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Computational Fluid Dynamics (CFD) in Medicine And Biology in Conjunction With the Seventh International Biofluid Mechanics Symposium

Proceedings

2012

Conference Program

David Elad
Tel Aviv University

Program

Computational Fluid Dynamics (CFD) in Medicine and Biology

in conjunction with the

Seventh International Biofluid Mechanics Symposium

March 25 – 30, 2012
Crowne Plaza Dead Sea, Ein Bokek, Dead Sea, Israel

Conference Chair:

David Elad
Tel Aviv University

Conference Co-Chairs:

Danny Bluestein
Stony Brook University

Denis Doorly
Imperial College London

Morteza Gharib
California Institute of Technology

Peter Hunter
University of Auckland

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Sunday, March 25, 2012

14:00 – 17:00	Arrival and Check-in
17:00 – 18:00	Welcome Reception – Balcony facing the Dead Sea
18:00 – 18:15	Opening Comments **David Elad**, Chairman of the conference **Dov Litvinoff**, Mayor of Tamar Regional Council
18:15 – 18:30	Vocal Performance – "Desert Voices"
18:30 – 19:30	Opening Lecture: **THE DELICATE DISTINCTION BETWEEN MOLECULAR DYNAMICS AND FUNCTIONAL DISORDER: LESSONS FROM THE DEAD SEA BACTERIA RIBOSOMES** Nobel Laureate Prof. Ada Yonath, Weizmann Institute of Science, Israel
20:00 – 21:00	Dinner
21:00 – 23:00	Social Hour

Monday, March 26, 2012

07:00 – 08:00 Breakfast

Session I: New CFD Methods
Chairman: Robert Nerem, USA
Ezra Neufeld, Switzherland

08:00 – 08:18 **CFD SIMULATION IN BIOMEDICAL APPLICATIONS**
Michael Engelman, ANSYS Inc., USA

08:18 – 08:36 **WAVING RINGS AND SWIMMING IN CIRCLES: SOME LESSONS THROUGH COMPUTATIONAL FLUID DYNAMICS**
Lisa Fauci, Tulane University, USA

08:36 – 08:54 **TAKING IMAGE-BASED CFD OUT OF THE LAB AND INTO THE CLINICS: APPROACHES, PITFALLS, OPEN-SOURCE SOFTWARE AND THE CLOUD**
Luca Antiga, Orobix, Srl, Italy

08:54 – 09:12 **LARGE EDDY SIMULATION OF A NOVEL CAVOPULMONARY ASSIST DEVICE FOR FONTAN CIRCULATION**
Steven Frankel, Purdue University, USA

09:12 – 09:30 **APPLICATION OF LATTICE BOLTZMANN MODELS TO INVESTIGATE MULTISCALE TRANSPORT, MIXING AND DRUG DISSOLUTION IN THE INTESTINE**
James Brasseur, Pennsylvania State University, USA

09:30 – 09:48 **BUILDING 'BOTTOM UP' BLOOD FLOW COAGULATION MODELS USING MECHANICAL STATISTICS**
Gilead Moiseyev, Pinchas Bar-Yoseph, Technion, Israel

09:48 – 10:06 **HIGH-RESOLUTION NUMERICAL SIMULATION OF PATIENT-SPECIFIC HEMODYNAMICS WITH IMPLANTED MEDICAL DEVICES**
Fotis Sotiropoulos, University of Minnesota, USA

10:10 – 10:35 Coffee Break

Session 2: Flow & Transport on the Cellular & Molecular Scale
Chairman: Sheldon Weinbaum, USA
Jos Spaan, The Netherlands

10:35 – 10:53 **CELLULAR AND MOLECULAR DYNAMICS: MODELING NATURE'S ORCHESTRA**
Robert Nerem, Georgia Institute of Technology, USA

10:53 – 11:11 **COLLECTIVE CELL GUIDANCE BY COOPERATIVE INTERCELLULAR FORCES**
Jeffrey Fredberg, Harvard School of Public Health, USA

