Workshop

Drug Transporters in ADME: From the Bench to the Bedside

April 16–18, 2018 | Herndon, VA

Hyatt Regency Dulles

aaps®

Co-Sponsored by: FDA U.S. FOOD & DRUG ADMINISTRATION

Sunday, April 15, 2018

3:00 pm–5:00 pm	Registration Hours
3:00 pm–5:00 pm	Exhibit Setup

Monday, April 16, 2018

7:00 am–9:00 am	Registration Hours
7:00 am–8:00 am	Continental Breakfast
7:00 am–9:30 am	Exhibit Setup
8:00 am–8:10 am	**Opening Remarks** Steven Louie, Amgen Inc.
8:10 am–9:00 am	**Keynote Speaker: Searching for Transporter Impact** Per Artursson, Ph.D., Uppsala University Simple cell culture systems are invaluable tools for assigning transporter function but do not necessarily inform about transporter impact. The latter requires information from more advanced systems such as primary cell, organoid or tissue models, where the transporter of interest is functional in a physiological context. In addition, information on subcellular, organ and tissue distribution of the transporters is required. However, these complex systems are of variable quality and reproducibility. In this presentation, a new approach to rescue and maintain transporter and enzymatic function in primary cell cultures such as human hepatocytes is presented. Experimental and new bioinformatics tools that can assist in understanding transporter function are discussed. Finally, examples on how these methodologies are applied to understand transporter function and impact are presented.
	Session 1: New Transporters, New Transport Mechanisms—Part 1
9:00 am–9:30 am	**The ABCG5 ABCG8 Sterol Transporter: From Cholesterol Homeostasis to Sitosterolemia** Gregory Graf, Ph.D., University of Kentucky The session will cover the role of the ABCG5 ABCG8 sterol transporter in neutral sterol absorption and the exclusion of non-cholesterol sterols. Factors that regulate the expression of G5G8 in the liver and intestine, formation of the G5G8 complex, and its trafficking to the cell surface. In addition, the impact of biliary cholesterol and intestinal cholesterol flux on the development of metabolic disease, specifically insulin resistance and hepatic steatosis. Finally, adaptive non-G5G8 pathways for sterol excretion will be explored.

9:30 am–10:00 am **Organic Solute Transporter OSTα/β: An Overlooked Transporter in Drug-Bile Acid Interactions**
Melina Malinen, Ph.D., M.Sc. Pharm., University of North Carolina at Chapel Hill
Organic solute transporter OSTα/β is suggested to play a major role in bile acid homeostasis. OSTα- knockout mice and OSTβ-deficient humans exhibit impaired bile acid absorption and synthesis. In addition, OSTα/β is upregulated in the liver of patients with obstructive cholestasis, primary biliary cholangitis, and nonalcoholic steatohepatitis. This presentation will review the structure, function, and localization of OSTα/β, with a focus on the role of this protein in the liver. OSTα/β-mediated drug-bile acid, drug-steroid, and drug-drug interactions will be discussed.

10:00 am–10:30 am Coffee Break

10:00 am–7:00 pm Exhibits and Posters Open

- Absorption Systems
- BioIVT
- Cyprotex
- Hurel Corp.
- MilliporeSigma
- Optivia Biotechnology
- Sekisui XenoTech, LLC
- Simulations Plus, Inc.
- SOLVO Biotechnology US

10:30 am–11:00 am **Emerging Clinical Importance of OCT1 in PK, PD, PgX, and DDIs**
Maciej Zamek-Gliszczynski, Ph.D., GlaxoSmithKline plc
Hepatic OCT1 can be a determinant of drug clearance and distribution, which can impact drug exposure and response. OCT1 was shown recently to be the rate-determining step in the clearance of several drugs in humans (e.g., sumatriptan, ondansetron, tropisetron, fenoterol, etc.), and thereby a mechanism of pharmacogenetic variability and DDIs. OCT1 modulation impacts metformin response, but not pharmacokinetics, and therefore requires pharmacodynamic endpoints to enable rational metformin dose adjustment in DDIs. For this reason, OCT1 inhibition is a driver for the conduct of a metformin DDI study, but metformin is not a preferred clinical OCT1 probe drug.

