

# Training Course

## ADME, PK/TK, and Drug Metabolism in Drug Discovery and Development

January 20<sup>th</sup> and 21<sup>st</sup> 2009  
Brussels, Belgium

### Course Scope and Description

This course is specifically designed for personnel in the pharmaceutical and biotechnology industries and contract research organizations (CROs) who need to understand the requirements for ADME (absorption, distribution, metabolism, elimination), pharmacokinetics/toxicokinetics (PK/TK) and drug metabolism (DM) experiments during the drug discovery and development processes.

Participants should have some knowledge of these processes and desire to learn more about how ADME, PK/TK, and DM studies are designed, conducted, and interpreted in order to characterize the fate of a drug candidate. Nonclinical and clinical scientists, managers, and project team leaders at pharmaceutical companies and related industries will gain a detailed understanding of the types of ADME, PK/TK, and DM research studies conducted to support submissions to regulatory authorities.

The content of this course will assist pharmaceutical, biotechnology, and CRO researchers and managers in understanding the requirements for a well-designed and successful ADME, PK/TK, and DM program that is conducted within a drug development logic plan and in compliance ICH guidelines. The various types of ADME, PK/TK, and DM studies, which include *in vitro* metabolism and delivery, animal and human pharmacokinetics, protein binding, mass balance, tissue distribution, metabolite isolation and identification, and toxicokinetic support, will be discussed. Study designs and potential results, with possible interpretations, from each of the study types will be presented. The generation study reports and summaries, both of which are to be included in submissions to regulatory authorities, for completed research experiments will be delineated.

## **COURSE AGENDA**

### **DAY ONE**

#### **Session 1: Introduction and Overview (8:30 – 10:00 AM)**

- Purpose and Goals
- Drug Discovery and Development Logic Plan
- Types of Drug Metabolism and ADME Studies
- GLP Regulations Overview

#### **Session 2: Developability Assessment Experiments (10:30 AM to noon)**

- In Vitro Delivery and Example Profiles
- Preliminary Protein Binding
- In Vitro Metabolism
- Bioanalytical Chemistry Method Definition
- Preliminary Pharmacokinetics and Example Profiles
- Bioavailability and Example Profiles

#### **Session 3: Preclinical Drug Development Experiments – Part 1 (1:00 to 2:30 PM)**

- Bioanalytical Chemistry Method Validation
- Pharmacokinetic Assessments in Toxicology and Pharmacology Animal Species
- Absolute Bioavailability and Dose Proportionality Examples

#### **Session 4: Preclinical Drug Development Experiments – Part 2 (3:00 to 4:30 PM)**

- Toxicokinetics
  - Multiple Dose Evaluation Examples
  - Gender Effect Examples
- Drug Candidate Radioisotopic Labeling
  - Choice of Label and Labeling Site
  - Radiochemical and Metabolic Stability Evaluations
- Mass Balance in Toxicology Species
  - Metabolic Profiling Assay
  - Study Design and Sampling Recommendations
  - Extent of Metabolism
  - Route(s) and Rate(s) of Elimination
- Definitive Protein Binding in Various Species

## DAY TWO

### **Session 5: Clinical Drug Development Experiments (8:30 to 10:00 AM)**

- Types of Human ADME and Drug Metabolism Experiments
- Human Pharmacokinetic Evaluation Examples
- Drug-drug and Drug-Food Interactions
- Stereochemistry Issues
- Bioavailability and Bioequivalence Evaluations
- Renal and Hepatic Impairment Studies
- Age Effects

### **Session 6: Nonclinical Drug Development Experiments (10:30 AM to noon)**

- Toxicokinetic Support
  - Feto-placenta Transfer and Lacteal Secretion Toxicokinetic Studies
- Tissue Distribution (Single- and Repeat-Dose) and Whole Body Autoradiography
- Studies Design and Sampling Requirements
- Metabolite Isolation and Identification
  - Development and Validation of Bioanalytical Method(s) for Metabolites
  - Pharmacokinetic Evaluation of Metabolites
- Definition of Metabolism Pathway
- Induction and Inhibition of Drug Metabolizing Enzymes
- Animal Bridging Studies

### **Session 7: Clinical Drug Metabolism and ADME (1:00 to 2:30 PM)**

- Study Protocols
- Technical/Study Reports
- Test Assay Methods
- Standard Operating Procedures
- Summaries for Submission to Regulatory Authorities

### **Session 8: Documentation (3:00 to 4:30 PM)**

- Summary and Conclusions
- Workshop to Design and Discuss ADME and Drug Metabolism Studies Needed to Support the Discovery and Development of Various Drug Candidate Types – The Logical Approach to Discovery Lead Selection

### **For more information contact:**

Cristina Lungu  
Event Coordinator

Tel +44 20 8144 7170  
Fax +40 21 223 6500  
[cristinah@mondialresearchgroup.com](mailto:cristinah@mondialresearchgroup.com)



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