Joint Meeting of
The European Society for Clinical Hemorheology and Microcirculation
The International Society for Clinical Hemorheology
The International Society of Biorheology

July 2-6
2018

Cracow
Poland

Organized by:
Jagiellonian University
Jagiellonian University Medical College
Polish Society for Clinical Hemorheology and Microcirculation
Nothing Twice

Nothing can ever happen twice.
In consequence, the sorry fact is
that we arrive here improvised
and leave without the chance to practice.

Even if there is no one dumber,
if you’re the planet’s biggest dunce,
you can’t repeat the class in summer:
this course is only offered once.

No day copies yesterday,
no two nights will teach what bliss is
in precisely the same way,
with precisely the same kisses.

One day, perhaps some idle tongue
mentsions your name by accident:
I feel as if a rose were flung
into the room, all hue and scent.

The next day, though you’re here with me,
I can’t help looking at the clock:
A rose? A rose? What could that be?
It’s a flower or a rock?

Why do we treat the fleeting day
with so much needless fear and sorrow?
It’s in its nature not to stay:
Today is always gone tomorrow.

With smiles and kisses, we prefer
to seek accord beneath our star,
although we’re different (we concur)
just as two drops of water are.

Wislawa Szymborska (1923-2012) was
a Polish poet whose work was widely
translated into English. In 1996, she was
awarded the Nobel Prize in Literature.
Dear Participants,

It is our great pleasure to welcome you to Krakow, to the Joint Conference of Three Societies: The European Society for Clinical Hemorheology and Microcirculation, The International Society for Clinical Hemorheology and The International Society of Biorheology (ESCHM+ISCH+ISB), July 2-6, 2018, Krakow, Poland.

The Conference aims to cover a broad spectrum of topics in bio- and hemo-rheology, from both basic science and clinical investigations points of view. It also aims at providing opportunities for intense interaction of young researchers with the established experts in the field. We think there will be many occasions for such interactions through the discussions during scientific sessions, as well as during social activities that will be offered, including an opening reception, a banquet and a conference tour. We hope that the scientific and social parts of our Conference will complement each other by stressing the importance of science not only as a system of knowledge but also as a school of criticism, creativity and tolerance.

The site of the Conference, the City of Krakow, is one of the most important historical, cultural and tourist centers of Poland and Central Europe. Krakow, with its alluring attractions mixed in right proportions, has it all to attract millions of tourists a year.

We wish a very fruitful time at the Conference.

Maria Fornal
Jean-Frédéric Brun
Peter Butler
Sehyun Shin
Honorary Patronage

Kraków

President of the City of Krakow
Jacek Majchrowski

Organized by

Jagiellonian University
Medical College

Polish Society for Clinical Hemorheology and Microcirculation

Scientific Committee

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Jean-Frédéric Brun France, ESCHM Chair
Peter Butler USA, ISB Chair
Brian M. Cooke Australia, ISCH
Tomasz Grodzicki Poland, Jagiellonian Univ. Med. Colleage, Rector
Sehyun Shin Korea, ISCH Chair

Committee Members

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Vayá Amparo (Spain)
Nadia Antonova (Bulgaria)
Lajos Bogar (Hungary)
Kvetoslava Burda (Poland)
Gregorio Caimi (Italy)
Tze-Wen Chung (Taiwan)
Dirk Clevert (Germany)
Guy Cloutier (Canada)
Philippe Connes (France)
Zbigniew Dąbrowski (Poland)
Dmitry Fedosov (Germany)
Bingmei Fu (USA)
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Marijke Grau (Germany)
Friedrich Jung (Germany)
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Akos Koller (USA/Hungary)
Wojciech Kwiatek (Poland)
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F. Liao (China)
Chwee Teck Lim (Singapore)
Herbert Lipowsky (USA)
Mian Long (China)
Herbert Meiselman (USA)
Alexei Muravyev (Russia)
Gerard Nash (UK)
Norbert Nemeth (Hungary)
Lukas Prantl (Germany)
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Alexander Priezzhev (Russia)
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Eugene Roitman (Russia)
Carlota Saldanha (Portugal)
Masaaki Sato (Japan)
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Tim Secomb (USA)
Sergey Shevkoplyas (USA)
Masako Sugihara-Seki (Japan)
Kalman Toth (Hungary)
Jean-Luc Wautier (France)
Ursula Windberger (Austria)
Ölzem Yalcin (Turkey)
Sung Yang (Korea)

