Joint Conference of Three Societies:
European Society for Clinical Hemorheology and Microcirculation
International Society of Biorheology
International Society for Clinical Hemorheology
Krakow, Poland
July 2 – 6, 2018

Scientific Program

Monday, July 2

12:00–18:00 **Registration**
18:00–20:00 **Opening ceremony**
20:00–22:00 **Welcome Reception**

Tuesday, July 3

9:00–10:00 **ESCHM Plenary Lecture (L1)**
Philippe Connes: Blood rheology: from exercise responses to sickle cell disease pathophysiology

10:00–10:30 **Coffee Break**

10:30–12:00 **Symposia S1–S3, Free Communications O1-O2**

S1: Vessels and Hemorheology
Chairs: Kalman Toth, Norbert Nemeth

S1-1 Hemorheological parameters and mortality in critically ill patients
Beata Csiszar, Kinga Totsimon, Peter Kenyeres, Kalman Toth, Zsolt Marton
1st Department of Medicine, University of Pecs, Medical School, Hungary

S1-2 Leukocyte antisedimentation rate (LAR) and pituitary adenylate cyclase-activated polypeptid (PACAP) in polytrauma and burn victims. A preliminary study
Csaba Loibl[a] , Csaba Csontos[a], Livia Szelig[a], Lajos Bogar[a], Patricia Kovacs[a], Andrea Pankaczi[a], Szilard Rendeki[a], Martin Rozanovic[a], Marianna Matancic[b], Timea Nemeth[c], Beata Lelesz[d], Jozsef Nemeth[d] , Attila Miseta[e], Dora Reglodi[f], Andrea Tamas[f]
[a]University of Pécs, Medical School, Department of Anaesthesia and Intensive Care, Hungary; [b]University of Pécs, Medical School, 1st Department of Internal Medicine, Hungary; [c]University of Pécs, Medical School, Department of Languages for Specific Purposes, Hungary;[d] University of Debrecen, Department of Pharmacology and Pharmacotherapeutics, Hungary; [e] University of Pécs, Medical School, Department of Laboratory Medicine, Hungary; [f]University of Pécs, Medical School, Department of Anatomy, MTA-PTE PACAP Research Team, Centre for Neuroscience, Hungary

S1-3 Do AB0 and Rh blood groups influence hemorheological parameters in vascular patients?
Katalin Koltai[a], Dóra Endrei[a], Gábor Késmárky[a], Katalin Biró[a], Zsolt Márton Pécs[a], Gergely Fehér[b] , Dávid Kovács[a], Imre Boncz[c] , Antal Tibold[b], Kálmán Tóth[a]
[a]University of Pécs, Medical School, Ist Department of Medicine, Hungary; [b]University of Pécs, Medical School, Centre for Occupational Medicine, Hungary; [c]University of Pécs, Medical School, Faculty of Health Sciences, Institute of Health Insurance, Hungary

S1-4 Applications of finite element analysis in clinical hemorheology
Peter Varga, Sz. Javor, G. Jancso, A. Gedei, P. Maroti, G. Balazs
University of Debrecen, Hungary

S1-5 Effects of ischemia-reperfusion and various surgical preconditioning maneuvers on micro-rheological and microcirculatory parameters
Norbert Nemeth[a], Gabor Varga[a], Balazs Szabo[a], Csaba Korei [b], Bela Turchanyi [b], Katalin Peto[a]
[a]Department of Operative Techniques and Surgical Research, Faculty of Medicine, University of Debrecen, Hungary; [b] Department of Traumatology and Hand Surgery, Faculty of Medicine, University of Debrecen, Hungary

S1-6 Renal ischemia-reperfusion-induced micro-rheological and microcirculatory alterations and their influenceability by remote organ ischemic preconditioning
Gabor Varga, Kitti Nagy, Noemi Pal, Gabor Nadubinszky, Balazs Szabo, Bence Tanczos, Viktoria Somogyi, Adam Deak, Katalin Peto, Norbert Nemeth
Department of Operative Techniques and Surgical Research, Faculty of Medicine, University of Debrecen, Hungary

S2: Platelet Adhesion
Chairs: Shinya Goto, Terumitsu Hasebe

S2-1 Biologically Validated Model of Platelet Adhesion under Blood Flow Conditions
Shinya Goto
Department of Medicine, Tokai University School of Medicine, Japan

S2-2 Glycoprotein Distribution of Surface-Induced Platelet Activation on Medical Materials by Electron Microscopy Technology
Masamitsu Nakayama [a], Terumitsu Hasebe[b], Shunto Maegawa [a], Kenta Bito [a], Tomohiro Matsumoto[b], Tetsuya Suzuki [a]
[a] Keio University, Japan; [b]Tokai Univeristy, Japan

S2-3 Hemorheological Effects of Mechanical Stress on Whole Blood of Patients with Prosthetic Heart Valve Failure
Toru Maruyama, Chiharu Yoshida, Kei Irie, Shohei Moriyama, Taku Yokoyama, Mitsuhiro Fukata, Takeshi Arita, Keita Odashiro, Koichi Akashi
Kyushu University, Japan

S2-4 Platelet adhesion studies of implantable long-term use Fontan pump biomaterials
Bryan Good [a], Clare McHugh [a], Keefe Manning [a], William Weiss [b], Chris Siedlecki [b]
[a]Pennsylvania State University, USA; [b] Pennsylvania State University, Hershey Medical Center, USA

S2-5: Development of Hemocompatible Materials for Blood Contacting Devices by Physical and Chemical Surface Modification
Terumitsu Hasebe[a], Masamitsu Nakayama[b], Shunto Maegawa[b], Kenta Bito[b], Tomihiro Matsumoto[a], Tetsuya Suzuki[b]
[a]Tokai University; [b]Keio University

S3: Advances in Hemorheological Measurements-1
Chairs: Sehyun Shin, Sung Yang

S3-1 Holotomography techniques for imaging 3D label-free imaging of cells and tissues
Yong Keun Park
KAIST, South Korea

S3-2 A microfluidic device for simultaneous measurement of blood viscosity, hematocrit, and deformability
Byung Jun Kim, Sung Yang
GIST, South Korea

S3-3 Deformability measurement of continuous soft particles by lattice Boltzmann method and its applications to rheological flow characteristics
Joon-Sang Lee
Yonsei University, South Korea

S3-4 A microfluidic platelet assaying device for function test and antiplatelet response test
Sehyun Shin
Korea University, South Korea

O1: Cellular Rheology and Biophysics

Chair: Peter Butler

O1-1 Albumin solder covalently bound to a biodegradable polymer membrane: New approach to improve binding strength in laser tissue soldering
Andrea Nies, Bernhard Hiebl
University of Veterinary Medicine Hannover, Foundation, Germany

O1-2 Circumferential alignment of smooth muscle cells in micro-tube environment
Yang Jin[a], Linhong Deng[b]
[a]Bioengineering College, Chongqing University, China; [b]Institute of Biomedical Engineering and Health Sciences, Changzhou University, Changzhou, China

O1-3 Subhaemolytic mechanical trauma increases RBC aggregation by altering cell electrochemistry
Antony McNamee[a], Geoff Tansley[b], Michael Simmonds[c]
[a]Biorheology Research Laboratory, Griffith University, Australia; [b]School of Engineering, Griffith University, Australia; [c]Biorheology Research Laboratory, Griffith University, Australia

O1-4 Subhaemolytic mechanical damage alters erythrocyte behaviour in subsequent low-shear flows
Antony McNamee[a], Geoff Tansley[b], Michael Simmonds[c]
[a]Biorheology Research Laboratory, Griffith University, Australia; [b]School of Engineering, Griffith University, Australia; [c]Biorheology Research Laboratory, Griffith University, Australia

O1-5 Ultrafast imaging of cell elasticity with optical microelastography
Guy Cloutier[a] , Grasland-Mongrain[a], Ali Zorgani[b,] Shoma Nakagawa[a], Simon Bernard[a], Lia Gomes Paim[a], Greg FitzHarris[a], Stefan Catheline[b]
[a]University of Montreal Hospital Research Center, Canada; [b]INSERM, France

O1-6 The Effects of Substrate Stiffness on HUVEC Adhesion with THP-1 Cellsand Molecules Associated with Adhesion
Yan Wenhua Zhang Tian, Zhang Kang, Qiu Juhui, Wang Guixue
Key Laboratory for Biorheological Science and Technology of Ministry of Education, State and Local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University, Chongqing 400030, China

O2: Clinical Hemorheology

Chair: Jean-Frederic Brun

O2-1 Pilot clinical study of quantitative ultrasound spectroscopy measurements of erythrocyte aggregation within superficial veins of 50 volunteers

Guy Cloutier, Boris Chayer, Louise Allard, Julian Garcia-Duitama
University of Montreal Hospital Research Center, Canada

O2-2 Rapid clinical assessment of the sublingual microcirculation - visual scoring using microVAS in comparison to standard semi-automated analysis

Joel Sardinha, Christian Lehmann
Department of Anesthesia, Pain Management and Perioperative Medicine, Dalhousie University, Halifax, Nova Scotia, Canada

O2-3 L-cysteine improves blood fluidity that has been impaired by acetaldehyde

Ippo Otoyama[a], Tatsushi Kimura[b], Hironobu Hamada[a], Kiyokazu Sekikawa[a], Michinori Kamikawa[a], Teruki Kajiwara[a], Fumiya Aizawa[a], Yoshinobu Sato[a], Haruchi Namba[a]
[a] Department of Physical Analysis and Therapeutic Sciences, Graduate School of Biomedical and Health Sciences, Hiroshima University, Japan; [b] Faculty of Early Childhood Education and Care, Ohkagakuen University, Japan

O2-4 Hemorheological studies in a group of patients with Waldenström's macroglobulinemia

Anna Marcinkowska-Gapińska[a], Piotr Kowal[b], Włodzimierz Liebert[c]
[a] Katedra Biofizyki UM Poznań, Poland; [b] Katedra Neurologii UM Poznań, Poland ;[c] Katedra Neurochirurgii UM Poznań, Poland

O2-5 Adora2b receptor activation mediates flap protection from ischemia/reperfusion injury

Pinar Ulker[a], Ozlenen Ozkan[b], Matteo Amoroso[c], Mutay Aslan[d], Filiz Ozcan[d], Ibrahim Bassorgun[e], Omer Ozkan[b]
[a]Department of Physiology, Akdeniz University, Antalya, Turkey; [b]Department of Plastic and Reconstructive Surgery, Akdeniz University, Antalya, Turkey; [c]Department of Plastic Surgery Department of Plastic Surgery, Sahlgrenska University Hospital, Gothenburg, Sweden.; [d]Department of Biochemistry, Akdeniz University, Antalya, Turkey; [e]Department of Pathology, Akdeniz University, Antalya, Turkey

O2-6 Purinergic regulation of erythrocyte enzyme activity

Pinar Ulker[a] , Nur Özen[a] , Günel Abdullayeva[a] , Sadi Köksoy[b] , Nazmi Yaraş[c] , Filiz Basrali[a]
[a]Department of Physiology, Medical Faculty, Akdeniz University, Antalya, Turkey
[b]Department of Medical Microbiology, Medical Faculty, Akdeniz University, Antalya, Turkey
[c]Department of Biophysics, Medical Faculty, Akdeniz University, Antalya, Turkey

