



PhD Course A1 Basal Metabolism and Molecular Mechanisms in the Metabolic Syndrome

25-28 May 2009

Organised by the Danish PhD School of Molecular Metabolism and
Danish Cardiovascular Research Academy (DaCRA),
University of Southern Denmark/University of Copenhagen

Aim:

To introduce students to basal metabolism and the pathophysiology of the metabolic syndrome at the molecular level as a basis for the diagnosis and the treatment of specifically type 2 diabetes.

Capacity and prerequisites:

Up to 40 PhD students can be accepted (PhD students of the PhD School of Molecular Metabolism and DaCRA have priority). The course is directed at PhD candidates in molecular metabolism, diabetes, endocrinology, cardiology and higher physician training as a postgraduate segment towards their PhD degree.

Specific topics to be covered:

Glucose-fatty acid cycle, including the role of fat tissue, liver and muscles in metabolic regulation; glycolysis, glyconeogenesis, ketone body metabolism, TCA, glycogen metabolism, lipolysis and lipogenesis and regulation of these; signal transduction, including the hormones insulin, glucagon, adrenalin, noradrenalin and their mechanisms of action; the basic molecular and pathophysiological aspects of insulin resistance and the multiphase consequences of insulin resistance and hyperinsulinaemia; the biochemical role of obesity; the basic biochemistry of the atheromatous vascular disease; the development of and the disordered kinetics of the dyslipidaemia in vascular disease, highlighting the importance of the adipocyte to triglyceride and fatty acid economy; the pathophysiology of the hypertension and its relationship to the development of the syndrome; the biochemical and metabolic impact of the glucose intolerance; the clinical and the therapeutic implications arising out of the above pretentions will be stressed throughout the course.

Format: Lectures and workshops.

Venue: Hotel Storebælt, Østerøvej 121, Nyborg, Denmark, www.sinatur.dk.

Registration: Registration form can be found at: www.metabolism-phd.dk/reg.html and must be forwarded to the secretariat (see below) no later than 13 March 2009.

Fees: PhD students registered at the PhD School of Molecular Metabolism and DaCRA: free of charge; All other PhD students: DKK 5,000 covering accommodation and meals; Non-PhD students: DKK 9,500.

Further information:

See web site: www.metabolism-phd.dk/bascour.html or contact Research Secretary Kristine Michailidis, tel. +45 6541 1769 or e-mail: kristine.michailidis@ouh.regionsyddanmark.dk.

ORGANISED BY

The Danish PhD School of Molecular Metabolism,
University of Southern Denmark/University of Copenhagen, and
Danish Cardiovascular Research Academy (DaCRA),
University of Copenhagen

PRACTICAL INFORMATION

Check-out from rooms: Before 09h00 on the day of departure.

Main conference room:

Workshop rooms:

PCs/Internet access: PCs including free access to Internet is at your disposal in the course secretariat in the reception area. Wireless Internet access is available throughout the hotel.

Meals, etc.: All meals are included in the conference package. Beverages are not included except for one beverage at lunch and at dinner.

Course certificate: Will be handed out to all participants at the end of the course. Any non-collected certificates will be handed out after the course.



metabolism-phd.dk

Danish PhD School of Molecular Metabolism

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PhD Course A1 (4 ECTS) Basal Metabolism and Molecular mechanisms in the metabolic syndrome

Programme

Sessions

- I Basal metabolism
- II The Metabolic Syndrome
- III Insulin resistance and liver
- IV Epidemiology and lipids
- V The role of exercise
- VI Arteriosclerosis and endothelial function
- VII Dyslipidaemia and the pathophysiology of type 2 diabetes
- VIII Hypertension and MS

Workshops

- A Proteomics
- B Transcriptomics
- C Lipidomics
- D Bioinformatics

Format: Lectures, discussions, workshops, oral presentations

Participants: PhD candidates in molecular metabolism, diabetes, endocrinology, cardiology and higher physician Training. See separate document for information about students' research interests.