Session 2: New Transporters, New Transport Mechanisms—Part 2

11:00 am–11:30 am **Investigation of Endogenous Biomarkers Applicable to Drug Interactions Involving Transporters Using Animal Models and Metabolomics**
Hong Shen, Ph.D., Bristol-Myers Squibb Company
There has been growing interest from researchers in academia and the pharmaceutical industry to identify endogenous probes of drug transporter activity. In the current investigation, pyridoxic acid and homovanillic acid were identified as potential endogenous plasma biomarkers of OAT1 and OAT3 activity using a cynomolgus monkey model and metabolomic analysis. Transporter profiling using human embryonic kidney cells stably transfected with major human renal and hepatic drug transporters confirmed these biomarkers were OAT1 and OAT3 substrates. Based on the data from these experiments, pyridoxic acid and homovanillic acid are novel plasma endogenous biomarkers that have potential for assessing OAT1 and OAT3 inhibition in the clinical setting.

11:30 am–noon **Translational DMPK Application of Microphysiological Systems**
Murat Cirit, Ph.D., MIT Biological Engineering

Microphysiological Systems (MPS) technologies are to provide an improved approach for more predictive preclinical drug discovery via a highly integrated experimental/computational paradigm. We describe a systems pharmacology perspective on this problem, incorporating more mechanistic detail for tissue chip studies than traditional pharmacokinetic (PK) and pharmacokinetic/ pharmacodynamic (PK/PD) models yet within broadly comprehensive scope. These systems pharmacology approaches offer new insight into design of experiments, data interpretation and organ-specific responses, which can be translated to in vivo responses, such as patient-to-patient variability, drug efficacy and toxicity

Noon–1:30 pm — Networking Lunch and Posters in the Exhibit Hall

1:00 pm-1:30 pm Authors (Posters 112-120) available for Questions and Answers

Poster 112 *Investigation of Inhibitor Preincubation Condition on Human OATP1B1, P -gp and BCRP Transporter In Vitro Inhibitory Potencies*

Poster 113 *Time-Dependent Inhibition Demonstrated across Multiple Classes of Uptake Transporters*

Poster 114 *Effects of Single-Nucleotide Variants in the Intracellular Loop 1 (ICL1) of ABCG2*

Poster 115 *Molecular Interactions and Size Restrictions in the Binding and Transport of Drugs by Human Solute Carriers*

Poster 116 C-DILI™ *Assay: Integrating BSEP Inhibition and FXR Antagonism to Improve Prediction of Cholestatic Drug Induced Liver Injury*

Poster 117 *In Vitro Assessment of Transporter Interactions of PI3K/mTOR Inhibitor, LY3023414, for Potential for Clinical Implications*

Poster 118 *Effect of a Common Genetic Variant (p.V444A) in the Bile Salt Export Pump on the Kinetics and Inhibition of Bile Acid Transport*

Poster 119 *Functional Screening of Renal Drug Transporters Activity in Cryopreserved Human Proximal Tubule Epithelial Cells*

Poster 120 *Sex Differences in Functional Expression of Organic Anion Transporting Polypeptide 1a4 (Oatp1a4) at the Blood-Brain Barrier in Sprague-Dawley Rats*

12:15 pm-12:45 pm — **Continued Conversation presented by BioIVT**
Subject: Organic Solute Transporter OSTα/β: An Overlooked Transporter in Drug-Bile Acid Interactions
Kenneth R. Brouwer, Ph.D., R.Ph., Vice President, ADME-TOX BioIVT and Melina Malinen, Ph.D., M.Sc. Pharm., University of North Carolina at Chapel Hill

12:45 pm-1:15 pm — **Continued Conversation presented by SOLVO Biotechnology USA, Inc**
Subject: New Transporters, New Transport Mechanisms
Joseph Zolnerciks, Ph.D. VP Business Development

Session 3: Intracellular Transport Mechanisms

1:30 pm–2:00 pm — **Lysosomal Transporters Gain Momentum in Research**
Raj Govindarajan, Ph.D., D.V.M, Ohio State University
Emerging evidence indicates that lysosome function extends beyond macromolecular degradation. Genetic and functional defects in components of the lysosomal transport machinery cause lysosomal storage disorders implicating the lysosomal solute carrier (SLC) transporters as essential to vital cell processes. The pathophysiology and therapeutic potential of lysosomal SLC transporters will be

highlighted, focusing on recent discoveries in lysosomal transport of nucleosides and nucleoside analogs in physiology, pharmacology and drug toxicity.

