Course on Blood-Brain Barrier in CNS Drug Development
- Principles, Transport Kinetics, Diseases & Methods

26th - 28th September 2012
Uppsala, Sweden

This course addresses the latest insights on role and function of the Blood-Brain Barrier (BBB) in research concerning CNS drug development, CNS drug delivery and CNS diseases. It provides in depth insight in the complex function of the BBB with regard to transport kinetics in health and disease.

Background

Only a few CNS diseases can be treated adequately. We are facing an extremely high unmet medical need. Moreover, this problem is getting worse as with our current ageing population the number of people suffering from CNS diseases is growing. Thus, there is a huge market for new CNS drugs. However, the development of new CNS drugs is notoriously difficult. For a proper CNS effect the drug should have the ability to cross the BBB and then to reach the relevant target site within the CNS. This indicates that BBB functionality is of high importance. However, also other factors like plasma pharmacokinetics and intracerebral distribution are of importance. All these factors are all governed by mechanisms which may have intra- and between subject variability. Among many others factors, active transport by P-glycoprotein and binding of the drug to plasma and brain components play a role. Knowledge of the conditional (!) contribution of such mechanisms is of utmost importance for proper CNS drug development and disease treatment.

Who will benefit?

This course will be of benefit to researchers from Academia, Pharmaceutical Industries, Regulatory Agencies and Contract Research Organizations with a need for better understanding of the BBB and other factors that determine CNS target site distribution of drugs. A general understanding of physiology and minimal knowledge on differential equations is expected (some information can be provided upon request).

Learning Objectives

After having taken this course, the participants will
- have in-depth insight into mechanisms that contribute to BBB transport and intra-brain distribution, with special emphasis on drug delivery and active transport mechanisms
- know about the driving forces that determine whether or not a CNS drug will be at the right place, at the right time and at the right concentration
- be able to compare and choose between different methods for studying parameters that can be used to understand or even predict BBB transport and CNS distribution
Program

Wednesday Sept 26th 2012
Basic Aspects of the Blood-Brain Barrier

08.45 - 09.00  Coffee and tea
09.00 - 09.15  Welcome and Introduction
09.15 - 10.00  BBB Morphology, Anatomy, Physiology and Function
10.00 – 10.30  Coffee and Tea
10.30 - 11.30  BBB Transport Modes
11.30 - 12.30  Factors in CNS Drug Effects
12.30 - 14.00  Lunch
14.00 - 14.45  BBB: Variability in Health and Disease
15.30 - 16.00  Coffee and Tea
16.00 - 16.30  Approaches to Overcome Problems in CNS Drug Delivery
16.30 - 17.30  Discussions BBB Research Issues
18.00 - 20.00  Drinks and Dinner

Thursday Sept 27th 2012
Methods for Investigating BBB Transport

08.45 - 09.00  Coffee and Tea
09.00 - 10.00  General Pharmacokinetic (PK) Principles
10.00 - 10.30  In vitro Methods (Cell Cultures, Monolayers)
10.30 - 11.00  Coffee and Tea
11.00 - 11.30  Brain Sampling Techniques
11.00 - 12.00  In vitro Methods (Brain Slice and - Homogenate Uptake)
12.00 - 12.30  In vivo Monitoring Methods: CSF & Microdialysis
12.30 - 13.30  Lunch
13.30 - 14.00  In vivo Monitoring Methods: CSF & Microdialysis
14.00 - 14.45  In vivo Monitoring Methods: NMR and PET
14.45 - 15.15  Coffee and tea
15.15 - 16.00  BBB transport: Rate and Extent. Impact on Brain vs Plasma PK
16.00 - 16.30  Discussions
17.30 - 20.00  Drinks and Dinner

Friday Sept 28th 2012
Pharmacokinetics of CNS Drug Delivery

08.45 - 09.00  Coffee and Tea
09.00 - 09.30  Factors that influence brain,u PK
09.30 - 10.15  PK/PD relationships of CNS active drugs
10.15 - 10.45  Coffee and Tea
10.45 - 12.30  Hands-on comp Exercises on Relationships between Plasma and Brain PK
12.30 - 14.00  Lunch
14.00 - 14.30  What Parameters to Use in CNS Drug Development?
14.30 - 15.00  Discussion, Perspectives and Conclusions
15.00 - 15.30  Certificates and final comments
**Location**

**Radisson Blu, Uppsala**

Stationsgatan 4, 753 40 Uppsala, Sweden  
Tel +46 (0)18-474 7969, Fax +46 (0)18-68 1109, [http://www.radissonblu.com/hotel-uppsala](http://www.radissonblu.com/hotel-uppsala)

Radisson Blu is the newest hotel in Uppsala, located just by the Central Train Station. It will be opened in May 2012 and will have high-level cuisine and facilities.

The hotel is easily accessible from Stockholm International Airport with only 30 min by taxi or train, or 50 min with bus, and from Stockholm or other parts of Sweden by air or train.

