trygg i oss selv at vi kan selge oss til turister. Samisk turisme mellom kommersielle interesser, lokal kunnskap & verdensskapende praksiser*). This dissertation takes as its point of departure questions regarding the commodification of indigenous culture in tourism. In particular, it addresses the complicated ethical considerations having to do with cultural ownership and appropriation. The dissertation takes readers on a journey that includes exploration of academic texts about Sami tourism, a trip to Kåfjord in northern Troms, a study-trip to New Zealand with a group of Sami tourism entrepreneurs, and a photographic exhibition in Tromsø. Growing through experiences and encounters at these various sites, the dissertation discusses what tourism is, and its potential. Theoretically, this dissertation seeks to move tourism research away from reproducing



the “traditional-modern” dichotomy and towards an approach that views tourism as a “world-making practice”. Empirically, with inspiration from Maori tourism, it seeks to create space for re-enacting pasts, and for constructing futures differently.

Page link to thesis: <http://hdl.handle.net/10037/11849>

Faculty of Humanities, Social Sciences and Education
Department of Social Sciences
18.12.2017

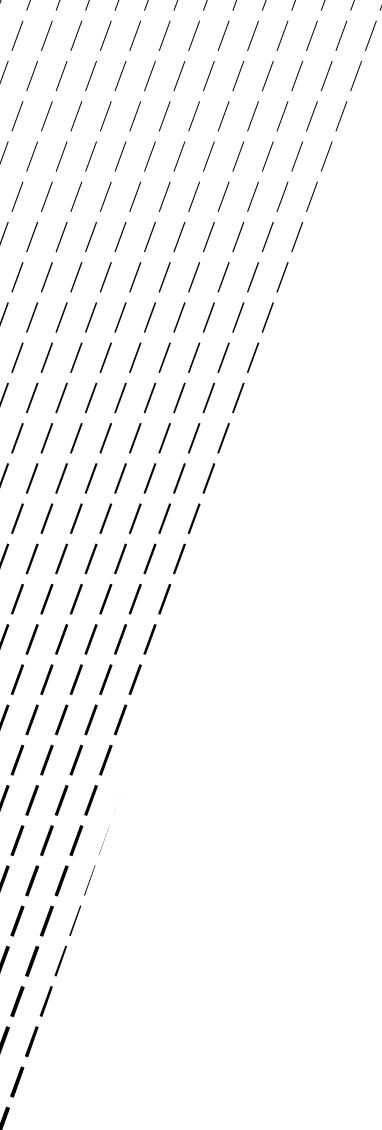
Kassaye Yitbarek Yigzaw

Philosophiae doctor

Towards Practical Privacy-Preserving Distributed Statistical Computation of Health Data

The continuous developments of medicine through research have saved countless lives and improved the overall quality of life. New scientific evidence improves our understanding of illness, and lead to better treatments and preventions. The large amount of health information the doctors collect about our health, the health-related data the researchers collect with our mobile devices, and the questionnaires they fill out for medical studies have huge potential to support the advancements of medicine. However, one often does not want others to learn about our sensitive personal information. Is not it interesting if one can donate her/his health data for research without compromising privacy? The PhD project designed and developed techniques that allow health data of large number of individuals to be analysed, while nobody learns sensitive information about individuals. Therefore, medical research that could be hampered due to privacy concerns will be possible, and consequently there will be more medical advances.

Faculty of Science and Technology
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10.1.2017



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