11:11 – 11:29 **ON INTRA-MEMBRANE CAVITATION AND PRESSURE IN THE MOLECULAR LEVEL**
Eitan Kimmel, Technion, Israel

Monday, March 26, 2012 (continued)

11:29 – 11:47	**HOW FORCES REGULATE THE CELL RESPONSE TO THE SURROUNDING ENVIRONMENT?** Daniel Isabey, Inserm-CNRS & University Paris Est Créteil, France
11:47 – 12:05	**MECHANOTRANSDUCTION AND THE GLYCOCALYX** John Tarbell, City College of the City University of New York, USA
12:05 – 12:23	**MECHANICS OF SOLUTE TRANSPORT THROUGH THE ENDOTHELIAL GLYCOCALYX** Herbert Lipowsky, Penn State University, USA
12:23 – 12:38	**ENDOTHELIAL SURFACE GLYCOCALYX AND TUMOR CELL ADHESION IN THE MICROVESSEL** Bingmei Fu, City College of the City University of New York, USA
12:45 – 15:10	Lunch & Free Time
15:10 – 15:30	Coffee Break
15:30 – 16:00	**FDA Session** Chairman: Marvin Slepian, USA **MEDICAL DEVICE REGULATION AND THE ROLE OF MODELING STRATEGIES TO AID PRE-CLINICAL TESTING**
	Session 3: Respiratory Flows Chairman: Kerry Hourigan, Australia Kelly Burrowes, New Zealand
16:00 – 16:18	**HOW WELL DOES MODELING INFORM THE PHYSIOLOGY FROM WHICH IT STEMS?** Robert Schroter, Imperial College London, UK
16:18 – 16:36	**BIOFLUID MECHANICS OF PULMONARY ATELECTRAUMA** Don Gaver, Tulane University, USA
16:36 – 16:54	**UNDERSTANDING RESPIRATORY AIR AND BLOOD FLOW DELIVERY** Merryn Tawhai, University of Auckland, New Zealand
16:54 – 17:12	**PARTICLE DEPOSITION & DRUG DELIVERY THROUGH THE LUNG AIRWAY SYSTEM: PATIENT-SPECIFIC OR STATISTICAL APPROACH?** Marcel Filoche, Ecole Polytechnique, France
17:12 – 17:30	**EXERCISES IN NATURAL ANATOMICAL VARIATIONS: THE NASAL AIRWAYS** Denis Doorly, Imperial College London, UK
17:30 – 17:48	**CFD ON THE NASAL AIRFLOWS: ROLE IN DIAGNOSIS AND SURGERY** Sung-Kyun Kim, Seung-Kyu Chung, Konkuk University & Sungkyunkwan University, South Korea
17:48 – 18:06	**TWO PHASE FLOWS IN PULMONARY AIRWAYS** James Grotberg, University of Michigan, USA

Monday, March 26, 2012 (continued)

19:00 – 20:00	Dinner
20:00 – 22:00	Posters & Social Hour

Tuesday, March 27, 2012

07:00 – 08:00 Breakfast

Session 4: Virtual Prototyping of Medical Devices
Chairman: Mory Gharib, USA
Idit Avrahami, Israel

08:00 – 08:18 **VASCULAR DEVICE DESIGN AND THE ROLE OF CFD**
Tim McGloughlin, University of Limerick, Ireland

08:18 – 08:36 **STENT STRUT CROSS-SECTIONAL GEOMETRY: STREAMLINING REDUCES FLOW SEPARATION**
Juan Jimenez, Peter Davies, University of Pennsylvania, USA

08:36 – 08:54 **FROM VIRTUAL TO RAPID PROTOTYPING AND EXPERIMENTAL VALIDATION: ECMO REDEFINED**
Ulrich Steinseifer, RWTH Aachen University, Germany