Local Committee

Maria Fornal Chair, PTHiM, Jagiellonian University Medical College
Zbigniew Dąbrowski PTHiM, University of Physical Education in Krakow
Katarzyna Pogoda PTHiM, IFJ PAN, Krakow
Conference Office

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Venue

Auditorium Maximum of the Jagiellonian University
ul. Krupnicza 33, 31-351 Kraków, Poland
The legend of hall names in Auditorium Maximum UJ

**LLH-A** – Large Lecture Hall A
**LLH-B** – Large Lecture Hall B
**MLH-A** – Medium Lecture Hall A
**MLH-B** – Medium Lecture Hall B
**SLH** – Small Lecture Hall
**SR** – Seminary Room
**CR** – Conference Room
**ER** – Exhibition Room
General Information

RECEPTION
The reception of the Conference will be in the lobby Auditorium Maximum UJ, 33 Krupnicza Street, 31-123 Kraków
- Monday, 2 July 12.00 - 18.00
- Tuesday, 3 July 8.30 - 18.00
- Wednesday, 4 July 8.30 - 16.00
- Thursday, 5 July 8.30 - 17.00
- Friday, 6 July 8.30 - 16.00

IDENTITY BADGES
Badges should be worn during the sessions and social events. Replacement badges are available at the registration desk after paying a charge.

LUNCH AND COFFEE BREAKS
Complimentary tea/coffee and lunch will be served on special areas level 2nd EXHIBITION ROOM A+B [ER A+B] accordance with the time in the programme

OFFICIAL LANGUAGE
English

CELLULAR PHONES
Cellular phones must be switched off during all sessions.

POSTER SERVICE
Poster sessions will be located at the 2nd floor of the EXHIBITION ROOM A (ER-A) Auditorium Maximum in a dedicated place with number. Posters should be removed on Friday, July 6, at noon at the latest.

SUBMISSION OF PRESENTATIONS
The speakers are requested to submit their presentations to the AV coordinator in the slide room (floor 0) a day before the session.

INTERNET
Participants can use Internet after receiving a password from reception.

TAXI SERVICE
Please use the following Taxi numbers:
- Radio taxi 12 919
- Barbakan taxi 12 196-61
- Mega taxi 12 196-25
- Taxi Icar 12 653 55 55
Scientific Programme

MONDAY, JULY 2

12.00-18.00  REGISTRATION

18.00-19.30  OPENING CEREMONY
LARGE LECTURE HALL A [LLH-A]
Auditorium Maximum UJ 33 Krupnicza St.

WELCOME
Wojciech Nowak, Rector of the Jagiellonian University
Tomasz Grodzicki, Vice-Rector of the Jagiellonian University for the Medical College
Maciej Małecki, Dean of Faculty of Medicine UJ CM

Presidents of Three Societies:
Jean-Frédéric Brun, European Society for Clinical Hemorheology and Microcirculation
Peter Butler, International Society of Biorheology
Sehyun Shin, International Society for Clinical Hemorheology

In memoriam of Sandro Forconi and Holger Schmid-Schönbein
Jean-Frédéric Brun

City of Krakow – Its Treasures
Ryszard Gryglewski, Head of the History of Medicine

POLISH FOLKLORE ENSEMBLE

20.00-21.30  WELCOME RECEPTION
at Town Hall 3/4 Wszystkich Świętych
# Tuesday, July 3

**9.00-10.00**

**ESCHM PLENARY LECTURE (L1)**  
MLH-A+B  
**Philippe Connes:**  
*Blood rheology: from exercise responses to sickle cell disease pathophysiology*  
**Chair:** Jean-Frédéric Brun