12:00–13:00 **Lunch Break**

13:00–14:00 **POISEUILLE GOLD MEDAL AWARD (ISB)**
Ceremony and Lecture (L2)

Laudatio: **Herbert H. Lipowsky**
Lecture: **Axel R Pries:** Microvascular hemodynamics: System Properties

14:15–15:45 **Symposia S4–S7, Free Communications O3**

S4: Glycocalyx – Its Structure and Function

Chairs: John Tarbell**,** Hans Vink

S4-1 Multilayer structures of the endothelial glycocalyx: barrier functions versus red cell hemodynamics
FitzRoy Curry
University of California, Davis, USA

S4-2 Endothelial Surface Glycocalyx (ESG) Components and Ultra-Structures Revealed by Stochastic Optical Reconstruction Microscopy (STORM)
Jie Fan, Yi Sun, Yifan Xia, John Tarbell, Bingmei Fu
The City College of the City University of New York, USA

S4-3 In Vivo Studies of the Enzymatic Degradation and Structure of the Endothelial Glycocalyx
Herbert Lipowsky
Penn State University, USA

S4-4 The endothelial glycocalyx and control of microvascular flow and perfused capillary density
Hans Vink
Department of Physiology, Cardiovascular Research Institute Maastricht, Maastricht University, The Netherlands

S5: Novel mechanisms regulating blood cell rheology

Chair: Brian Cooke, Tamas Alexy

S5-1 Interaction of mesenchymal stem cells with platelets: aid to targeting to tissue or thrombotic risk?
Lozan Sheriff[a], Asma Alanazi, Lewis Ward[a], Julie Rayes[a], Mohammed Alassiri, Steve Watson[a], Gerard Nash[a]
[a]Institute of Cardiovascular Sciences, College of Medical and Dental Sciences, University of Birmingham, United Kingdom; [b]Medical College, King Saud bin Abdulaziz University for Health Sciences, Saudi Arabia

S5-2 Malaria and babesiosis: same rheopathobiology but different molecular mechanisms
Brian Cooke
Biomedicine Discovery Institute, Monash University, Australia

S5-3 Form and function: erythrocyte responses to supra-physiological shears and circulatory support
Michael Simmonds
Menzies Health Institute Queensland, Australia

S5-4 Blood rheology, arterial stiffness, and clinical complications in diabetic patients with and without sickle-cell trait.
Sarah Skinner[a], Mor Diaw[b], Maïmouna Ndour Mbaye[c], Brigitte Ranque[d], Philomène Lopez[e], Malick Ndour[e], Fatou Gueye[e], Demba Diedhiou[c], Djiby Sow[c], Saliou Diop[f], Abdoulaye Samb[b], Vincent

Pialoux[g], Philippe Connes[g]
[a]University Lyon 1, France; [b]Laboratoire de physiologie et explorations fonctionnelles, FMPO, UCAD, Senegal; [c]Clinique Médicale II, Centre Hospitalier Abass Ndao, Senegal; [d]Laboratoire d'Excellence GR-Ex, Paris, France; UMR INSERM 970, Universite´ Paris Descartes; Service de Médecine Interne, Hôpital Europe´en Georges Pompidou, France; [e]Laboratoire de Biochimie Pharmaceutique, Faculté de Médecine, de Pharmacie et d'Odontologie, Université Cheikh Anta Diop, Senegal; [f]Laboratoire d'hémato-immunologie, FMPO, UCAD, Senegal; [g]Laboratoire Interuniversitaire de Biologie de la Motricité EA7424, « Vascular Biology and the Red Blood Cell » team, Université Claude Bernard Lyon 1, Université de Lyon 1; Laboratoire d'Excellence GR-Ex; Institut Universitaire de France, Paris, France

S5-5 The importance of hemorheology in the design of continuous flow left ventricular assist devices
Tamas Alexy
Department of Medicine, Division of Cardiology, University of Minnesota, USA

S6: Advances in Hemorheological Measurements-2

Chairs: Sehyun Shin, Sung Yang

S6–1 Optical study of red blood cells interactions in vitro mediated by different plasma components
Alexander Priezzhev[a], Alexey Semenov[a], Andrei Lugovtsov[a], Kisung Lee[b], Christian Wagner[c]
[a]Department of Physics and International Laser Center, M.V. Lomonosov Moscow State University, Russia
[b]Ulsan National Institute of Science and Technolog, South Korea
[c] Experimental Physics, Saarland University, Germany

S6-2 Effect of integrin glycoproteins inhibition on specific adsorption of cells adhesion macromolecules on red blood cell membrane: a microrheologic study
Alexey Semenov[a], Andrei Lugovtsov[b], Kisung Lee[c], Alexei Myravyev[d], Sehyu Shin [e], Evgeny Shirshin[a], Alexander Priezzhev[b]
[a]Department of Physics of M.V. Lomonosov Moscow State Universit, Russia; [b]International Laser Center of M.V. Lomonosov Moscow State University, Russia; [c]Ulsan National Institute of Science and Technology, South Korea; [d]K.D.Ushinsky Yaroslavl State Pedagogical University, Russia; [e]Korea University, South Korea

S6-3 Electrochemical impedance spectroscopy of blood for blood aggregation, sedimentation, and hematocrit
Alexander Zhbanov, Sung Yang
GIST, South Korea

S6-4 Comparison of critical shear stress in RheoScan and adhesion force between RBCs measured in optical tweezer
Sehyun SHIN[a], Hoyoon Lee[a], Kisung Lee[b], Alexander Priezzhev[c]
[a]Korea University, South Korea; [b]UNIST, South Korea; [c]Lomonosov Moscow State University, Russia

S7: Hemorheology and blood coagulation

Chairs: Ursula Windberger, Resia Pretorius

S7-1 Stress sweep tests on whole blood clots

Ursula Windberger
Medical University Vienna, Austria

S7-2 The novel discovery of amyloid formation in fibrin(open) and how it affects hemorheology and blood coagulation
Etheresia Pretorius
Stellenbosch University, Republic of South Africa

S7-3 Multiscale mechanics of fibrin networks
Cristina Martinez-Torres
AMOLF, The Netherlands

S7-4 Study of blood clotting mechanism by rheological and electrorheological methods
Nadia Antonova, Ivan Ivanov
Institute of Mechanics to the Bulgarian Academy of Sciences, Bulgaria

S7-5 Influence of polymeric nanoparticles on the kinetics of coagulation of conserved blood
Nadya Todorova, Nadia Antonova
Institute of Mechanics to the Bulgarian Academy of Sciences, Bulgaria

S7-6 What are conditions defining blood clot properties in some disorders
Eugene Roitman[a], Alla Shabalina[b], Marine Tanashyan[b], Irina Kolesnikova[a]
[a]Pirogov Russian National Research Medical University, Russia; [b]Research Center of Neurology, Russia

O3: Endothelial Function and Shear Stress

Chairs:

O3-1 Arrangement and morphology of endothelial cells under the mechanical microenvironment changes after vascular stent implantation
Tieying Yin, Yuzhen Ren, Ruolin Du, Yuhua Huang, Yazhou Wang, Guixue Wang
Key Laboratory for Biorheological Science and Technology of Ministry of Education, State and Local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University, China

O3-2 Blood Flow Regulates Zebrafish CVP Angiogenesis by Inducing ERK5 Signaling
Guixue Wang
Bioengineering College of Chongqing University, Chongqing, 400044, China

O3-3 The role of Id1 in oscillatory shear stress-mediated endothelial lipid uptake
Kang Zhang, Yidan Chen, Guixue Wang
Key Laboratory for Biorheological Science and Technology of Ministry of Education, State and Local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University, Chongqing, 400030, China

O3-4 Effect of DNA methyltransferase 1 in oscillatory shear stress-induced atherosclerotic vulnerable plaque formation
Lu Huang, Desha Luo, Yuanhang Zhou, Kang Zhang, Juhui Qiu, Guixue Wang,
Key Laboratory for Biorheological Science and Technology of Ministry of Education, State and Local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University, China

O3-5 The influence of hemodynamic changes on proliferation and adhesion of endothelial progenitor cells
Jinxuan Wang, Li Xiao, Daming Sun, Yiming Zheng, Tieying Yin, Guixue Wang
Bioengineering College of Chongqing University

O3-6 Short term effects of the Mediterranean Diet in human microvascular function - comparison between older and younger healthy, sedentary adults.
Yingshan Liu[a], Marianne Milner[a], Markos Klonizakis
[a]University of Sheffield, *United Kingdom*; [b]*Sheffield Hallam University, United Kingdom*

15:45–16:15 **Coffee Break**

16:15–17:45 **Symposia S8–S12**

S8: Glycocalyx – Its Diversity
Chair: Herbert Lipowsky

S8-1 Surface glycocalyx mediates tumor cell metastasis
Henry Qazi[a], Heriberto Moran[b], Limary Cancel[b], Mariya Mayer[b], Lance Munn[c], John Tarbell[a]
[a]*Univ. Cal. San Diego, USA*; [b]*The City College of New York, USA*; [c] *MGH/Harvard University, USA*

S8-2 Visualization of heparan sulfate proteoglycans in the glycocalyx and the perivascular space of 3-dimensional perfusable microvascular networks in microfluidic devices.
Sebastian Beyer[a], Anna Blocki[a], Roger D. Kamm[b]
[a]*Institute for Tissue Engineering and Regenerative Medicine, Chinese University of Hong Kong, Hong Kong Special Administrative Region of China;* [b]*Department of Biological Engineering, Massachusetts Institute of Technology, USA*

S8-3 Integrin-mediated adhesion is lipid bilayer and glycocalyx dependent Seoyoung Son, Joseph Moroney, Peter Butler
The Pennsylvania State University, USA

S8-4 Coupled dynamics of blood flow and endothelial glycocalyx: a large-scale molecular dynamics study
Xi Zhuo Jiang, Kai H. Luo, Yiannis Ventikos
Department of Mechanical Engineering, University College London, United Kingdom

S9: Molecular and mechanical markers of various pathologies
Chair: Małgorzata Lekka

S9-1 Early stage of essential hypertension monitoring
Kvetoslava Burda [a], Magdalena Kaczmarska [a], Maria Fornal [b], Franz Messerli [c], Jozef Korecki [a], Tomasz Grodzicki [b]
[a] *AGH University of Science and Technology, Faculty of Physics and Applied Computer Science, Poland;* [b] *Collegium Medicum, Department of Internal Medicine and Gerontology, Jagiellonian University, Poland;* [c] *Division of Cardiology, Columbia University College of Physicians and Surgeons, St. Luke's-Roosevelt Hospital, USA*

S9-2 Label-free methods in diagnostics and prognostics of malignant melanoma
Tomasz Kobiela
Warsaw University of Technology, Faculty of Chemistry, Chair of Drug and Cosmetics Biotechnology, Poland

S9-3 Advanced vibrational imaging techniques to aid clinical research
Tomasz P. Wrobel [a], Paulina Koziol [a], Natalia Piergies [a], Ewa Pieta [a], Czeslawa Paluszkiewicz [a], Maria Fornal [b], Tomasz Grodzicki [b], Wojciech Kwiatek [a]
[a]Institute of Nuclear Physics Polish Academy of Sciences, Poland; [b]Jagiellonian University, Collegium Medicum, Department of Internal Medicine and Gerontology, Poland