08:54 – 09:12 **QUANTITATIVE COMPARISON OF MECHANICAL BLOOD DAMAGE PARAMETERS IN ROTARY VENTRICULAR ASSIST DEVICES**
Katharine Fraser, University of Maryland, USA

09:12 – 09:30 **SHEAR STRESS AND VULNERABLE PLAQUE FORMATION**
Rob Krams, Imperial College London, UK

09:30 – 09:48 **APPLICATION OF THE EULERIAN HEMOLYSIS INDEX METHOD FOR SIMULATING HEMOLYSIS IN PERIPHERAL INTRAVENOUS CATHETER DEVELOPMENT**
Patrick Downie, Austin McKinnon, Ray Isaacson, BD, USA

09:50 – 10:20 Coffee Break

Session 5: Microfluidic Devices
Chairman: Nikos Stergiopulos, Switzerland
Joseph Bull, USA

10:20 – 10:38 **MICROFLUIDIC STUDIES OF CANCER METASTASIS**
Roger Kamm, Massachusetts Institute of Technology, USA

10:38 – 10:56 **MICROFLUIDIC PLATFORM FOR VASCULAR BIOLOGY: ANGIOGENESIS AND ANASTOMOSIS IN MICROFLUIDIC DEVICES**
Noo Li Jeon, Seol National University, Korea

10:56 – 11:14 **MECHANICS BASED MICROFLUIDIC DEVICEFOR THE DETECTION AND RETRIVAL OF RARE CIRCULATING TUMOR CELLS**
Chwee Teck Lim, National University of Singapore, Singapore

11:14 – 11:32 **FLUID MECHANICS AND MASS TRANSPORT IN A MICROGRAVITY-SIMULATING CELL BIOREACTOR**
Mian Long, Chinese Academy of Sciences, China

11:32 – 11:50 **MULTIPLE PARALLEL FLOW-CHAMBER FOR SHEAR-DEPENDENT LEUKOCYTES ADHESION ASSAYS**
Gabriele Dubini, Politecnico di Milano, Italy

Tuesday, March 27, 2012 (continued)

11:50 – 12:08	**MICROFLUIDIC DESIGNS OF PULMONARY ACINAR NETWORKS: CFD AND EXPERIMENT** Josue Sznitman, Technion, Israel
12:10 – 23:00	***Tour to Jerusalem*** *Lunch box on the bus* *Dinner in Jerusalem*

Wednesday, March 28, 2012 – The Elizabeth & Nicholas Slezak Day

07:00 – 08:00 Breakfast

Session 6: Patient Specific & Multi-Scale Modeling
Chairman: Mort Friedman, USA
Andrea Remuzzi, Italy

08:00 – 08:17 **USING CFD FOR PATIENT SPECIFIC SURGICAL PLANNING IN SINGLE VENTRICLE PATIENTS**
Ajit Yoganathan, Georgia Institute of Technology, USA

08:17 – 08:34 **TECHNIQUES FOR CARDIAC VALVE REPAIR: SIMULATION OF PATIENT SPECIFIC POSTOPERATIVE SCENARIOS FOR PERSONALIZED SURGICAL PLANNING**
Alberto Redaelli, Politecnico di Milano, Italy

08:34 – 08:51 **SHEAR STRESS AND ATHEROSCLEROSIS IN HUMAN CORONARY ARTERIES**
Frank Gijsen, Erasmus Medical Center Rotterdam, The Netherlands

08:51 – 09:08 **PATIENT-SPECIFIC AORTIC VALVE DYNAMIC SIMULATIONS AND PATHOLOGY OF THE ASCENDING AORTIC SEGMENTS**
Krishnan Chandran, University of Iowa, USA

09:08 – 09:25 **IMAGE-BASED COMPUTATIONAL FLUID DYNAMICS SIMULATIONS IN PATIENT-SPECIFIC VASCULAR MODELS USING THE MIMICS INNOVATION SUITE**
Patricia Lopes, Erik Boelen, Materialise Group, Belgium

