

Report from course in “Phenotype Characterisation of Genetically Modified Mouse Models”

Turku, Finland

March 23-24, June 5-6, Nov 27-28, 2006, December 13-14, 2007 and December 8-9, 2008

The course was organised by Sari Mäkelä, Partner 7, in collaboration with postgraduate schools at University of Turku, Finland.

The course had five two-day long modules. The course had in total 450 participants and 52 senior scientists were invited as speakers. The modules had the following topics: cardiovascular system, bone and cartilage, mouse genetics, prostate and mammary gland, and obesity. The learning outcome from the course was practical understanding of the usefulness of mouse models in biomedical research.

SYMPOSIUM

Phenotype Characterization of Genetically Modified Mouse Models Cardiovascular System

23-24 March, 2006
Mauno Koivisto Centre auditorium, BioCity, Tykistökatu 6 B, Turku

This symposium is the first in a series of events focusing on methods used in the phenotypic characterization of genetically modified mice. The aim of the symposium series is to provide practical information on current in vitro and in vivo research methods for PhD students, post-doctoral researchers and other scientists involved in the generation and phenotype characterization of genetically modified mouse models.

Participation is free of charge, but registration is required.

A representative of DSI (specialized in telemetry) will be present during the symposium days to answer questions and to give a presentation of their line of products.

Registration form: <vanha.med.utu.fi/farmakol/forms/mouse.html>

Symposium program

THURSDAY 23.3.2006

Chair: Heikki Ruskoaho

- 14.00 Opening words
- 14.10 Genetically modified mouse models in biomedicine (Matti Poutanen, Univ. of Turku)
- 15.00 Experimental models for cardiovascular physiology (Heikki Ruskoaho, Univ. of Oulu)
- 16.00 Coffee break
- 16.20 Ex vivo models I: Cardiac myocytes in culture (Heikki Tokola, Univ. of Oulu)
- 16.55 Ex vivo models II: Micromyography of isolated blood vessels (Amir Snapir, Univ. of Turku)
- 17.30 Break
- 17.45 Ex vivo models III: Isolated heart: Langendorff preparation (Olli Tenhunen, Univ. of Oulu)
- 18.15 Ex vivo models IV: Sympathetic neurotransmitter release (Lutz Hein, Univ. of Freiburg, Germany)
- 19.00 Buffet

FRIDAY 24.3.2006

Chair: Lutz Hein

- 9.00 Morphological characterization of mouse heart and blood vessels (Markku Kallajoki, Univ. of Turku)
- 9.30 In vivo phenotyping of cardiac hypertrophy and heart failure (Lutz Hein, Univ. of Freiburg, Germany)
- 10.30 Coffee break
- 10.50 Practical aspect of cardiovascular investigations in the mouse (Laurent Monassier, Univ. Louis Pasteur, Strasbourg, France)
- 11.40 In vivo models I: Telemetric monitoring of cardiovascular functions in the mouse (Göran Bergström, Univ. of Göteborg, Sweden)
- 12.40 Lunch break
- 13.30 In vivo models III: Analysis of cardiac function: echocardiography and Single Photon Emission Tomography (Laurent Monassier, Univ. of Strasbourg)
- 14.20 Coffee break
- 14.40 In vivo models IV: Echocardiography: ventricular function and coronary flow (Ville Kytö and Antti Saraste, Turku)
- 15.30 The usefulness of mouse cardiovascular pharmacology for drug development (Jouko Levijoki, Orion Pharma, Espoo)
- 16.00 General discussion
- 16.30 Closing of the symposium

Phenotype Characterization of Genetically Modified Mouse Models BONE AND CARTILAGE

June 5 - 6, 2006

PharmaCity Auditorium, Itäinen Pitkätatu 4B, Turku, Finland

Organizers: CASCADE Network of Excellence, Center for Reproductive and Developmental Medicine, Drug Discovery Graduate School, The National Graduate School for Musculoskeletal Diseases, Turku Graduate School of Biomedical Sciences, Turku Postgraduate School of Health Sciences

Organizing committee: Teuvo Hentunen, Anna-Marja Säämänen, Tiina Laitala-Leinonen, Eeva Valve, Pirjo Pakarinen, Leena Strauss, Sari Mäkelä and Matti Poutanen

This symposium is the 2nd in a series of events focusing on methods used in the generation and phenotypic characterization of genetically modified mice. The aim of the symposium series is to promote practical understanding of the usefulness of mouse models in biomedical research in general and in drug discovery and development in particular. It aims to provide in-depth training for PhD students, post-doctoral researchers and other scientists involved in this field of research. The present workshop focuses on specific aspects of bone and cartilage. Participation is free of charge, but registration is required. Please register to Eeva Valve (eeva.valve@utu.fi) before May 22, 2006.

