



19 – 23 AUGUST 2019, 9:00 – 16:30



EUR 2,680 / DKK 19,900 EXCL. DANISH VAT

Copenhagen Summer University

BIG DATA DRIVEN PERSONALIZED MEDICINE

Personalized medicine is a rapidly growing field that targets medical interventions tailored to an individual's medical profile rather than the long established 'one-size-fits-all' approach. It is primarily driven by advancements in our ability to generate large amounts of genomic and phenotypic data in a clinical setting, and it requires a multidisciplinary approach to implement in clinical practice. Accordingly, this course is aimed at anybody engaged in basic research, clinical medicine, the pharmaceutical industry, and those involved in health care administration and politics.

“Very well structured and organized. Very experienced lectures”

Participant about Copenhagen Summer University

Personalized medicine identifies elements that predict the individual's predisposition to disease and their response to treatment. The tools and methods of personalized medicine integrate genomic and other “-omics” information with clinical and custom laboratory data, which enables the classification of unique disease susceptibility, better diagnoses, earlier interventions, targeted and more efficient drug therapies, and customized treatment. At the same time, the health system is increasingly using big data derived from novel technologies to guide clinical decision-making aimed at optimizing individual benefits from available interventions. However, the question remains: how do we best take advantage of these novel opportunities?

WHAT YOU WILL LEARN

Personalized medicine has far-reaching implications for public health, preventive interventions including the rational design of screening programs, as well as for medical and surgical treatment in hospitals. The multidisciplinary approach this requires is reflected in the syllabus for this course.

After the course you will have acquired:

- A toolbox of techniques for providing personalized medicine, for example diverse technologies to generate and analyze big data, approaches to defining health and disease (e.g. the phenotype), and linking big data to routine clinical care
- An understanding of the challenges and pitfalls in the analyses and interpretation of “big data”
- Knowledge on the practical translation of research findings into clinical practice
- Insight into the future perspectives on personalized medicine

COURSE CONTENT

The course will provide you with insight into key principles and give you a practical understanding of the concept of personalized medicine. We will take you through important aspects of the personalized medicine strategy with an overview of methodological principles, advances in research, and how they are applied to the daily clinical practice of medicine and drug development. The teaching style is interactive and consists of a combination of lectures, discussions, group work and case studies/exercises.

The topics include:

- Definition, mission and vision for personalized medicine
- What data are generated by the various “-omics” technologies and what are they good for?
- Future tools to categorize states of health – or, what exactly is (deep) phenotyping? Covering biological vs syndrome categorization of diagnosis taxonomy, own assessment (personalized electronic health data (incl. PRO-data, wearable health data))
- Stratification versus individualization – what is the difference?
- What infrastructure is needed to implement personalized medicine? Role of laboratories generating data, combining data, use of biobanks, and supercomputer capability
- Data integration, incl. artificial intelligence, machine learning, deep learning – strengths and limitations of the supercomputer infrastructures
- Handling of person-sensitive data in clinical contexts and in research
- The host genome: Challenges in understanding the composition of 3 billion base-pairs
- Why focus on something rare and not the prevalent conditions?
- Images of the body – an “-omics” technology able to capture dynamic metabolic and immunological changes
- The forefront of personalized medicine: oncology and hematology
- How to use personalized medicine in psychiatry: complex diseases using common genetic variants and polygenic risk scores
- Immune dysfunction: complex inherent and acquired conditions rendering the host vulnerable to increased risk of infection, non-infectious immune activation and many other things
- Genome editing techniques incl. CAR T-cells
- Complications in surgery: “a patient-like-me platform in clinical practice”
- Ethical dilemmas in personalized medicine
- Future perspectives on personalized medicine – in 10, 20 and 30 years

For more information and registration

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“Nice facilities and catering”

Participant about Copenhagen Summer University

PARTICIPANTS

The course is for professionals working in the field of medicine, bioinformatics or related health sciences (e.g. public health, human biology and biotechnology), people with a special interest in the technical aspects of health and medicine and people from the pharmaceutical industry. The course offers an excellent introduction for those less familiar with the concept of personalized medicine and will provide a deeper understanding for health professionals with experience of the field. It will also be of interest to those working in ministerial departments and the regions.

Participants must hold a relevant bachelor degree or equivalent.

COURSE DIRECTOR

Jens Lundgren, Professor, Dept. of Infectious Diseases, Rigshospitalet, University of Copenhagen

Other course teachers

Søren Brunak, Professor, NNF Center for Protein Research, Panum Institute, University of Copenhagen

Ismail Gögenur, Professor, Dept. Surgery, Zealand University Hospital, University of Copenhagen

Marie Helleberg, Specialist, Dept. of Infectious Diseases, Rigshospitalet, University of Copenhagen

Liselotte Højgaard, Professor, Dept. of Clinical Physiology, Nuclear Medicine & PET Rigshospitalet, University of Copenhagen

Andreas Kjær, Professor, Dept. of Clinical Physiology, Nuclear Medicine & PET, Rigshospitalet, University of Copenhagen

Ulrik Lassen, Professor, Dept. of Oncology, Rigshospitalet, University of Copenhagen

Ole Lund, Professor, Genomic Epidemiology, DTU Food

Rasmus Marvig, Head of Bioinformatics, Center for Genomic Medicine, Rigshospitalet, University of Copenhagen

Trine Mogensen, Professor, Aarhus Universitetshospital

Finn Cilius Nielsen, Professor, Center for Genomic Medicine, Rigshospitalet, University of Copenhagen

Carsten Utoft Niemann, Ass Professor, Dept. of Haematology, Rigshospitalet, University of Copenhagen

Henrik Ullum, Professor, Dept. of Clinical Immology, Rigshospitalet, University of Copenhagen

Thomas Werge, Professor, Institute of Biological Psychiatry, Copenhagen Mental Health Services, University of Copenhagen

Additional course teachers will be included – all international experts in their field.

COURSE FEE

EUR 2,680/DKK 19,900 excl. Danish VAT. Fee includes teaching, course materials and all meals during the course.

For more information and registration

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