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**Evaluations from the 2011 course in Leiden**

On a scale from 1 – 10, where 10 is top evaluation, the course received the following scores in 2011:

- “Whole course” 9.0
- “Material (course documentation) 8.8
- “I would recommend this course to others” 9.8
Hotels

Radisson Blu, Uppsala

Stationsgatan 4, 753 40 Uppsala
Tel +46 (0)18-474 7969, Fax +46 (0)18-68 1109

Radisson Blu is a new, very modern, high-level hotel in Uppsala, located in the very center of the city. Free internet. Reservations made before August 10th can be made with booking reference 70230 with a cost for a standard room of SEK 1138/night. These rooms should be reserved directly via email to the hotel at info.uppsala@radissonblu.com. If you want to reserve room after this date, please do so online, where more information about the hotel is also located.
http://www.radissonblu.com/hotel-uppsala

Other recommended hotels

Hotel Uppsala 3.5 stars, Kungsgatan 27, Uppsala. The hotel is located 10 min walk from Radisson Blu and 8 min from the train station. http://www.profilhotels.com/hoteluppsala/

Park Inn by Radisson Uppsala, Storgatan 30, Uppsala. This 4-star hotel is 2 min walk from Radisson Blu and 5 min walk from the train station. http://www.parkinn.com/hotel-uppsala

First Hotel Linné, Skolgatan 45, 15 min walk from Radisson Blu and from the train station. Lange Mare 43, Leiden. This 3-star hotel offers modern rooms in the historic centre, only 10 minutes’ walk from Leiden Railway Station. Best Western features free Wi-Fi, bicycle rental and a casual restaurant bar. +46 18 10 20 00. http://www.firsthotels.com/Our-hotels/Hotels-in-Sweden/Uppsala/First-Hotel-Linne/

Best Western Hotel Svava (no stars given), Bangårdsgatan 24, Uppsala. This hotel is located on the other side of the train station with a walk of 3-4 minutes to Radisson Blu. http://www.hotelsvava.se/

Hotell Centralstation is a hostel and low-cost hotel at Bangårdsgatan 13, opposite to the Best Western Hotel Svava. It is also located only 3-4 min from Radisson Blu. http://www.hotellcentralstation.se/

More hotels can be found on www.hotels.com or www.expedia.se where reservations also can be made.
Elizabeth de Lange is Head of the Target Site Equilibration group of the Division of Pharmacology at the LACDR. She obtained her PhD on “The Use of Intracerebral Microdialysis to Study the Blood-Brain Barrier (BBB) Transport Characteristics of Drugs”. Her ultimate aim is to aid in the prediction of the dose-response relationship of CNS drugs in the clinical setting, on the basis of preclinical data (translational research). Her research involves the identification and characterization of the rate and extent key factors in the dose-response relationship of CNS drugs in health and CNS disorders. Dr de Lange's current research involves the use of intracerebral micro-dialysis, EEG monitoring, and PET scanning. Furthermore advanced mathematical modeling is used to model PKPD relationships and disease progression.

Elizabeth de Lange is a member of the Editorial Board of Journal of Pharmaceutical Sciences and Cerebrospinal Fluid Research, and a member of the editorial advisory board of the Journal of Pharmaceutical Sciences. She has been the cofounder and (co-)Chair at the 1st, 2nd and 5th of the series of International Symposia on Microdialysis in Drug Research and Development. She has been the Chair of the Organizing Committee of the 9th International Cerebrovascular Biology Conference, to be held in Leiden, The Netherlands, 2011. Furthermore, she is the current Chair of the section “Pharmacokinetics, Pharmacodynamics and Drug Metabolism” (PPDM) of the American Association of Pharmaceutical Scientists (AAPS). With her company In Focus (www.infocus-ecmdelange.nl) she provides courses, training and advice within her area of expertise on microdialysis, PK, PKPD, BBB, and intra-brain distribution (info@infocus-ecmdelange.nl).

Margareta Hammarlund-Udenaes is a Professor in Pharmacokinetics and Pharmacodynamics at Uppsala University. Her research is focused at studying pharmacokinetic aspects of BBB transport of drugs in relation to CNS effects, which has led to the development of new concepts within the BBB transport area, focusing on unbound drug relationships. The concepts make it possible to study the BBB contribution to drug transport to the CNS. A method frequently used is microdialysis, but also PET and other techniques are utilized. Her research group has also optimized in vitro methods for more rapid screening of BBB transport properties in drug discovery.

Dr Hammarlund-Udenaes is an Associate Editor of Pharmaceutical Research and a member of the Editorial Advisory Board of Journal of Pharmaceutical Sciences and Cerebrospinal Fluid Research. She became an AAPS Fellow in 2005 and is a frequent lecturer at conferences and drug industry within the BBB transport - pharmacokinetics area. She co-founded and has co-chaired several of the International Symposia on Microdialysis in Drug Research and Development together with Dr de Lange. She is the incoming Chair of the Gordon Conference on Barriers of the CNS in 2014, and the co-chair for the 2012 meeting. Her company Udenaes Consulting (udenaesconsulting@gmail.com) gives advice to drug industry in PKPD and BBB transport issues.
3rd Annual Course on the BBB in CNS Drug Development
Principles, Transport Kinetics, Diseases & Methods
26-28th September 2012, Uppsala, Sweden

Registration Form

Please fill in the registration form below, alternatively send an email with the required information, and send it to udenaesconsulting@gmail.com

Personal information

Name: Date:
Title:
Email:
Affiliation:

Fee

Payment completed before June 30th 2012
• PhD students € 1195,- 0
• Academic € 1495,- 0
• Business € 1695,- 0

Payment completed after June 30th but before September 1st 2012
• PhD students € 1395,- 0
• Academic € 1695,- 0
• Business € 1895,- 0

➢ Included in the fee is course material, and coffee/tea, lunches and dinners on Wednesday and Thursday
➢ Tick the applicable
➢ PhD students should accompany this form by a letter of their supervisor to ensure the status of PhD student
➢ Prices are excl VAT
➢ Registration is complete upon receiving the payment (see below)
➢ In case of cancellation before July 31st 2012 payment will be restituted (-10% administration costs).
➢ In case of cancellation after July 31st 2012 there will be no restitution. The participant may be exchanged for another participant.

Payment information
Payment should be made to:
Udenaes Consulting
SEB Bank
bg 459–9361 (if payment from Sweden)
IBAN Account: SE3850000000053681044384
BIC: ESSESESS
Skandinaviska Enskilda Banken
106 40 Stockholm, Sweden
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Company Information
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