Language: English

Information: www.metabolism-phd.dk or
tine.hylle@regionyddanmark.dk

25 May 09h00 to 28 May 2009 17h45



metabolism-phd.dk

Danish PhD School of Molecular Metabolism

Hotel Storebælt

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DAY 1: MONDAY 25 MAY 2009

09h00-09h30 Registration and refreshments

09h30-09h40 Welcome and introduction by Henning Beck-Nielsen,
Head of the PhD School of Molecular Metabolism

Session I Basal metabolism

Chair: Nils Færgeman

**09h40-
10h20** Lecture

**10h20-
10h30** Discussion

**10h30-
11h10** Lecture

**11h10-
11h20** Discussion

**11h20-
12h00** Lecture

**12h00-
12h10** Discussion

**12h10-
13h30** Lunch

**13h30-
14h10** Lecture

**14h10-
14h20** Discussion

**14h20-
15h00** Lecture

**15h00-
15h10** Discussion

NOTES

**15h10-
15h40** Coffee break

Session II The Metabolic Syndrome

Chair: Henning Beck-Nielsen

**15h40-
16h20** The Metabolic Syndrome (MS): Definition, clinical HBN
features and metabolic "costs" in 2008.

**16h20-
16h30** Discussion

Theme: Insulin resistance—what is it and how do we measure it?

**16h30-
17h15** 1. The "Clamp technique" (including indirect calo- JEH
rimetry, glucose turnover measurements, glucose
processing in vivo and muscle biopsy procedure).

**17h15-
17h30** Short break with refreshments

**17h30-
17h45** 2. Surrogate measurements: Fasting plasma insu- JEH
lin, HOMA, QUIKY, etc.

**17h45-
18h00** Insulin resistance and hyperinsulinaemia JEH

**18h00-
18h15** Discussion

19h00 Dinner

DAY 2: TUESDAY 26 MAY 2009

Session II The Metabolic Syndrome (continued)

Chair: XX

- 08h30-09h10** Insulin resistance as the cause of MS KH
- 09h10-09h20** Discussion
- 09h20-10h00** Molecular/Biochemical basis of insulin resistance KH
- 10h00-10h10** Discussion
- 10h10-10h40** Coffee break
- 10h40-11h20** Mitochondrial function and insulin resistance MM
- 11h20-11h30** Discussion

Session III Insulin resistance and the liver

Chair: Kurt Højlund

- 11h30-12h10** Insulin resistance in the liver: clinical consequences OHN
- 12h10-12h20** Discussion
- 12h20-13h30** Lunch
- 13h30-14h10** Non-alcoholic fatty liver (NAFL) and insulin resistance HG
- 14h10-14h20** Discussion

NOTES

FACULTY

Børge Nordestgaard (BN)	Professor Dept. of Clinical Biochemistry Herlev Hospital
Christian Torp Pedersen (CTP)	Professor Clinic of Cardiology Y Bispebjerg Hospital
Tune Pers (TP)	PhD student, MSc CBS, Technical University of Denmark, Lyngby
Pernille Poulsen (PP)	Post.doc. Steno Diabetes Center, Copenhagen
Bjørn Richelsen (BR)	Professor Dept. of Medical Endocrinology Aarhus University Hospital
Qihua Tan (QT)	Assistant Professor Human MicroArray Center Odense University Hospital
Jørgen Wojtaszewski (JW)	Associate Professor August Krogh Institute University of Copenhagen

DAY 2: TUESDAY 26 MAY 2009

14h20-14h30 Short break

Session IV Epidemiology and lipids

Chair: Bjørn Richelsen

14h30-15h10	The epidemiology of MS	KBJ
15h10-15h20	Discussion	
15h20-15h50	Coffee break	
15h50-16h30	The genome and MS	TH
16h30-16h40	Discussion	
16h40-17h20	Obesity and its role in the development of MS	BR
17h20-17h30	Discussion	
17h30-17h40	Short break with refreshments	
17h40-18h20	The adipocytokines (Leptin, adiponectin, TNFalpha)	BR
18h20-18h30	Discussion	
19h00	Dinner	

DAY 3: WEDNESDAY 27 MAY 2009

07h00-08h30 Breakfast

Session V The role of exercise

Chair: Jørgen Wojtaszewski

08h30-09h10	Cytokines, insulin resistance and MS	BK
09h10-09h20	Discussion	
09h20-10h00	Exercise as "medicine"	BK
10h00-10h10	Discussion	
10h10-10h40	Coffee break	
10h40-11h20	The role of skeletal muscle in MS	KH
11h20-11h30	Discussion	
11h30-12h10	The signalling cascade for energy supply in exercising skeletal muscle of normal and insulin resistance subjects	JW
12h10-12h20	Discussion	
12h20-13h30	Lunch	

