Biomedical
Image Quantification

PMOD Technologies Ltd
Sumatrastrasse 25
8006 Zürich Switzerland

T +41 44 350 46 00
F +41 44 350 46 01
info@pmod.com pmod.com

PMOD Training Courses in March 2017

March 6-9, 2017, Zurich, Switzerland
www.pmod.com / Training

Overview of Courses

As a general introduction, the PMOD Basic Application Course is being offered. Afterwards, two specialized courses on small animal imaging and on statistical analysis using PMOD will be organized. The prerequisite for participation in those latter courses is an intermediate skill level in PMOD, as acquired for instance at the basic course. Detailed information can be found on the respective course flyers (available on the PMOD website).

PBA - PMOD Basic Application Course, Monday-Tuesday, March 6-7, 2017

The aim of this 2-day course is to teach the participants the effective use of the major PMOD tools. Short presentations will outline the principles behind the different types of data analysis. The core of the course will be a series of guided exercises on the computer. Spare time will be devoted to individual practice using the PMOD Basic Workbook and to interaction with the trainers.

PAP - PMOD Small Animal Image Processing Course, Wednesday, March 8, 2017

This proven 1-day course covers the specific aspects of small animal imaging when working with PMOD. The participants will be trained in the processing of small animal data using PMOD and will learn the principles and special techniques required for the meaningful analysis of the uptake in small tissue structures.

PST - PMOD Statistics Course, Thursday, March 9, 2017

This recently launched 1-day course aims to train the participants in using PMOD for the meaningful statistical analysis of study data, particularly in the presence of multiple regional outcome values. The participants will learn the major statistical concepts relevant for their research, and will be taught how to leverage the statistical power available in the current PMOD version, in order to obtain sound results when comparing populations.

Course Registration and Rates

Registration to the above courses can be done online and will be handled on a first-come, first-served basis. ***Early-bird rates are applicable until February 5, 2017***, whereas the standard rates will apply afterwards. Student rates are 20% off the respective regular rates. New PMOD license holders are granted a 50% discount on the regular rates. The table below summarizes the prices for single and multiple course registrations (including volume discounts):

Courses		Regular Rates		Student Rates	
Choice of Courses	**#Days**	**Early-Bird**	**Standard**	**Early-Bird**	**Standard**
PBA	2	790 €	890 €	632 €	712 €
PAP or PST	1	540 €	590 €	432 €	472 €
PBA + (PAP or PST)	3	1180 €	1330 €	944 €	1064 €
PBA + PAP + PST	4	1420 €	1620 €	1136 €	1296 €
PAP + PST	2	880 €	980 €	704 €	784 €

Biomedical
Image Quantification

PMOD Technologies Ltd
Sumatrastrasse 25
8006 Zürich Switzerland

T +41 44 350 46 00
F +41 44 350 46 01
info@pmod.com pmod.com

PMOD Basic Application Course (PBA)

Monday-Tuesday, March 6-7, 2017, Zurich, Switzerland

www.pmod.com / Training

Overview

The aim of PMOD's biannual Basic Application Course (PBA), held each year in March and September in Zurich, is to teach the participants the effective use of the major PMOD tools. Short presentations will outline the principles behind the different types of data analysis. The core of the course will be a series of guided exercises on the computer. Spare time will be devoted to individual practice using the PMOD Basic Workbook and to interaction with the trainers.

The participants are required to bring their own notebooks. Each participant will be given a USB flash key containing the latest PMOD version as well as training data sets. PMOD can be started directly from the key, such that the configuration of the notebook will remain untouched. As a courtesy, the key can be taken home and will work for another two months. This will give the participants the opportunity to complete their studies if needed, and to try the PMOD tools on their own data.

Educational Objectives

- master the wealth of image presentations and layouts offered by PMOD
- define Volumes-of-Interest (VOIs) using manual and automatic methods and calculate their statistics
- calculate time-activity curves and submit them to the kinetic modeling tool
- explore different types of models in the general and pixel-wise modeling tool
- match multi-modal images of a single patient by manual and automatic methods
- normalize stereotactically a brain image to a brain atlas, in order to create objective VOIs
- apply segmentation techniques to extract organ surfaces and render them in 3D

Target Audience and Course Trainers

The course is aimed at participants with a basic to intermediate PMOD skill level. It is primarily designed for PMOD beginners who wish to extend their knowledge and interact with PMOD experts. The participants will also have the opportunity to evaluate tools that are not available in their acquired installations. Participants eager to have an advance taste of the software are invited to request a free, 2-month trial license via the PMOD website and to download the PMOD Basic Workbook, and to practice with the example data provided.