S9-4 Effect of dietary carotenoids on erythrocytes from diabetic patients: a spectroscopic study
Joanna Fiedor[a], Mateusz Przetocki[a], Grzegorz Gajos[b], Józef Korecki[a], Kvetoslava Burda[a]
[a]AGH-University of Science and Technology, Faculty of Physics and Applied Computer Science, Department of Medical Physics and Biophysics, Poland; [b]Jagiellonian University Medical College, Faculty of Medicine, Department of Coronary Artery Disease and Heart Failure, Poland

S10: MiDAS Microcirculation Meeting (3M)
Chairs: Christian Lehmann, Vladimir Cerny

S10-1 Dynamic Contrast Enhanced Ultrasound (CEUS) of Tissue transplants
Ernst Michael Jung[a], Sebastian Geis[b], Andreas Kehrer[b], Philipp Edmund Lamby[b], Lukas Prantl[b]
[a]Interdisciplinary Ultrasound Department, University Hospital Regensburg; [b]Center of Plastic-, Hand- and Reconstructive Surgery, University of Regensburg

S10-2 Assessment of glycocalyx
Vladimir Cerny
University Hospital Hradec Kralove, Medical Faculty in Hradec Kralove, Charles University in Prague, Czech Republic

S10-3 Automated vs. visual video analyses - where is the future?
Christian Lehmann
Dalhousie University, Canada

S10-4 Is sodium a link between endothelial glycocalyx and microcirculation?
David Astapenko, Vladimir Cerny
University Hospital Hradec Kralove, Medical Faculty in Hradec Kralove, Charles University in Prague, Czech Republic

S11: Beyond Red cell stiffness
Chairs: Jean-Frédéric Brun, Carlota Saldanha

S11-1 RBC deformability: an exquisite homeostasis
Jean-Frederic Brun[a], Emmanuelle Varlet-Marie[b]
[a]INSERM U1046 Université Montpellier, France; [b]Faculty of Pharmacy Université Montpellier, France

S11-2 Eryptosis or the death of a rigidified erythrocyte
Etheresia Pretorius
Stellenbosch University, Republic of South Africa

S11-3 Erythrocyte deformability under nitric oxide Influence
Carlota Saldanha, Ana Silva-Herdade
Institute of Biochemistry, Institute of Molecular Medicine, Faculty of Medicine, University of Lisbon, Portugal

S11-4 The sickle cell: far more than a rigid erythrocyte
Philippe Connes[a], Elie Nader[a], Nicolas Guillot [b], Romain Fort[a], Berenike Möckesch[c], Nathalie Lemonne[d], Sophie Antoine-Jonville[e], Céline Renoux[a], Philippe Joly[a], Vincent Pialoux[a], Marie-Dominique Hardy-Dessources[f], Marc Romana[f]
[a]Laboratoire LIBM EA7424, Equipe « Biologie Vasculaire et du Globule Rouge », Université Claude Bernard Lyon 1, France; [b]CarMeN Laboratory, INSERM 1060, INRA 1397, Université Claude Bernard Lyon1, INSA Lyon, Villeurbanne, France; [c]Laboratoire ACTES EA3596, Université des Antilles, Pointe-à-Pitre, France; [d] Unité Transversale de la Drépanocytose, Centre Hospitalier Universitaire de Pointe-à-Pitre, Pointe-à-Pitre, Guadeloupe; [e]Laboratoire ACTES EA3596, Université des Antilles, Pointe-à-Pitre, France; [f]UMR Inserm U1134, Université des Antilles et de la Guyane, Pointe-à-Pitre, Guadeloupe

S11-5 Signaling pathways in regulation of RBC microrheological properties by catecholamines
Irina Tikhomirova, Alexei Myravyov, Elena Petrochenko
Yaroslavl State Pedagogical University

S11-6 Complete Dynamics of Erythrocytes in Shear Flow: the story behind the term of deformability
Simon Mendez[a], Luca Lanotte[b], Johannes Mauer[c], Franck Nicoud[a], Gerhard Gompper[c], Dmitry Fedosov[c], Manouk Abkarian[d]
[a]IMAG. CNRS UMR 5149 - University of Montpellier, France; [b]INRA Rennes and CBS. CNRS UMR 5048 - INSERM UMR 1054 - University of Montpellier, France; [c]Institute of Complex Systems and Institute for Advanced Simulation, Forschungszentrum Juelich, Germany; [d]CBS. CNRS UMR 5048 - INSERM UMR 1054 - University of Montpellier, France

S12: Macro and micro hemorheology in vitro and in vivo

Chairs: Michael Simmonds, Jon Detterich

S12-1 The "tipping point" of mechanical stress on erythrocyte biology
Michael Simmonds
Griffith University, Australia

S12-2 Testing the sensitivity of red cell fragmentation and deformability measurements for shear-mediated mechanical damage
Özlem Yalcin, Ali Cenk Aksu , Elif Ugurel, Selcuk Surucu
Koc University, School of Medicine, Turkey

S12-3 Discussion about high shear stress induced erythrocyte's damage and lysis -Interpretation of hemolysis in cardiovascular devices based on our visualized erythrocytes' behaviors -
Nobuo Watanabe, Nobuo Watanabe, Takahiro Shimada, Nao Ikeda, Kousuke Igarashi
Shibaura Institute of Technology, Japan

S12-4 Mechanical sensitivity of blood in sickle patients on chronic blood transfusion – understanding erythrocyte exposure to chronic physiologic shear vs. chronic supra-physiologic but sub-hemolytic shear stress
Jon Detterich[a], Silvie Siriany[a], Derek Ponce[a], Michael Simmonds[b]

[a] *Division of Cardiology, Children's Hospital Los Angeles, University of Southern California Keck School of Medicine, USA;* [b] *Griffith University, Australia*

S12-5 Drag-reducing polymer effects on macro- and microcirculation
Marina Kameneva
University of Pittsburgh, USA

17:45–18:15 **Coffee Break**

18:00-21:00 **Poster Session**

Wednesday, July 4

9:00–10:00 **ISB Plenary Lecture (L3)**
F.J. Gijsen: Biomechanics and atherosclerotic plaques progression
10:00–10:30 **Coffee Break**

10:30–12:00 **Symposia S13–S15, Free Communications O4-O5**

S13: Microcirculation of Inner Organs

Chairperson: L.E.M. Jung, P. Zengel

S13-1 Critical analysis of CEUS examinations of the liver in an interdisciplinary ultrasound department

Franz Josef Putz[a] , Anna Erlmeier[b], Niklas Verloh[b] , Bernhard Banas[a] , Christian Stroszczynski[b] , Ernst Michael Jung[b]
[a] Department of Nephrology, University Hospital Regensburg, Germany; [b]Department of Radiology and Interdisciplinary Ultrasound, University Hospital Regensburg, Germany

S13-2 VTIQ and VTQ in combination with B-mode and color Doppler ultrasound improve classification of salivary gland tumors, especially for inexperienced physician.
Pamela Zengel[a] , Florian Notter[a] , Dirk Andre Clevert[b]
[a] ENT Department Munich, LMU, Germany; [b] Institute of Radiology, LMU, Munich, Germany [b]

S13-3 CEUS perfusion imaging after ablation treatment in patients with prostate cancer: First results
Isabel Wiesinger, Lukas Beyer, Philipp Wiggermann, Christian Stroszczynski, Ernst Michael Jung
University Medical Center Regensburg, Germany

S13-4 Contrast-enhanced ultrasound (CEUS) and gallbladder diseases - a retrospective monocenter analysis of imaging findings with histopathological correlation.
G. Negrão de Figueiredo, K. Mueller-Peltzer, P. Zengel, E. Gresser, J. Rübenthaler, D.A. Clevert
München

S13-5 Contrast-enhanced ultrasound (CEUS) for the evaluation of gallbladder diseases in comparison to cross-sectional imaging modalities and histopathological results.
G. Negrão de Figueiredo, K. Mueller-Peltzer, P. Zengel, E. Gresser, J. Rübenthaler, D.A. Clevert
München

S13-6 New Horizons for Kidney Imaging: Dynamic Microvascularization in Contrast-enhanced Ultrasound (CEUS)
Franz Josef Putz[a], Anna Erlmeier[b], Miriam Banas[a], Bernhard Banas[a], Ernst Michael Jung[b]
[a]Department of Nephrology, University Hospital of Regensburg, Germany, [b]Department of Radiology and Interdisciplinary Ultrasound, University Hospital Regensburg, Germany

S14: Cell mechanics and cell mechanobiology - 1

Chairs: Taiji Adachi, Yukiko Matsunaga

S14-1 Effect of Physical Environment on Cell Migration Using Microchannel Device

Toshiro Ohashi[a], Mazlee Bin Mazalan[b], Ma Ming[b], Jennifer H. Shin[c]
[a]Faculty of Engineering, Hokkaido University, Sapporo, Hokkaido, Japan; [b]Graduate School of Engineering, Hokkaido University, Sapporo, Hokkaido, Japan; [c]Department of Mechanical Engineering, Korea Advanced Institute of Science and Technology, Korea

S14-2 Protein Kinase Cα Translocation in Endothelial Cells in Response to Mechanical Stimulus
Susumu Kudo, Toshihiro Sera, Masataka Arai
Kyushu University, Japan

S14-3 Hydrostatic pressure-induced DNA breaks in chondrocytes and its relationship with chromatin architecture
Koichiro Maki[a], Katsuko Furukawa[a], Takashi Ushida[a]
[a]The University of Tokyo, Japan

S14-4 In situ, fluorescence lifetime-based measurements of cell membrane micromechanics
Seoyoung Son[a], Hari Muddana[a], Changjin Huang[a], Sulin Zhang[a], Peter Butler[a]
[a]The Pennsylvania State University, USA

S15: Hemodynamic Functionality of Red Blood Cells in Blood Microcirculation: Experiments and Modeling

Chairs: Saul Yedgar, Ming Dao

S15-1 Biomechanics of Red Cell Diseases
Ming Dao
Massachusetts Institute of Technology, USA

S15-2 Microvascular blood flow peculiarities in cancer
Irina Tikhomirova[a], Yulia Malysheva[a], Nikolay Kislov[b], Mihail Ryabov[b]
[a]Yaroslavl State Pedagogical University, Russia
[b]Yaroslavl Regional Cancer Hospital

S15-3 Shape and dynamics of red blood cells in microvessels
Johannes Mauer[a], Felix Reichel[b], Jochen Guck[b], Gerhard Gompper[a], Dmitry Fedosov[a]
[a]Forschungszentrum Juelich, Germany; [b]Technical University of Dresden, Germany

S15-4 Hemodynamic Functionality of Transfused Red Blood Cells in the Microcirculation of Blood Recipients
Gregory Barshtein[a], Axel Pries[b], Neta Goldschmidt[c], Orly Zelig[c], Dan Arbell[c], Saul Yedgar[a]
[a]Hebrew University Medical School; [b]Charité-Universitätsmedizin; [c]Hadassah University Hospital

S15-5 Red Blood Cell Aggregate Flow Characteristics in Bifurcating Microchannels
Efstathios Kaliviotis
Cyprus University of Technology, Cyprus

O4: Red Blood Cell Deformability

Chairs: Edgar O'Rear, Philippe Connes

O4-1 Beta-Estradiol and Ethinylestradiol enhance RBC deformability dependent on their blood concentration
Paulo Farber[a], Teresa Freitas[b], Carlota Saldanha[b], Ana Silva-Herdade[b]
[a]Hospital da Luz de Aveiro, Portugal; [b]Institute of Molecular Medicine, Institute of Biochemistry, Faculty of Medicine, University of Lisbon, Portugal

