

# A 3-DAY INTRODUCTORY WORKSHOP IN POPULATION PK DATA ANALYSIS

A HANDS-ON COURSE USING NONMEM®



Thursday, May 18 – Saturday, May 20, 2006  
Buffalo, NY



## WORKSHOP SYNOPSIS

This introductory population PK training workshop has been designed to provide the necessary information to successfully implement population pharmacokinetic methodology in a drug development program. The material is structured to impart both the theoretical and practical aspects of the population approach and is versatile so that participants with diverse backgrounds and areas of expertise may benefit. Examples of the use of population PK studies in drug development programs, especially those from the published scientific literature, will be presented whenever possible to provide specific details of various implementations and better illustrate essential aspects of population PK methods. Emphasis will be placed on compliance with the FDA's Guidance for Industry on Population PK; participants will gain an appreciation for the importance of protocol compliance, the essentials of accurate and sufficient data collection, and learn how to proactively plan in order to maximize study effectiveness.

The workshop content is provided as a combination of formal lectures, review of data, code, and data analysis results, and hands-on exercises. Participants will be provided with a computer terminal where they will be afforded the opportunity to practice coding control streams, running various models, and evaluating the results. A thorough examination of an example dataset, from development of the structural model, through covariate analysis, and model refinement will be covered. Overall, this workshop will provide the audience with a comprehensive understanding of the population PK approach to data analysis, its usefulness and added value in drug development, as well as when and where to employ population PK methods and sparse sampling within a given development program. The format is designed to be both comprehensive and interactive.

## LEARNING OBJECTIVES

Following the workshop, the participant should be able to:

1. Understand the conceptual basis and rationale for the population approach to data analysis
2. Understand where and when population methods may be optimally applied to PK and PK/PD analyses during the drug development process
3. Understand and describe the potential benefits and advantages to implementing a population strategy
4. Identify the critical logistic and practical issues involved in study design, protocol development, case report form development, overall planning, and efficient execution for population PK studies
5. Describe the critical documentation standards for population PK reports intended for submission to the FDA
6. Write, execute, and de-debug basic NONMEM® control streams for simple structural PK models
7. Outline the requirements and format for basic NONMEM® datasets
8. Understand, identify, and code some basic functional forms for covariate-parameter relationships
9. Perform covariate analysis using a forward selection followed by backward elimination approach
10. Understand the importance of exploratory data analysis (EDA) and the interpretation of standard goodness-of-fit diagnostic plots
11. Understand the basis for model selection strategies and discriminate between model candidates on the basis of both quantitative and qualitative factors
12. Have insight into potential model refinement issues

*Models:*

*Covariate*

*Statistical*

*Structural*

## COURSE INSTRUCTION

The workshop is organized and taught by experienced pharmacometricians from Cognigen Corporation and the University at Buffalo School of Pharmacy and Pharmaceutical Sciences, a pioneer and global leader in the field of pharmacodynamics and pharmacokinetics. Cognigen Corporation has been providing clinical pharmacology consulting services, including population PK/PD modeling and simulation to the global pharmaceutical industry for over 12 years. Cognigen specializes in performing innovative data management and analyses to generate and communicate the knowledge required for time-sensitive decision-making and regulatory review. Course faculty will include: Jill Fiedler-Kelly, Alan Forrest, Ted Grasela, and Joel Owen.



This session precedes a 3-day separate course in the concepts and applications of Pharmacokinetic/Pharmacodynamic Modeling coordinated by Dr. William J. Jusko. For information see: <http://pharmsci.buffalo.edu/symposia/> or contact [wj Jusko@buffalo.edu](mailto:wj Jusko@buffalo.edu).