Participants are encouraged to provide their specific questions and research problems to the organizing committee. You are also welcome to bring your own specimens for analyses. Please, contact Eeva Valve before May 26 by e-mail to specify your particular interest.

Monday 5.6.2006

Theory Session I

Chair: Heikki Helminen

- 13:00-13:10** Opening words, Kalervo Väänänen, Turku
- 13:10-14:10** Cartilage structure and GM mouse models of cartilage diseases, Heikki Helminen, Kuopio
- 14:10-15:10** Bone structure and remodeling, Kalervo Väänänen, Turku
- 15:10-15:30** Coffee Break

Theory Session II

Chair: Kalervo Väänänen

- 15:30-16:30** Bone and cartilage biomarkers, Morten Karsdal, Copenhagen, Denmark

Techniques I

Chair: Kalervo Väänänen

- 16:30-16:55** Ex vivo bone assays, Tiina Laitala-Leinonen, Turku
- 16:55-17:10** Break
- 17:10-17:55** Bone histomorphometry, Juha Tuukkanen, Oulu
- 17:55-18:55** Specific problems suggested and/or presented by the participants
"Meet-the-expert session"
- 19:00** Buffet Dinner

Tuesday 6.6.2006

Theory Session III

Chair: Teuvo Hentunen

- 9:00-10:00** Mouse models to study hormonal effects on bone, Dirk Vanderschueren, Leuven, Belgium

Techniques II

Chair: Jukka Jurvelin

- 10:00-10:40** Bone biomechanical testing and macroimaging, Timo Jämsä, Oulu
- 10:40-11:00** Coffee Break
- 11:00-11:40** Imaging of cartilage and bone, Jukka Jurvelin, Kuopio
- 11:40-12:20** Collagen network structure and proteoglycan distribution; polarized light microscopy and densitometry, Mika Hyttinen, Kuopio

- 12:20-13:20** Lunch Break

Techniques III

Chair: Juha Tuukkanen

- 13:20-13:45** Sample processing for histology; bone histochemistry and immunohistochemistry, Tiina Laitala-Leinonen, Turku
- 13:45-14:10** Skeletal development; whole embryo staining and cartilage histochemistry, Anna-Marja Säämänen, Turku

Practical training sessions

- 14:30-19:00** Histological methods of cartilage and bone
Bone histomorphometry
MicroCT, pQCT, Faxitron
Biomechanical testing of bone

Phenotype Characterization of Genetically Modified Mouse Models

Mouse Genetics

November 27-28, 2006

Mauno Koivisto Centre Auditorium, BioCity, Tykistökatu 6 B, Turku

Organizers: CASCADE Network of Excellence, Center for Reproductive and Developmental Medicine, Drug Discovery Graduate School, Turku Graduate School of Biomedical Science, Turku Postgraduate School of Health Sciences.

Organizing committee: Tassos Damdimopoulos, Sari Mäkelä, Pirjo Pakarinen, Matti Poutanen, Pia Rantakari, Leena Strauss, Heikki Turunen and Eeva Valve.

This symposium is the 3rd in a series of events focusing on methods used in the generation and phenotypic characterization of genetically modified mice. The aim of the symposium series is to promote practical understanding of the usefulness of mouse models in biomedical research in general and in drug discovery and development in particular. It aims to provide in-depth training for PhD students, post-doctoral researchers and other scientists involved in this field of research. The present workshop focuses on specific aspects of the mouse genetics. Participation is free of charge, but registration is required. Please register before November 21, 2006 at <http://ddgs.utu.fi/courses/genetics/>.

Participants are encouraged to provide their specific questions and research problems to organizing committee. For these purposes, please, contact the Organizing Committee in advance (eeva.valve@utu.fi).

