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Lectures and Courses

Summer Semester 2014

| Uni-Ulm | **Institute of General Zoology and Endocrinology**

Animal Physiology

Course description

The course covers the fundamentals of comparative animal physiology. Major focus of this course is the understanding of life functions of animals, by showing the integration of biochemical and cellular processes into functioning organs and organ systems. The course also will emphasize the multitude of physiological adaptation strategies to environmental challenges in various animal clades. The course also overviews the integration of organ physiology and homeostasis by the neuroendocrine system.

Venue and date

Lecture hall: H3
Monday 10:00 and Friday 12:00

Nervous system, sensory system and motor functions

Lecturer: Harald Wolf

„Natura nihil facit frustra“ - There is no function without an aim

Lecturer: Tamás Röszer

1. Demands of a multicellular oganism: evolution of the organ systems
2. Phenotypic prevalence of physiological traits, physiological plasticity and resistance to change
3. Physiological adaptation to the environment, acquisition of new functions, rudimentation, change of the primary organ function

Life is metabolism

Lecturer: Tamás Röszer

1. Uptake of nutrients, and utilization of resources
2. Functions of the digestive system
3. Resource sharing and competition
4. Adaptation to resource restriction by diapause and dormancy. Effects of resource abundance; example of deep sea gigantism
5. Metabolic oscillaton, life cycles and reproductive cycles

Stay tuned and balanced

Lecturer: Tamás Röszer

1. Evolution oft he fluid- and the ionic homeostasis: organs of the osmoregulation and the excretion
2. Adaptation to marine-, freshwater- and arid environments
3. Terrestrial radiation of species and the evolution of the excretory organs

Physiology and evolution of the respiratory system and the circulation
Lecturer: Tamás Röszer

The need for organ synergy: homeostasis

Intermediary metabolism, energy homeostasis, regulation of metabolic performance (apetite, nutrient utilization) and body temperature
Lecturer: Tamás Röszer

Evolution of the host defense. Discriminate „self“ and „invader“ by the immune system
Lecturer: Maja Vujic

The need for organ synergy: control and regulation

Basic concepts of neuroendocrinology
Lecturer: Maja Vujic

Comparative endocrinology: evolution of the hormonal control
Lecturer: Maja Vujic

Hormonal control 1-2
Lecturer: Maja Vujic

Prerequisities and input competencies

Students attended to this course are familar with the basic chemical and physical prinicples of life. Knowledge on the organization of cells, tissues and the anatomy of organs is required. Good knowledge of English language, ability to follow lectures, write lecture notes and use printed or electronic literature are needed.

Output competencies

Students attending this course will acquire increased understanding of biological form and prevalence (why organs have evolved in the way as we can observe them today), will integrate their molecular- and cellular biology knowledge into the understanding of organ physiology. Students will be able to continue higher studies in related disciplines, such as human physiology and comparative medicine.

Recommended textbooks

1. Clauss & Clauss (2006) Tierphysiologie kompakt. ISBN 978-3-8274-1661-2, Springer Spektrum, Heidelberg
2. Eckert (2002)Tierphysiologie. ISBN 3-13-6644004-7 Georg Thieme Verlag, Stuttgart