Workshop IV: Optimal Transport in the Human Body: Lungs and Blood

Monday May 19, 2008

8:00–12:00 *Check-In/Light Breakfast (Hosted by IPAM)*

8:55–9:00 *Welcome and Opening Remarks*

9:00–9:50 **Dr. Doreen Rosenstrauch** (University of Texas Health Science Center and Texas Heart Institute)
The Cardiovascular System - an overview of Human Anatomy and Physiology

10:00–10:20 *Break*

10:20–11:10 **Aaron Fogelson** (University of Utah)
Computational Modeling of Blood Clotting

11:20–2:00 *Lunch (on your own) *Set-up for poster session participants*

2:00–2:50 **Suncica Canic** (University of Houston)
Fluid-Structure Interaction and Transport in Blood Flow

3:00–3:15 *Break*

3:15–4:05 **Jean-Frédéric Gerbeau** (Institut National de Recherche en Informatique Automatique (INRIA))
Fluid-structure interaction problems in the cardiovascular system

4:15–4:30 *Break*

4:30–5:20 **Giovanna Guidoboni** (University of Houston)
Fluid-structure interaction in arterial blood flow: modeling, analysis and simulations

5:30–12:00 **Non-workshop event & reception in celebration of newly elected members of the National Academy of Sciences - All participants welcome.*

Tuesday May 20, 2008

8:00–9:00 *Continental Breakfast*

9:00–9:50 **Dr. Craig Hartley** (Baylor College of Medicine)
Measurement and scaling of vascular mechanics in large and small mammals

10:00–10:15 *Break*

10:15–11:05 **Mauro Ferrari** (University of Texas Health Science Center and Texas Heart Institute)
Rational design of nanovectors for medical therapy and imaging

11:15–11:30 *Break*

(Tuesday schedule continued on next page)

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11:30–12:20 **Marina Kameneva** (University of Pittsburgh)
Rheological Dissimilarities in Female and Male Blood: Potential Link to Cardiovascular Diseases

12:30–2:30 *Lunch (on your own) *Informal lunch for all female participants and speakers. If interested, meet in the lobby.*

2:30–3:20 **Genevieve Guillot** (Centre National de la Recherche Scientifique (CNRS))
Introduction to NMR and MRI techniques for localized diffusion measurements

3:30–4:00 *Break*

4:00–4:50 **Ludovic de Rochefort** (Cornell University)
Evaluation of Cardiovascular and Pulmonary Functions using MRI

Wednesday May 21, 2008

8:00–9:00 *Continental Breakfast*

9:00–9:50 **Bernard Sapoval** (École Polytechnique)
Magic trees and mammalian respiration

10:00–10:15 *Break*

10:15–11:05 **Marcel Filoche** (École Polytechnique)

11:15–11:30 *Break*

11:30–12:20 **Mair Zamir** (University of Western Ontario)
Blood Flow: The Ultimate Lifeline

12:30–2:00 *Lunch (on your own)*

2:00–2:50 **Celine Grandmont** (Institut National de Recherche en Informatique Automatique (INRIA))
Multiscale modelling of the respiratory track

3:00–3:50 **Bertrand Maury** (Université d'Orsay)
Some mathematical models of the human lungs

4:00–4:30 *Break*

4:30–5:30 **Ewald Weibel** (Universität Bern)
*Public Lecture - located at Franz Hall, Room 1178 (next to IPAM)
 From the Lung to the Cells' Powerhouses: Symmorphosis in the Design of the Pathway for Oxygen*

5:30–7:15 *Reception and Poster Session at IPAM*

Thursday May 22, 2008

8:00–9:00 *Continental Breakfast*

9:00–9:50 **Vincent Fleury** (Université de Rennes I)
Mechanogenetics of self-organization

10:00–10:15 *Break*

10:15–11:05 **Michael Yampolsky** (University of Toronto)
Dynamical modeling of human placental vasculature

11:15–11:30 *Break*

11:30–12:20 **Paolo Zunino** (Politecnico di Milano)
Mathematical models and numerical simulation of drug release in the vascular system

12:30–2:30 *Lunch (on your own)*

2:30–3:20 **Denis Grebenkov** (École Polytechnique)
Diffusion, reaction, and spin-echo signal attenuation in branched structures

3:30–4:00 *Break*

4:00–4:50 *Discussion (all)*

Friday May 23, 2008

8:00–9:00 *Continental Breakfast*

9:00–9:50 **Anne Marie Robertson** (University of Pittsburgh)
1D and Directed Continuum Models for Arterial Flows

10:00–10:15 *Break*

10:15–11:05 **Alessandro Veneziani** (Emory University)
Statistical and numerical investigations of cerebral aneurysms' morphology and haemodynamics

11:15–11:30 *Break*

11:30–12:20 **Charles Taylor** (Stanford University)
Modeling Blood Flow and Vessel Wall Dynamics in the Cardiovascular System

12:30–2:30 *Lunch (on your own)*

2:30–3:20 **Maria McGee** (Wake Forest University)
Structure-Function of Interstitial Spaces:New Clues to Fluid-Balance Mechanisms

3:30–4:00 *Break*

4:00–4:50 **Roberto Camassa** (University of North Carolina)
Spinning rods, microfluidics, and propulsion by cilia in biological systems

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