The course will be taught by senior PMOD staff and seasoned PMOD users.

Contents

Presentations

The presentations are limited to allocate maximal time for hands-on work. They include a short introduction of PET quantification by kinetic models as well as overviews of the working principles of the different tools.

Guided Exercises

In the guided exercises, the trainers will demonstrate how work is done with the most prevalent PMOD tools, while the participants reproduce the workflows in parallel on their own notebooks:

- Basic PMOD techniques (PVIEW)
- Kinetic modeling with regional time-activity curves (PKIN)
- Applying pixel-wise models to image data (PXMOD)
- Image fusion, algebra, and stereotactic normalization (Fuse It)
- Automatic generation of brain Volumes-of-Interest (PNEURO)

Note that due to time limitations, the following PMOD tools will only be covered marginally: Cardiac PET / MR Modeling (PCARD), Alzheimer's Analysis for FDG PET (PALZ), and the 3D tool (P3D). However, short demonstrations will be given, and related questions may be discussed on an individual basis.

Note that we reserve the right for minor changes of the course content without notification.

Work on the Computer, PMOD Basic Workbook, and Documentation

A participant's notebook should comprise at least 8GB RAM, and a 64-bit operating system is needed. The display of the notebook should have a resolution of at least 800 pixels in height to support adequate program layouts.

The participants will conduct the guided exercises on their notebooks, using the supplied USB flash key. At the outset of the course, the participants will be handed out the PMOD Basic Workbook, a concise 36-page step-by-step tutorial of all major PMOD tools as well as of database management. The exercises will consist of a set of processing tasks whose solutions are detailed in the workbook. Note that the workbook is also available for download from the PMOD website.

The course presentations, the PMOD Workbook, and the PMOD documentation will all be available on the supplied USB flash key.

Organization

Course Schedule

Monday, March 6	09:00 - 17:00
Tuesday, March 7	09:00 - 16:00

Course Dinner

On the eve of the first course day, PMOD will offer to all participants a complimentary dinner. The dinner will allow for continuing discussions and for networking among peers in an informal and relaxed setting.

Course Registration and Rates

Registration can be done online, and will be handled on a first-come, first-served basis for a maximal number of 20 participants. The course fee amounts to:

- Regular: EUR 790.- ***(Early-Bird, until February 5, 2017)***, EUR 890.- (Standard, afterwards)
- Student: EUR 632.- ***(Early-Bird, until February 5, 2017)***, EUR 712.- (Standard, afterwards)

The fee covers the training lessons and documentation, the USB flash key, all refreshments during the breaks, two lunches as well as the course dinner on the eve of the first training day. After registration, the participants will receive by e-mail a confirmation message with access information and payment directions. Note that the course fee must be paid ***within 10 days*** after registration (online payment). Thereafter, we reserve the right to offer the place to persons waiting for a vacancy.

The student fee (20% off the regular fee) is applicable to participants from academia who are currently enrolled in a doctoral or other graduate degree program. As a student participant, please perform the standard registration procedure without payment. Then, send your application for the student fee to info@pmod.com. Once accepted, you are invited to proceed with the online payment.

Note that new PMOD license holders are granted a 50% discount on the regular rates.

Course Location

The course will be held at Hotel Continental, Zurich, Switzerland (Stampfenbachstrasse 60, CH-8006 Zurich). The hotel is conveniently located in downtown Zurich, just a 10-minute walk off the main station.

Accommodation

Accommodation is not included in the course fee and must be booked individually. A list of selected hotels near the course location is available on the PMOD website.

Cancellation Policy

The course will be cancelled, if one month prior to the course, not enough enrolments have been done. In that case, the registered participants will be notified and will receive a full refund. If a registered participant has to cancel attendance, he or she will get a refund (fee minus bank expenses) provided that the seat can be filled by another person.

