

## Faculty of Health Sciences

### FACULTY

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### HAE OPISKELJAKSI

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# GEF3

## Genetic, epigenetic and functional aspects of complex diseases III: *Special emphasis on epigenetics and bioinformatics*

University of Eastern Finland, Kuopio, Finland  
August 29-30, 2013

<b>Updated</b>	27.8.2013
<b>Registration</b>	Deadline for registration was August 15, 2013.
<b>COURSE FEEDBACK</b>	<a href="#">Link to e-form is here.</a>
<b>General info</b>	Coffees are included to the course. Special diet inquired in the registration form for Get-together party.
<b>Venue</b>	Lectures: Tietoteknia Auditorium, 1st floor, Savilahdentie 6 Get-together Party & Poster Session: Tietoteknia Auditorium Hall, 1st floor, Savilahdentie 6 Exercises in bioinformatics: Canthia, 1st floor, Yliopistonranta 1C Map of locations: <a href="#">here</a> (pdf)
<b>ECTS credits</b>	1,0
<b>Teaching language</b>	English
<b>Contact information &amp; Course coordinators</b>	- Merja Heinäniemi <a href="mailto:merja.heinaniemi@uef.fi">merja.heinaniemi@uef.fi</a> - Petri Pölonen <a href="mailto:petri.polonen@uef.fi">petri.polonen@uef.fi</a>
<b>Responsible department</b>	Institute of Clinical Medicine - <b>Neurology</b>
<b>Course director</b>	Research Director <b>Mikko Hiltunen</b>
<b>Contents</b>	This course will cover current topics related to genetic, epigenetic and molecular studies in complex diseases. The specific topics are: <b>1)</b> How to identify novel risk genes and pathways in complex diseases by means of genetics, epigenetics and bioinformatics. <b>2)</b> How to characterize the functional roles and regulation of the identified candidate genes and pathways in disease pathogenesis. Lectures will introduce current computational, in vitro and in vivo approaches in the functional characterization of novel candidate genes and pathways for complex diseases, including basics of next generation sequencing methodology. The course consists of lectures and small group exercises given by national and international experts. This course is also applicable to post-graduate students and senior researchers.
<b>Study material</b>	Preliminary exercises and material distributed during the course.
<b>Teaching methods and assessment</b>	Lectures 10 h, exercises/problem-based tasks during the course 4 h and 13 h to prepare one of 1) poster/talk presentation at the course or 2) completed independent study material (preliminary exercises). For further information related to teaching methods and assessments, please be in contact with the Course Coordinators.

### Program

**Thursday, August 29, 2013** - location: Tietoteknia Auditorium, 1st floor, Savilahdentie 6 - see [MAP](#)

08:30-08:45	<b>Opening and Introduction to the Course</b> Program Chair: Mikko Hiltunen (UEF)
08:45-09:15	<b>Basic concepts related to epigenetic regulation of gene expression</b> Antero Salminen (UEF)
09:15-10:45	<b>Epigenetics of Acquired Epilepsy</b> Chair: Asla Pitkänen (UEF)

09:15-09:45	<b>Key-note lecture: Epigenetics in human health and disease</b> Assam El-Osta (Baker IDI Heart & Diabetes Institute, Australia)
09:45-10:15	<b>The emerging role of DNA methylation in epileptogenesis</b> Katja Kobow (Universitätsklinikum Erlangen, Germany)
10:15-10:45	<b>miRNA in acquired epilepsy</b> Katarzyna Lukasiuk (The Nencki Institute, Poland)
10:45-11:15	<i>Coffee break and exhibition</i>
11:15-11:45	<b>Epigenetics in cancer</b> Arto Mannermaa (UEF)
11:45-12:15	<b>Epigenetics in cardiovascular disease</b> Einari Aaviik (UEF)
12:15-13:15	<i>Lunch</i>
13:15-14:15	<b>Regulation at the Genome Level</b>
13:15-13:45	<b>Key-note lecture: Integrating enhancer transcription and genome topology</b> Christopher Benner (Salk Institute, CA, USA)
13:45-14:15	<b>Gene regulation in Type 2 diabetes research</b> Sami Heikkinen (UEF)
14:15-14:35	<b>Student presentation 1</b>
14:45-16:00	<b>Bioinformatics Approaches in Molecular Medicine</b>
14:45-15:15	<b>Key-note lecture: Integrated sequencing of prostate cancer</b> Matti Nykter (University of Tampere)
15:15-15:40	<b>New bioinformatics initiatives at UEF</b> Jussi Paananen (UEF)
15:45-16:00	<b>Student presentation 2</b>
16:00-16:20	<b>Introduction to the bioinformatics research at LCSB - Luxembourg Centre for Systems Biomedicine</b> Rudi Balling (LCSB - Luxembourg Centre for Systems Biomedicine, Luxembourg)
	<i>Get-Together Party &amp; Poster Session</i> Location: Tietoteknia Auditorium Hall - see <a href="#">MAP</a>
<b>Friday, August 30, 2013</b> - location: Tietoteknia Auditorium, 1st floor, Savilahdentie 6 - see <a href="#">MAP</a>	
09:00-10:00	<b>Systems Biology</b>
09:00-09:30	<b>Key-note lecture: Systems biology in cancer</b> Sampsa Hautaniemi (University of Helsinki)
09:30-10:00	<b>Gene pairs that form developmental switches</b> Merja Heinäniemi (UEF)
10:00-11:30	<b>Statistical Machine Learning and Bioinformatics</b>
10:00-10:30	<b>Network deregulation analysis of complex diseases</b> Nikos Vlassis (Luxembourg Centre for Systems Biology)
10:30-11:00	<b>Learning from multiple views of cancer cells - DREAM meets reality</b> Elisabeth Georgii (Aalto University)
11:00-11:30	<b>From statistical to dynamic modeling: a case study with epidemiological data</b> Mikko Kolehmainen (UEF)
11:30-11:45	<b>Closing remarks</b>
11:45-12:15	<i>Coffee break and exhibition</i>
13:00-16:00	<b>Exercises in bioinformatics</b> - location: MC2 & MC3, Canthia, 1st floor, Ylipistonranta 1C - see <a href="#">MAP</a>
13:00-13:45	<b>Fast access to available data: from visualization to functional analysis using ENCODE datasets</b> - Merja Heinäniemi (UEF)
13:45-14:30	<b>Enrichment methods</b> - Petri Pölonen (UEF)
14:30-16:00	<b>Analysis of next-generation sequencing data using Homer</b> - Christopher Benner (Salk Institute, CA, USA)