NCMM Molecular Medicine Research Course

Course no.: MF9120BTS - Molecular Medicine (national PhD-level course)

Time: November 11-22, 2019

Place: Oslo Science Park, Level 0, Hagen 1+2 (see daily plan)

Organized by: Centre for Molecular Medicine Norway, Nordic EMBL Partnership, University of Oslo and Oslo University Hospital

Topics and Programme

1. **Disease mechanisms and development** (14h)
    a. Disease mechanisms in cancer
        - Molecular pathogenesis of cancer (1h, Oddbjørn Straume)
        - Tumor angiogenesis (1h, Oddbjørn Straume)
        - Cancer genomics and metabolism (1h, Hege Russnes)
        - Tumor immune evasion mechanisms (1h, Kjetil Taskén)
    b. Inflammation (2 h, Bente Halvorsen/Espen Melum)
    c. Patophysiology of excitatory diseases in the brain (2h, Vidar Gundersen)
    d. Metabolic diseases, diabetes (2h, Johan Fernø)
    e. Epigenetics and chromatin structure (1h, Nikolina Sekulic)
    f. DNA repair mechanisms (1h, Hilde Nilsen)
    g. Disease mechanism and risk factors of venous thrombosis (2 h, Lynn Butler)

2. **Animal models of disease** (3h)
    a. Animal models in cancer (1h, Ludvig Munthe)
    b. Disease mechanisms and animal models of cardiovascular disease (2h, Andreas Romaine /Ida G. Lunde)
    c. Zebrafish as model organism (1h, Camila Esguerra)

3. **Biobanks, health registries and biomarker discovery** (7h)
    a. Use of population biobanks to understand human disease (2h, Kristian Hveem)
    b. Predictive medicine: Use of health registries and epidemiology (2h, Trude E. Robsahm)
    c. Cancer biomarkers (1h, Laxmi Silwal-Pandit)
    d. Biomarkers for early diagnosis and management of heart diseases (2h, Torbjørn Omland)

4. **Imaging disease** (8h)
    a. Introduction to imaging modalities (2h, Lars Tore Gyland Mikalsen)
    b. Imaging cardiovascular diseases in animal models and patients (2h, Bill Louch/Magnus Arnonsen)
    c. Multiphoton imaging of brain diseases (2h, Erlend Nagelhus)

d. Imaging cancer (2h, Siver Moestue)

5. **Drug targeting and pharmacology** (8h)
    a. Basics of Chemical Biology and High throughput screening (1h, Johannes Landskron)
    b. Introduction to structural biology and drug development (2h, Eva Cunha)
    c. Targeting signaling pathways in cancer (2h, Sigrid Skånland)
    d. Nano-medicine (1h, Irep Gözen)

6. **Tailored and personalized medicine** (9 h)
    a. Introduction to Precision Medicine (1h, Janna Saarela)
    b. Precision medicine in everyday practice - rare diseases (2 h, Dag Undlien)
    c. Drug sensitivity testing and personalized medicine (2h, Krister Wennerberg/ Bjørn Tore Gjertsen)
    d. Novel analytics in personalized medicine (2 h, Anthony Mathelier/Marieke Kuijjer)
    e. Utilizing common genetic variation to predict disease predisposition (2 h, Samuli Ripatti, Elisabeth Widen)

7. **Advanced cell-based therapies** (6 h)
    a. Stem cells and their niche as a basis for future therapies (1h, Lorena Arranz)
    b. Introduction to use of gene editing/CRISPR (1 h, Emma Haapaniemi)
    c. Cell based therapies in medicine – Laboratory work flow and clinical practice in cancer treatment (2h, Else Marit Inderberg Suso)
    d. T cell receptor engineering and T cell therapies in cancer (1h, Johanna Olweus)
    e. Regenerative Medicine: Organ and cell transplantation, Tissue Engineering (1h Hanne Scholz)

8. **Organizational**
    a. Introduction and organization (1h, Elisa Bjørgo)
    b. Ethical and regulatory issues in molecular medicine (2 h, Katrine Ore)
    c. Student Poster session (2h, see separate list)