09:25 – 09:42 **A MULTI-SCALE PATIENT SPECIFIC COMPUTATIONAL STUDY TO PREDICT HEMODYNAMICS OF STAGE 2 PALLIATION FOR SINGLEVENTRICLE HEARTS**
Francesco Migliavacca, Politecnico di Milano, Italy

09:42 – 09:59 **IMAGE-BASED VS. PATIENT-SPECIFIC MODELS: WHAT IS THE DIFFERENCE AND DOES IT MATTER?**
David Steinman, University of Toronto, Canada

10:00 – 10:25 Coffee Break

Session 7: Cardiovascular Engineering 1
Chairman: Forbes Dewey, USA

10:25 – 10:42 **DESIGN OPTIMIZATION IN BIOFLUID MECHANICS**
Ross Ethier, Imperial College London, UK

10:42 – 10:59 **INTERFACING BASIC COMPUTATIONAL RESEARCH AND CLINICAL PRACTICE: A VASCULAR ACCESS CASE STUDY**
Pascal Verdonck, Ghent University, Belgium

10:59 – 11:16 **THREE-DIMENSIONAL NUMERICAL SIMULATION OF BLOOD FLOW IN APOE- /- MICE AORTIC ARCH AROUND ATHEROSCLEROSIS PLAQUES**
Kerry Hourigan, Monash University, Australia

Wednesday, March 28, 2012 – The Elizabeth & Nicholas Slezak Day (continued)

11:16 – 11:33	**CORONARY PERFUSION IN HEALTH AND DISEASE: TRANSLATION FROM PHYSIOLOGICAL MODELS TO CLINICAL PRACTICE** Maria Siebes, University of Amsterdam, The Netherlands
11:33 – 11:50	**EMERGING ROLE OF MECHANICAL CIRCULATORY SUPPORT IN THE MANAGEMENT OF ADVANCED HEART FAILURE: SUCCESS, LIMITATIONS AND OPPORTUNITIES** Marvin Slepian, University of Arizona, USA
11:50 – 12:07	**WALL SHEAR STRESS AND ATHEROSCLEROSIS; A HETERODOX VIEW** Peter Weinberg, Imperial College London, UK
12:07 – 12:24	**WALL SHEAR STRESS AND ATHEROSCLEROSIS: AGE RELATED VARIATIONS IN A STUDY OF RABBIT AORTAS** Spencer Sherwin, Imperial College London, UK
12:24 – 12:41	**AORTIC WAVE DYNAMICS AND ITS INFLUENCE ON LEFT VENTRICULAR WORKLOAD** Mory Gharib, California Institute of Technology, USA
12:45 – 15:20	Lunch & Free Time
15:20 – 15:40	Coffee Break
	Session 8: Cardiovascular Engineering 2 Chairman: Yacov Shamash, USA
15:40 – 15:57	**ISRAELI TECH-INNOVATIONS IN CARDIOVASCULAR MEDICINE – THE "START UP' NATION** Ran Koronowski, Rabin Medical Center, Israel
15:57 – 16:14	**FLUID DYNAMICS IN CARDIOVASCULAR SURGERY: EXPERIMENTAL MODELING, COMPUTATIONAL SIMULATION AND CLINICAL RELEVANCE** Ikuo Fukuda, Hirosaki University School of Medicine, Japan
16:14 – 16:31	**THE ROLE OF LOW SHEAR STRESS RATES FOR PLATELET DEPOSITION** Klaus Affeld, Medical University Berlin, Germany
16:31 – 16:48	**BIOMECHANICS AND PLAQUE PROGRESSION IN HUMAN CORONARY ARTERIES** Don Giddens, Georgia Institute of Technology, USA
16:48 – 17:05	**OPTIMIZING THE THROMBORESISTANCE OF MECHANICAL CIRCULATORY SUPPORT DEVICES - DEMONSTRATION IN A VENTRICULAR ASSIST DEVICE** Danny Bluestein, Stony Brook University, USA
17:05 – 17:22	**FREQUENCY AND DISTRIBUTION OF MICROCALCIFICATIONS IN VULNERABLE PLAQUE AND THEIR ROLE IN FIBROUS CAP RUPTURE** Sheldon Weinbaum, City College of the City University of New York, USA