O4-2 Dual mechanical characterization of red blood cells : role of surface area, internal viscosity and membrane rigidity
Céline Renoux[a], Magali Faivre[b], Amel Bessaa[a], Philippe Joly[a], Philippe Connes[a]
[a]LIBM EA7424 / UCBL1, France; [b]INL-UMR5270 CNRS / UCBL1, France

O4-3 Proteomic analysis of the role of adenylyl cyclase-cAMP pathway in red blood cell mechanical response
Ozlem Yalcin, Elif Ugurel
Koc University, School of Medicine, Turkey

O4-4 The oxygenscan: continuous measurement of red blood cell deformability with oxygen gradient ektacytometry to monitor disease severity and treatment effect in sickle cell disease
Minke Rab[a], Brigitte van Oirschot[a], Tesy Merkx[a] , Annet van Wesel[a], Sisto Hendriks[b], Jan de Zoeten[b], Osheiza Abdulmalik[c], Martin Safo[d] , Birgitta Versluijs[a], Roger Schutgens[a] , Gerard Pasterkamp[a], Eduard van Beers[a], Richard van Wijk[a]
[a]University Medical Center Utrecht, The Netherlands; [b]RR Mechatronics, The Netherlands; [c]The Children's Hospital of Philadelphia, USA; [d]Virginia Commonwealth University, USA

O4-5 Nitric Oxide Regulates Human Erythrocyte Deformability through Adjusting Band 3 Phosphorylation Status in Hypoxia
Yajin Zhao, Xiang Wang
Chongqing University

O4-6. Hypoxia: The Best Stimulator that Increases Shear-Induced Response of Red Blood Cells
Elif Ugurel[a] , Ali Cenk Aksu[a], Senol Piskin[b], Ozlem Yalcin[a]
[a]Koc University School of Medicine, Turkey; [b]The University of Texas at San Antonio, USA

O5: Flow Visualization and Modeling

Chairs: Sung Yang, Efstathios Kaliviotis

O5-1 Velocity and erythrocyte aggregation characteristics for surface tension-driven flow of blood in rectangular microfluidic channels.
Dimitris Pasias, Efstathios Kaliviotis
Cyprus University of Technology, Cyprus

O5-2 A new approach of blood viscosity: hemodynamic viscosity
Tilly Alexandre
PISCO, France

O5-3 Evaluation and comparison of haemodynamic parameters of vascular end-to side anastomoses
Balazs Gasz, Peter Varga, Peter Maroti, Gabor Jancso
University of Pécs, Hungary

O5-4 Similarities in Erythrocyte Senescence and Microfluidic High Shear Environment Damage
James Buerck[a], Dimitrios Papavassiliou[a], Trevor Snyder[b], David Schmidtke[c] , Edgar O'Rear[a]
[a]The University of Oklahoma, USA; [b]VADovations, USA; [c]The University of Texas at Dallas, USA

O5-5 Investigation of bright collapsing ring by Lattice Boltzmann method
Young Woo Kim, Chan Soo Min, Joon Sang Lee
Yonsei University, South Korea

12:00–13:00 **Lunch Break**

13:00–14:00 **ISCH MEDAL AWARD Ceremony and Lecture (L4)**

Laudatio: **Gerard Nash**
Lecture: **Brian M Cooke**

14:15–15:45 **Symposia S16–S18, Free Communications O6**

S16: Special Symposium to Celebrate the Centennial of Distinguished Professor Yuan-Cheng B. Fung - 1

Chairs: Linhong Deng, Li Yang

S16-1 Morphogenesis and mechanobiology of airway smooth muscle cells on 3D tubular micropatterns as mechanism of bronchial airway development
Linhong Deng[a], Yang Jin[b], Mingzhi Luo[a], Lei Liu[a], Jingjing Li[a]
[a]Institute of Biomedical Engineering and Health Sciences, Changzhou University, China
[b]Bioengineering College, Chongqing University, China

S16-2 Glycosylation is a strong molecular determinant of MUC5AC rheology in airway mucus at both single protein and bulk solution levels
Lei Liu, Mingzhi Luo, Yan Pan, Jingjing Li, Linhong
Institute of Biomedical Engineering and Health Sciences, Changzhou University, China

S16-3 Dynamics of neutrophil transmigration mediated by beta-2 integrin via P- and E-selectins
Yan Zhang, Mian Long
Center of Biomechanics and Bioengineering, Key Laboratory of Microgravity (National Microgravity Laboratory), and Beijing Key Laboratory of Engineered Construction and Mechanobiology, Institute of Mechanics, Chinese Academy of Sciences; School of Engineer, China

S16-4 Membrane structural protein analysis and mechanical property analysis of rat erythroblasts in different developmental stages
Hongliang Zhu
Chongqing University Department of Biomedical Engineering, China

S16-5 Influence of different rhythms sound wave to serotonin concentration in rats hippocampus
Yang Ren, Zhidan Deng
BME Department of Chongqing University

S17: Rheology and Microcirculation

Chairs: L. Prantl, G. Pindur

S17-1 Longitudinal analysis of thrombin generation biomarkers in venous thromboembolism
Gerhard Pindur[a], Aida Beye[b], Bernhard Stephan[a], Harald Helling[c]
[a]University Hospital of Saarland, Germany; [b]Centre Hospitalier CHNDS, France; [c]University Hospital of North Norway, Norway

S17-2 Comparison of PIRADS 3 lesions with histopathological findings after MRI-ultrasound fusion targeted biopsy of the prostate in a real-world setting

Boris Schlenker[a], Maria Apfelbeck[a], Christian G. Stief[a], Dirk-Andre Clevert[b]
[a]Department of Urology, University Hospital Grosshadern, Ludwig-Maximilians-University Munich, Munich, Germany; [b]Department of Clinical Radiology, Interdisciplinary Ultrasound-Center, University Hospital Grosshadern, Ludwig-Maximilians-University Munich, Munich, Germany

S17-3 Does acoustic radiation force Elastography help to improve the diagnostic value of ultrasound in the preoperative characterization of tumors of the parotid gland?

Pamela Zengel[a], Florian Notter[a], Dirk Andre Clevert[b]
[a]ENT Department Munich, LMU, Germany; [b]Institut of Radiology, LMU, Munich, Germany

S17-4 Technologies for Adipose Stem Cell Isolation

L. Prantl, V. Brebant, S. Klein, A. Anker, C Strauss, O. Felthaus
Department of Plastic, Hand and reconstructive Surgery, University Medical Center Regensburg, Germany

S17-5 Blood rheology in breast and gynecologic cancer patients at primary diagnosis and stage of cancer progression

O. Schelkunov, P. Tsikouras, R. Csorba, W. Rath, G-F. von Tempelhoff
Department of Obstetrics and Gynecology, City Hospital of Aschaffenburg, Aschaffenburg, Germany.

S17-6 First experiences with an into the clinical work flow integrated CAM Assay in Patients with oral squamous cell carcinoma

P. Kauffmann[1*], M. Troeltzsch[1], P. Brockmeyer[1], H. Bohnenberger[2], P. Stroebel[2], M. Manzke[3], R. Cordesmeyer[1], H. Schliephake[1], L. Prantl[5], T. Aung[5]
[1]Department of Oral and Maxillofacial Surgery, Georgia Augusta University, Göttingen, Germany, [2]Institute of Pathology, University Medical Centre, Göttingen, Germany.
[3]Department of Preventive Dentistry, Periodontology and Cariology, University Medical Center, Göttingen, Germany, [4]Department of Orthodontics, University of Göttingen, Göttingen, Germany, [5]Department of Plastic, Hand, and Reconstructive Surgery, University Medical Center Regensburg, Regensburg, Germany.

S18: Nanostructures in disease and health.

Chairs: Květoslava Burda, Marek Cyrklaff

S18-1 Malaria parasites, host-erythrocytes and blood circulation

Marek Cyrklaff
Heidelberg University School of Medicine, Germany

S18-2 Polyhedrocytes in type 2 diabetes

Grzegorz Gajos[a], Aleksander Siniarski[a], Joanna Natorska[b], Michał Ząbczyk[c], Jakub Siudut[c], Aneta Undas[b]
[a]Jagiellonian University Medical College, Faculty of Medicine, Department of Coronary Artery Disease and Heart Failure, Poland; [b]Institute of Cardiology, Jagiellonian University Medical College; Krakow Centre for Medical Research and Technologies, John Paul II Hospital, Poland; [c]Institute of Cardiology, Jagiellonian University Medical College, Poland

S18-3 Differentiation between various melanomas based on biophysical characterization of their properties

Justyna Bobrowska[a], Joanna Pabijan[a], Kamil Awsiuk[b], Jakub Rysz[b], Andrzej Budkowski[b], Małgorzata Lekka[a]

[a]Institute of Nuclear Physics, Polish Academy of Sciences, Kraków, Poland; [b]Institute of Physics, Jagiellonian University, Kraków, Poland

S18-4 Endothelial nanomechanics in vascular diseases - an ex vivo AFM nanoindentation study

Marta Targosz-Korecka[a], Magdalena Jaglarz[a], Katarzyna Małek-Ziętek[a], Stefan Chłopicki[b], Marek Szymoński[a]

[a]Department of Physics of Nanostructures and Nanotechnology, Faculty of Physics, Astronomy and Applied Computer Science, Jagiellonian University, Poland; [b]Jagiellonian Centre for Experimental Therapeutics, JCET, Jagiellonian University; 2 Chair of Pharmacology, Jagiellonian University Medical College)

O6: Red blood cell Aggregation

Chairs: Dong-Guk Paeng, Norbert Nemeth

O6-1 Alterations in RBC aggregation during incubation in glucose solution

Alicja Szołna-Chodór, Paulina Grychtal, Bronisław Grzegorzewski

Biophysics Department, Collegium Medicum in Bydgoszcz, Nicolaus Copernicus University, Poland

O6-2 Numerical study of red blood cell aggregation kinetics under sinusoidal pulsatile flow

CheongAh Lee, Soohong Min, Minho Lee, Dong-Guk Paeng

Jeju National University, South Korea

O6-3 Structure and stability of red blood cell aggregates in model flows

Thomas Podgorski[a], François Yaya[a] , Gwennou Coupier[a], Daniel Flormann[b], Christian Wagner[b]

[a]CNRS – LIPhy, France; [b]Universität des Saarlandes, Germany

O6-4 Covalent immobilization of biomolecules on stent materials through mussel adhesive protein coating to promote cell adhesion

Yi Wang, Hualin Lan, Tieying Yin, Yazhou Wang, Guixue Wang

Key Laboratory for Biorheological Science and Technology of Ministry of Education, State and Local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University

O6-5 The changes of vascular mechanical properties of porcine coronary artery after stent implantation

Yinping Zhao, Lili Tan, Xiaojuan Zhang, Juhui Qiu, Guixue Wang

Key Laboratory for Biorheological Science and Technology of Ministry of Education, State and Local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University

Thursday, July 5

9:00–10:00 **ISCH Plenary Lecture (L5)**
Sehyun Shin: Advances in Platelet Assay: Microfluidics to Clinics

