

Invitation

Invitation to participate in the ph.d. course

Doping and human exercise performance

Participation in the course is free. Travel, accommodation and catering costs are to be covered by the participant. Hotel costs are expected to amount to approximately 200 EUR per night but cheaper alternatives may be found.

Lunch is available from the University cantina at the participants own expense. Dinner is not included.

Teachers: Senior researchers will be present and interact with the participants during the course. See the course program for further information.

The course venue is at the University of Copenhagen. The course is running from 9.00 am Monday to Friday. Course activities end at 5 pm Monday to Thursday and Friday the course ends at 1.30 pm.

Important: As a participant in the course, you need to prepare for each day by reading the curriculum. This is a prerequisite for fruitful discussions. Also, you will be asked to engage in various tasks and presentations.

Sign up for the course here: <http://nexs.ku.dk/english/calendar/2017/phd-course-anti-doping/>

The course is normed to 15 participants. If more apply, access to the course will be based on the applicants curriculum and research project.

Yours Sincerely,

Nikolai B. Nordsborg , Carsten Lundby & Lars Nybo

Course organizers

The course is funded by the PhD School of SCIENCE and Partnership for Clean Competition:

Lectures (follow links to personal webpages)

[Nikolai Nordsborg, Assoc. Prof. Department of Nutrition, Exercise & Sport, Uni. Copenhagen](#)

[Lars Nybo, Prof. Department of Nutrition, Exercise & Sport, Uni. Copenhagen](#)

[Carsten Lundby, Prof. Department of Clinical Medicine, Uni. Copenhagen](#)

[Mike Sawka, Prof. Biological Sciences, Georgia Tech & PCC board member](#)

[Martial Saugy, Assoc. Prof. University of Lausanne, Institute of Sport Science](#)

[Lars Dragsted, Prof. Department of Nutrition, Exercise & Sports, Uni. Copenhagen](#)

[Rasmus Bro, Prof. Department of Food Science, Uni. Copenhagen.](#)

[Julie Gehl, Chief Physician, Department of Oncology, Herlev & Gentofte Hospital, Denmark](#)

[Jørgen Wojtaszewski, Prof. Department of Nutrition, Exercise & Sports, Uni Copenhagen](#)

[Christoph Siebenmann, Post Doc, Department of Clinical Medicine, Uni. Copenhagen](#)

[Morten Hostrup, Assist. Prof., Department of Nutrition, Exercise & Sport, Uni. Copenhagen](#)

[Peter Møller Christensen, Sport Physiologist, Team Denmark](#)

[Jacob Bejder, ph.d. student, Department of Nutrition, Exercise & Sports, Uni. Copenhagen](#)

[Sara Solheim, ph.d. student, Department of Nutrition, Exercise & Sports, Uni. Copenhagen](#)

[Jakob Mørkeberg, Scientific officer, Anti-Doping Denmark](#)

[Michael Rasmussen, Former professional cyclist](#)

Monday, November 20th

- 09.00- 09.15 Course introduction (Nikolai Nordsborg)
- 09.15 -10.00 Lecture I: Assesment of water balance (Mike Sawka)
- 10.00-10.45 Lecture II: Measuring total hemoglobin mass (Carsten Lundby)
- 11.00-12.30 Lab I: Measuring total hemoglobin mass (Christoph Siebenmann)
- 12.30-13.30 Lunch
- 13.30-16.00 Symposium 1: Volume boosting & performance
 - 13.30-14.00: Heat, plasma volume, blood volume & human performance (Mike Sawka)
 - 14.00-14.15: Discussion (Lars Nybo)
 - 14.15-14.45: Training, altitude & human performance (Carsten Lundby)
 - 14.45-15.00: Discussion (Nikolai Nordsborg)
 - 15.00-15.30: Detection of autologous blood transfusion (Jakob Mørkeberg)
 - 15.30-16.00: General discussion

Tuesday, November 21st

09.00 – 12.15 Student assignment 1: Future anti-doping strategies in relation to Hbmass manipulation

09.00 – 09.10: Teaser 1: Metabolomics & proteomics (Lars Dragsted)

09.10 – 09.20: Teaser 2: Performance analyses & AI (Nikolai Nordsborg)

09.20 – 09.30: Teaser 3: Iron homeostasis (Carsten Lundby)

09.30 – 09.40: Teaser 4: Existing and future PCC projects (Mike Sawka)

10.00 – 11.00: Prepare pitch in groups of three (Students)

11.00 – 12.15: Present the pitch and discuss (Students)

12.15-13.00 Lunch

13.00 – 16.00 The biological passport approach and future opportunities (Martial Saugy)

13.00-14.00: Lecture 1: The ABP hematological module (Martial Saugy)

14.00-15.00: Student interaction – ABP cases

15.00-16.00: Lecture 2: The future of the ABP approach (Martial Saugy)

Wednesday, November 22nd

09.00 – 09.15 Introduction: The Grey-zone (Nikolai Nordsborg)

09.15 – 09.45 Lecture 1: Legal ergogenic aids (Peter Møller Christensen)

10.00 – 10.45 Lecture 2: B2 agonists (Morten Hostrup)

11.00-11.45 Lecture 3: Tramadol (Jacob Bejder)

12.00-12.45 Lunch

12.45 – 16.00 Lab exercise part I: Precise measurement of performance & manipulation of performance with grey-zone drugs

Thursday, November 23rd

- 09.00-9.15 Introduction: current challenges and opportunities in anti-doping (Nikolai Nordsborg)
- 09.15-10.00 Lecture 1: Physiological effects of testosterone in a lifespan perspective (Anders Juul)
- 10.15-11.00 Lecture 2: Detection of testosterone by analyses of dried blood or plasma spots (Sara Solheim)
- 11.15-12.00 Lecture 3: Altitude training and the athletes biological passport (Nikolai Nordsborg)
- 12.00-12.45 Lunch
- 12.45–14.15 Michael Rasmussen – doping from an athletes perspective
- 14.30-17.00 Lab exercise part II: Precise measurement of performance & manipulation of performance with grey-zone drugs

Friday, November 24th

- 08.30-08.45 Introduction: The future of doping & anti-doping efforts (Nikolai Nordsborg)
- 08.45- 09.30 Lecture 1: New analytical strategies (Rasmus Bro)
- 09.45-10.30 Lecture 2: Genetic manipulation in treatment of disease (Julie Gehl)
- 10.45-11.15 Lecture 3: Genetic doping and exercise pills (Jørgen Wojtaszewski)
- 11.15-12.30 Student interaction: Develop the most promising project you can think of based on the last weeks input and present the idea in 3 min...
- 12.30-13.30 Lunch & course evaluation