Monday 27.11.2006

Session I: Future challenges for mouse genetics and biology cores

Chair: Matti Poutanen, University of Turku, Finland

13:00-13:05 **Opening words**, Matti Poutanen

13:05-14:05 **Essential future technologies implemented in efficient TG core facility**, Thom Saunders, University of Michigan, USA

14:05-15:05 **The German Mouse Clinic: Organization of standardized and comprehensive phenotype screens**, Johannes Beckers, GSF, Institute of Experimental Genetics, Germany

15:05-15:30 **Coffee Break**

Session II: Genetic background and phenotyping

Chair: Sari Mäkelä, University of Turku, Finland

15:30-16:30 **Identification of candidate genes for behavioral phenotypes by gene expression profiling in inbred mouse strains**, Iiris Hovatta, National Public Health Institute, Helsinki, Finland

16:30-17:30 **The genetic background influences your phenotypes**, Björn Rozell, Karolinska Institutet, Stockholm, Sweden

17:30 **Buffet Dinner**

Tuesday 28.11.2006

Session III: Bioinformatics and systems biology

Chair: Pirjo Pakarinen, University of Turku, Finland

9:00-10:00 **Comparative genomic analysis of mouse models of human cancers**, Thomas Ried, CCR/NCI/NIH, Bethesda, USA

10:00-11:00 **Quantitative trait loci in mice**, Jonathan Flint, University of Oxford, UK

11:00-11:30 **Coffee Break**

Session IV: New developments in GM techniques

Chair: Pia Rantakari, University of Turku, Finland

11:30-12:30 **Spatio-temporally controlled targeted somatic mutagenesis in the mouse**, Daniel Metzger, IGBMC, Strasbourg, France

12:30-13:30 **Advanced DNA engineering for mouse models using Red/ET recombineering**, Francis Stewart, Technical University of Dresden, Germany

13:30-14:30 **Lunch Break**

14:30-15:30 **Defects in mouse development causing embryonic lethality**, Kirsi Sainio, Helsinki, Finland

15:30-17:00 Meet the expert: Send your questions to the organizers

Chair: Thom Saunders, University of Michigan, USA

Phenotype Characterization of Genetically Modified Mouse Models Prostate and Mammary Gland

December 13-14, 2007

Mauno Koivisto Centre auditorium, BioCity, Tykistökatu 6 B, Turku, Finland

Organizers: CASCADE Network of Excellence, Centre for Reproductive and Developmental Medicine, Drug Discovery Graduate School, Turku Graduate School of Biomedical Science, Turku Postgraduate School of Health Sciences.

Organizing committee: Sari Mäkelä, Pirjo Pakarinen, Matti Poutanen, Leena Strauss, Eeva Valve and Anni Wärrä.

This symposium is the 4th in a series of events focusing on methods used in the generation and phenotypic characterization of genetically modified mice. The aim of the symposium series is to promote practical understanding of the usefulness of mouse models in biomedical research in general and in drug discovery and development in particular. It aims to provide in-depth training for PhD students, post-doctoral researchers and other scientists involved in this field of research. The present workshop focuses on specific aspects of the prostate and mammary gland development and function. Participation is free of charge, but registration is required. Please register before 5th of December, 2007.

Participants are encouraged to provide their specific questions and research problems to the organizing committee. For these purposes, please, contact the Organizing Committee in advance. **Registration at:** <http://ddgs.utu.fi>.

Thursday 13th of December

Session I: Prostate

Chair: *Matti Poutanen, University of Turku, Finland*

13:00-13:05 Opening words, Matti Poutanen

13:05-14:05 **Genetically engineered mice for prostate cancer research**, Norman Greenberg, Fred Hutchinson Cancer Research Center, USA

14:05-15:05 **Prostate pathology, from mouse to human**, Paula Martikainen, University of Tampere, Finland

15:05-15:30 *Coffee Break*

Session II: Prostate (continued)

Chair: *Sari Mäkelä, University of Turku, Finland*

15:30-16:30 **Prostate imaging**, Chris Albanese, Georgetown University, USA

16:30-17:30 **Genetic characterization of prostate cancer models**, Tapio Visakorpi, University of Tampere, Finland

17:30 *Buffet Dinner*

Friday 14th of December

Session III: Mammary gland

Chair: *Anni Wärrä, University of Turku, Finland*

9:00-10:00 **Genetically modified mice as breast cancer models**, Cathrin Brisken, Swiss Institute for Experimental Cancer Research, Switzerland