Total 60 hours

Week 1 Schedule; NCMM Molecular Medicine Research Course

Date	Day/Room	Time	Topic	Title	Lecturer
11.11.2019	Mon Hagen 1+2	09.00 09.15	- Organizational - Drug targeting & pharmacology	- Info & organization - Basics of chemical biology and high-throughput screening	- Elisa Bjørgo - Johannes Landskron
11.11.2019	Mon Hagen 3	10.00 – 12.00	Student Poster session		All students
11.11.2019	Mon Hagen 1+2	12.15 – 13.00	Disease mechanisms	Cancer genomics and metabolism	Hege Russnes
11.11.2019	Mon Hagen 1+2	14.00 – 15.45	Disease mechanisms	- DNA repair mechanisms - Epigenetics and chromatin structure	- Hilde Nilsen - Nikolina Sekulic
12.11.2019	Tue Hagen 1+2	09.00 – 10.45	Tailored and personalized medicine	- Introduction to Precision Medicine - Tumor immune evasion mechanisms	Janna Saarela Kjetil Taskén
12.11.2019	Tue Hagen 1+2	11.00 – 12.45	Disease mechanisms	- Molecular pathogenesis of cancer - Tumor angiogenesis	Oddbjørn Straume
12.11.2019	Tue Hagen 1+2	14.00 – 15.45	Tailored and personalized medicine	Precision medicine in everyday practice - rare diseases	Dag Undlien
13.11.2019	Wed Hagen 1+2	09.00 – 10.45	Imaging disease	Introduction to imaging modalities	Lars Tore Gyland Mikalsen
13.11.2019	Wed Hagen 1+2	11.00 – 12.45	Imaging disease	Imaging cancer	Siver Moestue
13.11.2019	Wed Hagen 1+2	14.00 – 15.45	Imaging disease	Imaging cardiovascular diseases in animal models and patients	Bill Louch/ Magnus Aronsen
14.11.2019	Thu Hagen 1+2	09.00 – 10.45	Advanced cell-based therapies	- Introduction to use of gene editing/CRISPR - Stem cells and their niche as a basis for future therapies	- Emma Haapaniemi - Lorena Arranz
14.11.2019	Thu Hagen 1+2	11.00 – 12.45	Advanced cell-based therapies	Cell based therapies – Laboratory work flow and clinical practice	Else Marit Inderberg Suso
14.11.2019	Thu Hagen 1+2	14.00 – 15.45	Disease mechanisms	Disease mechanism and risk factors of venous thrombosis	Lynn Butler
15.11.2019	Fri Hagen 1+2	09.00 – 10.45	Biobanks, health registries and biomarker discovery	Predictive medicine: Use of health registries and epidemiology	Trude Eid Robsahm
15.11.2019	Fri Hagen 1+2	11.00 – 12.45	Biobanks, health registries and biomarker discovery	Use of population biobanks to understand human disease	Kristian Hveem
15.11.2019	Fri Hagen 1+2	14.00 – 15.45	Tailored and personalized medicine	Drug sensitivity testing and personalized medicine in leukemia	Krister Wennerberg/ Bjørn Tore Gjertsen

Week 2 Schedule; NCMM Molecular Medicine Research Course

Date	Day/Room	Time	Topic	Title	Lecturer
18.11.2019	Mon Hagen 1+2	09.00 – 10.45	Structure-based understanding of disease	Introduction to structural biology	Eva Cunha
18.11.2019	Mon Hagen 1+2	11.00 – 12.45	Disease mechanisms	Metabolic diseases, diabetes	Johan Fernø
18.11.2019	Mon Hagen 1+2	14.00 – 15.45	- Drug targeting & pharmacology - Advanced cell-based therapies	- Nano-medicine - T cell-based immunotherapy in cancer	- Irep Gözen - Johanna Olweus
19.11.2019	Tue Hagen 1+2	09.00 – 10.45	Imaging disease	Multiphoton imaging of brain diseases	Erlend A. Nagelhus
19.11.2019	Tue Hagen 1+2	11.00 – 12.45	Disease mechanisms	Patophysiology of excitatory diseases in the brain	Vidar Gundersen
19.11.2019	Tue Hagen 1+2	14.00 – 15.45	Disease mechanisms	- Inflammation - the fuel in atherosclerosis - Gut and liver inflammation	- Bente Halvorsen - Espen Melum
20.11.2019	Wed Hagen 1+2	09.00 – 10.45	Organizational	Ethical and regulatory issues in molecular medicine	Katrine Ore
20.11.2019	Wed Hagen 2	11.00 – 12.45	Tailored and personalized medicine	Novel analytics in personalized medicine	Anthony Mathelier/ Marieke Kuijjer
20.11.2019	Wed Hagen 2	14.00 – 15.45	Tailored and personalized medicine	- Genomics in Disease Prevention and Management - Genomics in Action: Preventing Ischemic Heart Disease	- Samuli Ripatti - Elisabeth Widen
21.11.2019	Thu Hagen 1+2	09.00 – 10.45	Biobanks, health registries and biomarker discovery	Biomarkers for early diagnosis and management of heart diseases	Torbjørn Omland
21.11.2019	Thu Hagen 1+2	11.00 – 12.45	Animal disease models	Disease mechanisms and animal models of cardiovascular disease	Andreas Romaine/Ida G. Lunde
21.11.2019	Thu Hagen 1+2	14.00 – 15.45	- Animal disease models	- Zebrafish as a model organism - Animal models in cancer. The dog, the mouse and humanized mice.	- Camila Esguerra - Ludvig Munthe
22.11.2019	Fri Hagen 1+2	09.00 – 10.45	- Advanced cell-based therapies - Biobanks, health registries and biomarker discovery	- Stem cell treatment in diabetes - Cancer biomarkers: from discovery to clinical practice	- Hanne Scholz - Laxmi Silwal-Pandit
22.11.2019	Fri Hagen 1+2	11.00 – 12.45	Drug targeting & pharmacology	Targeting signaling pathways in cancer	Sigrid Skånland
22.11.2019	Fri Hagen 1+2	13.00	Organizational	Summary course	Elisa Bjørgo

Contacts:

Course responsible: NCMM Group Leaders and Elisa Bjørgo

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Contact for Programme andPoster session: see distribution on days below

Week 1

11.11.2017: Nikolina Sekulic

12.11.2017: Janna Saarela

13.11.2017: Sandra Lopez-Aviles

14.11.2017: Emma Haapaniemi

15.11.2017: Judith Staerk

Week 2

18.11.2017: Irep Gözen

19.11.2017: Anthony Mathelier

20.11.2017: Marieke Kuijjer

21.11.2017: Camila Esguerra

22.11.2017: Elisa Bjørgo