Pion

Biorelevant Symposium

June 29, 2023
Munich, Germany

AGENDA

PRELIMINARY AGENDA

Start Time	End Time	Title	Presenter
8:00 am	9:00 am	Registration	
9:00 am	9:15 am	Welcome	Pion
9:15 am	9:50 am	Biorelevant dissolution testing to support drug product development – A state-of-the-art overview of the available types of equipment	Dr. Philippe Berben, Scientist Biopharmaceutics, Idorsia Pharmaceuticals Ltd., Basel, Switzerland
9:50 am	10:25 am	Prediction of food effects on oral bioavailability – what are the options?	Dr. Mirko Koziolek, Principal Research Scientist, AbbVie Ludwigshafen, Germany
10:25 am	11:00 am	Refreshments Break & Networking	
11:00 am	11:35 am	In-vitro Dissolution-Absorption Tools and Using Flux as a Predictor of Oral Absorption	Karl Box, CSO Pion Europe
11:35 am	12:10 pm	Predicting oral drug absorption in pediatric patients – are we there yet?	Prof. Sandra Klein, University of Grefswald, Department of Pharmacy
12:10 pm	1:30 pm	Lunch & Networking	
1:30 pm	2:05 pm	A Data-centric View of Early Phase Development of Oral Small Molecule	Stephen Tindal, Director, Science & Technology, Catalent

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Start Time	End Time	Title	Presenter
2:05 pm	2:40 pm	Development of a physical and digital twin of the colon and its application in biopharmaceutics	Prof. Hannah Batchelor, Strathclyde Institute of Pharmacy and Biomedical Sciences
2:40 pm	3:10 pm	Refreshment Break & Networking	
3:10 pm	3:45 pm	Solubility enhancement via amorphous solid dispersions: A new opportunity for challenging drug substances	Dr. Thomas Kipping, Head of Drug Carriers at Merck Life Science KGaA Darmstadt
3:45 pm	4:20 pm	Computational and Biorelevant Tools to Support Rational Lipid-Based Formulation Design	Prof. Brendan Griffin, Professor of Pharmaceutics and Head of School of Pharmacy, University College Cork
4:20 pm	4:50 pm	Roundtable Discussion	All speakers
4:50 pm		Final remarks	Pion
5:00 pm		Meeting Adjourns	

ABSTRACTS

Biorelevant dissolution testing to support drug product development – A state-of-the-art overview of the available types of equipment.

Dr. Philippe Berben, Scientist Biopharmaceutics, Idorsia Pharmaceuticals Ltd., Basel, Switzerland

The dissolution test is the only in vitro test that characterizes a drug substance's release from the drug product and its subsequent dissolution, both in terms of rate and extent of dissolution.

Due to these unique properties, dissolution plays a central role during the entire lifecycle of a drug, from early in development until market launch and beyond.

To cover this wide timespan and to anticipate the different questions arising during the phases of drug development, different dissolution methodologies (QC, biorelevant, and clinically relevant dissolution) have been established.

In this presentation, the contribution of dissolution, with a specific focus on biorelevant dissolution, to the drug development process will be discussed.

To this end, a state-of-the-art overview of different biorelevant dissolution methodologies including relevant case studies will be presented.

Prediction of food effects on oral bioavailability – what are the options?

Dr. Mirko Koziolek is a Principal Research Scientist I in Small Molecule CMC Development at AbbVie in Ludwigshafen, Germany

Abstract: The intake of food can alter the bioavailability of orally administered drugs in multiple ways and by this, it may even affect the efficacy and safety of the pharmacotherapy. For this reason, it is important to predict food-drug interactions early on during drug product development. In this presentation, Mirko Koziolek will provide an overview of the various in vivo, in vitro and in silico approaches that are used in the development of oral drug products to predict pharmacokinetically related food-drug interactions. Thereby, he will highlight the advantages and limitations of the different approaches and speak about the considerations and challenges in choosing the right tools at the right time.