**10.00-10.30**

**COFFEE BREAK**

**10.30-12.00**

**SYMPOSIA S1-S3 / FREE COMMUNICATIONS O1-O2**

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</table>
| Vessels and Hemorheology  
**Chair:** Kalman Toth, Norbert Nemeth  
**Chair:** Philippe Connes  
*Blood rheology: from exercise responses to sickle cell disease pathophysiology* | Platelet Adhesion  
**Chair:** Shinya Goto, Terumitsu Hasebe  
**Chair:** Peter Butler  
*Cellular Rheology and Biophysics* | Advances in Hemorheological Measurements  
**Chair:** Sehyun Shin, Sung Yang  
**Chair:** Jean-Frédéric Brun  
*Clinical Hemorheology* | Cellular Rheology and Biophysics  
**Chair:** Peter Butler  
*Cellular Rheology and Biophysics* | Clinical Hemorheology  
**Chair:** Jean-Frédéric Brun  
*Clinical Hemorheology* |

**12.00-13.00**

**LUNCH BREAK**

**13.00-14.00**

**POISEUILLE GOLD MEDAL AWARD (ISB)**  
MLH-A+B  
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**

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| Glycocalyx – Its Structure and Function  
**Chair:** John Tarbell, Hans Vink  
**Chair:** Herbert Lipowsky  
*Endothelial Function and Shear Stress* | Novel mechanisms regulating blood cell rheology  
**Chair:** Brian Cooke, Tamas Alexy  
**Chair:** Markos Klonizakis, Guixue Wang  
*Endothelial Function and Shear Stress* | Advances in Hemorheological Measurements  
**Chair:** Sehyun Shin, Sung Yang  
**Chair:** Jean-Frédéric Brun  
*Clinical Hemorheology* | Hemorheology and blood coagulation  
**Chair:** Ursula Windberger, Resia Pretorius  
**Chair:** Markos Klonizakis, Guixue Wang  
*Endothelial Function and Shear Stress* | Endothelial Function and Shear Stress  
**Chair:** Markos Klonizakis, Guixue Wang  
*Endothelial Function and Shear Stress* |

**15.45-16.15**

**COFFEE BREAK**

**16.15-17.45**

**SYMPOSIA S8-S12**

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| Glycocalyx – Its Diversity  
**Chair:** Herbert Lipowsky  
**Chair:** Peter Butler  
*Macro and micro hemorheology in vitro and in vivo* | Molecular and mechanical markers of various pathologies  
**Chair:** Malgorzata Lekka  
**Chair:** Michael Simmonds, Jon Detterich  
*Macro and micro hemorheology in vitro and in vivo* | MiDAS Microcirculation Meeting (3M)  
**Chair:** Christian Lehmann, Vladimir Cerny  
**Chair:** Michael Simmonds, Jon Detterich  
*Macro and micro hemorheology in vitro and in vivo* | Beyond Red cell stiffness  
**Chair:** Jean-Frédéric Brun, Carlota Saldanha  
**Chair:** Michael Simmonds, Jon Detterich  
*Macro and micro hemorheology in vitro and in vivo* | Macro and micro hemorheology in vitro and in vivo  
**Chair:** Michael Simmonds, Jon Detterich  
*Macro and micro hemorheology in vitro and in vivo* |

**18.00-19.30**

**POSTER SESSION**  
ER-A

**20.00-21.30**

Walk through the Gardens of the Archaeological Museum  
(3, Senacka Street)
WEDNESDAY, JULY 4

9.00-10.00  ISB PLENARY LECTURE (L3)
MLH-A+B
Frank J. Gijsen:
Biomechanics and atherosclerotic plaques progression
CHAIR: Peter Butler