10:00-11:00 **Markers of dietary influence in breast cancer models**, Leena Hilakivi-Clarke, Georgetown University Medical Center, USA

11:00-11:30 *Coffee Break*

Session IV: Techniques

Chair: *Niina Saarinen, University of Turku, Finland*

11:30-12:30 **New breast cancer models and imaging in drug development**, Sanna-Maria Käkönen, Bayer Schering Pharma, Germany

12:30-13:30 **Tumor imaging with fluorescent proteins *in vivo***, Robert Hoffman, AntiCancer Inc., USA

13:30-14:30 *Lunch Break*

Meet The Expert

Chairs: *Matti Poutanen and Anni Wärrä*

14:30-16:30 Challenges in disease modeling in mice

Introductions:

Practical challenges and opportunities of modeling human cancers in the mouse, Norman Greenberg, Fred Hutchinson Cancer Research Center, USA

Practical challenges and opportunities in transplantation techniques in mouse, Cathrin Brisken, Swiss Institute for Experimental Cancer Research, Switzerland

Phenotype Characterization of Genetically Modified Mouse Models

OBESITY

December 8-9, 2008

Mauno Koivisto Centre Auditorium, BioCity
Tykistökatu 6 B, Turku, Finland



Organizers: Turku Center for Disease Modeling (TCDM), CASCADE Network of Excellence, Drug Discovery Graduate School, Centre for Reproductive and Developmental Medicine, Turku Graduate School of Biomedical Science, Turku Postgraduate School of Health Sciences.

Organizing committee: Eriika Savontaus, Matti Poutanen, Sari Mäkelä, Pirjo Pakarinen and Eeva Valve.

This symposium is the 5th in a series of events focusing on methods used in the generation and phenotypic characterization of genetically modified mice. The aim of the symposium series is to promote practical understanding of the usefulness of mouse models in biomedical research in general and in drug discovery and development in particular. It aims to provide in-depth training for PhD students, post-doctoral researchers and other scientists involved in this field of research. The present workshop focuses on specific aspects of obesity including mechanisms and methods for analyses. Participation is free of charge, but registration is required. Please, register before 1st of December, 2008.

Participants are encouraged to provide their specific questions and research problems to the organizing committee. For these purposes, please, contact the Organizing Committee in advance (eeva.valve@utu.fi)

Registration at: <http://ddgs.utu.fi>

Monday 8th of December

Session I: Background

Chair: Matti Poutanen

- 13:00-13:10** Opening words, Matti Poutanen
13:10-13:50 Human obesity, Kirsi Virtanen, University of Turku, Finland
13:50-14:30 Regulation of energy balance, Eriika Savontaus, University of Turku, Finland
14:30-15:30 Genetics of mouse obesity, Streamson Chua, Albert Einstein University, New York, USA
15:30-16:00 Coffee Break

Session II: Energy expenditure

Chair: Pirjo Pakarinen

- 16:00-17:00** Measuring energy expenditure in mice Esa Hohtola, University of Oulu, Finland
17:00-18:00 Physical activity and metabolic syndrome in rats, Heikki Kainulainen, University of Jyväskylä, Finland
18:00 Buffet Dinner

Tuesday 9th of December

Session III: Energy intake

Chair: Sari Mäkelä

- 9:00-10:00** Feeding behavior in mice, Streamson Chua, Albert Einstein University, New York, USA
10:00-11:00 Gastrointestinal hormones and feeding, Kristiina Juvonen, University of Kuopio, Finland
11:00-11:30 Diet-induced obesity, Graham Tobin, Harlan Teklad Europe, UK
11:30-12:30 Lunch Break

Session IV: Adipose tissue

Chair: Eriika Savontaus

- 12:30-13:30** Adipose tissue in obesity and metabolic disease, Sven Enerbäck, University of Gothenburg, Sweden
13:30-14:00 Sponsors' presentations
14:00-14:30 Coffee Break

Session V: Glucose homeostasis

Chair: Eriika Savontaus

- 14:30-15:15** Analyzing glucose homeostasis in mice, Eija Pirinen, University of Kuopio, Finland
15:15-16:15 Short presentations
16:15-17:00 Panel discussion; questions from the audience, all speakers
17:00 Closing words, Eriika Savontaus