Wednesday, March 28, 2012 – The Elizabeth & Nicholas Slezak Day (continued)

17:22 – 17:39	**MICROCIRCULATORY TRANSPORT INFORMS THE STUDY OF ARTERIAL DISEASE** Forbes Dewey, Massachusetts Institute of Technology, USA
17:39 – 18:00	**CONCLUDING REMARKS** Shmuel Einav, Tel Aviv University, Israel
19:00 – 22:00	**Banquet Dinner + Celebration of Shmuel's 70th birthday** **Keynote Lecture**: **THE ISRAELI SPACE INDUSTRY** Prof. Daniel Hershkovitz, Minister of Science and Technology, Israel

Thursday, March 29, 2012

07:00 – 08:00 Breakfast

Session 9: Physiological Flow Modeling 1
Chairman: Patrick Segers, Belgium
Alexander Yakhot, Israel

08:00 – 08:18 **A MULTISCALE MODEL OF HYPERACTIVATED SPERM**
Sarah Olson, Lisa Fauci, Worcester Polytechnic University, USA

08:18 – 08:36 **LEFT-RIGHT PATTERNING IN DEVELOPING EMBRYOS: A CASE OF THEORETICAL PREDICTION FROM FLUID DYNAMICS IN BIOLOGY**
Oreste Piro, University of Balearic Islands, Spain

08:36 – 08:54 **EMBRYONIC GROWTH APPLICATIONS OF CARDIOVASCULAR FLUID MECHANICS**
Kerem Pekkan, Carnegie Mellon, USA

08:54 – 09:12 **FSI SIMULATION OF THE VELOCITY PROFILE IN THE HUMAN FETAL DUCTUS VENOSUS**
Leif Rune Hellevik, Norwegian Institute of Science & Technology, Norway

09:12 – 09:30 **AN INITIAL CORRELATION STUDY OF PULSATILE VENTRICULAR ASSIST DEVICE THROMBUS DEPOSITION BETWEEN EXPERIMENTAL FLUID DYNAMICS AND AN IN VIVO IMPLANT**
Keefe Manning, Pennsylvania State University, USA

09:30 – 09:48 **QUANTITATIVE COMPARISON OF 4D MRI FLOW MEASUREMENTS TO 3D CFD OF CEREBROSPINAL FLUID MOVEMENT IN THE SPINAL SUBARACHNOID SPACE**
Bryn Martin, Nikos Stergiopulos, Swiss Federal Institute of Technology (EPFL), Switzerland

09:50 – 10:20 Coffee Break

Session 10: Physiological Flow Modeling 2
Chairman: Ronald Magness, USA
Yoram Lanir, Israel

10:20 – 10:38 **INTERSTITIAL FLOW IN THE HIERARCHICAL PORE SPACE ARCHITECTURE OF BONE TISSUE**
Steve Cowin, City College of the City University of New York, USA

10:38 – 10:56 **SLOW FRICTIONAL FLOW AND ION TRANSPORT WITH EMPHASIS ON CARTILAGE CELLULAR ELECTOMECHANICAL-SIGNAL TRANSDUCTION**
Van Mow, Columbia University, USA

10:56 – 11:14 **EXPERIMENTAL CHARACTERIZATION OF LYMPHATIC VESSEL MECHANICS AND PUMPING**
James Moore, Texas A&M University, USA

11:14 – 11:32 **LUMPED-PARAMETER MODELING OF MICROLYMPHATIC VESSELS**
Chris Bertram, University of Sydney, Australia

Thursday, March 29, 2012 (continued)