10.00-10.30  COFFEE BREAK

10.30-12.00  SYMPOSIA S13-S15 / FREE COMMUNICATIONS O4-O5

S13 MLH-A  S14 MLH-B  S15 SLH  O4 SR  O5 CR
CHAIRS: Ernst Michael Jung, Pamela Zengel  CHAIRS: Taiji Adachi, Yukiko Matsunaga  CHAIRS: Saul Yedgar, Ming Dao

12.00-13.00  LUNCH BREAK

13.00-14.00  ISCH MEDAL AWARD (L4)
MLH-A+B
Ceremony and Lecture
Laudatio: Kalman Toth
Lecture: Brian M. Cooke

14.15-15.45  SYMPOSIA S16–S18 / FREE COMMUNICATIONS O6

S16 MLH-A  S17 MLH-B  S18 SLH  O6 SR
Special Symposium to Celebrate the Centennial of Distinguished Professor Yuan-Cheng B. Fung (1)  Rheology and Microcirculation  Nanostructures in disease and health  Red blood cell Aggregation
CHAIRS: Linhong Deng, Li Yang  CHAIRS: Lukas Prantl, Gerhard Pindur  CHAIRS: Květoslava Burda, Marek Cyrklaff  CHAIRS: Dong-Guk Paeng, Norbert Nemeth

17.00-19.30  Meet the old Krakow
THURSDAY, JULY 5

9.00-10.00  ISCH PLENARY LECTURE (L5)
MLH-A+B
Sehyun Shin:  
Advances in Platelet Assay: Microfluidics to Clinics
CHAIR: Gerard Nash

10.00-10.30  COFFEE BREAK

10.30-12.00  SYMPOSIA S19-S23

| S19 MLH-A | S20 MLH-B | S21 SLH | S22 SR | S23 CR |
| Interaction of blood cells / tissue engineering  | Flow Visualization of Cardiovascular Devices  | Macro- and micro rheological characteristics under physiological and pathological conditions  | The Glycocalyx – Its Role in Disease  | Special Symposium to Celebrate the Centennial of Distinguished Professor Yuan-Cheng B. Fung '2 |

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12.00-13.00  LUNCH BREAK

13.00-14.00  FAHRAEUS GOLD MEDAL AWARD (L6)
MLH-A+B
Ceremony and Lecture
Laudatio: Nadia Antonova
Lecture: Carlota Saldanha:  
Multifunctional life of erythrocyte

14.15-15.45  SYMPOSIA S24-S26 / FREE COMMUNICATIONS O7-O8

| S24 MLH-A | S25 MLH-B | S26 SLH | O7 SR | O8 CR |
| Clinical Studies in Hemorheology  | Clinical Microcirculation  | Red blood cell nitric oxide/rheology  | Disease and Hemorheology  | Biorheology and Biotechnology-1 |

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16.00-16.45  SOCIETY BUSINESS MEETINGS
CR

16.45-17.30  ISCH-ESCH-ISB COMBINED BUSINESS MEETING
CR

17.30-20.00  Tour to Wieliczka Salt Mine
FRIDAY, JULY 6

9.00-10.00  PLENARY LECTURES IN TRIBUTE TO PROF. OGUZ BASKURT (L7)
MLH-A+B
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
CHAIR: Jean-Frédéric Brun

10.00-10.30  COFFEE BREAK

10.30-12.00  SYMPOSIA S27-S29 / FREE COMMUNICATIONS O9

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<td>Cell mechanics and cell mechano-biology - 2</td>
<td>Rheology and microstructure of cellular blood flow</td>
<td>Role of gasotransmitters (NO, CO and H2S) in blood cell functions and the molecular mechanisms of their microrheology alterations</td>
<td>Biorehology and Biotechnology-2</td>
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<tr>
<td>CHAIRS: Toshio Ohashi, Susumu Kudo</td>
<td>CHAIRS: Masako Sugihara-Seki, Ken-ichi Tsubota</td>
<td>CHAIRS: Carlota Saldanha, Eugene Roitman</td>
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12.00-13.00  LUNCH BREAK

