

Introduction to Circadian Biology and Medicine

Topics Covered

- Basic concepts of circadian timekeeping
- Molecular, cellular, and neural substrates of circadian clocks
- Circadian rhythm synchronization to the 24-hr day-night cycle
- Circadian regulation of physiology, metabolism, and sleep
- Circadian misalignment and its role in disease symptomatology and etiopathogenesis
- Methods for circadian research in model organisms and human subjects
- Methods and protocols for circadian analysis, from molecular to clinical
- Circadian considerations in medical diagnosis and therapy (chronotherapy)
- The future of translational and personalized circadian medicine
- Circadian biology and society

Faculty

Cátia Reis (CR)

Luísa Vaqueiro Lopes (LVL)

Joaquim Ferreira (JF)

Ana Rita Peralta (ARP)

William Schwartz (WS)

Schedule – 22 to 26 of May

Day 1

15:00-19:00

Course Introduction and Basic Circadian Biology

15:00 – 15:30

Introduction to the course, student groups, and projects (CR, WS)

15:30 – 17:30

Lectures 1 & 2: each 45 min + 10 min for questions (10 min break between lectures) (WS)
Circadian clocks and rhythms, entrainment, molecular and neural substrates

17:45 – 19:00

Interactive discussion with student groups (data visualization, problem sets) (WS, CR)

19:00 – Paper assignments 1 & 2 for Day 2 topics (selected by CR)

Day 2**15:00-19:00****Circadian Dysrhythmias**

15:00 – 17:00

Lectures 3 & 4: each 45 min + 10 min for questions (10 min break between lectures) (CR)
Chronotype, circadian misalignment, jet lag, shift work

17:15 – 19:00

Interactive discussion of day 2 paper assignments with student groups (CR, WS)

19:00 – Paper assignments 3 & 4 for Day 3 topics (selected by ARP)

Day 3**15:00-19:00****Sleep and Circadian Sleep-Wake Disorders**

15:00 – 17:00

Lectures 5 & 6: each 45 min + 10 min for questions (10 min break between lectures) (ARP)
Circadian and homeostatic sleep regulation, ASPS, DSPS, N24SWD

17:15 – 19:00

Interactive discussion of day 3 paper assignments with student groups (ARP, CR, WS)

19:00 – Paper assignments 5 & 6 for Day 4 topics (selected by CR, WS)

Day 4**15:00-19:00****Applications of Circadian Biology to Neuroscience & Medicine**

15:00 – 17:00

Lectures 7 & 8: each 45 min + 10 min for questions (10 min break between lectures) (LVL, JF)
Impact of circadian biology on metabolism, physiology, neuroscience, and medicine

17:15 – 19:00

Interactive discussion of day 4 paper assignments with student groups (LVL, JF, ARP, CR, WS)

19:00 – Evening social activity for the in-person participants

Day 5**15:00 – 19:00****Presentation of Group Projects**

15:00 – 18:45

Project presentation and discussion (CR, WS, ARP, LVL, JF)

18:45- 19:00

Closing remarks