2:00 pm–2:30 pm **In Vitro and In Silico Methods to Investigate Lysosomal Sequestration and Consequences on Intracellular Drug Concentration**
Aleksandra Galetin, Ph.D., University of Manchester
Lysosomal sequestration may have implications on drug efficacy, off-target effects and safety. In this talk, assessment of lysosomal sequestration of respiratory drugs in alveolar macrophages is illustrated. Furthermore, the interplay of lysosomal sequestration and CYP2D6-mediated metabolic drug-drug interactions in rat and human hepatocytes is discussed using desipramine. To support the in vitro studies, in silico mechanistic cell model was developed and applied to predict subcellular distribution of a range of drugs and their concentration in lysosomes, cytosol and mitochondria. The mechanistic in silico cell model highlighted the importance of incorporating the interactions of ionized cationic drugs with membrane lipids and necessity for robust physiological data on organelle membrane phospholipid composition.

2:30 pm–3:00 pm **Beyond the Free Drug Hypothesis: Understanding the Influence of Cellular and Sub-cellular Physiology on the Distribution of Unbound Drug**
Dennis Scott, Ph.D., Pfizer Inc.
Passive mechanisms can lead to significant accumulation or restriction of drugs to intracellular sites of drug action. These mechanisms include lipoidal diffusion of ionized species and pH partitioning according to the electrochemical potential and to pH gradients that exist across subcellular compartments, respectively. These mechanisms are increasingly being exploited in the design of safe and effective drugs for the treatment of a wide variety of diseases. In this presentation, the physical and physicochemical mechanisms associated with passive cellular drug permeation will be discussed. A generic mathematical model of the cell is provided and used to illustrate concepts relevant to steady-state intracellular distribution.

3:00 pm–3:30 pm Coffee Break

3:30 pm–4:00 pm **Role of Intracellularly Expressed Transporters on Drug Resistance of Antibody-Drug Conjugates: Studies on Brentuximab Vedotin and Monomethyl Auristatin E (MMAE)**
Yurong Lai, Ph.D., Gilead Sciences Inc.
Antibody-drug conjugate (ADC) is composed of an antibody and cytotoxic anticancer payloads. The antibody of an ADC can specifically bind to surface antigens of tumor cells and internalize through the processes of endosomes and lysosomes formation. Once internalized, cytotoxic payloads are released in the lysosome and transported across the lysosomal membrane for cell killing effects. Unfortunately, the class of drugs encounters a number of challenges including inherent and acquired drug resistance. In the present presentation, the role of intracellularly expressed transporters in intracellular disposition of ADC payloads and the path forward to develop new ADC drugs capable of overcoming resistance will be discussed.

Session 4: Transport Mechanisms

4:00 pm–4:30 pm **Regulation of Oatp1a4 Functional Expression by Transforming Growth Factor-Beta Signaling at the Blood-Brain Barrier**
Patrick Ronaldson, Ph.D., University of Arizona
This session will describe ongoing research in Dr. Ronaldson's laboratory, which emphasizes targeting transporters at the blood-brain barrier (BBB) for CNS drug delivery. Our recent work has identified transforming growth factor-beta (TGF-beta)

signaling as a critical pathway involved in regulation of organic anion transporting polypeptide 1a4 (Oatp1a4) at the brain microvascular endothelium. Activation of TGF-beta signaling increased BBB Oatp1a4 functional expression and leads to enhanced CNS exposure of Oatp substrate drugs. This session will provide insights as to how these data can impact treatment of CNS diseases such as ischemic stroke.

4:30 pm–5:00 pm **CNS Delivery of Therapeutic Antibodies**
Saileta Prabhu, Ph.D., Genentech, Inc.
Discuss novel technologies to deliver therapeutic antibodies across the blood-brain barrier

5:00 pm–5:30 pm **Pharmacokinetic Considerations for siRNA Therapeutics**
Dan Wolak, Ph.D., Amgen Inc.
This talk will serve as an introduction to silencing RNA and other RNA interference based therapeutics. It will summarize early efforts as well as the current field with a focus on different factors that influence the pharmacokinetics and pharmacodynamics of siRNA therapeutics. This includes a discussion of novel delivery techniques, chemical modifications to improve stability, and the transporters involved in PKPD.

5:30 pm–7:00 pm Reception and Posters in the Exhibit Hall
6:30 pm–7:00 pm Authors (Posters 112-120) available for Questions and Answers

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5:45 pm-6:15 pm **Chalk Talk Presented by Absorption Systems**
Title: "The source REALLY matters!": Test System and Study Design Considerations
Ami Patel, Ph.D.

