September 3-5, 2020, Niagara Falls, NY

3-DAY WORKSHOP ON MONOCLONAL ANTIBODY

PHARMACOKINETICS & PHARMACODYNAMICS Concepts, Applications, & Case Studies

University at Buffalo
School of Pharmacy and
Pharmaceutical Sciences

COURSE OUTLINE



This workshop has been designed to provide a detailed discussion of issues relevant to the pharmacokinetic / pharmacodynamic (PK/PD) modeling of antibody drugs, and to provide a series of "hands-on" case studies describing the development and application of mathematical models to simulate and characterize antibody PK/PD. Lectures will address primary determinants of antibody pharmacokinetics (PK) and pharmacodynamics (PD), the design and implementation of pre-clinical investigations of antibody PK/PD, and state-of-the-art mathematical models to characterize and predict antibody PK and PD. Case studies, featuring



use of the ADAPT program, will include application of models for antibody-ligand binding and disposition, target-mediated disposition, and physiologically-based pharmacokinetic modeling. Special emphasis is placed on discussion of the role of FcRn on the absorption, distribution, and elimination of antibodies, on the mathematical modeling of target-mediated antibody disposition, and on physiologically-based modeling of antibody pharmacokinetics. The workshop content is provided as a combination of formal lectures and informal review sessions.

Subjects that will be presented include:

Determinants of antibody pharmacokinetics and pharmacodynamics: mechanisms of antibody elimination, the role of convection in the kinetics of antibody distribution, the role of FcRn in antibody absorption, distribution, and elimination

Interspecies Scaling of Antibody PK: considerations and examples involving the use of allometric methods to scale protein pharmacokinetics from pre-clinical models to humans

Drug-drug interactions: mechanistic considerations and examples for drug-drug interactions involving monoclonal antibodies, including consideration of antibodies as perpetrators and as victims of DDI

Target-Mediated Antibody Disposition: modeling, implications for interspecies scaling, implications for First-in-Human studies Modeling of bimolecular antibody-ligand interaction

Physiologically-based pharmacokinetic modeling: Incorporation of FcRn-mediated antibody transport in PBPK models, incorporation of target-mediated disposition, use of PBPK and preclinical data to predict antibody disposition in humans

COURSE DIRECTION

Joseph P. Balthasar, PhD. Dr. Balthasar is Professor of Pharmaceutical Sciences at the University at Buffalo, State University of New York and Director of the Center for Protein Therapeutics. His PK/PD modeling interests and capabilities include the development and preclinical evaluation of anti-cancer immunotherapies (including immunoconjugate immunotherapies), and the development and preclinical evaluation of novel immunotherapies for humoral autoimmune conditions.



David Z. D'Argenio, PhD is Professor of Biomedical Engineering at the University of Southern California and holder of the Chonette Chair of Biomedical Technology. He is a Fellow of the American Institute for Engineering in Medicine and Biology, American Association of Pharmaceutical Sciences, International Society of Pharmacometrics, and a past member of the FDA Advisory Committee for Pharmaceutical Science and Clinical Pharmacology. Since 1985 he has served as co-director of the Biomedical and Simulations Resource (BMSR) at USC, which develops, applies and disseminates advanced modeling methods for studying biological systems, where he has also led the development of the ADAPT software for PK/PD modeling and analysis.



Donald E. Mager, PharmD, PhD is Professor of Pharmaceutical Sciences at the University at Buffalo, State University of New York. He was also a Visiting Professor at the University Paris Descartes (Jan. 2007-2013). He currently serves on the Pharmaceutical Sciences and Clinical Pharmacology Advisory Committee to the FDA, and as an Associate or Consulting Editor at CPT:Pharmacometrics & Systems Pharmacology and Pharmacology, Research & Perspectives. His research involves identifying molecular and physiological factors that control the pharmacological properties of drugs, with a focus on anti-cancer and immunomodulatory agents.



Dhaval K. Shah, PhD is Associate Professor of Pharmaceutical Sciences at the University at Buffalo, State University of New York. His research focuses on understanding the determinants for the ADME of protein therapeutics. He is involved in the development of a platform PBPK model for biologics that can characterize and predict the pharmacokinetics of diverse protein therapeutics in several preclinical species and human. Dr. Shah also directs the discovery, development and clinical translation of novel protein therapeutics like antibody-drug conjugates and bi-specific molecules in his laboratory. His research is supported by NIH & pharmaceutical industry.