11:32 – 11:50	**COMPUTATIONAL FLUID DYNAMIC MODEL OF FISH FEEDING** Roi Holzman, Tel Aviv University, Israel
11:50 – 12:08	**GENERATION AND CONTROL OF FLOW RATE BY A MULTI-PINCHER IMPEDANCE PUMP** Moshe Rosenfeld, Tel Aviv University, Israel
12:10 – 18:00	**Tour to Masada** Lunch box on the bus
19:00 – 20:00	Dinner
20:00 – 22:00	Posters & Social Hour

Friday, March 30, 2012

07:00 – 09:00	Breakfast
09:00	Departures

COMPUTATIONAL FLUID DYNAMICS (CFD) IN MEDICINE AND BIOLOGY
in conjunction with the
SEVENTH INTERNATIONAL BIOFLUID MECHANICS SYMPOSIUM

Monday (March 26) Poster Presentations

1. **A FLUID STRUCTURE INTERACTION MODEL OF PHYSIOLOGIC PORCINE AORTIC VALVE UNDER FULL CARDIAC CYCLE**
   Gil Marom, Tel-Aviv University, Israel

2. **CORRELATION BETWEEN PLAQUE COMPOSITION AND SHEAR STRESS USING THREE-DIMENSIONAL RECONSTRUCTED HISTOLOGY AND COMPUTATIONAL FLUID DYNAMICS OF DISEASED HUMAN CAROTID ARTERIES**
   Jolanda Wentzel, ErasmusMC, The Netherlands

3. **SHEAR STRESS DISTRIBUTION IN 3D RECONSTRUCTED CORONARY BIFURCATIONS BY FUSION OF IVUS AND MSCT**
   Frank JH Gijsen, ErasmusMC, The Netherlands

4. **A PATIENT-SPECIFIC MULTISCALE STUDY OF THE NORWOOD PROCEDURE INCLUDING AORTIC COARCTATION: EXPERIMENTAL VERSUS COMPUTATIONAL MODELING**
   Francesco Migliavacca, Politecnico di Milano, Italy

5. **STATISTICAL WSS MAPS IN RUPTURED AND UNRUPTURED CEREBRAL ANEURYSMS**
   Leonid Goubergrits, Biofluid Mechanics Laboratory, Charité, Germany

6. **NUMERICAL SIMULATION OF BLOOD FLOW IN FEMORAL PERFUSION WITH CANNULA OR GRAFT**
   Takeshi Goto, Hirosaki University, Japan

7. **FULLY COUPLED 3D FLUID-STRUCTURE-INTERACTION SIMULATIONS OF A TOTAL ARTIFICIAL HEART**
   Simon Sonntag, RWTH Aachen University, Germany

8. **CFD EVALUATION OF THE THROMBOGENIC POTENTIAL OF BLOOD RECIRCULATING DEVICES IN EXTRACORPOREAL CIRCULATION.**
   Alessandra Pelosi, Politecnico di Milano, Italy

9. **NOVEL AORTIC CANNULA FOR CARDIOPULMONARY BYPASS TO REDUCE CEREBRAL EMBOLI – A NUMERICAL STUDY**
   Idit Avrahami, Ariel University, Israel

10. **MECHANICAL ASPECTS OF FENESTRATED ENDOGRAFTS FOR TREATMENT OF ABDOMINAL AORTIC ANEURYSM**
    Idit Avrahami, Ariel University center of Samaria, Israel, Israel

11. **COMPUTATIONAL FLUID DYNAMICS IN BIFURCATED STENTED CORONARY ARTERIES**
    Gabriele Dubini, Politecnico Di Milano, Italy

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Monday (March 26) Poster Presentations

12. **THE INFLUENCE OF SIMPLIFIED BOUNDARY CONDITIONS ON THE OUTCOME OF CFD SIMULATIONS IN THE MOUSE AORTA**
    Patrick Segers, Ghent University, Belgium

