Final Program

2004 International Interdisciplinary Workshop on Flow and Motion

University Hospital Zurich

Hosted by:
Institute of Neuroradiology, University Hospital Zurich
&
Institute of Biomedical Engineering, University and Swiss Federal Institute of Technology (ETH), Zurich, Switzerland

Registration Fees

- Full 625 SFr (~Euro 415)
- ISMRM Member 475 SFr (~Euro 315)
- Student 400 SFr (~Euro 265) (provide letter of confirmation)
- Workshop Social Activity 50 SFr (~Euro 35)

Registration Form and details are available from the Workshop website.

Attendees of the 2004 Swiss – Japanese Joint Society for Neurosurgery will be eligible for a 75 SFr (~Euro 50) rebate.

Refunds and Cancellations: A refund of the registration fee, less 120 SFr (~Euro 80) for administration charges, will be made when a written request is received by the workshop organizer on or before 15th June 2004. No refunds are possible after that date.
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Workshop Venue

Grosser Hörsaal, Nordtrakt 1, Level C
University Hospital Zurich
Frauenklinikstr. 10
CH-8091 Zurich
Sunday, July 11th, 2004

12:00 – 16:00

Welcome

Keynote Speech
Roderic Pettigrew, NIH, Bethesda, USA

Plenary Lectures

Flow in Vascular Physiology
Colin Caro, London, England

Interacting Luminal, Mural & Subarachnoid Components of Cerebral Aneurysms: Implications for Imaging and Treatment
Anton Valavanis, Zurich, Switzerland

Break

Flow in Cardiovascular Disease
Philip Kilner, London, England

Flow in Neurovascular Disease
Charles Kerber, San Diego, USA

Focus Session

Principles of MR Flow Measurements
Erik Pedersen, Aarhus, Denmark

16:20 – 17:50

Topic Session: Flow MRI: Ready for Prime Time?

Quantitative Flow Measurement:
- Precision, Accuracy, Spatial and Temporal Resolution
  Romhild Hoogeveen, Best, Netherlands
- Measurement Accuracy: Eddy, Maxwell and 3T
  Sebastian Kozerke, Zurich, Switzerland
- Phase Contrast SSFP: Velocity Mapping of the Future?
  Klaus Scheffler, Basel, Switzerland
- Particle Tracing and Pressure Calculation
  Lars Wigström, Linköping, Sweden
- Accelerating Cine Flow Measurement with $k$-t BLAST & $k$-t SENSE
  Jeff Tsao, Zurich, Switzerland

17:55 – 18:45

Proffered Papers Session
Listed below

Monday, July 12th, 2004

08:30 – 09:10

Focus Session

Vascular Flow Imaging
David Saloner, San Francisco, USA

09:10 – 10:55

Topic Session: Cardiovascular Applications & Implications of Flow & Motion

Coronary Flow Measurement
Jennifer Keegan, London, England

How to Cope With Motion in Coronary MRA
Peter Börnert, Hamburg, Germany

New Advances in Tissue Phase Mapping
Bernd Jung, Freiburg, Germany

From Flow to Pressure: Estimation of Pressure Gradient and Derivative by MR Acceleration Mapping
Jacques Bittoun, Paris, France

Catheter-based Real-time Flow Measurement
Michael Bock, Heidelberg, Germany

ISMRM Flow & Motion Study Group
Guidelines for Clinical and Research Use- part II
Martin Graves & Christopher Macgowan

11:10 – 12:35

Topic Session: Intracranial Hemodynamics & Hydrodynamics

The Role of CSF and Interstitial Fluid in Health and Neurological Disease
Roy Weller, Southampton, England

From Hemo-Hydrodynamic Linkage to Non-invasive Intracranial Pressure Measurement by Phase Contrast MRI (MR-ICP)
Noam Alperin, Chicago, USA

The Cranium as Oscillator; Analysis of Phase Relationships of Intracranial Blood and CSF Pulsations Using Flow-sensitive MRI
Mike Egnor, New York, USA

Blood and CSF flow in Neurohydrodynamic Related Diseases
Olivier Baledent, Amiens, France

12:35 – 14:00

Lunch Break
Monday, July 12th, 2004

14:00 – 15:30  Topic Session: Flow and Perfusion

Neurovascular Regulation of Flow and Perfusion
Jeroen van der Grond, Utrecht, Netherlands

Extravascular Contrast Agent Perfusion vs Coronary Flow
Jürg Schwitter, Zurich, Switzerland