Tuesday, April 17, 2018

7:00 am–9:00 am Registration Hours

8:00 am–9:00 am Continental Breakfast

8:00 am–7:00 pm	Exhibits and Posters Open
8:15 am–8:45 am	**Chalk Talk presented by Optivia Biotechnology, Inc.** **Title: What Drives Transporters and Why Do We Care?** Dr. Yong Huang, Founder and CEO, Optivia Biotechnology
8:45 am-9:15 am	**Chalk Talk resented by Hurel Corp.** **Single-well Method to Measure Hepatic Metabolism and Biliary Efflux** Eugene Chen, Associate Scientist, PK/Transport Lab at Genentech
	Poster Podium
8:00 am–8:10 am	**Introduction to Poster Presentations** Arthur "Audie" Roberts, Ph.D., University of Georgia
8:10 am–8:30 am	**Poster 105** ***Epigenetic Regulation of the MDR1 Transporter at the Human Blood-Brain Barrier: Interplay Between Histone Acetylation and Aryl Hydrocarbon Receptor Signaling*** Dahea You, Rutgers University
8:30 am–8:50 am	**Poster 104** ***Assessing OATP1B1- and OATP1B3-Mediated Drug-Drug Interaction Potential of Vemurafenib Using Static and Physiologically Based Pharmacokinetic Models*** Taleah Farasyn, University of Oklahoma Health Sciences Center
8:50 am–9:10 am	**Poster 102** ***Interactions of Bile Acids and Liver Injury-Associated Drugs with Organic Solute Transporter*** James John Beaudoin, University of North Carolina, Chapel Hill
9:10 am–9:30 am	**Poster 106** ***Altered Hepatic and Renal Drug Transporter Expression and Endogenous Coproporphyrin I and III Concentrations in Serum and Urine of Polycystic Kidney Rats*** Jacqueline Bezencon, UNC Eshelman School of Pharmacy
9:30 am–9:50 am	**Poster 103** ***Spatial and Sex Differences in the Intestinal Expression of Monocarboxylate Transporters*** J. Cao, University of the Pacific
9:50 am–10:10 am	**Poster 101** ***Elucidation of Substrate-Binding Interactions Within Human Organic Cation Transporter 2 (SLC22A2) Through Homology Modeling*** Raymond E. Lai, Virginia Commonwealth University
10:15 am–10:30 am	Coffee Break
	Session 5: Cellular Molecular Toxicology Focus Group
10:30 am–11:00 am	**Cellular Molecular Toxicology Focus Group: Transporters as Clinical Relevant Mediators of Organ/Drug Toxicity** Yan Zhang, Ph.D., Incyte Membrane transporters play an important role in maintaining the homeostasis and physiological functions of nutrients, ions, and hormones. In addition, they also contribute significantly to the absorption, distribution and elimination of therapeutic agents and their metabolites. Interruption of the transporter activity due to either transporter interaction or gene mutation may alter the systemic pharmacokinetics

and tissue exposure of target drugs, therefore, can potentially lead to organ/drug toxicities. In this presentation, several examples of transporter associated organ/drug toxicity resulting from transporter functional inhibition in the liver and kidney will be reviewed and discussed.

11:00 am–11:30 am **The Role of Transporters in ADMEE of Antibody Drug Conjugates**
Nagendra Chemutri, Ph.D., Novartis Institutes of BioMedical Research
The session will focus on ADCs as a new therapeutic modality in treatment of cancer and how transporters affect the disposition of these ADCs in vivo. The DDI potential of ADCs will also be discussed.

11:30 am–noon **Molecular Mechanisms of Oligonucleotide Transport Leading to Proteinuria**
Roos Masereeuw, Ph.D., Utrecht Institute for Pharmaceutical Sciences, Division of Pharmacology
The Cellular and Molecular Toxicology Focus Group's primary aim is to promote an understanding of toxicology as it relates to drug molecules and drug safety. In this session, the role of transporters in adverse drug reactions will be discussed.

Noon–1:30 pm Networking Lunch and Posters in the Exhibit Hall
1:00 pm–1:30 pm Authors (Posters 101-109) available for Questions and Answers

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Poster 107 *Physiologically-Based Pharmacokinetic Modeling of the Effect of Chronic Kidney Disease on the Pharmacokinetics of Drugs Eliminated Nonrenally by CYP2C8 and OATP1B*

Poster 108 *Functional Expression of MRP1 in Human Distal Lung Epithelium and Its Interaction with Inhaled Drugs In Vitro*

Poster 109 *The Influence of Dissolution, PMAT Influx, and MATE Efflux Rates on Paracellular Absorption of Metformin Using a Mechanistic Oral Absorption/PBPK Model*

12:15 pm-12:45 pm **Chalk Talk presented by Sekisui-XenoTech**
Title: Impact of the 2017 FDA DDI Guidance on Interpretation of Transporter Assays
Greg Loewen, Director and Technical advisor BD, B.S.

