

Second Annual INSPECTOR Workshop

Columbia University in the City of New York

Jerome L. Greene Science Center

3227 Broadway (West 129th and Broadway), New York, NY 10027

Friday, 11/30/2018, 8:50 am - 5:45 pm, conference room L3-079 (3rd floor)

8:50 AM - 9:00 AM

Welcome

Christoph Juchem, Ph.D., Columbia University

9:00 AM - 9:30 AM

MR Spectroscopy of the Human Body

Martin Gajdosik, Ph.D., Columbia University

9:30 AM - 10:00 AM

An Introduction to J-Difference Editing and Application for Treatment Response Prediction in Major Depressive Disorder

Kenneth Wengler, Ph.D., Stony Brook University

10:00 AM - 10:30 AM

MRS biomarkers in traumatic brain injury (TBI)

Ivan Kirov, Ph.D., New York University

10:30 AM - 11:00 AM

Coffee Break - Meet and Greet

11:00 AM - 11:30 AM

¹³C Labeling Studies and Challenges of Spectral and Kinetic Fitting

Graeme Mason, Ph.D., Yale University

11:30 AM - 12:00 PM

Development of Radio-Frequency Pulses for MR Spectroscopy

Priti Balchandani, Ph.D., Mount Sinai School of Medicine

12:00 PM - 12:30 PM

Towards an Integrated Understanding of Neurotransmitter Dysfunction in Schizophrenia: A Multimodal MR Study

Jodi Weinstein, M.D., Stony Brook University

12:30 PM - 1:30 PM

Lunch

(light lunch will be served)

1:30 PM - 2:00 PM

Introduction to INSPECTOR Software

Overview, download, license, OS, installation, documentation, tooltips, protocol files, setup, usage, customization, support, user community

Christoph Juchem, Ph.D., Columbia University

2:00 PM - 2:45 PM

Data Handling and Quality Assessment

Supported data formats and experiments, receiver/repetition/scan handling, FID/spectrum visualization, Rx/NR selection, QA Tool, spectrum superposition/series/array, dummy scans, phase cycling, combination of Rx/NR, eddy current correction, automated frequency/phase/EC correction, data replacement.

Usage example: Short-Echo Time ^1H MRS of the human brain at 7T with STEAM

Christoph Juchem, Ph.D., Columbia University

2:45 PM - 3:00 PM

Break

3:00 PM - 3:45 PM

Data Processing and Corrections

Spectral post-processing, alignment of editing conditions, baseline correction, water removal, preparation for quantification.

Usage example: ^1H JDE of glutathione (GSH) and GABA in human brain at 7T with MEGA sLASER

Kelley Swanberg, M.Sc. & Christoph Juchem, Ph.D., Columbia University

3:45 PM - 4:30 PM

LCM Basis and Quantification

Concept of LCM analysis, LCM parameters, baseline, CRLB/Hessian/Monte-Carlo for confidence analysis, independent/coupled CRLB, spectrum preparation, individual/linked fitting parameters. Visualization, documentation, data/result export, automation.

Usage example: ^1H JDE of glutathione (GSH) and GABA in human brain at 7T with MEGA sLASER

Kelley Swanberg, M.Sc. & Christoph Juchem, Ph.D., Columbia University

4:30 PM - 4:45 PM

Break

4:45 PM - 5:30 PM

Basis Set Creation and Handling

Density matrix simulations of magnetic resonance spectra

Usage example: ^1H JDE of glutathione (GSH) and GABA in human brain at 7T with MEGA sLASER

Karl Landheer, Ph.D. & Christoph Juchem, Ph.D., Columbia University

5:30 PM - 5:40 PM

INSPECTOR as a Tool for Teaching

Data structures and handling, processing concepts, effects of apodization/zero-filling/line broadening etc, simulation of singlet array, synthesis of brain-like spectrum, addition of noise, impact of noise on quantification

Christoph Juchem, Ph.D., Columbia University

5:40 - 5:45 PM

Final Comments & Adjournment

Christoph Juchem, Ph.D., Columbia University