In-vitro Dissolution-Absorption Tools and Using Flux as a Predictor of Oral Absorption

Karl Box, Chief Scientific Officer – Europe

Pion has been at the forefront of developing in-vitro dissolution-absorption tools as a method for prioritizing formulations for oral drug absorption. In this presentation, we will introduce and describe various setups for measuring drug dissolution-absorption and will illustrate the use of the resultant flux data as an input into a new software package for predicting the fraction of absorbed drug. Discussion of

the parameters that influence the predictions and have an influence on the overall drug absorption process will be presented.

Predicting oral drug absorption in pediatric patients – are we there yet?

Prof. Sandra Klein, University of Greifswald, Institute of Pharmacy

Children is the collective term for a patient group that spans patients of widely varying ages and maturational stages. The development of safe and effective oral dosage forms for children presents unique challenges, as the requirements for these dosage forms can vary widely depending on the age of the child and the maturity of the child's gastrointestinal physiology. Moreover, the administration conditions for dosage forms given to children may differ significantly from those administered to adults. All these aspects must be considered in the development of test methods when aiming to predict the in vivo performance of a dosage form based on in vitro data. The presentation aims to discuss the current state of knowledge and highlight important aspects in the development of biopredictive pediatric in vitro release models based on selected case studies.

A Data-centric View of Early Phase Development of Oral Small Molecule

Stephen Tindal, Director, Science & Technology, Catalent

To be successful in accelerating proof of concept for small molecule drugs, small companies must navigate a path through a bewildering process of data collection, being smart about which studies are performed and which ones are not, in order to collect a minimal, yet most impactful data set that enables the molecule to progress before running out of funding. In this presentation, we will show how flexible solutions using elements of quality by design, API sparring techniques, phase-appropriate CMC activities, and PBPK modeling can be applied to early-stage drug development programs.

Development of a physical and digital twin of the colon and its application in biopharmaceutics

Prof. Hannah Batchelor, Strathclyde Institute of Pharmacy and Biomedical Sciences

This talk will explain the development of a physical model of the human adult colon and its use in exploring dissolution of modified release products. The use of this model to inform a digital twin will also be covered to highlight where a digital twin has applications as part of the biopharmaceutics toolkit. The final part of the talk will cover the integration of data from the models into PBPK software to further advance the value of biorelevant models.

ABSTRACTS

Solubility enhancement via amorphous solid dispersions: A new opportunity for challenging drug substances

Dr. Thomas Kipping, Head of Drug Carriers at Merck Life Science KGaA Darmstadt

The solubility of drug substances has a significant impact on formulation development, clinical testing, and commercialization of medicinal products. Poor solubility can conceal the true potential of new chemical entities resulting in lost opportunities and extensive formulation efforts. The creation of solid dispersions is one of the most prominent strategies for solubility enhancement. In particular hot melt extrusion is a highly promising technology. Understanding interactions between drug substances and polymers is key to a successful development strategy.

Computational and Biorelevant Tools to Support Rational Lipid-Based Formulation Design

Prof. Brendan Griffin, Professor of Pharmaceutics and Head of School of Pharmacy, University College Cork

Declining developability in the face of increasing numbers of poorly water-soluble drugs has fast-tracked the necessity for predictive tools to assess the delivery potential of bio-enabling formulations. Computational pharmaceutics is a growing area of research interest to support greater structured guidance in formulation strategy. In recognition of the fact that computational models may optimize but not entirely circumvent the need for experimental screening, there is a need for small-scale and high throughput bio-predictive *in vitro* tools to predict bioenabling formulation performance. This presentation will provide a brief overview of the opportunities of Lipid-based formulations (LBFs) for improving oral bioavailability of poorly water-soluble drugs and discuss the current challenges in formulation of emerging drugs within LBF. The presentation will outline where computational tools are employed to predict biorelevant solubility gains of drugs formulated as LBFs and to inform drug developability classifications (DCS) (based on a predicted Dose number). A proposal for reimagining of the drug substance to drug product development framework involving of both computationally informed and experimentally confirmed aspects of drug product pathway decision-making will be presented.