10:00–10:30 **Coffee Break**

10:30–12:00 **Symposia S19–S23**

S19: Interaction of blood cells / tissue engineering

Chairs: F. Jung, A. Blocki

S19-1 Long-term prognosis of coronary microvascular dysfunction
Remzi Anadol, Tommaso Gori
Center of Cardiology, Cardiology I, University hospital Mainz and German Center of Cardiovascular Research (DZHK), Mainz, Germany

S19-2 AD-MSCs change their morphology and secretion profile as a response to changes in substrates' elastic properties in combination with inflammatory stimuli.
M. Papagrigorakes[a,b], N. Chirico[a], A. Blocki[a,c], A. Neffe[a], F. Jung[a,c], N. Ma[a,d], A. Lendlein[a,b,c]
[a]Institute of Biomaterial Science, Helmholtz-Zentrum Geesthacht, Teltow, Germany; [b]University of Potsdam, Potsdam, Germany; [c]Berlin-Brandenburg Center for Regenerative Therapies (BCRT), Charité, Universitätsmedizin Berlin and Helmholtz-Zentrum Geesthacht, Teltow, Germany; [d]Institute of Chemistry and Biochemistry, Freie Universität Berlin, Takustraße 3, 14195 Berlin, Germany

S19-3 Thrombogenicity testing of polymers: round-robin study to assess inter-center variability
Steffen Braune[a], Claudia Sperling[b], Manfred F. Maitz[b], Ulrich Steinseifer[c], Johanna Clauser[c], Bernhard Hiebl[d], Stefanie Krajewski[e], Hans P. Wendel[e], Friedrich Jung[a]
[a]Helmholtz-Zentrum Geesthacht und Berlin-Brandenburger Centrum für Regenerative Therapien, Germany ; [b]Max Bergmann Center of Biomaterials Dresden, Leibniz Institute of Polymer Research Dresden, Germany; [c]Department of Cardiovascular Engineering, Institute of Applied Medical Engineering Helmholtz-Institute, RWTH Aachen University, Germany; [d]Institute for Animal Hygiene, Animal Welfare and Farm Animal Behaviour, University of Veterinary Medicine Hannover, Foundation, Germany; [e]Department of Thoracic and Cardiovascular Surgery, University Medical Center Tübingen, Germany

S19-4 The controversial origin of pericytes - implications for cell-based therapies
Anna Blocki[a], Sebastian Beyer[a], Friedrich Jung[b], Michael Raghunath[c]
[a]Institute for Tissue Engineering and Regenerative Medicine & School of Biomedical Sciences, Faculty of Medicine, Chinese University of Hong Kong, China; [b]Institute for Clinical Hemostasiology and Transfusion Medicine, University Saarland, Germany; [c]Institute of Chemistry and Biotechnology, Zurich University of Applied Sciences, Switerland

S19-5 A facile way to achieve biomimetic laminin networks on substrates
Thanga Bhuvanesh, Rainhard Machatschek, Burkhard Schulz, Yan Nie, Nan Ma, Andreas Lendlein
Institute of Biomaterial Research, Helmholtz-Zentrum Geesthacht, 14513 Teltow, Germany

S19-6 Medical compression stockings reduce hypertension of nailfold capillaries at the toe of patients with chronic venous insufficiency
Michael Jünger, Anja Oelert, Manuela Kittel, Hermann Haase, Martin Hahn
University Dermatology Clinic, University-Medicine, 17489 Greifswald, Germany

S20: Flow Visualization of Cardiovascular Devices

Chairs: Keefe Manning, Ajit Yoganathan

S20-1 Visualization of Cardiac Flows: In Vitro, In Vivo, and In Silico Studies

Immanuel David Madukauwa-David[a], Vrishank Raghav[b], Prem A. Midha[c], Vahid Sadri[d], Phillip Trusty[d], Zhenglun Wei[d], Ajit Yoganathan[d]

[a]George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, USA; [b]Department of Aerospace Engineering, Auburn University, USA; [c]Biomedical Engineering Practice, Exponent Inc., USA; [d]Wallace H. Coulter Department of Biomedical Engineering, Georgia Institute of Technology & Emory University, USA

S20-2 On the effective visualization of aortic sinus flows: Eulerian vs Lagrangian schemes

Hoda Hatoum, Lakshmi Dasi

The Ohio State University, USA

S20-3 Leveraging Fluid Dynamic Measurements to Improve Cardiac Device Design

Keefe Manning

The Pennsylvania State University, USA

S20-4 Hemodynamics Assessment of New Transcatheter Bi-Caval Valves in the Interventional Treatment of Tricuspid Regurgitation

Munirah Binte Ismail, Foad Kabinejadian, Yen Ngoc Nguyen, Hwa Liang Leo

National University of Singapore, Singapore

S21: Macro- and microrheological blood characteristics under physiological and pathological conditions

Chairs: Nadia Antonova, Eugene V. Roitman

S21-1 Analysis of the cutaneous blood flow responses and microvascular tone regulation in patients with type 2 diabetes mellitus. Relationship to rheological properties of blood

Nadia Antonova[a], Vasilka Paskova[a], Irena Velcheva[b], Nino Chaushev[b], Sergey Podtaev[c], Kirill Tsiberkin[d]

[a]Institute of Mechanics to the Bulgarian Academy of Sciences, Bulgaria; [b]University Hospital of Neurology and Psychiatry "St. Naum, Bulgaria; [c]Perm State University, Russia; [d]Institute of Continuous Media Mechanics UB RAS, Russia

S21-2 Relationship between rheological properties of blood and leukocyte adhesion under flow conditions in patients with type 2 diabetes mellitus

Anika Aleksandrova[a], Nadia Antonova[a], Alexei Muravyov[b], Ekaterina Uzikova[b]

[a] Department of Biomechanics, Institute of Mechanics, Bulgarian Academy of Sciences, Bulgaria

[b] Departmet of Medicine and Biology, State Pedagogical University, Russia

S21-3 Hemorheological disturbances as the thrombosis-developing factor

Eugene Roitman[a], Alla Shabalina[a], Marine Tanashyan[b], Irina Kolesnikova[b]

[a]Pirogov Russian National Research Medical University, Russia; [b]Research Center of Neurology, Russia

S21-4 Gender-linked hemorheologic features in patients during and after acute stroke

Alla Shabalina

Pirogov Russian National Research Medical University, Russia

S21-5 Local carotid stiffness in patients with cerebral small vessel disease. Relation to blood viscosity
Irena Velcheva[a], Nadia Antonova[b], Tsocho Kmetski[a], Galina Tsonevska[a], Anika Alexandrova[b]
[a]Department of Neurology, Univerity Hospital, Bulgaria; [b]Department Biomechanics, Institute of Mechanics, Bulgarian Academy of Sciences, Bulgaria

S22: The Glycocalyx – Its Role in Disease

Chairs: John Tarbell, Hans Vink

S22-1 Role of the Glycocalyx in Atheroprotective vs. Atheropermissive Endothelium Function
Eno Ebong, Ian Harding, Solomon Mensah, Ming Cheng, Ronodeep Mitra
Northeastern University, USA

S22-2 Loss of the Retinal Endothelial Glycocalyx in Diabetes
Norman R. Harris, Wendy Leskova, Haley Peace, Patsy R. Carter, Randa Eshaq
Louisiana State University Health Sciences Center, USA

S22-3 Endothelial glycocalyx restoration by growth factors in diabetic kidney disease
Karen Onions, Sara Desideri, Nicola Buckner, Monica Gamez , Gavin Welsh, Andrew Salmon, Simon Satchell, Rebecca Foster
University of Bristol, United Kingdom

S22-4 Modification of renal macrophage signalling via MCP-1 inhibition reduces albuminuria in diabetic nephropathy
Bernard van den Berg[a], Margien Boels[a] , Angela Koudijs[a] ,Cristina Avramut[a] , Wendy Sol[a] Annemarie van Oeveren-Rietdijk[a] , Hetty de Boer[a] , Cees van Kooten[a] , Dirk Eulberg[b], Johan Van der Vlag[c,] Daphne IJpelaar[a], Ton Rabelink[a]
[a]LUMC/Internal Medicine-Division of Nephrology, France ; [b]NOXXON Pharma AG, France; [c]Radboud University Medical Center / Dept of Nephrology, France

S23: Special Symposium to Celebrate the Centennial of Distinguished Professor Yuan-Cheng B. Fung - 2

Chairs: Linhong Deng, Li Yang

S23-1 Investigation on energy characteristic of red blood cell deformability: a quantitative analysis of extending and retracting curves based on Atomic Force Microscopy
Dong Chen, Xiang Wang
Chongqing University, China

S23-2 Research on non-Newtonian shear thinning suspension for standard viscosity fluid of blood
Ruofeng Wang
Chongqing University, China

S23-3 Nitric Oxide Regulates Human Erythrocyte Deformability through regulating Band 3 Phosphorylation Status in Hypoxia
Yajin Zhao , Xiang Wang
Chongqing University, China

12:00–13:00 **Lunch Break**

13:00–14:00 **FAHRAEUS GOLD MEDAL AWARD**
Ceremony and Lecture (L6)

Laudatio: **Nadia Antonova**
Lecture: **Carlota Saldanha:** Multifunctional life of erythrocyte

14:15–15:45 **Symposia S24–S26, Free Communications O7-O8**

S24: Clinical Studies in Hemorheology

Chairs: Byoung K. Lee, KyuChang Won

S24-1 The role of hemorheologic changes in diabetic microvascular complications
Jun Sung Moon, Kyu Chang
Division of Endocrinology and Metabolism, Department of Internal Medicine, Yeungnam University College of Medicine, South Korea

S24-2 RBC abnormalities presented with clinical diagnostic variables in sepsis
Choon Hak Lim[a], Jung Min Youn[b], Eun Gi Ko[a]
[a]Department of Anesthsiology and Pain Medicine, Korea University Medical Center, South Korea
[b]Korea University Medical School, South Korea

S24-3 Decrease myocardial perfusion associated with hemorheologic parameters in patients with type 2 Diabetes.
Byoung Kwon Lee[a], Minhee Cho[a], Sehyun Shin[b]
[a]Gangnam Severance Hospital, Department of Internal Medicine, Yonsei University Medical College, South Korea; [b]School of Mechanical Engineering, Korea University, South Korea

S24-4 Erythrocyte aggregation and deformability as factors determining capillary blood flow in patients with arterial hypertension
Andrei Lugovtsov[a], Alexey Semenov[b], Yuri Gurfinkel[c], Petr Ermolinskiy[b], Anastasiya Maslyanitsina[b], Nikita Povalyaev[c], Larisa Dyachuk[c], Elena Pavlikova[c], Alexander Priezzhev[b]
[a]International Laser Center of M.V. Lomonosov Moscow State University, Russia; [b]Department of Physics of M.V. Lomonosov Moscow State University, Russia; [c]Medical Research and Education Center of M.V. Lomonosov Moscow State University, Russia

S25: Clinical Microcirculation

Chairs: D.A. Clevert, I. Wiesinger

S25-1 Postoperative control of vascularized lymph node transfer (VLNT) for the treatment of extremity lymphedema: Ultrasound guided lymph node monitoring using contrast enhanced ultrasound (CEUS)
T. Aung[1], C. Taeger[1], S. Geis[1], A. Kehrer[1], L. Prantl[1], E.M. Jung[2]
[1]Department of Plastic, Hand and reconstructive Surgery, University Medical Center Regensburg, Germany; [2]Department of Radiology, University Medical Center Regensburg, Germany