FACULTY

Jan Erik Henriksen (JEH)	MD, PhD Dept. of Endocrinology Odense University Hospital
Ole Hother-Nielsen (OHN)	MD, PhD Dept. of Endocrinology Odense University Hospital
Kurt Højlund (KH)	MD, PhD Dept. of Endocrinology Odense University Hospital
Bente Klarlund (BK)	Professor Muscle Research Centre Rigshospitalet, Copenhagen
Jens Knudsen (JK)	Professor Dept. of Biochemistry and Molecular Biology University of Southern Denmark
Martin Larsen (ML)	Research professor, PhD Dept. of Biochemistry and Molecular Biology University of Southern Denmark
Mogens Lytken Larsen (MLL)	DMSc, Head of Department Dept. of Medical Cardiology A Aarhus Hospital
Christian Rask Madsen (CRM)	Research Fellow Harvard Medical School, Joslin Diabetes Center Boston, USA
Martin Mogensen (MM)	MSc, PhD student Institute of Sports Science and Biomechanics University of Southern Denmark

FACULTY

Henning Beck-Nielsen (HBN) Course leader	Professor of Medicine Dept. of Endocrinology Odense University Hospital
Sten Christensen (SC) Course leader	Professor Dept. of Pharmacology University of Copenhagen
Christian Berne (CB)	Professor Endocrinology and Diabetes Section The Uppsala Academic Hospital, Sweden
Knut Borch-Johnsen (KBJ)	Professor, Chief physician Steno Diabetes Center, Copenhagen
Hans Erik Bøtker (HEB)	Consultant Dept. of Cardiology B Skejby Hospital, Aarhus University Hospital
Erling Falk (EF)	Professor Dept. of Cardiology B, Skejby Hospital Aarhus University Hospital
Nils Færgeman (NF)	Associate Professor Dept. of Biochemistry and Molecular Biology University of Southern Denmark
Dorte Glintborg (DG)	MD, PhD Dept. of Endocrinology Odense University Hospital
Henning Grønbaek (HG)	Consultant Medical Department V Aarhus Hospital
Torben Hansen (TH)	Adjungated professor Steno Diabetes Center, Copenhagen

DAY 3: WEDNESDAY 27 MAY 2009

Session VI Arteriosclerosis and endothelial function

Chair: Christian Torp Pedersen

13h30-14h10	Arteriosclerosis: pathophysiology	EF
14h10-14h20	Discussion	
14h20-15h00	Endothelial function and MS	CRM
15h00-15h10	Discussion	
15h10-15h40	Coffee break	
15h40-16h20	Endothelial function and cardiovascular disease	CTP
16h20-16h30	Discussion	
16h30-16h45	Short break with refreshments	
16h45-18h15	Workshop/seminar: Newer techniques in defining the dysmetabolic signalling cascades in MS	
	A. Proteomics	ML
	B. Transcriptomics	QT
	C. Lipidomics	JK
	D. Bioinformatics	TP
19h00	Dinner	

DAY 4: THURSDAY 28 MAY 2009

07h00-08h30 Breakfast

Session VII Dyslipidaemia and the pathophysiology of type 2 diabetes

Chair: Børge Nordestgaard

08h30-09h10 Dyslipidaemia—lipid turnover and its implication for insulin resistance BN

09h10-09h20 Discussion

09h20-10h00 Dyslipidaemia—implications for the development of atherosclerosis and vascular disease BN

10h00-10h10 Discussion

10h10-10h40 Coffee break

10h40-11h20 MS in the cardiovascular clinic HEB

11h20-11h30 Discussion

11h30-12h10 Evidence based management of dyslipidaemia in MLL MS: How relevant are targets to outcomes?

12h10-12h20 Discussion

12h20-13h30 Lunch

13h30-14h10 The prenatal/intrauterine environment in the development of MS and arteriosclerosis PP

14h10-14h20 Discussion

14h20-15h00 The pathophysiology of type 2 diabetes HBN

15h00-15h10 Discussion

DAY 4: THURSDAY 28 MAY 2009

15h10-15h40 Coffee break

Session VIII Hypertension and MS

Chair: Henning Beck-Nielsen

15h40-16h20 Hypertension and MS CB

16h20-16h30 Discussion

16h30-17h10 PCOS and the MS—insulin resistance and dyslipidaemia DG

17h10-17h20 Discussion

17h20-17h45 Questions to the entire course curriculum Conclusions and farewell HBN