13.00-14.30  SYMPOSIA S30-S32

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<td>From Rheology to Microcirculation: New Insights</td>
<td>Cardiovascular Biomechanics from Cells to Organs</td>
<td>Computational Models of Thrombosis</td>
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<td>CHAIRS: Gregorio Caimi, Antonio Colantuoni</td>
<td>CHAIRS: Noriyuki Kataoka, Ryoko Otomo</td>
<td>CHAIRS: Keefe Manning, Shawn Shadden</td>
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14.30-15.30  CLOSING SESSION
MLH-A+B
SYMPOSIUM S1: VESSELS AND HEMORHEOLOGY  
MEDIUM LECTURE HALL A [MLH-A]  
CHAIRS: Kalman Toth, Norbert Nemeth

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

S1-2 Leukocyte antisedimentation rate (LAR) and pituitary adenylate cyclase-activated polypeptide (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 Pankacz,a Szilard Rendeki,a Martín Rozanovic,b Marianna Matancic,b Timea Nemeth,b Beata Lelesz,b Jozsef Nemeth,b Attila Miseth,b Dára Reglodi,b Andrea Tamas,a  
*aUniversity of Pécs, Medical School, Department of Anaesthesia and Intensive Care, Hungary; †University of Pécs, Medical School, 1st Department of Internal Medicine, Hungary; ‡University of Pécs, Medical School, Department of Languages for Specific Purposes, Hungary; §University of Debrecen, Department of Pharmacology and Pharmacotherapeutics, Hungary;  
∥University of Pécs, Medical School, Department of Laboratory Medicine, Hungary; ¶University of Pécs, Medical School, Department of Anatomy, MTA-PTE PACAP Research Team, Centre for Neuroscience, Hungary

S1-3 Do ABO and Rh blood groups influence hemorheological parameters in vascular patients?  
Katalin Kolta,a Dóra Endrei,a Gábor Késmárky,a Katalin Biró,a Zsolt Márton Pécs,a Gergely Fehér,a Dávid Kovács,a Imre Boncz,a Antal Tibold,a Kálmán Tóth,a  
aUniversity of Pécs, Medical School, Ist Department of Medicine, Hungary; †University of Pécs, Medical School, Centre for Occupational Medicine, Hungary; ‡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,a Sz. Javor,a G. Jancso,a A. Gedei,a P. Maroti,a G. Balazs,a  
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  
Department of Operative Techniques and Surgical Research, Faculty of Medicine, University of Debrecen, Hungary; †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,a Kitti Nagy,a Noemi Paia, Gabor Nadubinszky,a Balazs Szabo,a Bence Tanczos,a Viktoria Somogyi,a Adam Deak,a Katalin Peto,a Norbert Nemeth,a  
Department of Operative Techniques and Surgical Research, Faculty of Medicine, University of Debrecen, Hungary

SYMPOSIUM S2: PLATELET ADHESION  
MEDIUM LECTURE HALL B [MLH-B]  
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,a Shunto Maegawa,a Kenta Bito,a Tomohiro Matsumoto,b Tetsuya Suzuki,a  
*Keo University, Japan; †Tokai University, Japan

S2-3 Hemorheological Effects of Mechanical Stress on Whole Blood of Patients with Prosthetic Heart Valve Failure  
Toru Maruyama,a Chiharu Yoshida,a Kei Irie,a Shohei Moriyama,a Taku Yokoyama,a Mitsuhiro Fukata,a Takeshi Arita,a Keita Odashiro,a Koichi Akashi,a  
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,a Chris Siedleckib,a  
 dupennsylvania State University, USA; †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,a Shunto Maegawa,a Kenta Bito,a Tomohiro Matsumoto,a Tetsuya Suzuki,a  
*Keo University; †Tokai University
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**SYMPOSIUM S3: ADVANCES IN HEMORHEOLOGICAL MEASUREMENTS-1**
SMALL LECTURE HALL [SLH]
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

