Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

SLUkurs

Syllabus

PVS0145 Pharmacodynamics from an in vivo perspective, 5.0 credits

Syllabus approved

2017-03-08

Subjects

Veterinary Medicine

Education cycle

Third cycle

Grading scale

Pass / Failed
The requirements for attaining different grades are described in the course assessment criteria which are contained in a supplement to the course syllabus. Current information on assessment criteria shall be made available at the start of the course.

Language

English

Prior knowledge

To be eligible for the course the equivalent of 180 higher education credits within one of the following programs: Veterinary- (including residency candidates), pharmacy-, general science (in chemistry, biology or physics), chemical/biotechnology engineering-, medical- or toxicology programs.

Objective, including learning outcomes

There is a tremendous unmet need for scientists with a strong background in kinetic/dynamic reasoning within the pharma industry, academia and at regulatory bodies. In order to remedy that shortage, we offer a state of the art 2-module course for biologically oriented scientists. The course aims at studying the factors determining the onset, intensity and duration of a pharmacodynamic response in vivo in addition to comparative studies on within and between individual variability in the pharmacological response in animals and man. The workshop is a continuing educational course in pharmacodynamics also for the pharmaceutical scientist within industry and regulatory bodies.

The course aims at giving the participants:
-Describe basic pharmacodynamic concepts related to onset, intensity and duration of a pharmacological response (e.g., biomarker response)
-Capabilities in analyzing the interplay between pharmacokinetics and pharmacodynamics
-methods to estimate basic pharmacodynamic parameters (based on in vivo experimental data) such as potency (and affinity), intensity (efficacy), turnover parameters (turnover rate and fractional turnover rate), biophase availability, rate of onset/offset
-Capabilities in designing experiments of acute and chronic dosing for pharmacodynamic characterization following the administration of small and large molecules in animals and man
-Tools to critically interpret pharmacodynamic data of acute and chronic studies in animals and man
-Describe how to assess pharmacodynamic variability due to disease, age, gender, species, environmental factors and non-linearities
-Describe and use allometric analyses and inter-species scaling of turnover parameters
-Capacity to use the Maxsim2 simulation program for design, interpretation and communication of pharmacodynamic processes.

Content

The purpose of this course is to provide in depth knowledge on in vivo pharmacodynamics. Lectures cover principles of different pharmacodynamic models for handling of pharmacodynamic biomarker data obtained from animals and man. The lectures, seminars and computer lab exercises cover the interplay between physiology and pharmacodynamics.
Target mediated drug disposition on large molecules and antibody turnover are

covered in lectures and computer simulation sessions.

The participants will apply their acquired knowledge during seminars and computer sessions with respect to design, analysis and interpretation of pharmacodynamic data from animals and humans.
Typical real life Case Studies are discussed in small groups during the course.

Each participant will get a copy of the Maxsim2 program on a USB-stick with a 3-month trial period.

Requirements for examination

Grade Pass on project report and practical exercises

Additional information

Course format
Scheduled activities (hours) Mandatory
- Lectures approx 15-20 yes
- Computer sessions, hands-on practical exercises approx. 25 yes

Additional activities, self-studies
- Individual project work (report writing 5 pages) approx 25
- Individual computer lab exercises approx 20
- Hands-on exercises from compendium approx 20
- Literature studies approx 40
- Project presentations 8

Total approx 135 hours (corresponding to 5 hp)

Graduate students and scientists from the pharma industry and regulatory bodies are also eligible.

For application: www.slu.se/gs-vmas-courses

Responsible department

Department of Biomedical Sciences and Veterinary Public Health