Complementary PMOD Courses

This course is part of a series of PMOD courses all taking place during the same week in Zurich, Switzerland. Further information can be found on the respective course flyers (available on the PMOD website).
Registration for the complementary courses is being handled separately from registration for this course, yet volume discounts do apply on multiple course registrations (see consolidated price list published on the flyer "PMOD Courses in March 2017", available on the PMOD website).

Biomedical
Image Quantification

PMOD Technologies Ltd
Sumatrastrasse 25
8006 Zürich Switzerland

T +41 44 350 46 00
F +41 44 350 46 01
info@pmod.com pmod.com

PMOD Small Animal Image Processing Course (PAP)

Wednesday, March 8, 2017, Zurich, Switzerland

www.pmod.com / Training

Overview

The PMOD Small Animal Image Processing Course (PAP) is a 1-day course that focuses on specific aspects of small animal imaging when working with PMOD. The participants will be trained in the processing of small animal data using PMOD and will learn the principles and special techniques required for the meaningful analysis of the uptake in small tissue structures. Presentations will be complemented with guided exercises, during which the trainers and the participants simultaneously process representative data. Additionally, time will be available for working with individual data and for interacting with the trainers.

The participants are required to bring their own notebooks. They will obtain a USB flash key containing the latest PMOD version as well as training data sets. PMOD can be started directly from the key, such that the configuration of the notebook will remain untouched. As a courtesy, the key can be taken home and will work for another two months. This will give the participants the opportunity to complete their studies if needed, and to try the PMOD tools on their own data.

Target Audience and Course Trainers

The audience is expected to be researchers who do preclinical studies on small animals or plan to do so, PET hardware engineers as well as scientists wishing to learn more about end user requirements, researchers and engineers interested in molecular imaging techniques, and so on.

To get optimal benefit from attending, some familiarity with PMOD will be required, particularly with the viewing (base), fusion, and kinetic modeling tools. Participants new to PMOD can acquire such expertise by attending the 2-day PMOD Basic Application Course, and/or by requesting a free, 2-month trial license via the PMOD website and downloading the PMOD Basic Workbook, and by practicing with the example data provided.

The course will be taught by Dr. Geoff Warnock and by other senior PMOD staff. Dr. Warnock is a seasoned PMOD user and expert in the field of small animal research. Beyond PMOD, he is affiliated with University of Zurich and with www.swisstrace.com.

Contents

Main Topics

- ***Image pre-processing.*** This brief section covers the import of data from different modalities and in different image formats as well as image cropping and image reorientation.
- ***Image matching.*** Image matching is required to align the images acquired with separate scanners. It will be demonstrated how the different matching options can be applied depending on the available data.
- ***Template-based VOI statistics & template creation.*** The use of standard VOIs requires the spatial normalization of the subject data to an anatomical template image. PMOD includes both rat and mouse brain VOI templates, and a template creation tool for user-defined VOI templates. The course will show how the subject brain images are normalized, and how the corresponding VOI templates can be applied to calculate the VOI statistics. Template creation will also be demonstrated.
- ***Organ segmentation.*** Functionally differing parts of organs should be analyzed independently. It will be shown how the PSEG tool can be applied for defining compact tissue clusters with similar kinetics and calculating their organ time-activity curves.
- ***Input curves.*** Kinetic modeling requires the tracer activity in arterial blood plasma as the input curve. The difficulties with obtaining a usable input curve are discussed and potential solutions explored.
- ***Quantitative analysis.*** Kinetic analysis is applied to time activity curves. When a suitable model is chosen, the resulting model parameters quantify a physiologic process such as perfusion or glucose consumption, a quantity such as the receptor binding potential or the tracer delivery such as the distribution volume. Models based on arterial input function as well as reference tissue models will be presented.

Work on the Computer, Course Workbook, and Documentation

A participant's notebook should comprise at least 8 GB RAM, and a 64-bit operating system is needed. The display of the notebook should have a resolution of at least 800 pixels in height to support adequate program layouts.

The participants will conduct a number of guided exercises on their notebooks, using the supplied USB flash key. At the outset of the course, the participants will be handed out a course workbook that contains all the exercises presented, together with step-by-step solutions. The course presentations, the course workbook, and the PMOD documentation will all be available on the supplied USB flash key.