S25-2 The Use of Indocyanine green (ICG) imaging technique in the groin lymphocele microsurgical resection

M. Ranieri[a], C.D. Taeger[a] , S. Geis[a], S. Klein[a], P. Lamby[a], D. Schiltz[a], K. Pfister[b], L. Prantl[a], V. Hoesl[b], T. Aung[a*]
[a]Department of Plastic, Hand and reconstructive Surgery, University Medical Center Regensburg, Germany; [b]Department of Vascular Surgery, University Medical Center Regensburg, Germany

S25-3 Significance of high-resolution Color-Duplex-Ultrasound (CDU) designing adipocutaneous, fasciocutaneous and chimeric perforator flaps
A. Kehrer, S. Geis, C. Taeger, N. Platz Batista da Silva, E.M. Jung, L. Prantl, V. Mandlik
Regensburg, Germany

S25-4 Influence of systemic vasopressor drugs and fluid administration on microcirculation in free tissue transfer
A. M. Anker, L. Prantl, C. Strauss, V. Brébant, S. M. Klein
Regensburg, Germany

S25-5 ICG-fluorescence-angiography– a new indication in revascularized digits and toes
C. Strauss, A. Anker, L. Prantl, N. Heine, C. Wenzel, S. Geis, T. Aung, V. Brébant
Regensburg, Germany

S25-6 ICG-fluorescence-angiography in revascularized digits – first results of a standarized clinical study
C. Strauss, A. Anker, V. Brébant, L. Prantl, D. Schiltz, R. Kemper, S. Geis, T. Aung
Regensburg, Germany

S26: Red blood cell nitric oxide/rheology

Chairs: Michael Simmonds, Philippe Connes

S26-1 Nitric oxide synthase activity at various levels and durations of shear stress
Michael Simmonds
Griffith University, Australia

S26-2 Erythrocyte nitric oxide dependent of acetylcholinesterase receptor
Carlota Saldanha, Ana Silva–Herdade
Institute of Biochemistry, Institute of Molecular Medicine, Faculty of Medicine, University of Lisbon, Portugal

S26-3 Hydroxyurea therapy modulates sickle cell anemia red blood cell physiology by acting as a nitric oxide donor: impact on RBC deformability, oxidative stress and nitric oxide synthase activity
Elie Nader[a], Marijke Grau[b], Romain Fort[c], Nicolas Guillot[d], Cyril Martin[a], Giovanna Cannas[e], Solène Poutrel[e], Arnaud Hot[e], Alexandra Gauthier[f], Wilhelm Bloch[b], Marc Romana[g], Philippe Connes[a]
[a]Laboratoire LIBM, Université Claude Bernard Lyon 1, France; [b]Molecular and Cellular Sport Medicine, Deutsche Sporthochschule Köln, Germany; [c]Service de Médecine Interne, Hôpital Edouard Herriot, Hospices Civils de Lyon, France; [d]Laboratoire Carmen Inserm 1060, Université Claude Bernard Lyon 1, France; [e]Service de Médecine Interne, Hôpital Edouard Herriot, Hospices Civils de Lyon, France; [f]Institut d'hématologie et d'oncologie pédiatrique - Hospices Civils de Lyon, Lyon, France; [g]UMR Inserm 1134, Hôpital Ricou, Centre Hospitalier Universitaire, Pointe-à-Pitre, France

S26-4 The multifaceted role of nitrite and the epigenetic nitric oxide donor, RRx-001 on erythrocyte deformability
Selma Cırrık[a] , Ozlem Yalcin[b]

[a]*Ordu University, Faculty of Medicine, Department of Physiology, Turkey*; [b]*Koc University, School of Medicine, Department of Physiology, Turkey*

O7: Disease and Hemorheology

Chairs: Gerard Nash, Sajad Ahmadizad

O7-1 Do changes in bone marrow pressure contribute to the egress of cells (RBC, reticul.) from bone marrow?

Zbigniew Dąbrowski[a], Anna Marchewka[a], Aneta Teległów[a], Maria Fornal[b]
[a]*Academy of the Physical Education in Cracow, Poland;* [b]*Jagiellonian University, Coll. Med. Dept. of Internal Med. Gerontol., Poland*

O7-2 Platelet-derived extracellular vesicles promote the adhesion of flowing neutrophils to endothelial cells

Sahithi Kuravi[a], Paul Harrison[b], G.Ed Rainger[a], Gerard Nash[a]
[a]*Institute of Cardiovascular Sciences, College of Medical and Dental Sciences, University of Birmingham, United Kingdom;* [b]*Institute of Inflammation and Ageing, College of Medical and Dental Sciences, University of Birmingham, United Kingdom*

O7-3 Morphological and Metabolic Abnormalities of Erythrocytes as Risk Factors for Alzheimer's Disease

Francesco Misiti[a], Marco Girasole[b], Simone Dinarelli[b]
[a] *Human, Social and Health Department, University of Cassino and Lazio Meridionale, Italy;*
[b]*Institute for the Structure of the Matter (ISM), National Research Council (CNR), Italy*

O7-4 Effects of two different high intensity interval training protocols on hemorheological variables in hypertensive patients

Sajad Ahmadizad, Mohammad Soltani, Neda Aghaei Bahmanbeglou,
Department of Biological Sciences in Sport and Health, Faculty of Sports Sciences and Health, Shahid Beheshti University, Islamic Republic of Iran

O7-5 Sedentarity status as a regulator of the optimal hematocrit : involvement of red cell deformability?

Jean-Frederic Brun[a], Emmanuelle Varlet-Marie[b], Bénédicte Marion[b], Céline Roques[b], Marlène Richou[a], Eric Raynaud de Mauverger[a]
[a]*U1046 INSERM, UMR 9214 CNRS Physiopathologie & Médecine Expérimentale du Cœur et des Muscles - PHYMEDEXP , Unité d'Explorations Métaboliques (CERAMM), Université de Montpellier, Département de Physiologie Clinique, Hôpital Lapeyronie CHRU Montpellier, France*
[b]*Institut des Biomolécules Max Mousseron (IBMM) UMR CNRS 5247, Université de Montpellier, Ecole Nationale Supérieure de Chimie de Montpellier, France*

O7-6 The effects of n-6 polyunsaturated free fatty acids dietary intake on hemorheology and endothelium-dependent microvascular function

Ines Drenjančević
Faculty of Medicine Osijek, University of Osijek and Croatian National Scientific Center of Excellence for Personalized Health Care Josip Juraj Strosssmayer University of Osijek, Croatia

O8: Biorheology and Biotechnology-1

Chair: Guixue Wang

O8-1 Fabrication of Gradient Nanofibrous Scaffold for Interface Tissue Engineering

Li Yang, Peixing Chen, Yu Zhang,
Chongqing University, China

O8-2 Tanshinone Can Inhibit Inflammation and Angiogenesis in Several Chondrocytic Cells
Li Yang, Yu Zhang, Peixing Chen
Base for Innovation and Talents Recruiting of Biomechanics and Tissue Repairing Engineering, Chongqing University, Chongqing 400044, China; Key Laboratory of Biorheological Sciences and Technologies (MOE), College of Bioengineering, Chongqing, China

O8-3 The Preliminary Research of Mechanical Compress Damage on Neurons Induced by Hematoma
Wei Wang, Yin Yin, Jun Wang, Tieying Yin, Yazhou Wang, Guixue Wang
Key Laboratory for Biorheological Science and Technology of Ministry of Education, State and Local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University, Chongqing, 400030, China

O8-4 Hemodynamic Analysis of Cerebral Aneurysms: Suggestions for Surgical Options
Shicheng He
Key Laboratory for Biorheological Science and Technology of Ministry of Education, State and Local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University, China

O8-5 Development History, Progress and Future Prospects of Biorheology and Biomechanics in Chongqing University
Wang Guixue
Key Laboratory for Biorheological Science and Technology of Ministry of Education, State and local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University, Chongqing 400030, China

O8-6 Zebrafish caudal vein formation is flow sheer stress dependent
Lin Wen
Key Laboratory for Biorheological Science and Technology of Ministry of Education, State and Local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University, Chongqing 400030, China

16:00–16:45 **Society Business Meetings**

16:45–17:30 **ISCH-ESCH-ISB Combined Business Meeting**

17:30–20:00
Tour to Wieliczka Salt Mine

20:00 - 22:00
Banquet

Friday, July 6

9:00–10:00 **Plenary Lectures in tribute to Prof. Oguz Baskurt (L7)**
Özlem Yalçın: Blood Rheology as a Determinant of Blood Flow: Physiological and Clinical Aspects
Jon Detterich: Red blood cell rheology and nitric oxide production: a scientist on the forefront

10:00–10:30 **Coffee Break**

10:30–12:00 **Symposia S27–S29, Free Communications O9**

S27: Cell mechanics and cell mechanobiology - 2

Chairs: Toshiro Ohashi, Susumu Kudo

S27-1 Effect of Local Tensile Stress Field on Bone Matrix and Cell Alignment: an *In Vitro* Study
Taiji Adachi, Kei-ichi Ishikawa, Junko Sunaga, and Yoshitaka Kameo
[a]*Institute for Frontier Life and Medical Sciences, Kyoto University, Japan;* [b]*Department of Micro Engineering, Graduate School of Engineering, Kyoto University, Japan*

S27-2 Blood vessel on a chip - 3D vs. 2D
Yukiko Matsunaga
The University of Tokyo, Japan

S27-3 Mechanotargeting of nanoparticles to atherogenic endothelium
Pouria Fattahi, Sulin Zhang, Justin Brown, Yin-Ting Yeh, Peter Butler
The Pennsylvania State University, USA

S27-4 The roles of vessel pulsation and dilation in clearing extracellular waste from the brain
Ravi Kedarasetti, Bruce Gluckman, Patrick Drew, Francesco Costanzo
The Pennsylvania State University, USA

S28: Rheology and microstructure of cellular blood flow

Chairs: Masako Sugihara-Seki, Ken-ichi Tsubota

S28-1 Effect of internal viscosity on suspension rheology of red blood cells
Naoki Takeishi[a], Marco Rosti[b], Yohsuke Imai[a], Shigeo Wada[a], Luca Brandt[b]
[a]*Osaka University, Japan*
[b]*Linne Flow Centre and SeRC, KTH, Sweden*

S28-2 Hemolytic behavior of human red blood cells caused by osmotic pressure difference - Visualization of hemoglobin behavior by use of light absorption characteristics
Ryoko OTOMO, Akihito MORITA, Kiyoshi BANDO
Kansai University, Japan

S28-3 Effects of red blood cells on blood flow in micro vessel network: in vitro experiment and computer simulation
Ken-ichi Tsubota, Yuya Kodama, Ryoma Kanai
Chiba University, Japan

S28-4 Capillary flow imaging with genetically-engineered red blood cells in the living animal brains
Yuika Kurihara, Takuma Sugashi, Kazuto Masamoto
University of Electro-Communications, Tokyo, Japan

S28-5 Fluid dynamical study of preferential distributions of blood cell components in microchannel flows
Masako Sugihara-Seki, Nozomi Takinouchi, Tenki Onozawa, Junji Seki
Kansai University, Japan

S29: Role of gasotransmitters (NO, CO and H_2S) in blood cell functions and the molecular mechanisms of their microrheology alterations