13. **MITRAL VALVE ANTERIOR LEAFLET IN VIVO SHAPE MAY CONTRIBUTE TO OPTIMIZING VENTRICULAR EJECTION**
    Marco Stevanella, Politecnico di Milano, Italy

14. **REDUCING THE DATA: ANALYSIS OF THE ROLE OF VASCULAR GEOMETRY ON BLOOD FLOW PATTERNS IN CURVED VESSELS**
    Spencer Sherwin, Imperial College London, United Kingdom

15. **TOWARD OPTIMIZING HEMODYNAMIC EFFICIENCY OF THE FONTAN Y-GRAFT WITHIN ANATOMIC CONSTRAINTS**
    Christopher Haggerty, Georgia Institute of Technology, USA

16. **FLOW DEVELOPMENT PAST BICUSPID AORTIC VALVES AND THE RELATIONSHIP TO ASCENDING AORTIC PATHOLOGY**
    Sarah C. Vigmostad, The University of Iowa, USA

17. **EFFECT OF ARTERIAL WALL HYPERTROPHY AND STIFFNESS ON THE BLOOD FLOW IN FLEXIBLE CAROTID ARTERY BIFURCATION**
    Jung Yul Yoo, Seoul National University, Korea

18. **EXPERIMENTAL AND COMPUTATIONAL STUDIES OF A FORMED THROMBUS WITHIN A BACKWARDS FACING STEP GEOMETRY**
    Joshua O. Taylor, The Pennsylvania State University, USA

19. **CELL FREE LAYER AND SHEAR STRESS VARIATION IN MICROVESSELS**
    Junfeng Zhang, Laurentian University, Canada

20. **UNDERSTANDING WAVE PROPAGATION PHENOMENA IN THE ARTERIAL TREE**
    Nikos Stergiopulos, EPFL, Switzerland

21. **MIDDLE MEATAL ANTROSTOMY AND NASAL AIRFLOW: A COMPUTATIONAL FLUID DYNAMIC STUDY**
    Seung-Kyu Chung, Sungkyunkwan University School of Medicine, Korea

22. **EFFECT OF ARTERIAL DISTENSIBILITY AND STENOSES ON PRESSURE DROP IN PULSATILE FLOW**
    Oren Rotman, Tel Aviv University, Israel

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Thursday (March 29) Poster Presentations

1. **PERMEABILITY OF THE PLASMA MEMBRANE INCREASES WITH THE STRAIN LEVEL IN STATICALLY-STRETCHED MYOBLASTS**
   Amit Gefen, Tel Aviv University, Israel

2. **BENCHMARKING OF FLUID/STRUCTURE-INTERACTION MODELS OF WAVE PROPAGATION**
   C.D. Bertram, University of Sydney, Australia

3. **MEASUREMENT AND MR IMAGING BASED SIMULATION OF THE MAGNETO-HEMODYNAMIC EFFECT**
   Esra Neufeld, Foundation for Research on Information Technologies in Society (IT'IS), Switzerland

4. **PATIENT SPECIFIC MULTI-SCALE HEMODYNAMIC COMPUTATIONAL MODEL FOR PLANNING VASCULAR ACCESS SURGERY IN HEMODIALYSIS PATIENTS**
   Andrea Remuzzi, University of Bergamo, Italy

5. **OSCILLATORY COUETTE FLOW OF A SISKO FLUID IN A ROTATING SYSTEM**
   Shirley Abelman, University of the Witwatersrand, South Africa

6. **ANALYSIS OF NEOROLOGIC COMPLICATIONS DURING CARDIOPULMONARY BYPASS**
   Tim A.S. Kaufmann, RWTH Aachen University, Germany

7. **WAKE FLOW OF ECCENTRIC STENOTIC GEOMETRIES**
   Kerry Hourigan, Monash University, Australia