Jill Fiedler-Kelly

## AGENDA

<b>May 18</b>	<b>Thursday</b>		
08:30-08:40	Pf. J. Fiedler-Kelly: <b>Introduction &amp; Welcome</b>	01:00-01:45	Pf. J. Fiedler-Kelly: <b>Hands-on Exercise 3 (cont'd)</b>
08:40-09:55	Dr. T. Grasela: <b>The Transition to Model-Based Development</b>	01:45-02:15	Pf. J. Fiedler-Kelly: <b>Data Review 2: Base Model</b>
09:55-10:10	Break	02:15-03:00	Pf. J. Fiedler-Kelly: <b>Lecture 7: Model Selection</b>
10:10-11:15	Pf. J. Fiedler-Kelly: <b>Lecture 1: Population PK Modeling &amp; Its Role in New Drug Development</b>	03:00-03:15	Pf. J. Fiedler-Kelly: <b>Lecture 8: Modeling Covariate Effects: Functional Forms &amp; Coding Issues</b>
11:15-12:15	Dr. A. Forrest: <b>Lecture 2: Population PK Modeling Constructs &amp; Statistical Basis for Estimation</b>	03:15-03:30	Break
12:15-01:15	Lunch	03:30-04:15	Pf. J. Fiedler-Kelly: <b>Lecture 8 (cont'd)</b>
01:15-02:00	Pf. J. Fiedler-Kelly: <b>Lecture 3: Introduction to NONMEM® Terminology</b>	04:15-04:30	Pf. J. Fiedler-Kelly: <b>Data Review 3: Introduction to Covariate Analysis</b>
02:00-03:00	Pf. J. Fiedler-Kelly: <b>Lecture 4: Overview of NONMEM® Program &amp; Writing an NM-TRAN Control Stream</b>	04:30-05:30	Pf. J. Fiedler-Kelly: <b>Hands-on Exercise 4: Forward Selection of Covariate Effects</b>
03:00-03:15	Break		
03:15-04:15	Pf. J. Fiedler-Kelly: <b>Lecture 5: NONMEM® Dataset Structure</b>	<b>May 20</b>	<b>Saturday</b>
04:15-05:30	Pf. J. Fiedler-Kelly: <b>Hands-on Exercise 1: Writing Control Streams &amp; Diagnosing Dataset Problems</b>	08:30-09:00	Pf. J. Fiedler-Kelly: <b>Data Review 4: Forward Selection Results and Multivariable Model Checking</b>
<b>May 19</b>	<b>Friday</b>	09:00-10:00	Pf. J. Fiedler-Kelly: <b>Hands-on Exercise 5: Backward Elimination of Covariate Effects</b>
08:30-09:15	Pf. J. Fiedler-Kelly: <b>Review Hands-on Exercise 1 &amp; Hands-on Exercise 2: Introduction to PANDA and Test Run Execution</b>	10:00-10:15	Break
09:15-10:00	Pf. J. Fiedler-Kelly: <b>Lecture 6: Running NONMEM® &amp; Interpreting the Output</b>	10:15-10:45	Pf. J. Fiedler-Kelly: <b>Lecture 9: Diagnosing Errors, Model Checking &amp; Model Refinement Techniques</b>
10:00-10:15	Break	10:45-11:00	Pf. J. Fiedler-Kelly: <b>Data Review 5: Model Refinement</b>
10:15-11:15	Pf. J. Fiedler-Kelly: <b>Data Review 1: Introduction to Example Dataset, Exploratory Data Analysis &amp; Model Diagnostic Plots</b>	11:00-12:00	Dr. A. Forrest: <b>Lecture 10: Bayesian Approaches to Population PK</b>
11:15-12:00	Pf. J. Fiedler-Kelly: <b>Hands-on Exercise 3: Developing a Base Structural Model</b>	12:00-01:00	Lunch
12:00-01:00	Lunch	01:00-01:30	Pf. J. Fiedler-Kelly: <b>Hands-on Exercise 6: CRF Design Considerations for Population Studies</b>
		01:30-02:30	Dr. J. Owens: <b>Lecture 11: Additional Topics</b>
		02:30-02:45	Break
		02:45-03:45	Dr. J. Owens: <b>Case Study: Practical Approaches to Utilizing Exposure-Response Relationships to Inform Drug Development and Prescribing Decision-Making</b>
		03:45-05:00	Dr. T. Grasela: <b>Challenges in the Implementation of a Pharmacometrics Service</b>

## REGISTRATION DETAILS

**Course location:** The course will be held at the University at Buffalo, Cooke-Hochstetter Hall, North Campus.

**Fee:** The fee is \$2000. A US government employee rate of \$1500 and student rate of \$1000 is available for up to 4 participants of each type. The registration fee includes course documentation and handouts. Lunches during the course are included, plus several on-campus options are available.

**Accommodations:** University Inn, 716-636-7500 or Marriott Hotel, 716-689-6900.

**Registration:** Given the hands-on nature of the course, enrollment will be limited to 28 persons. Please register by filling out the form and returning to the address shown below. Confirmation of registration will be returned upon receipt, together with an invoice for the course fee. Registration will not be final until payment is received. Checks should be made out to the University at Buffalo Foundation Inc. Bank transfers and credit card payments are also accepted.

**Cancellations:** Cancellations with a full refund may be made until March 31, 2006. No refunds will be given for cancellations received after this date. Substitutions may be made at any time.

### REGISTRATION FORM: INTRODUCTORY NONMEM® WORKSHOP

Name: \_\_\_\_\_

Organization: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State/Country: \_\_\_\_\_

Postal Code: \_\_\_\_\_

Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-mail: \_\_\_\_\_

For credit card payment:

Credit card number: \_\_\_\_\_

Signature: \_\_\_\_\_ Expiration Date: \_\_\_\_\_

**Kindly return to:** PK/PD MODELING – NONMEM Workshop, Dept. of Pharmaceutics, School of Pharmacy, University at Buffalo, 519 Hochstetter Hall, Buffalo, NY 14260; phone: 716 645 2842, x. 224; fax: 716 645 3693; e-mail: wjjusko@buffalo.edu