

International PhD Course – University of Southern Denmark  
**Assessment and evaluation of human muscle, nervous system and tendon-  
aponeurosis function in sports science, clinical science and aging**

**PROGRAMME**

I. Monday March 9th (Lecture Room O 96)

9:00 – 9:30

Per Aagaard: Welcome & Course Introduction.

**Assessment of mechanical muscle function in vivo**

9:30 – 10:30

Per Aagaard: Assessment and evaluation of mechanical muscle function in vivo -  
paradigms and applications from elite sports to patient rehabilitation

10:30 – 10:45 Coffee break

**Adaptive plasticity in human skeletal muscle with exercise**

10:45 – 11:45

Jesper L. Andersen: Assessment and evaluation of muscle morphology, fibertype  
composition and MHC isoform distribution - paradigms and applications.

**Cellular muscle adaptation - signalling pathways and muscle growth**

11.45 – 12:45

Peter Schjerling: Assessment and evaluation of molecular mechanisms related to  
myofiber growth – signalling pathways, growth factors, growth inhibitors, effects of  
exercise

12:45 – 14.00 Lunch

**From macroscopic muscle morphology and architecture to single fiber contractility**

14:00 – 15:00

Olivier Seynnes: Assessment of anatomical muscle architecture and size in vivo –  
adaptive changes induced by exercise, aging and disuse

15:00 – 15:15 Coffee break



[Monday continued...]

15:15 – 16.15

Lars Hvid: Contractility of isolated single myofibers – influence of training and disuse in young and old adults

## II. Tuesday March 10<sup>th</sup> (Lecture Room O 96)

### **Human tendon and aponeurosis function in vivo**

9:00 – 10:00

Peter Magnusson: Assessment and evaluation of muscle tendon and aponeurosis function in vivo - paradigms and applications.

10:00 – 11.00

Jens Bojsen-Møller: Muscle use and force transduction in vivo evaluated by imaging techniques (PET, MRI, US) - evidence of non-uniform tendon force transmission

11:00 – 11:15 Coffee break

### **Cellular signaling effects with contrasting exercise modalities**

11.15 – 12.15

Lars Holm: Resistance exercise intensity: effects on muscle protein turnover and related cellular signaling, muscle growth, and optimization with protein supplementation.

12:15 – 13.30 Lunch

13:30 – 14.30

Kristian Vissing: The Akt–AMPK switch mechanism - Antagonistic cellular signaling with resistance exercise vs. endurance exercise

14:30 – 14:45 Coffee break

### **Myogenic satellite cells**

14:45 – 15.45

Abigail Mackey-Sennels: Activating satellite cells in humans: mechanical and pharmacological stimuli

15:45 – 16.45

Fawzi Kadi: Regulation of myonuclear number in human skeletal muscle - role of satellite cells and effects of exercise, relationships to 'muscle memory'

### III. Wednesday March 11th (Lecture Room O 95)

#### **Assessment and evaluation of neuronal function in vivo - paradigms and applications.**

9:00 – 10.00

Per Aagaard: Use of surface EMG recording and evoked H-reflex responses to evaluate neuromuscular function – adaptations elicited by resistance training

10:00 – 11.00

Jesper Lundbye-Jensen: Use of transcranial magnetic stimulation and neuroimaging methods to evaluate the effect of disuse and exercise on human neuromotor function

11:00 – 11:15 Coffee break

#### **Muscle atrophy with disuse and disease**

11:15 – 12.15

Charlotte Suetta: Molecular mechanisms and treatment options for muscle atrophy and muscle wasting with disuse and disease – age related aspects

12:15 – 13.30 Lunch

13.30 – 14.30

Ulrik Frandsen: Molecular factors and mechanisms related to apoptosis – effects of disuse, aging and exercise

14:30 – 14:45 Coffee break

#### **Molecular and cellular aspects related to tendon adaptation in vivo**

14:45 – 15.45

Katja Heinemeier: Molecular factors and mechanisms related to tendon growth and atrophy – influence of training and aging, effects of TGF-beta and IGF-1

#### **Skeletal muscle glycogen and fatigue resistance**

15.45 – 16.45

Joachim Nielsen: Subcellular glycogen localization in skeletal muscle - assessment techniques, regulation, role in cellular fatigue, effects of exercise aging and disuse

### IV. Thursday March 12th (Lecture Room O 98)

#### **Evaluation of neuromechanical function in orthopaedic patients**

9.00 – 10.00

Jonas Thorlund: Neuromuscular function in meniscectomized patients at high risk of osteoarthritis

[Thursday continued...]

10.00 – 11.00

Anders Holsgaard-Larsen: Assessment of between-limb asymmetry and the association of objective and subjective outcomes in ACL patients

11:00 – 11:15 Coffee break

### **Muscle, sarcopenia, neuromuscular function and training in the elderly**

11:15 – 12:15

Jesper L. Andersen: Changes in muscle morphology and fibertype composition with aging – effects of resistance training, adaptive responses in the very old

12:15 – 13.30 Lunch

13:30 – 14.30

Per Aagaard: Neuromuscular and sarcopenic changes with advanced aging – use of exercise as a countermeasure, exercise in the hospitalized elderly

14:30 – 14:45 Coffee break

14:45 – 15.45

Paolo Caserotti: Changes in body composition with aging, impact on function, and reversibility with training

### **Use of resistance exercise in clinical patients**

15:45 – 16.45

Lars L. Andersen: Muscle function in clinical patients – effects of exercise in myalgia and stroke patients, influence on ADL function and movement performance

## V. Friday March 13th (Lecture Room O 97)

### **Injury rehabilitation and prevention in human muscle, tendon and ligaments**

9:00 – 10.00

Tine Alkjær: Antagonist muscle co-activation following ACL injury - copers vs non-copers

10.00 – 11.00

Mette Zebis: Neuromuscular aspects related to non-contact ACL injury in elite female athletes - pre-injury screening, effects of neuromotoric exercise, design of training

11:00 – 11.15 Coffee break

11.15 – 12.15

Per Aagaard: Prevention and rehabilitation of musculo-tendinous overuse injury by use of exercise – biomechanical and neuromuscular aspects

12:15 – 13.15 Lunch



[Friday continued...]

## **Project presentations by participants**

13:15 – 17:00

Course Participants own projects - Presentations by participants

## VI. Saturday March 14th (Lecture Room O 97)

### **Project presentations by participants**

9:00 – 10:30

Course Participants own projects - Presentations by participants, continued

10:30 – 10.45 Coffee break

10:45 – 13:00

Course Participants own projects - Presentations by participants, continued

13.00 - 13:15

Per Aagaard: Concluding remarks, Course Closing

13:15 Lunch

For more information, please contact Per Aagaard (arranger): [paagaard@health.sdu.dk](mailto:paagaard@health.sdu.dk)

For course registration, please go to:

[http://www.sdu.dk/en/Forskning/PhD/Phd\\_skoler/PhdSkolenSundhedsvidenskab/PhD\\_Students/PhD\\_Courses/Courses/FAB\\_assessment](http://www.sdu.dk/en/Forskning/PhD/Phd_skoler/PhdSkolenSundhedsvidenskab/PhD_Students/PhD_Courses/Courses/FAB_assessment)

