

## **Theoretical/Practical Course and Symposium:**

### ***“Mitochondria: bioenergetics, oxidative metabolism and signaling”***

**Date:** October 23<sup>nd</sup> to November 1<sup>st</sup>, 2018

**Location:** Center for Free Radical and Biomedical Research (CEINBIO), Facultad de Medicina, Universidad de la República, Montevideo, Uruguay

**Coorganizers:** Adriana Cassina Ph.D., Laura Castro M.D., Ph.D., and Celia Quijano Ph.D.

**Aims:** The course and symposium aim to provide graduate students in Master or Ph.D. programs Biomedicine, Biology and Chemistry, from our country and the region (Argentina, Brazil, Chile), with an integrated and updated view of mitochondrial physiology and its role in cell biology and pathology; along with methodologies to study of mitochondrial function and oxidant formation.

#### **Preliminary Program**

##### *Lectures and speakers*

- 1-Mitochondria and energy metabolism (**Celia Quijano, Ph.D.**, Department of Biochemistry, Facultad de Medicina, Universidad de la República, Montevideo, Uruguay).
- 2- Electron transport and oxidative phosphorylation (**Adriana Cassina, Ph.D.**, Department of Biochemistry, Facultad de Medicina, Universidad de la República, Montevideo, Uruguay).
- 3- Bioenergetics (**Gerardo Ferrer-Sueta, Ph.D.**, Department of Physical Chemistry, Facultad de Ciencias, Universidad de la República, Montevideo, Uruguay).
- 4- Mitochondrial oxidants (**Laura Castro, M.D., Ph.D.**, Department of Biochemistry, Facultad de Medicina, Universidad de la República, Montevideo, Uruguay).
- 5- Redox pharmacology, targeting antioxidants to mitochondria (**Rafael Radi, M.D., Ph.D.**, Department of Biochemistry, Facultad de Medicina, Universidad de la República, Montevideo, Uruguay).
- 6- Mitochondrial DNA and primary mitochondrial diseases (**Victor Raggio, M.D.**, Department of Genetics, Facultad de Medicina, Universidad de la República, Montevideo, Uruguay).

- 7- Sirtuin regulation of mitochondrial metabolism (**Carlos Escande, Ph.D.**, Laboratorio de Metabolismo y Envejecimiento, Institut Pasteur de Montevideo, Uruguay).
- 8- Cell death, pathways and mechanisms. (**Lucía Piacenza, Ph.D.**, Department of Biochemistry, Facultad de Medicina, Universidad de la República, Montevideo, Uruguay).
- 9- Energy metabolism of immune cells (**María Noel Álvarez, Ph.D.**, Department of Biochemistry, Facultad de Medicina, Universidad de la República, Montevideo, Uruguay).
- 10- Lecture 10 (Dr. Anibal Vercesi, Faculdade de Ciências Médicas, Universidade Estadual de Campinas (UNICAMP)).
- 11- Metabolic reprogramming of stem cells (**Álvaro Elorza, Ph.D.**, Center for Biomedical Research, Faculty of Biological Sciences and Faculty of Medicine and Faculty of Biological Sciences, Universidad Andres Bello, Chile)
- 12- Mitochondrial lipids (**Luis Alberto Luévano-Martínez, Ph.D.**, Department of Biochemistry, Instituto de Química, Universidade de São Paulo (USP), Brazil).
- 13- Mitochondrial Biogenesis and Autophagy (**Álvaro Elorza, Ph.D.**, Center for Biomedical Research, Faculty of Biological Sciences and Faculty of Medicine and Faculty of Biological Sciences, Universidad Andres Bello, Chile).
- 14- Mitochondrial Dynamics (**Orian Shirihai, M.D., Ph.D.**, Department of Medicine and Department of Pharmacology, David Geffen School of Medicine at the University of California (UCLA), United States of America).
- 15- Mitochondria in neurodegenerative diseases (**Patricia Cassina, M.D., Ph.D.**, Department of Histology and Embryology, Facultad de Medicina, Universidad de la República, Montevideo, Uruguay.)
- 16-Metabolic reprogramming in cancer (**Hebe Durán, Ph.D.**, Comisión Nacional de Energía Atómica, Gerencia de Investigación y Aplicaciones, Argentina).
- 17- Mitochondria in cardiovascular disease (**Sruti Shiva, Ph.D.**, Vascular Medicine Institute, Dept of Pharmacology & Chemical Biology, School of Medicine, University of Pittsburgh, United States of America).
- 18- Mitochondria in metabolic diseases (**Orian Shirihai, Ph.D.**, Department of Medicine and Department of Pharmacology, David Geffen School of Medicine at the University of California (UCLA), United States of America).
- 19- Mitochondria in the biology of aging (**Toren Finkel, M.D., Ph.D.**, Department of Medicine, Division of Cardiology, School of Medicine and Aging Institute, University of Pittsburgh, United States of America, to be confirmed).

All theoretical activities will be free of charge and open to the scientific community and students from the School of Medicine.

### *Practical Activities*

1. Evaluation of mitochondrial oxygen consumption in isolated mitochondria and tissue biopsies
2. Simultaneous analysis of mitochondrial oxygen consumption and aerobic glycolysis in intact cells.
3. Hydrogen peroxide formation by isolated mitochondria and evaluation of mitochondrial enzymatic activities.

### *Seminars*

Students will present and discuss the findings of scientific manuscripts in the presence of other students and of one of the authors of the paper.

### *Evaluation*

The evaluation will consist of an individual written test based on the analysis of a scientific manuscript.

### *Symposium*

A two-day symposium will take place during October 31<sup>st</sup> and November 1<sup>st</sup>, 2018. In the symposium, local and invited researchers will present their most recent and relevant scientific work. The symposium will be composed of conferences of senior participants and selected oral presentations by junior scientists and course attendees.

The symposium will be free of charge and not restricted to the students of the course but open to the scientific community, maximizing the benefits of the visit of renowned scientists.

### **Preliminary schedule for the activities**

Time	Tuesday 10/23/18	Wednesday 10/24/18	Thursday 10/25/18	Friday 10/26/18	
9:30-10:30	Welcome  Lecture 1	Lecture 6	Preparation of seminar presentations	Practical activities	
10:45-11:45	Lecture 2	Lecture 7	Preparation of seminar presentations	Practical activities	

12:00- 13:00	Lecture 3	Lecture 8			
Lunch					
14:30-15:30	Lecture 4	Lecture 9	Seminar 1	Practical activities	
Coffee Break					
15:45-16:45	Lecture 5	Preparation of seminar presentations	Seminar 2	Practical activities	
17:00-18:00	Distribution of manuscripts for seminars and practical activities	Lecture 10	Seminar 3	Practical activities	

Time	Monday 10/29/18	Tuesday 10/30/18	Wednesday 10/31/18	Thursday 11/1/18	Friday 11/2/18
9:30-10:30	Lecture 11	Lecture 16	Symposium	Symposium	
10:45-11:45	Lecture 12	Lecture 17			
12:00-13:00	Lecture 13	Lecture 18			
Lunch					
14:30-15:30	Lecture 14	Lecture 19	Symposium	Symposium	Evaluation
Coffee Break					
15:45-16:45	Lecture 15	Seminar 5	Symposium	Symposium	
17:00-18:00	Seminar 4	Seminar 6			