Chairs: Carlota Saldanha, Eugene Roitman

S29-1 Leukocytes as a link between inflammation and erythrocyte nitric oxide
Ana Silva-Herdade, Carlota Saldanha
Institute of Biochemistry, Institute of Molecular Medicine, Faculty of Medicine University of Lisbon, Portugal

S29-2 Contribution of fibrinogen to erythrocyte scavenger nitric oxide
Carlota Saldanha
Institute of Biochemistry, Institute of Molecular Medicine, Faculty of Medicine, University of Lisbon, Portugal

S29-3 Role of nitrogen oxide and hydrogen sulfide as signaling molecules in the change of the red blood cell microrheology in patients with type 2 diabetes mellitus
Svetlana Bulaeva, Alexei Muravyov, Irina Tikhomirova, Pavel Avdonin
Yaroslavl State Pedagogical University named after K.D. Ushinsky, Russia

S29-4 Change of microrheological characteristics of erythrocytes under the influence of donors of gasotransmitters NO and H_2S: in vitro study
Yulia Malysheva, Alexei Muravyov
Yaroslavl State Pedagogical University named after K.D. Ushinsky, Russia

O9: Biorheology and Biotechnology-2

Chair: Jinxuan Wang

O9-1 Proteomic analysis of ApoE-/- mice with disturbed flow model
Li Tianhan, Wang Guixue
Key Laboratory for Biorheological Science and Technology of Ministry of Education, State and local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University, Chongqing 400030, China

O9-2 Effects of suspension state on the biological behavior of breast cancer cells
Yonggang Lv, Xiaomei Zhang, Ying Zhang, Ya Wang
Chongqing University, China

O9-3 Preliminary study of endothelial cell tight junction protein in response to different mechanical stimuli
Yazhou Wang, Desha Luo, Tieying Yin, Guixue Wang
Key Laboratory for Biorheological Science and Technology of Ministry of Education, State and Local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University, China

O9-4 PI3K-nos2b Signaling is Crucial for Simulated Microgravity-mediated angiogenesis in Zebrafish CVP Network
Daoxi Lei, Guixue Wang
Bioengineering College of Chongqing University, China

12:00–13:00 **Lunch Break**

13:00–14:30 **Symposia S30–S32**

S30: From Rheology to Microcirculation: New Insights

Chairs: Gregorio Caimi, Antonio Colantuoni

S30-1 Red blood cell rheology under different pathological conditions
Patrizia Caprari, Carlotta Bozzi, Sara Massimi, Loretta Diana Istituto Superiore di Sanità,
National Centre for the Control and Evaluation of Medicine, Italy

S30-2 Role of hemorheological alterations in skin ulcers
Rosalia Lo Presti, Patrizia Caprari, Gregorio Caimi
University of Palermo, Italy

S30-3 Hemorheology in kidney disease
Francesco Fontana
Surgical, Medical and Dental Department of Morphological Sciences, Section of Nephrology, University of Modena and Reggio Emilia, Italy

S30-4 Rat pial microvascular changes during brain hypoperfusion and reperfusion injury: role of antioxidant substances
Martina Di Maro, Martina Chiurazzi, Dominga Lapi, Teresa Mastantuono, Laura Battiloro, Gilda Nasti, Antonio Colantuoni
Dep Clinical Medicine and Surgery Federico II University Medical School, Italy

S30-5 Bridging the gap from basic microcirculation to the clinical world
Romeo Martini
UOC Angiologia ; Azienda Ospedaliera Universitaria di Padova, Italy

S31: Cardiovascular Biomechanics from Cells to Organs

Chairs: Noriyuki Kataoka, Ryoko Otomo

S31-1 Biorheology of bile
Minh Nguyen Ngoc[a], Hiromichi Obara[a], Kenji Shimokasa[b], Junfang Zhu[c]
[a]Mechanical Engineering Department, Tokyo Metropolitan University, Japan; [b]Faculty of Industrial Technology, National University Corporation of Tsukuba University of Technology, Japan; [c]National Institute of Advanced Industrial Science and Technology, Japan

S31-2 Electrical impedance spectroscopic technique for cancerous cell sensing by considering the extracellular fluid around cells
Daisuke Kawashima[a], Songshi Li[a], Michiko Sugawara[a], Hiromichi Obara[b], Masahiro Takei[a]
[a]Chiba University, Japan; [b]Tokyo Metropolitan University, Japan

S31-3 Matrix metalloprotease production of vascular endothelial cells under extremely high wall shear stress condition
Naoya Sakamoto[a], Yuki Oyama[a], Yuta Horie[a], Masanori Nakamura[b], Naoyuki Kimura[c]

[a]*Tokyo Metropolitan University, Japan;* [b]*Nagoya Institute of Technology;* [c]*Jichi Medical University Saitama Medical Center*

S31-4 Observation of microscopic elastic structure in arterial tissue by use of a scanning haptic microscope (SHM)
Takeshi Moriwaki[a], Sadao Omata[b], Yasuhide Nakayama[c]
[a]*Hirosaki University, Japan*
[b]*CYBERDYNE, INC., Japan*
[c]*National Cerebral and Cardiovascular Center Research Institute, Japan*

S31-5 Ultrafast imaging of cell elasticity with optical microelastography
Guy Cloutier[a] , Grasland-Mongrain[a], Ali Zorgani[b], Shoma Nakagawa[a], Simon Bernard[a], Lia Gomes Paim[a], Greg FitzHarris[a], Stefan Catheline[b]
[a]*University of Montreal Hospital Research Center, Canada;* [b]*INSERM, France*

S32: Computational Models of Thrombosis

Chairs: Keefe Manning, Shawn Shadden

S32-1 The contact activation system in device-related thrombosis modeling
Rodrigo Méndez Rojano, Simon Mendez, Franck Nicoud
IMAG, CNRS / Uniiversity Montpellier, France

S32-2 Development of a Device-Induced Computational Thrombosis Model
Keefe Manning
The Pennsylvania State University, USA

S32-3 Reduced-order computational modeling of thrombogenic potential in large arteries
Kirk Hansen, Shawn Shadden
University Berkeley, USA

S32-4 Ferric iron, lipopolysaccharide and lipoteichoic acids can induce anomalous fibrin amyloid formation: an assessment with novel amytracker™ stains and thioflavin T
Martin Page[a], Douglas Kell[b], Etheresia Pretorius[a]
[a]*Stellenbosch University, South Africa;* [b]*University of Manchester, United Kingdom*

14:30–15:30 CLOSING SESSION

POSTERS

P1 Effects of hypertrophy and strength weight training on resting levels and responses of hemorheological parameters to a single session of exercise

Fatholah Havil[a,b] , Afshar Jafari[a,c] , Sajad Ahmadizad[c] , Saeed Nikoukheslat[a]
[a]*Faculty of Sports Sciences, Tabriz University, Iran;* [b]*Department of Physical Education, Faculty of Imam Ali, Safadasht Branch, Technical and Vocational University, Iran;* [c]*Department of Biological Sciences in Sport and Health, Faculty of Sports Sciences and Health, Shahid Beheshti University, Iran*

P2 Modulation of Erythrocyte Mechanical Function by Calcium-calmodulin-protein kinase C

Ali Cenk AKSU[a,b], Yasemin AKSU[b] , Dilan ATAR[b] Zeynep Busra Kısakurek[b] Elif Ugurel[b], Ozlem Yalcin[b]
[a]*Graduate School of Health Sciences, Turkey;* [b]*Koç Universit, Turkey*

P3 Clinical relevance of hemodynamic viscosity measurement in vascular study

Tilly Alexandre
PISCO, France

P4 Analysis of seismocardiographic signals by the discrete Chebyshev transform

Mikhail Basarab , Natalya Konnova
Bauman Moscow State Technical University, Russian Federation

P5 Fetal growth retardation and oxygen delivery hemorheological predictors in hypertensive vs normotensive pregnant women

Jean-Frederic Brun[a,b] Emmanuelle Varlet-Marie[c], Pierre Boulot[d], Bénédicte Marion[d], Céline Roques[d,] Eric Raynaud de Mauverger[a]
[a]*U1046 INSERM, UMR 9214 CNRS, Physiopathologie & Médecine Expérimentale du Cœur et des Muscles - PHYMEDEXP, Unité d'Explorations Métaboliques (CERAMM), Université de Montpellier;* [b]*Département de Physiologie Clinique, Hôpital Lapeyronie CHRU Montpellier;* [c]*Institut des Biomolécules Max Mousseron (IBMM) UMR CNRS 5247, Université de Montpellier, Ecole Nationale Supérieure de Chimie de Montpellier; Laboratoire de Biophysique & Bio-Analyses, Faculté de Pharmacie, Université de Montpellier;* [d]*Institut des Biomolécules Max Mousseron (IBMM) UMR CNRS 5247, Université de Montpellier, Ecole Nationale Supérieure de Chimie de Montpellier*

P6 Leg electrical resistance predicts venous blood viscosity and hematocrit

Emmanuelle Varlet-Marie[a,b], Laurent Vachoud[c], Bénédicte Marion[a], Céline Roques[a], Marlène Richou[d], Eric Raynaud de Mauverger[e], Jean-Frederic Brun[e]
[a]*Institut des Biomolécules Max Mousseron (IBMM) UMR CNRS 5247, Université de Montpellier, Ecole Nationale Supérieure de Chimie de Montpellier;France;* [b]*Laboratoire de Biophysique & Bio-Analyses, Faculté de Pharmacie, Université de Montpellier;* [c] *Université de Montpellier, France;* [d]*U1046 INSERM, UMR 9214 CNRS, Physiopathologie & Mé (INSERM U1046), France;* [e]*U1046 INSERM, UMR 9214 CNRS, Physiopathologie & Médecine Expérimentale du Cœur et des Muscles - PHYMEDEXP, Unité d'Explorations Métaboliques (CERAMM), Université de Montpellier, Département de Physiologie Clinique, Hôpital Lapeyronie CHRU Montpellier, France*

P7 The transient hyperviscosity syndrome of labor and delivery shifts the hemorheological profile toward a lower ability to deliver oxygen to tissues.

Jean-Frédéric Brun[a], Pierre Boulot[b], Emmanuelle Varlet-Marie[c,d], Bénédicte Marion[c], Céline Roques[c], Eric Raynaud de Mauverger

[a]*U1046 INSERM, UMR 9214 CNRS, Physiopathologie & Médecine Expérimentale du Cœur et des Muscles - PHYMEDEXP , Unité d'Explorations Métaboliques (CERAMM), Université de Montpellier, Département de Physiologie Clinique, Hôpital Lapeyronie CHRU Montpellier, France;* [b] *Université de Montpellier,France;* [c]*Institut des Biomolécules Max Mousseron (IBMM) UMR CNRS 5247, Université de Montpellier, Ecole Nationale Supérieure de Chimie de Montpellier; France*
[d]*Laboratoire de Biophysique & Bio-Analyses, Faculté de Pharmacie, Université de Montpellier, France*

P8 Studies of the chemically induced changes of the mechanical properties of murine RBCs with the use of Atomic Force Microscopy (AFM)

Katarzyna Bulat[a], Jakub Dybas[a,b] , Aneta Blat[a], Mateusz Mardyla[a,c], Anna Rygula[a,b], Stefan Chłopicki[a,d], Małgorzata Baranska [a,b], Katarzyna M. Marzec [a,e]
[a]*Jagiellonian Centre for Experimental Therapeutics (JCET), Jagiellonian University, Poland;*
[b]*Faculty of Chemistry, Jagiellonian University, Poland;* [c]*Faculty of Motor Rehabilitation, University School of Physical Education,Poland;* [d]*Chair of Pharmacology, Jagiellonian University Medical College,Poland;* [e]*Center for Medical Genomics (OMICRON), Jagiellonian University Poland*

P9 Investigation on energy characteristic of red blood cell deformability: a quantitative analysis of extending and retracting curves based on Atomic force microscopy

Dong Chen, Xiang Wang
Chongqing University, China

P10 Measurement of Glycocalyx Volume: An Unreliable Biomarker.

