

Pharmacokinetic - Pharmacodynamic Data Analysis: Concepts and Applications

19th to 24th August 2007, Gothenburg University, Gothenburg

There is a tremendous demand for PK and PKPD trained analysts within Academia, Industry and Regulatory Agencies. There is also a costly time-lag from the Industry's need of this competence and request for new courses, to the final output of competent scientists. The gap between need and what is provided by educational institutions is continuously growing. Since there are no formal academic training programs on the Master level within Europe in this field, this advanced Summer School is aimed to bridge some of that gap. It will also serve as an embryo from which a more module-based Master-program can evolve. The programme is aimed to give the participant a sense that when he/she is entering the scientific area, this is knowledge that has immediate bearings on the drug discovery-development process. The course provides an interface between the computer analysis of PK and PD data and physiological concepts. Based on the background and concepts provided by the course lecturers, delegates will apply this information to the *WinNonlin* industry standard modelling package. A unique feature of the course is the access to the computer package to undertake hands-on exercises on real-life case studies and availability of course tutors to help in problem solving. The participants will be exposed to a wide range of real life preclinical and clinical pkpd datasets based on single/multiple subjects. There will be a half a day preparatory course on how to use WinNonlin prior to the main course (Sunday 19th of August afternoon).

A residential course organised by Dept. of Neuroscience and Physiology, Section of Pharmacology, Gothenburg University, Gothenburg, in collaboration with AstraZeneca R&D.

COURSE TEAM

Dr Johan Gabriellsson is a Senior Principal Scientist at AstraZeneca R&D Mölndal. He has conducted numerous workshops on biological (PK/PD) data analysis.

MSc Christine Isaksson is a graduate student at dept of Pharmacology at GU, and **Dr Anders Hall** is a DMPK team manager and project leader at AstraZeneca R&D Lund.

OUTLINE PROGRAMME

- Basic pharmacodynamic theory
- Turnover concept and modelling
- Effect compartment models
- Receptor on/off binding models
- Pharmacodynamic complexities
- Single/multiple dose dynamics
- Inter-species scaling of PD data
- Tolerance & rebound models
- Transduction, synergy
- PKPD in discov & development
- Antibody/protein/peptide PKPD

Aim

This unique advanced workshop provides an interface between the computer analysis of PK & PD data and physiological concepts. Based on the background and concepts provided by the course lecturers, delegates will apply this information to the appropriate modelling package (*WinNonlin*) in hands-on exercises on real-life case studies.

Who should attend?

Biochemists, DMPK, pharmacology, clinical pharmacology and toxicology scientists, participants who attended the earlier introductory workshop, and researchers with a working knowledge of *WinNonlin* who want to learn more about the advanced features of the programme.

Course outline

Morning sessions consist of advanced lectures dealing with pharmacodynamic theory, interpretation of computer output, practical experimental design, discrimination between rival models and combining data of different sources. Afternoon/evening sessions are devoted to applying the methods discussed in the lectures to actual data using *WinNonlin*. One group session of *going from data to insight* and *building conceptual models* is planned.

An extensive number of pharmacodynamic models and real life data sets will be covered. Users of software other than *WinNonlin* would also benefit from the methods discussed in the lectures and hands-on sessions. This includes single and multiple dose dynamics, steady-state data, receptor on/off models, turnover (indirect response) models, link models, tolerance, rebound and synergistic models, bi-phasic response data, physiological kinetic/dynamic modelling, transduction models, diurnal variations, allometric models for scaling kinetic and dynamic data-parameters. **Participants are strongly encouraged to bring their own kinetic-dynamic data.** There will be a half a day preparatory course on how to use *WinNonlin* prior to the main course (Sunday 19th of August afternoon).

Course Material

The delegate pack, which is provided at the start of the workshop, includes copies of all presentation material, group exercises, project exercise, and reference list.

The 4th edition of “*Pharmacokinetic/Pharmacodynamic Data Analysis: Concepts and Applications*” (Swedish Pharmaceutical Press 2006, 1250 pages).

Limited number of available seats

The total number of seats are limited to 20. A few seats are also available for participants outside academia. The latter category will be billed for the bench fee.

Click below for application!:

<http://www.pharmguse.net/application-mailmyform.html>

Programme for ADVANCED COURSE ON PK/PD MODELING

DAY ONE Monday 20th, 2007

8:15am – 8:30am	1	Introduction and mental contract (Gunnar/Johan) <ul style="list-style-type: none">◆ What are our expectations◆ Course layout & course material◆ Course evaluation form
8:30am – 9:30am	2	Pharmacodynamic I (Equilibrium) (Johan) <ul style="list-style-type: none">◆ Introduction to PKPD reasoning◆ Steady-state models◆ Kinetics of drug action◆ Initial parameter estimates◆ Design issues and case studies
9:30 – 9:45am		Coffee/tea
9:45 – 10:30am	3	Pharmacodynamic II (Distributional delays) (Johan) <ul style="list-style-type: none">◆ Steady-state models vs. time delay◆ Basic concepts on distributional delays◆ Modeling QT-data with link models◆ Initial parameter estimates◆ Design issues and case studies
10:30 – 12:00am	4	Hands-on 1 (Tutors/Johan) <ul style="list-style-type: none">◆ Inst. equil. models, steady-state, log-linear, sigmoidal◆ Incomplete datasets◆ Adair model◆ Design issues and case studies
12:00 – 1:00pm		Lunch
1:00 – 4:00pm	5	Hands-on 2 (Tutors/Johan) <ul style="list-style-type: none">◆ Modeling EEG-data with link models◆ Modeling QT-data with link models◆ Design issues and case studies
2:30 – 2:45am		Coffee/tea
4:30 – 4:45pm		Wrap-up & Project presentation (Johan/project presenter)

DAY TWO Tuesday 21st, 2007

8:15 – 9:30am	6	Pharmacodynamics III (Turnover A) (Johan) <ul style="list-style-type: none">◆ Residual questions from Day 1◆ Turnover concepts I - ‘The Gang of four’◆ Constant and variable baseline◆ Comparing link- and turnover models◆ The thought process◆ Initial estimates◆ Design issues and case studies
9:30 – 9:45am		Coffee/tea
9:45 – 12:00am	7	Hands-on 3 (Tutors/Johan) <ul style="list-style-type: none">◆ Turnover models I-IV
12:00 – 1:00am		Lunch
1:00 – 5:00pm	7	Hands-on 3 cont. (Tutors/Johan) <ul style="list-style-type: none">◆ Collapsing hysteresis loops◆ Turnover model I of blood clotting data◆ Design issues and case studies
2:30 – 2:45am		Coffee/tea
4:30 – 4:45pm		Wrap-up & Sniffer time (Johan/ Tutors)
5:00		Course dinner

DAY THREE Wednesday 22nd, 2007

8:15 - 9:30am	8	Pharmacodynamics IV (Turnover B) (Johan) <ul style="list-style-type: none">◆ Residual questions from Day 2◆ The thought process◆ Peak shifts◆ Limited production and loss◆ Synergy by means of turnover models◆ Transduction models◆ Irreversible response◆ Initial parameter estimates◆ Confounding factors
9:30 – 9:45am		Coffee/tea
9:45 - 12:00am	9	Hands-on 4 (Johan/Tutors) <ul style="list-style-type: none">◆ Turnover models I-IV◆ Comparing IRP and Link◆ Design issues and case studies
12:00 - 1:00pm		Lunch
1:00 - 4:00pm	9	Hands-on 4 cont. (Johan/Tutors) <ul style="list-style-type: none">◆ Turnover models I-IV cont.◆ Fitting multiple dose PD data
2:30 – 2:45am		Coffee/tea
4:00 - 4:15pm		Wrap-up & Project presentation (Johan/project presenter) Outdoor activity

DAY FOUR Thursday 23rd, 2007

8:15 - 9:30am	10	Pharmacodynamics V (Adaptation) (Johan) <ul style="list-style-type: none">◆ Residual questions from Day 4◆ Models for adaptation, Tolerance and rebound◆ Feed-back systems◆ The thought process◆ Oscillating baselines◆ Initial parameter estimates
9:30 – 9:45am		Coffee/tea
9:30 - 12:00am	11	Hands-on 5 (Tutors/Johan) <ul style="list-style-type: none">◆ Turnover models I-IV continue◆ Synergy◆ Transduction models◆ Irreversible response◆ Design issues and case studies
12:00 - 1:00pm		Lunch
1:00 - 2:00pm	11	Hands-on 5 cont. (Tutors/Johan) <ul style="list-style-type: none">◆ Own datasets◆ Synergy◆ Transduction models◆ Irreversible response◆ Analyzing PD data from Phase I study
2:00 - 5:00pm	12	Introduction and group exercises (Johan/ Tutors) <ul style="list-style-type: none">◆ Group 1-3◆ Group 4-6
2:30 – 2:45pm		Coffee/tea
3:30 – 5:00pm	12	Presentations of group exercises (All) <ul style="list-style-type: none">◆ Group 1-3◆ Group 4-6

DAY FIVE Friday 24th, 2007

8:15 - 9:30am	13	Pharmacodynamic VI (Philosophy) (Johan) <ul style="list-style-type: none">◆ Going from data to insight◆ Going from idea to mechanistic to conceptual model◆ Close of workshop and farewell
9:30 – 9:45am		Coffee/tea
9:45 - 15:00am	14	Hands-on 6 (Johan/ Tutors) <ul style="list-style-type: none">◆ Residual questions from Day 4◆ Multiple subjects dataset◆ Tolerance and rebound◆ Feed-back systems◆ Initial parameter estimates
12:00 - 1:00pm		Lunch
14:45am		Information about project exercise (Johan/ Tutors)
16:00am		Wrap-up & end of workshop (Gunnar/Johan)