AGENDA

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Mechanisms Examples / case-studies Review Module #1: Design & Analysis of a Preclinical Investigation of Antibody PK (Balthasar) Study objectives Consideration for study design Assay considerations Initial evaluation of data (Additional studies needed?) Initial characterization of NCA results Reception and Group Dinner Mechanisms 9:00 – 9:45 Case Study: Target Mediated Drug Disposition (Mager) Case Study: Antibody-Ligand Interaction and Disposition (Balthasar) Case Study: Physiologically-Based Pharmacokinetic Modeling for mAb (Balthasar) Case Study: PKPD for Antibody Drug Conjugates (Shah) 12:00 – 1:00 Lunch Modeling Bispecific mAb PKPD (Shah) Evaluation of NCA results Case Study: Denosumab PKPD (Mager) Study: Denosumab PKPD (Mager) Study: Denosumab PKPD (Mager) Study: Denosumab PKPD (Mager) Stestimation Principles & Challenges for Biologics (D'Argenio)	3:30-3:45	Break	Day 3	
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• Examples / case-studies 4:15-5:00 Review Module #1: Design & Analysis of a Preclinical Investigation of Antibody PK (Balthasar) • Study objectives • Consideration for study design • Assay considerations • Initial evaluation of data (Additional studies needed?) • Initial characterization of ADME (NCA vs. modeling) • Evaluation of NCA results 5:00-7:30 Reception and Group Dinner • Examples / case-study: Antibody-Ligand Interaction and Disposition (Balthasar) 10:15 - 10:30 Break Case Study: Physiologically-Based Pharmacokinetic Modeling for mAb (Balthasar) Case Study: PKPD for Antibody Drug Conjugates (Shah) 1:15 - 12:00 Lunch 1:00 - 1:45 Modeling Bispecific mAb PKPD (Shah) 1:45 - 2:30 Case Study: Denosumab PKPD (Mager) 2:30 - 2:45 Break 2:45 - 3:30 Estimation Principles & Challenges for Biologics (D'Argenio)		Mechanisms	9:00 - 9:45	Case Study: Target Mediated Drug Disposition (Mager)
4:15-5:00 Review Module #1: Design & Analysis of a Preclinical Investigation of Antibody PK (Balthasar) • Study objectives • Consideration for study design • Assay considerations • Initial evaluation of data (Additional studies needed?) • Initial characterization of ADME (NCA vs. modeling) • Evaluation of NCA results 1:0:15 - 10:30 Break 10:30 - 11:15 Case Study: Physiologically-Based Pharmacokinetic Modeling for mAb (Balthasar) Case Study: PKPD for Antibody Drug Conjugates (Shah) 12:00 - 1:00 Lunch Modeling Bispecific mAb PKPD (Shah) 1:45 - 2:30 Case Study: Denosumab PKPD (Mager) 5:00-7:30 Reception and Group Dinner 2:30 - 2:45 Break 2:45 - 3:30 Estimation Principles & Challenges for Biologics (D'Argenio)		 Examples / case-studies 	9:45 - 10:15	
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DAV / Jane Study, Mon-depleting Anni-CD4 man to Argenton	Day 2		3:30-4:15	Case Study: Non-depleting Anti-CD4 mAb (D'Argenio)
8:00-9:00 Continental Breakfast 4:15 Discussion / Adjourn		Continental Breakfast		
9:00-10:00 Mathematical Modeling of Bimolecular Antibody-				
Antigen Interaction and ADC PKPD (Shah)	2.00 10.00			

REGISTRATION INFORMATION

Course location: The course will be held at The Conference Center Niagara Falls, 101 Old Falls Street, Niagara Falls, NY 14303. USA. Phone: (716) 278-2100. Fax: (716) 278-0008. The Center is 28 min from Buffalo International Airport. Website: http://www.cenfny.com

Hotel location: *Sheraton Niagara Falls*, 300 Third St., Niagara Falls, NY 14303. USA. Phone: (716) 285-3361. The price is \$124/night August & \$96/night September single/double occupancy (triple/quadruple add \$10 per person). *Hotel Deadline: July 31st*, 2020.

Website: https://book.passkey.com/go/2020PKPDModeling

Fee: Individual fee: \$2800. This includes course documentation, continental breakfasts, mid-session refreshments, lunches and opening dinner. Graduate Students may enroll at a fee of \$1400 (registered MS and PhD).

Registration: Online registration begins April 30th, 2020.

The course is limited to the capacity of 30 participants. Confirmation email of registration will be returned upon successful registration and payment at the following website: http://pharmacy.buffalo.edu/ under Quick Links.

Cancellations: Cancellations with a full refund may be made until July 6th, 2020. No refund are possible on cancellations received after this date. Substitutions may be made at any time.

Payment: Mastercard, Visa, American Express, and Discover card payments will be accepted only at the following website: http://pharmacy.buffalo.edu/ under Quick Links. Contact course secretary: Suzette Mis, (716) 645-4831; mis@buffalo.edu, if you need further assistance.