FitzRoy Curry[a], Charles Michel[b]
[a]*University of California, Davis, USA;* [b]*Imperial College, London, United Kingdom*

P11 L-Arginine supplementation does not affect red blood cell properties during high intensity interval exercise in overweight men

Sajad Ahmadizad[a], Ali Daraei[a], Minoo Bassami[b], Hiwa Rahmani[a]
[d]*Department of Biological Sciences in Sport and Health, Faculty of Sports Sciences and Health, Shahid Beheshti University, Iran;* [b]*Faculty of Sports Sciences, Allameh Tabataba'i University, Iran*

P12 Resonance Raman spectroscopy in detection and differentiation of various hemoglobin derivatives inside packed human red blood cells

Jakub Dybas[a], Malgorzata Baranska[b], Stefan Chlopicki[a], Katarzyna M Marzec[a]
[a]*Jagiellonian Centre for Experimental Therapeutics (JCET), Jagiellonian University, Poland;*
[b]*Faculty of Chemistry, Jagiellonian University, Poland*

P13 Effects of different rehabilitation models on the elongation index of erythrocytes, study of activity of chosen erythrocyte enzymes, and the level of glutathione in elderly women

Katarzyna Filar-Mierzwa, Anna Marchewka, Zbigniew Dąbrowski, Paulina Aleksander-Szymanowicz
University of Physical Education in Cracow, Poland

P14 Effects of whole body vibration training on hemorheological blood indicators in young healthy women

Halina Gattner[a], Justyna Adamiak[b], Magdalena Kępińska[c], Anna Piotrowska[c], Olga Czerwińska-Ledwig[c], Sylwia Mętel[b], Wanda Pilch[c]
[a]*University of Physical Education in Krakow, Faculty of Physical Education and Sport, Doctoral Studies, Poland;* [b]*University of Physical Education in Krakow, Faculty of Motor Rehabilitation, Faculty of Physiotherapy, Department of Physical Medicine and Biological Renewal, Poland;*
[c]*University of Physical Education in Krakow, Faculty of Motor Rehabilitation, Faculty of Cosmetology, Department of Biochemistry and Basics of Cosmetology, Poland*

P15 Evaluation of vascular effects of photodynamic therapy in skin microcirculation using different photosensitizers

Tatyana Grishacheva, Dinara Faizullina, Nickolay Petrishchev, Irina Mikhailova
Pavlov First Saint Petersburg State Medical University, Russian Federation

P16 Analysis of Flow and Thrombus Development Within PDMS Channels of Varying Geometry
Tice Harkins, Jeremey Myslowski, Keefe Manning
The Pennsylvania State University, USA

P17 Measurement of blood viscosity by measuring flows in microfluidic channel
Hyeonji Hong , Eunseop Yeom
Pusan National University, Korea South

P18 Repeated whole body cryotherapy treatments does not cause changes in hemorheological parameters in healthy people
Magdalena Kępińska[a], Zbigniew Szyguła[b], Zbigniew Dąbrowski[c]
[a]*Department of Biochemistry and Basics of Cosmetology at the University of Physical Education in Krakow, Poland;* [b]*Department of Sports Medicine and Human Nutrition, Faculty of Physical Education and Sport, University of Physical Education, Krakow, Poland;* [c]*Department of Clinical Rehabilitation, Faculty of Motor Rehabilitation, University of Physical Education, Krakow, Poland*

P19 Correlation between certain biochemical plasma factors and rheological properties of white blood cells in stroke
Piotr Kowal
Department of Neurology, Poland

P20 Cell volume regulation via the Calcium-activated Potassium channel KCa3.1 contributes to red blood cell compliance under shear
Jan Lennart Kuck[a], Michael J. Simmonds[a,b]
[a] *Griffith University, Australia;* [b]*Biorheology Research Laboratory, Australia*

P21 Effects of rowing on rheological properties of blood
Mateusz Mardyła[a,b], Aneta Teległów[a], Zbigniew Dąbrowski[a], Jakub Marchewka[a,c], Jacek Głodzik[a,d]
[a]*University School of Physical Education, Poland;* [b]*Jagiellonian Centre for Experimental Therapeutics, Poland;* [c]*5th Military Hospital, Poland;* [d]*Małopolska Cryotherapy Centre, Poland*

P22 - Impaired Deformability of Erythrocytes in Hypertensive Rats and Patients: Investigation by Nickel Mesh Filtration Technique
Toru Maruyama[a], Keita Odashiro[a], Takehiko Fujino[b], Shiro Mawatari[c]
[a]*Kyushu University, Japan;* [b]*BOOCS Clinic, Japan;* [c]*Institute of Rheological Function of Foods, Japan*

P23 Determinants of sublethal trauma to red blood cells: effects of shear rate at standardised shear stresses
Jacob Turner, Antony McNamee Jarod Horobin, Lennart Kuck, Kieran Richardson, Michael Simmonds
Biorheology Research Laboratory, Griffith University, Australia

P24 Susceptibility to mechanical damage of density-fractionated red blood cells
Antony McNamee , Kieran Richardson, Lennart Kuck, Kai Robertson, Michael Simmonds
Biorheology Research Laboratory, Griffith University, Australia

P25 Clinical Evaluation of Laser Doppler Flowmetry for diagnosis of microcirculatory disorders

Christof Mrowietz[a], R.P. Franke[b], G. Pindur[c], R. Sternitzky[d], F. Jung[e] , U. Wolf[f]

[a]ITTN, University of Veterinary Medicine, Hannover, Germany, [b]Central Institute for Biomedical Engineering, University Ulm, Germany, [c]Institute for Clin. Hemostasiol. and Transf. Medicine, University Saarland, Germany, [d]Praxisklinik Herz und Gefäße, Dresden, and BTU, Cottbus-Senftenberg, Germany,[e]Institute of Biomaterial Science and BCRT, HZG, Teltow, Germany, [f]University of Applied Science Fulda, Germany

P26 Erythrocytes aggregation index correlate with oxidative stress and hydrogen sulfide plasma concentration in diabetes mellitus

Agata Pietrzycka[a], Katarzyna Krzanowska[b], Przemysław Miarka[b], Władysław Sułowicz[b], Marcin Krzanowski[b]

[a]Department of Pharmacobiology, Jagiellonian University, Medical College, Poland; [b]Chair and Department of Nephrology, Jagiellonian University, Medical College, Poland

P27 Effects of carboxylated multiwall carbon nanotubes on erythrocytes stability and functionality

Mateusz Przetocki[a], Józef Korecki[a], Grzegorz Gajos[b], Leszek Stobiński[c], Krzysztof Matlak[a], Kvetoslava Burda[a]

[a]Faculty of Physics and Applied Computer Science, AGH-University of Science and Technology, Poland; [b]John Paul II Hospital, Department of Coronary Disease, Poland; [c]Faculty of Chemical and Process Engineering, Warsaw University of Technology, Poland

P28 Influence of different rhythms sound wave to serotonin concentration in rats hippocampus

Yang Ren , Zhidan Deng, Xiang Wang

BME Department of Chongqing University, China

P29 Physical properties of erythrocytes improve in hemochromatosis patients with repeated venesection therapy

Kieran Richardson, Antony McNamee, Michael Simmonds

Griffith University/ Biorheology Research Laboratory, Australia

P30 Experimental Characterization of the Embolus Trapping Efficiency of the U.S. FDA Generic Inferior Vena Cava Filter

Joshua Riley[a], Nicole Price[a], Brent Craven[b], Kenneth Aycock[b], Keefe Manning[a]

[a]Department of Biomedical Engineering, The Pennsylvania State University, USA; [b]Division of Applied Mechanics, Office of Science and Engineering Laboratories, Center for Devices and Radiological Health, U.S. Food and Drug Administration, USA

P31 Effects of pentoxifylline on hemodynamic and hemorheological parameters in SHRs during arterial hypertension development

Alexander Shamanaev, Oleg Aliev, Anastasia Sidekhmenova, Anna Anischenko, Mark Plotnikov

Goldberg Research Institute of Pharmacology and Regenerative Medicine, Tomsk National Research Medical Center, Russian Academy of Sciences, Russian Federation

P32 Effect of cholesterol-rich diet on hematological and hemorheological parameters in rabbits

Bence Tanczos[a], Viktoria Somogyi[a], Mariann Bombicz[b], Bela Juhasz[b], Norbert Nemeth[a], Adam Deak[a]

[a]Department of Operative Techniques and Surgical Research, Faculty of Medicine, University of Debrecen, Hungary; [b]Department of Pharmacology and Pharmacotherapy, Faculty of Medicine, University of Debrecen, Hungary

P33 Changes in biochemical properties of the blood in winter swimmers

Aneta Teległów[a], Jakub Marchewka[a], Anna Marchewka[a], Zbigniew Dąbrowski[a], Bartłomiej Ptaszek[b], Mateusz Mardyła[a]

[a]University of Physical Education, Poland; [b]Malopolska Cryotherapy Centre, Poland

P34 The paraclinical evolution in diabetic hypertensive patients with increased abdominal circumference

Cornel Cezar Tudorica[a], Ana Maria Vintila[a], Stefan Dragos Tudorica[b], Mirela Gherghe[c]
[a]*Coltea Clinical Hospital, Romania;* [b]*University Hospital, Romania;* [c]*Fundeni Hospital, Romania*

P35 Alterations of red blood cell deformability and mechanical stability by heat-treatment on animal blood samples

Gabor Varga, Adam Attila Matrai, Balazs Szabo, Viktoria Somogyi, Barbara Barath, Bence Tanczos, Norbert Nemeth
Department of Operative Techniques and Surgical Research, Faculty of Medicine, University of Debrecen, Hungary

P36 Shear-dependency of the predicted ideal hematocrit

Emmanuelle Varlet-Marie[a,b], Laurent Vachoud[c], Bénédicte Marion[a], Céline Roques[a], Marlène Richou[d], Eric Raynaud de Mauverger[d], Jean-Frederic Brun[d]
[a]*Institut des Biomolécules Max Mousseron (IBMM) UMR CNRS 5247, Université de Montpellier Ecole Nationale Supérieure de Chimie de Montpellier, France;* [b]*Laboratoire de Biophysique & Bio-Analyses, Faculté de Pharmacie, Université de Montpellier, France;* [c]*Université de Montpellier, France;* [d]*U1046 INSERM, UMR 9214 CNRS Physiopathologie & Médecine Expérimentale du Cœur et des Muscles - PHYMEDEXP, Unité d'Explorations Métaboliques (CERAMM), Université de Montpellier, Département de Physiologie Clinique, Hôpital Lapeyronie CHRU Montpellier, France*