12:45 pm-1:15 pm **Chalk Talk presented by Cyprotex Discovery LTD**
Title: Inhibitor Pre-incubation – an Artefact of the In Vitro Test System?
Hayley Atkinson, PhD

Session 6: Emerging Role of Uptake and Efflux Transporters

1:30 pm–2:00 pm

Role of Intestinal Nutrient Transporters in Drug Absorption

Melanie Felmlee, Ph.D., University of the Pacific

This session is focused on solute carrier family (SLC) transporters in the intestine that are classically thought of as nutrient transporters, but have emerging roles in drug absorption or drug-nutrient interactions. Transporters covered will include the thiamine transporter (THTR-2; SLC19A3), and the proton-coupled folate transporter (PCFT; SLC46A1), amino acid transporter (PAT1; SLC36A1) and monocarboxylate transporters (MCTs; SLC16). The session will discuss spatial expression and localization, clinical examples of drug-nutrient interactions, and use of nutrient transporters to improve oral drug absorption.

2:00 pm–2:30 pm

Contributions of Folate Transporters to Disease State

Reina Bendayan, Pharm.D., University of Toronto

Folates are essential for brain development and function. Folate transport in mammalian tissues is mediated by three major systems: reduced folate carrier (RFC), proton-coupled folate transporter (PCFT) and folate receptor alpha (FRα). Brain folate uptake primarily occurs at the choroid plexus through the concerted actions of FRα and PCFT. Inactivating mutations on FRα or PCFT can cause cerebral folate deficiency, resulting in childhood neurodegeneration. Thus, identifying alternative routes for brain folate delivery could lead to therapeutic benefits. This presentation will address the role of RFC in folate uptake at the blood-brain barrier (BBB) and its potential regulation by ligand-activated nuclear receptors i.e., vitamin D receptor (VDR).

2:30 pm–3:00 pm

Characterization of N-Ac-γ-Calicheamicin DMH, the Cytotoxic Payload of the ADC Inotuzumab Ozogamicin, as a Substrate or Inhibitor of the Major Drug Transporters

Theodore Johnson, Ph.D., Pfizer Inc.

Inotuzumab ozogamicin (InO; BESPONSA™) is an antibody-drug conjugate (ADC) comprised of an anti-CD22 antibody and a small molecule cytotoxin, N-Ac-γ-calicheamicin, conjugated via an acid-cleavable linker. InO was approved in 2017 for the treatment of adults with relapsed or refractory acute lymphoblastic leukemia. As part of the overall characterization of InO disposition, in vitro studies were conducted to investigate the released payload, N-Ac-γ-calicheamicin DMH, as a substrate or inhibitor of the major drug transporters. This presentation will provide an overview of the transporter assessment for InO and implications with respect to DDI risk and tumor cell toxicity.

3:00 pm–3:30 pm

Attempting to Differentiate SLC Activity in Human Primary Hepatocytes: Going Beyond OATPs to Encompass NTCP, OCT1, OAT2 and OAT7

David Rodrigues, Ph.D., Pfizer Inc.

Two hepatic organic anion-transporting polypeptides (OATP1B1, OATP1B3) dominate the literature, presenting as the loci of important drug-drug interactions and genotype-phenotype associations. In reality, the hepatic uptake of various substrates can be mediated by any number of additional solute carriers (SLCs) such as OATP2B1, organic cation transporter 1 (OCT1), organic anion transporters 2 and 7 (OAT2 and OAT7), and Na+-taurocholate co-transporting polypeptide (NTCP). The presentation will focus on efforts to develop tools to assess individual SLC activity in human primary hepatocytes. When used coordinately with a panel of transfected liver SLCs, the tools can support SLC phenotyping of new chemical entities and the characterization of candidate SLC biomarkers.