**FREE COMMUNICATIONS O1: CELLULAR RHEOLOGY AND BIOPHYSICS**
SEMINARY ROOM [SR]
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 Cells and Molecules Associated with Adhesion
Yan Wenhua, Zhang Tian, Zhang Kang, Qiu Juhui, Wang Guixue
Key Laboratory for Bioengineering Research and Technology of Ministry of Education, State and Local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University, Chongqing 400030, China

**FREE COMMUNICATIONS O2: CLINICAL HEMORHEOLOGY**
CONFERENCE ROOM [CR]
CHAIR: Jean-Frédéric 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 Otoyamaa, Tatsushi Kimurab, Hironobu Hamadac, Kiyokazu Sekikawad, Michinori Kamikawae, Teruki Kajiwaraf, Fumiya Aizawag, Yoshinobu Satoh, Haruchi Nambia
department of Physical Analysis and Therapeutic Sciences, Graduate School of Biomedical and Health Sciences, Hiroshima University, Japan; *Faculty of Early Childhood Education and Care, Ohkakakuen University, Japan

O2-4 Hemorheological studies in a group of patients with Waldenström’s macroglobulinemia
Anna Marcinkowska-Gapińska, Piotr Kowalb, Włodzimierz Liebertc
*Department of Biophysics UM Poznań, Poland; *Department of Neurology UM Poznań, Poland; *Department of Neurology UM Poznań, Poland

O2-5 Adora2b receptor activation mediates flap protection from ischemia/reperfusion injury
Pinar Ulker, Ozlenen Ozkan, Matteo Amorosoa, Mutay Aslan, Filiz Ozcan, Ibrahim Bassorgun, Omer Ozkan
*Department of Physiology, Akdeniz University, Antalya, Turkey; *Department of Plastic and Reconstructive Surgery, Akdeniz University, Antalya, Turkey; *Department of Plastic Surgery Department of Plastic Surgery, Sahlgrenska University Hospital, Gothenburg, Sweden; *Department of Biochemistry, Akdeniz University, Antalya, Turkey; *Department of Pathology, Akdeniz University, Antalya, Turkey

O2-6 Purinergic regulation of erythrocyte enzyme activity
Pinar Ulker, Nur Özena, Günel Abdullayeva, Sadi Köksoy, Nazmi Yarasa, Filiz Basra
*Department of Physiology, Medical Faculty, Akdeniz University, Antalya, Turkey; *Department of Medical Microbiology, Medical Faculty, Akdeniz University, Antalya, Turkey; *Department of Biophysics, Medical Faculty, Akdeniz University, Antalya, Turkey

S4 MLH-A

SYMPOSIUM S4: GLYCOCALYX – ITS STRUCTURE AND FUNCTION
MEDIUM LECTURE HALL A [MLH-A]
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 MLH-B

SYMPOSIUM S5: NOVEL MECHANISMS REGULATING BLOOD CELL RHEOLOGY
MEDIUM LECTURE HALL B [MLH-B]
CHAIRS: Brian Cooke, Tamas Alexy

S5-1 Interaction of mesenchymal stem cells with platelets: aid to targeting to tissue or thrombotic risk?
Lozan Sheriff, Asma Alanazi, Lewis Ward, Julie Rayes, Mohammed Alassiri, Steve Watson, Gerard Nash
*Institute of Cardiovascular Sciences, College of Medical and Dental Sciences, University of Birmingham, United Kingdom; *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
*University Lyon 1, France; #Laboratoire de physiologie et explorations fonctionnelles, FMPO, UCAD, Senegal; Centre Hospitalier Abass Ndao, Senegal; ‘Clinique Médicale II, Centre Hospitalier Abass Ndao, Senegal; ‘Laboratoire d’Excellence GR-Ex, Paris, France; UMR INSERM 970, Université Paris Descartes; Service de Médecine Interne, Hôpital Europe en Georges Pompidou, France; ‘Laboratoire de Biochimie Pharmaceutique, Faculté de Médecine, de Pharmacie et d’Odontologie, Université Cheikh Anta Diop, Senegal; ‘Laboratoire d’hématologie-immunologie, FMPO, UCAD, Senegal; ‘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