8. **THE OPTICAL VIRTUAL ENDOSCOPY FOR VISUALIZATION OF THE URINE FLOW IN THE PROSTATIC URETHRA**
   Takuro Ishii, Chiba University, Japan

9. **OPTIMAL SWIMMING GAIT OF UNDULATORY SWIMMERS AT LOW REYNOLDS NUMBER: THE NEMATODE C. ELEGANS**
   Josue Sznitman, Technion - Israel Institute of Technology, Israel

10. **EFFECTS OF ANASTOMOTIC ANGLE AND FLOW DIVISION ON DISTURBED FLOW IN RADIAL-CEPHALIC FISTULAE FOR HAEMODIALYSIS**
    Bogdan Ene-Iordache, Mario Negri Institute, Italy

11. **ROLE OF SHEAR STRESS FOR SURFACTANT PRODUCTION IN A MICROFLUIDIC MODEL OF FETAL AIRWAYS**
    Janna Tenenbaum-Katan, Technion - Israel Institute of Technology, Israel

12. **A MICROFLUIDIC NETWORK FOR DRUG SCREENING WITH STRONTIUM RANELATE ON CULTURED SAOS-2 CELLS FOR OSTEOPOROSIS THERAPY: DESIGN AND FABRICATION**
    Gabriele Dubini, Politecnico di Milano, Italy

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Thursday (March 29) Poster Presentations

13. **ROLE OF CONFINED JETS ON BLOOD CLOTTING WITHIN INTRACRANIAL CEREBRAL ANEURYSMS**
    S. Cito, Universitat Pompeu Fabra, Spain

14. **ACOUSTIC DROPLET VAPORIZATION FOR GAS EMBOLOTHERAPY**
    Joseph L. Bull, University of Michigan, USA

15. **REVISITING TURBULENCE IN CEREBRAL ANEURYSMS: A RISK FACTOR FOR RUPTURE?**
    Kristian Valen-Sendstad, University of Toronto, Canada

16. **CEREBRAL ARTERY HEMODYNAMICS IN PEDIATRIC SICKLE CELL DISEASE: A PRELIMINARY STUDY**
    Amanda K. Wake-Buck, Vanderbilt University, USA

17. **VALIDATION OF CORONARY PERFUSION PREDICTED FROM CUMULATIVE ARTERIAL LUMEN VOLUME**
    P. van Horssen, Academic Medical Center, The Netherlands

18. **NUMERICAL SIMULATION OF ULTRASOUND-INDUCED BIOMARKER CAPTURING INTO LIPOSOMES**
    Luai R. Khoury, Ben-Gurion University of the Negev, Israel

19. **MIMICKING PULMONARY ACINAR FLOWS AT THE MICROSCALE USING MICROFLUIDICS**
    Ramy Fischler, Technion - Israel Institute of Technology, Israel

20. **ACUTE CHANGES IN CORONARY WAVE INTENSITY IN PATIENTS UNDERGOING TRANSCUTANEOUS AORTIC VALVE IMPLANTATION**
    Cristina Rolandi, University of Amsterdam, The Netherlands

21. **DETERMINANTS OF TRANSMURAL CORONARY FLOW: MECHANISMS OF SUBENDOCARDIAL VULNERABILITY**
    Yoram Lanir, Technion ITT, Israel

22. **CHANGES IN UTERINE ARTERY SHEAR STRESS AND BLOOD PRESSURE IN NORMAL PREGNANT VS. PREECLAMPTIC WOMEN: EFFECTS OF HIGH ALTITUDE AND ANCESTRY**
    Ronald R. Magness, University of Wisconsin-Madison, USA

23. **VALVELESS PUMPING IN A THICK WALL ELASTIC TUBE**
    Pavel Kozlovsky, Tel Aviv University, Israel

24. **ON APPLICATION OF PROPER ORTHOGONAL DECOMPOSITION FOR ANALYZING BLOOD FLOWS IN ARTERIES**
    Alexander Yakhot, Ben-Gurion University, Israel