

## Practical Bioanalytical Method Validation

### Instructor



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### Course Description

Validation of analytical methods for the quantitative analysis of drugs, metabolites and biomarkers in a certain biological matrix is crucial for the successful conduct of nonclinical, biopharmaceutics, and clinical pharmacology studies. This short course will focus on the bioanalytical method validation using LC-MS. This course offers practical training for the practical scientists. It will take the participants step-by-step through the concepts and techniques to validate bioanalytical methods. The emphasis is on practical issues associated with the bioanalytical method validation. The participants will learn the essence of the method validation. After this course, the participants will be able to independently validate their own bioanalytical methods. How to apply the validated methods for routine assay and some typical case studies will be presented as well.

### Intended Audience

This short course will benefit the analytical chemists, lab supervisors, QA/QC managers, regulators, GLP auditors and CRO consultants who work in the GLP-regulated labs and the pharmaceutical industry. This course will also benefit all levels of management as a refresher course to stay current with the GLP regulations.

### Detailed Outline

1. Validation guidance/guidelines
  - ICH
  - AOAC
  - IUPAC
  - Eurachem
  - EMA
  - FDA
  - SANCO
  - Nordtest guide for measurement uncertainty

## 2. What can the validated methods answer

- Does the method measure the intended analyte?
- Does anything interfere with the measurement?
- Is the method specific or selective for the analyte?
- What is the variability associated with these measurements? - what are the accuracy and precision of the method?
- What is the LLOQ? What is the ULOQ?
- How do sample collection, handling, and storage affect the reliability of the data
- Do the samples need to be frozen during shipping?
- What temperatures are required to store the samples, and how long can the samples be stored?

## 3. Bioanalytical method validation

- How to design an accuracy & precision run
- What are the acceptance criteria for an A&P run
- Requirements for accuracy, precision, recovery, selectivity and specificity
- How to design a calibration curve - LLOQ, ULOQ and weighting factor
- How to prepare quality control (QC) samples
- Acceptance criteria for standards and QCs
- How to design selectivity and specificity tests
- How to design matrix effect and recovery tests
- How to design dilution effect tests
- How to design stability tests for autosampler, benchtop, extracted samples, stock solution and long-term storage
- When do I need partial or cross validation
- How to report bioanalytical method validation

## 4. Apply the validated methods for routine bioanalysis

- Recommendations for routine drug analysis
- Design an analytical run/batch
- How to arrange samples - by subject or by period?
- Evaluation of LLOQ, ULOQ and QCs
- Criteria to approve or reject results
- Evaluation of unknown study samples
- Deviations and remedial actions
- Re-assay and incurred sample reanalysis (ISR)
- How to select re-assay results
- How to report bioanalytical data

## 5. Case studies and GXP discussion

- Validation bottleneck and challenges

- How to prepare for bioanalytical inspections
- How to measure and minimize matrix effects
- How to harmonize the various global bioanalytical guidance documents
- How to deal with urine samples
- How to improve the throughput

### **Instructor Qualification and Experience**

Dr. Perry G. Wang worked in the pharmaceutical and medical-device industry from 2000 to 2008. He received his Ph.D. degree at Oregon State University. Dr. Wang currently works at FDA as a chemist. In addition to over twenty peer-reviewed publications, he has edited and coedited five books: "High-Throughput Analysis in the Pharmaceutical Industry", "Monolithic Chromatography and Its Modern Applications", "Hydrophilic Interaction Liquid Chromatography (HILIC) and Advanced Applications", "Counterfeit Medicines", and "High-Throughput Analysis for Food Safety". His expertise focuses on high throughput analysis and validation by LC-MS. He prepares and teaches this course in his own capacity but not as an employee of the FDA. He has been invited to teach this course at ASMS since 2015.