SYMPHOSIUM S6: ADVANCES IN HEMORHEOLOGICAL MEASUREMENTS-2
SMALL LECTURE HALL [SLH]
CHAIRS: Sehyun Shin, Sung Yang

S6-1 Optical study of red blood cells interactions in vitro mediated by different plasma components
Alexander Priezzhev#, Alexey Semenov#, Andrei Lugovtsov#, Kisung Lee#, Christian Wagner#
#Department of Physics and International Laser Center, M.V. Lomonosov Moscow State University, Russia; #Ulsan National Institute of Science and Technology, South Korea; #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#, Andrei Lugovtsov#, Kisung Lee#, Alexei Myravyev#, Sehyu Shin#, Evgeny Shirshin#, Alexander Priezzhev#
#Department of Physics of M.V. Lomonosov Moscow State University, Russia; #International Laser Center of M.V. Lomonosov Moscow State University, Russia; #Ulsan National Institute of Science and Technology, South Korea; #K.D.Ushinsky Yaroslavl State Pedagogical University, Russia; #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#, Hoyoon Lee#, Kisung Lee#, Alexander Priezzhev#
#Korea University, South Korea; #UNIST, South Korea; #Lomonosov Moscow State University, Russia

SYMPHOSIUM S7: HEMORHEOLOGY AND BLOOD COAGULATION
SEMINARY ROOM [SR]
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
Ethereisia 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#, Alla Shabalina#, Marine Tanashyan#, Irina Kolesnikova#
#Pirogov Russian National Research Medical University, Russia; #Research Center of Neurology, Russia
Tuesday, July 3

FREE COMMUNICATIONS O3: ENDOTHELIAL FUNCTION AND SHEAR STRESS
CONFERENCE ROOM [CR]
CHAIRS: Markos Klonizakis, Guixue Wang

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 Bio rheological 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 Bio rheological 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 Bio rheological 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*, Marianne Milner*, Markos Klonizakis
*University of Sheffield, United Kingdom; *Sheffield Hallam University, United Kingdom

S8 SYMPOSIUM S8: GLYCOCALYX – ITS DIVERSITY
MEDIUM LECTURE HALL A [MLH-A]
CHAIR: Herbert Lipowsky

S8-1 Surface glycocalyx mediates tumor cell metastasis
Henry Qazi*, Heriberto Moran*, Limary Cancel*, Mariya Mayer*, Lance Munn*, John Tarbell*
*Univ. Cal. San Diego, USA; *The City College of New York, USA; *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*, Anna Block*, Roger D. Kamm*
*Institute for Tissue Engineering and Regenerative Medicine, Chinese University of Hong Kong, Hong Kong Special Administrative Region of China; *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
**SYMPOSIUM S9: MOLECULAR AND MECHANICAL MARKERS OF VARIOUS PATHOLOGIES**

**MEDIUM LECTURE HALL B [MLH-B]**

**CHAIR:** Małgorzata Lekka

**S9-1** Early stage of essential hypertension monitoring
Kvetoslava Burda\(^a\), Magdalena Kaczmanska\(^a\), Maria Fornal\(^b\), Franz Messerli\(^c\), Jozef Korecki\(^a\), Tomasz Grodzicki\(^a\)

\(^a\)AGH University of Science and Technology, Faculty of Physics and Applied Computer Science, 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 Kozioł\(^a\), Natalia Piergies\(^a\), Ewa Pieta\(^a\), Czesława Paluszkiwicz\(^a\), Maria Fornal\(^b\), Tomasz Grodzicki\(^a\), 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

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**SYMPOSIUM S10: MiDAS MICROCIRCULATION MEETING (3M)**

**SMALL LECTURE HALL [SLH]**

**CHAIRS:** Christian Lehmann, Vladimir Cerny

**S10-1** Dynamic Contrast Enhanced Ultrasound (CEUS) of Tissue transplants
Ernst Michael Jung\(^a\), Sebastian Geis\(^a\), 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