Organization

Course Schedule

Wednesday, March 8 09:00 - 17:00

Course Dinner

At the end of the course day, PMOD will offer to all participants a complimentary dinner. The dinner will allow for continuing discussions and for networking among peers in an informal and relaxed setting.

Course Registration and Rates

Registration can be done online, and will be handled on a first-come, first-served basis for a maximal number of 20 participants. The course fee amounts to:

- Regular: EUR 540.- ***(Early-Bird, until February 5, 2017)***, EUR 590.- (Standard, afterwards)
- Student: EUR 432.- ***(Early-Bird, until February 5, 2017)***, EUR 472.- (Standard, afterwards)

The fee covers the training lessons and documentation, the USB flash key, lunch, all refreshments during the breaks as well as the course dinner at the end of the training day. After registration, the participants will receive by e-mail a confirmation message with access information and payment directions. Note that the course fee must be paid ***within 10 days*** after registration (online payment). Thereafter, we reserve the right to offer the place to persons waiting for a vacancy.

The student fee (20% off the regular fee) is applicable to participants from academia who are currently enrolled in a doctoral or other graduate degree program. As a student participant, please perform the standard registration procedure without payment. Then, send your application for the student fee to info@pmod.com. Once accepted, you are invited to proceed with the online payment.

Note that new PMOD license holders are granted a 50% discount on the regular rates.

Course Location

The course will be held at Hotel Continental, Zurich, Switzerland (Stampfenbachstrasse 60, CH-8006 Zurich). The hotel is conveniently located in downtown Zurich, just a 10-minute walk off the main station.

Accommodation

Accommodation is not included in the course fee and must be booked individually. A list of selected hotels near the course location is available on the PMOD website.

Cancellation Policy

The course will be cancelled, if one month prior to the course, not enough enrolments have been done. In that case, the registered participants will be notified and will receive a full refund. If a registered participant has to cancel attendance, he or she will get a refund (fee minus bank expenses) provided that the seat can be filled by another person.

Complementary PMOD Courses

This course is part of a series of PMOD courses all taking place during the same week in Zurich, Switzerland. Further information can be found on the respective course flyers (available on the PMOD website).
Registration for the complementary courses is being handled separately from registration for this course, yet volume discounts do apply on multiple course registrations (see consolidated price list published on the flyer "PMOD Courses in March 2017", available on the PMOD website).

Biomedical
Image Quantification

PMOD Technologies Ltd
Sumatrastrasse 25
8006 Zürich Switzerland

T +41 44 350 46 00
F +41 44 350 46 01
info@pmod.com pmod.com

PMOD Statistics Course (PST)

Thursday, March 9, 2017, Zurich, Switzerland

www.pmod.com / Training

Overview

The PMOD Statistics Course (PST) is a 1-day course that focuses on using PMOD for the meaningful statistical analysis of study data, particularly in the presence of multiple regional outcome values. The course is based on the comprehensive statistical framework which is being developed by Prof. Karl Herholz, and its implementation into PMOD via the R interface (www.r-project.org). The participants will learn the major statistical concepts relevant for their research, and will be taught how to leverage the statistical power available in the current PMOD version, in order to obtain sound results when comparing groups.

The participants are required to bring their own notebooks. They will receive a USB flash key with the latest PMOD version as well as training data sets. As a courtesy, the key can be taken home and will work for another two months. This will give the participants the opportunity to complete the teaching cases if needed, and to try the PMOD tools on their own data. Unlike PMOD which can simply be run from the key, the R software requires a local installation which will be organized prior to the course.

Target Audience and Course Trainers

The target audience comprises all the scientists who use PMOD for the analysis of their study data. To get optimal benefit from attending, sufficient familiarity with PMOD will be required, particularly with the viewing and volume of interest functionality. Participants new to PMOD can acquire such expertise by attending the 2-day PMOD Basic Application Course, and/or by requesting a free, 2-month trial license via the PMOD website and downloading the PMOD Basic Workbook, and by practicing with the example data provided.

The course will be taught by PMOD staff and by Prof. Karl Herholz, University of Manchester, UK, who is a renowned expert and consultant in the field of neuroimaging, with particular interest in dementia and brain tumors. His statistical expertise was sharpened as the coordinator of multiple international multicenter studies and by the development of automated image analysis procedures, such as the one employed in PMOD's PALZ module.