Intravascular Contrast Agents
Jens Bremerich, Basel, Switzerland

Dual Sequence Measurement of Arterial Input Function
Peter Gatehouse, London, England

Realities in MR Perfusion Mapping of the Brain
Denis Ducreux, Paris, France

15:30 – 16:45  Topic Session: In-vivo Wall Shear Stress

In-vivo Wall Shear Stress at the Limits of Resolution
Ian Marshall, Edinburgh, Scotland

Direct Estimation of Wall Shear Stress by MRI
John Oshinski, Atlanta, USA

Vascular Imaging and Wall Shear Stress
Erik Pedersen, Aarhus, Denmark

Quantification of Wall Shear Stress using 4D PCMRI
Charles Taylor & Erik Bekkers, Stanford, USA

17:05 – 18:00  Proffered Papers Session
Listed below

18:05 – 19:05  Vendor’s Forum

Vendor’s Views of Flow Measurements & Modeling
(Philips, Siemens GE, Fluent)

20:00  Dinner – Zunfthaus zur Zimmerleuten
By ticket only

Tuesday, July 13th, 2004

08:00 – 09:10  Panel Session
Guidelines for Clinical and Research Use - part II

09:10 – 10:40  Focus Session
Vascular Computational Fluid Dynamics (CFD)
Ross Ethier, Toronto, Canada

Challenges for Longitudinal Image-based CFD Studies
David Steinman, London, Canada

Image-based CFD Modeling of the Carotid Bifurcation
X Yun Xu, London, England

Hemodynamics and Morphological Changes of Cerebral Aneurysms
Liang-der Jou, San Francisco, USA

CFD and Paediatric Cardiac Surgery
Francesco Migliavacca, Milan, Italy

MRI-based CFD: Patient-specific Models for Treating Aortoiliac
and Pulmonary Vascular Disease
Charles Taylor, Stanford, USA

11:00 – 12:30  Topic Session: Advanced Topics in Vascular CFD

The Role of CFD in Simulation of Biomedical Systems
Yiannis Ventikos, Oxford, England

A Computational Model Combining Vascular Biology and Hemodynamics for
Thrombosis Prediction in Anatomically Accurate Cerebral Aneurysms
Shankar Sundaram, Huntsville, USA

Patient Based MRI-CFD Study of Infraginguinal Distal Bypass Grafts
Spencer Sherwin, London, England

MRI-based CFD Prediction of Mass Transport in Arteries
Peter Walker, Leeds, England

Experience in In-vivo Modeling of Intracranial Aneurysms
Makoto Ohta, Geneva, Switzerland

12:30 – 13:40  Proffered Papers Session
Listed below

Concluding Comments and Closing
Proffered Papers Presentations

Sunday 17:55 – 18:45

Correction of Phase Errors in Cine Phase-contrast MR Velocity Quantification
J. Tim Marcus, Amsterdam, The Netherlands

Velocity-slice Selection
Ludovic de Rochefort, Le Kremlin-Bicêtre, France

Accelerated Fourier Velocity Encoding by Exploiting Velocity-Spatial-Temporal Correlations
Michael Schacht Hansen, Aarhus, Denmark

Improving Velocity to Noise Ratio and Extending Dynamic Range of Phase Contrast Magnetic Resonance Velocity Imaging with 3-D and 4-D Unwrapping Methods
Maria Salfity, Loughborough, England

Evaluation of Segmental Pulmonary Blood Flow Using Phase Contrast MRI and Correlation Analysis
Christopher Macgowan, Toronto, Canada

Monday 17:05 – 18:00

Non-invasive In-vivo Investigation of Carotid Arteries Mechanical Properties: Combination of MRI and Numerical Simulation
Loïc Fin, Amiens, France

An Electrical Analog Model of Brain Hydrodynamics Validated by Flow-sensitive MRI
Guy Kongolo, Amiens, France

In Vivo Wall Shear Stress Assessment in the Carotid Bifurcation by a Combination of the Finite Element Approach and MRI
Frieke Box, Leiden, The Netherlands

Functional Analysis of Aortic Valve Prostheses: Shear rate Assessment Using MRI
Andrew Kiruluta, Boston, USA

Motion Correction in High-Resolution Coronary MRI Using Measurements from Intra-Vascular Tracking Catheters
Marcel Rutten, Eindhoven, The Netherlands