3:30 pm–4:00 pm

Coffee Break

Session 7: NexGen Technology in Studying Transporter Function

4:00 pm–4:30 pm

Leveraging Appropriate In Silico and PBPK Approaches for Transporter Strategies in Drug Discovery and Development
Kunal Taskar, Ph.D., B. Pharm., GlaxoSmithKline plc
This talk would look into the different in silico tools that can be used at appropriate stages of drug discovery and development. Drug transporters are important in drug disposition and hence can be crucial in determining drug mediated efficacy and/or toxicity. Hence along with in vitro and in vivo studies, leveraging suitable in silico approaches can support and aid in adopting a suitable drug transporter strategy.

4:30 pm–5:00 pm

Opportunities and Challenges Using Organ-Chips to Understand Safety Risks, Drug Metabolism, and Disease Mechanisms
Kyung-Jin Jang, Ph.D., Emulate, Inc.
Human Organ-Chips are micro engineered systems that recapitulate the tissue microenvironment. The chips' design goes beyond conventional in vitro models by recreating in vivo intercellular interactions, spatiotemporal gradients, and mechanical forces. Here we highlight findings from our Liver-Chip. We demonstrated that the Liver-Chip maintains stable physiologic levels of key hepatic functions; we also recapitulated toxicity findings in the Liver-Chip that were found in the clinic yet were not previously observed in other in vitro or animal models. Implementation of Organ-Chips within the pharmaceutical industry aims to improve the probability of success of drugs by generating models that are more human and disease relevant.

5:00 pm–5:30 pm

Nanoparticle Transport Across the BBB
Tao Lu Lowe, Ph.D., University of Tennessee

5:30 pm–7:00 pm

Reception and Posters in the Exhibit Hall
6:00 pm–7:30 pm Authors (Posters 101-109) available for Questions and Answers

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5:45 pm–6:15 pm

Chalk talk Presented by Simulations Plus, Inc.

Title: PBPK Models for Intestinal Absorption via Nonlinear Influx and Efflux
Michael Bolger, Ph.D. - Chief Scientist

7:00 pm–8:00 pm Exhibit Breakdown

Wednesday, April 18, 2018

7:00 am–9:00 am Registration Hours

7:00 am–8:00 am Continental Breakfast

8:15 am–8:30 am **Introductory Remarks**
Maciej Zamek-Gliszczynski, Ph.D., GlaxoSmithKline plc

Session 8: International Transporter Consortium

8:30 am–9:00 am **Review of ITCW3 White Paper Part 1**
Kathy Giacomini, Ph.D., University of California, San Francisco
In this presentation, an overview of four whitepapers from the International Transporter Consortium (ITC) will be presented including papers on clinically important polymorphisms and emerging transporters, as well as biomarkers for transporters. In particular, this presentation will focus on the scientific rationale for ITC recommendations suggesting that polymorphisms in ABCG2, SLCO1B1 and SLC22A1 should be monitored for their effects on pharmacokinetics and pharmacodynamics during drug development and that OCT1 should be considered a clinically important transporter for potentially mediating drug-drug interactions. Highlights of ITC recommendations for transporter biomarkers will be included in the presentation.

9:00 am–9:30 am **Review of ITC3 Whitepapers Part 2**
Pär Matsson, Ph.D., Uppsala University
The presentation will discuss whitepapers that resulted from the ITC3 World Meeting. The focus will be on the two publications emanating from the session on Computational Modeling of Transporters, covering the use of imaging, in vitro experiments and PBPK modeling to assess the impact of transporters on cellular and tissue drug distribution, and the use of molecular modeling to identify and rationalize drug-transporter interactions. Perspectives on the role of transporters in drug-associated toxicity and disease will also be discussed.

9:30 am–10:00 am **Panel Discussion**

10:00 am–10:30 am Coffee Break

Session 9: Regulatory Perspectives

10:30 am–11:00 am **FDA Perspectives on New In Vitro and In Vivo Guidances**
Shiew-Mei Huang, Ph.D., U.S. Food and Drug Administration

11:00 am–11:30 am **Introduction of the EMA Draft Guideline of Drug-Drug Interactions Regarding Transporters—A View from an EU Assessor**
Yang (Abby) Yu, Medicines Evaluation Board, The Netherlands
The current guideline at EMA was launched in 2013. In the past 5 years there have been a lot of new development in the field of transporters and enzymes, therefore it is important to update the current guideline. There is a concept paper now at EMA proposing a revision of the guideline. In the presentation, clarification and

	explanation of the concept paper will provided, e.g. importance of certain transporters in DDIs.
11:30 am–noon	**Panel Discussion**
Noon–12:30 pm	**Closing Remarks**