Contents

Main Topics

- ***Experimental Planning and Statistical Methods.*** In this course part, Prof. Herholz will give an overview on study design and statistical concepts. It will address specifically the opportunities and pitfalls related to imaging and simultaneous acquisition of quantitative values from multiple regions. Examples will include various types of studies such as test-retest, correlational studies, group comparisons (e.g., disease-control), and longitudinal, observational or intervention studies. Two solutions for the critical issue of multiple comparisons will be presented: repeated measures analysis of variance (rm-ANOVA) and linear mixed effects (LME) models. Their benefits and limitations will be discussed and later demonstrated in the practical part.
- ***Data Preparation.*** This practical part will illustrate the aggregation of regional results across a study population into a form suitable for PMOD's R statistics scripts. In addition to PMOD-derived results, external measurements such as scores can be imported for use as covariates.
- ***Statistical Analysis.*** The theoretical concepts will be explored in the statistical environment of the R-console. Simple data exploration using descriptive statistics and graphical plots is followed by the use of sophisticated scripts. They are applied to simulated data containing well-defined effects discovered in real-life publications. The scenarios include the analysis of regional data, the comparison of groups and the interaction with regional effects. The participants will learn how to run the appropriate analysis scripts, and how to interpret the resulting tables and plots.
- **Statistical Seminar.** Substantial time will be allocated to a seminar-style discussion of practical statistical questions. The participants will have the unique opportunity to summarize their own (past or planned) experimental studies and get advice regarding their statistical analysis.

Note that we reserve the right for minor changes of the course content without notification.

Work on the Computer, Course Workbook, and Documentation

A participant's notebook should comprise at least 8 GB RAM, and a 64-bit operating system is needed. The display of the notebook should have a resolution of at least 800 pixels in height to support adequate program layouts.

The participants will conduct a number of guided exercises on their notebooks, using the supplied USB flash key. At the outset of the course, the participants will be handed out a course workbook that contains all the exercises presented, together with step-by-step solutions. The course presentations, workbooks and the PMOD documentation will all be available on the supplied USB flash key.

Organization

Course Schedule

Thursday, March 9 09:00 - 17:00

Course Registration and Rates

Registration can be done online, and will be handled on a first-come, first-served basis for a maximal number of 20 participants. The course fee amounts to:

- Regular: EUR 540.- ***(Early-Bird, until February 5, 2017)***, EUR 590.- (Standard, afterwards)
- Student: EUR 432.- ***(Early-Bird, until February 5, 2017)***, EUR 472.- (Standard, afterwards)

The fee covers the training lessons and documentation, the USB flash key, lunch as well as all refreshments during the breaks. After registration, the participants will receive by e-mail a confirmation message with access information and payment directions. Note that the course fee must be paid ***within 10 days*** after registration (online payment). Thereafter, we reserve the right to offer the place to persons waiting for a vacancy.

The student fee (20% off the regular fee) is applicable to participants from academia who are currently enrolled in a doctoral or other graduate degree program. As a student participant, please perform the standard registration procedure without payment. Then, send your application for the student fee to info@pmod.com. Once accepted, you are invited to proceed with the online payment.

Note that new PMOD license holders are granted a 50% discount on the regular rates.

Course Location

The course will be held at Hotel Continental, Zurich, Switzerland (Stampfenbachstrasse 60, CH-8006 Zurich). The hotel is conveniently located in downtown Zurich, just a 10-minute walk off the main station.

Accommodation

Accommodation is not included in the course fee and must be booked individually. A list of selected hotels near the course location is available on the PMOD website.

Cancellation Policy

The course will be cancelled, if one month prior to the course, not enough enrolments have been done. In that case, the registered participants will be notified and will receive a full refund. If a registered participant has to cancel attendance, he or she will get a refund (fee minus bank expenses) provided that the seat can be filled by another person.

Complementary PMOD Courses

This course is part of a series of PMOD courses all taking place during the same week in Zurich, Switzerland. Further information can be found on the respective course flyers (available on the PMOD website).
Registration for the complementary courses is being handled separately from registration for this course, yet volume discounts do apply on multiple course registrations (see consolidated price list published on the flyer "PMOD Courses in March 2017", available on the PMOD website).