High Spatial and Temporal Resolution Myocardial Tagging in a Free-breathing Exam Using Multi-echo SSFP and PAGE
Vinay Pai, New York, USA

Postoperative Diastolic Regurgitation of Left to Right Pulmonary Artery in Patients with Competent Pulmonary Valve Replacement Demonstrated by MR Phase Contrast Flow Measurements
Stefanie Pertschy, Hannover, Germany

Tuesday 12:30 – 13:40

Neil Bressloff, Southampton, England

Low-Reynolds Number Turbulence Modelling in a Realistic Stenosed Carotid Artery Geometry
Jason Beech-Brandt, Edinburgh, Scotland

Flow Dynamics of the Anatomic TCPC: An Integrated MRI, In-Vitro Experimentation, and CFD Approach for Surgical Applications
Ajit Yoganathan, Atlanta, USA

Application of the Multiscale Approach to Investigate Fluidodynamics in Surgical Procedures for the Treatment of Congenital Heart Diseases
Katia Laganà, Milna, Italy

Combined Visualization and Analysis of Blood Flow and Motion in the Left Ventricle
Raghavendra Chandrashekara, London, England

Study of Flow Patterns in Left Ventricle by the Combination of CFD and MRI
Quan Long, Uxbridge, England

Flow Patterns in the Proximal Coronary Arteries Determined from MRI and CFD – Relation to Localization of Atherosclerotic Plaques
John Oshinski, Atlanta, USA

Evaluation of Image-based CFD Models of Cerebral Aneurysms Using MRI
Juan Cebral, Fairfax, USA
Proffered Posters

Detection and Quantification of Pulmonary Arterial Hypertension Caused by Increased Pulmonary Resistance Using MR Flow Measurements
Nasreddin Abolmaali, Waldorf, Germany

Anatomically Accurate Computational Hemodynamics in the Aorta and the Coronary Arteries
Evangelos Boutsianis, Zurich, Switzerland

Observations on the Flow of Blood in Experimental Arteriovenous Fistulae
Vidyasagar Casikar, Penrith, Australia

Cerebral Aneurysm Genesis: A Computational Model
Iordanis Chatziprodromou, Zurich, Switzerland

3D Volume Selective Turbo Spin Echo Imaging for Carotid Artery Wall Imaging With Navigator Detection of Swallowing
Lindsey Crowe, London, England

Identification and Removal of Residual Signal from Slow Flowing Blood in 3D Volume Selective Turbo Spin Echo Arterial Wall Imaging Using a Velocity Sensitive Phase Reconstruction Method
Lindsey Crowe, London, England

Real-Time Flow Measurement using Spiral RF pulse and EPI Readout During Breath-hold and Free Breathing
Lindsey Crowe, London, England

Computation Simulation for the Apheresis Process with a Non-Newtonian Model
Sandro De Gruttola, Zurich, Switzerland

Stereoscopic Particle Image Velocimetry: Parallel In-vitro Measurement of In-vivo Flow Studies for Cardiovascular Fluid Mechanic Applications
Pramote Hochareon, Minneapolis, USA

Phase Ordering with Automatic Window Selection (PAWS) with Half Fourier for Increased Scan Efficiency and Image Quality
Permi Jhooti, London, England

CSF Pressure and Flow Calculation in the Ventricular Space Using CFD
Vartan Kurtcuoglu, Zurich, Switzerland

Vendor’s View Presentations

Monday 18:05 – 19:05

Philips Medical Systems
Marc Kouwenhoven

Siemens Medical Solutions
Carmel Hayes

GE Healthcare
Jason Polzin

Fluent GmbH
Ralf Kroeger

Evaluation of Intracranial Elastance Using MRI in Patient with Normal-pressure Hydrocephalus
Tosiaki Miyati, Kanazawa, Japan

Monte Carlo Simulation to Verify Near-infrared Spectroscopy
Regina Mudra, Zurich, Switzerland

Analysis and Correction of Off-center Gradient Non-linearity and B0 Inhomogeneity Related Scaling Errors in Phase Contrast Flow Measurements
Johannes Peeters, Utrecht, The Netherlands

MRI-based Multiscale Models for the Haemodynamic and Structural Evaluation of Surgically Reconstructed Aortic Arches
Simone Pittaccio, London, England

MR Flow Measurements in the Iliac Artery during Reactive Hyperemia
Oliver Wieben, Freiburg, Germany

In Vitro Validation of MR Volumetric Flow Measurement
Meide Zhao, Chicago, USA