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**SYMPOSIUM S11: BEYOND RED CELL STIFFNESS**

**SEMINARY ROOM [SR]**

**CHAIRS:** Jean-Frédéric Brun, Carlota Saldanha

**S11-1** RBC deformability: an exquisite homeostasis
Jean-Frédéric Brun\(^a\), Emmanuelle Varlet-Marie\(^a\)

\(^a\)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, Elie Nader, Nicolas Guillot, Romain Fort, Berenike Möckesch, Nathalie Lemonne, Sophie Antoine-Jonville, Céline Renoux, Philippe Joly, Vincent Pialoux, Marie-Dominique Hardy-Dessources, Marc Romana

Laboratoire LIBM EA7424, Équipe « Biologie Vasculaire et du Globule Rouge », Université Claude Bernard Lyon 1, France; CarMeN Laboratory, INSERM 1060, INRA 1397, Université Claude Bernard Lyon1, INSA Lyon, Villeurbanne, France; Laboratoire ACTES EA3596, Université des Antilles, Pointe-à-Pitre, France; Unité Transversale de la Drépanocytose, Centre Hospitalier Universitaire de Pointe-à-Pitre, Pointe-à-Pitre, Guadeloupe; Laboratoire ACTES EA3596, Université des Antilles, Pointe-à-Pitre, France; UMR Inserm U1134, Université des Antilles et de la Guadeloupe

S11-5 Signaling pathways in regulation of RBC microrheological properties by catecholamines
Irina Tikhomirowa, 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, Luca Lanotte, Johannes Maurer, Franck Nicoud, Gerhard Gompper, Dmitry Fedosov, Manouk Abkarian

*IMAG. CNRS UMR 5149 - University of Montpellier, France; †INRA Rennes and CBS. CNRS UMR 5048 - INSERM UMR 1054 - University of Montpellier, France; ‡Institute of Complex Systems and Institute for Advanced Simulation, Forschungszentrum Juelich, Germany; CBS. CNRS UMR 5048 - INSERM UMR 1054 - University of Montpellier, France

SYMPOSIUM S12: MACRO AND MICRO HEMORHEOLOGY
IN VITRO AND IN VIVO
CONFERENCE ROOM [CR]
CHAIRS: Michael Simmonds, Jon Dettchrich

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, 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 Dettchrich, Silvie Siriany, Derek Ponce, Michael Simmonds

Division of Cardiology, Children’s Hospital Los Angeles, University of Southern California Keck School of Medicine, USA; ‡Griffith University, Australia

S12-5 Drag-reducing polymer effects on macro- and microcirculation
Marina Kameneva
University of Pittsburgh, USA
SYMPOSIUM S13: MICROCIRCULATION OF INNER ORGANS
MEDIUM LECTURE HALL A [MLH-A]
CHAIRPERSON: Ernst Michael Jung, Pamela Zengel

S13-1 Critical analysis of CEUS examinations of the liver in an interdisciplinary ultrasound department
Franz Josef Putza, Anna Erlmeierb, Niklas Verlohb, Bernhard Banasa, Christian Stroszczynskib,
Ernst Michael Jungb
aDepartment of Nephrology, University Hospital Regensburg, Germany; bDepartment 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 Zengela, Florian Notterb, Dirk Andre Clevertb
aENT Department Munich, LMU, Germany; bInstitute of Radiology, LMU, Munich, Germany

S13-3 CEUS perfusion imaging after ablation treatment in patients with prostate cancer: First results
Isabel Wiesinger, Lukas Beyera, Philipp Wiggermannb, Christian Stroszczynskib, 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. Negrao de Figueiredoa, K. Mueller-Peltzerb, P. Zengel, E. Gressera, J. Rübenthalerb, D.A. Cleverter
München

S13-5 Contrast-enhanced ultrasound (CEUS) for the evaluation of gallbladder diseases in comparison to cross-sectional imaging modalities and histopathological results
G. Negrao de Figueiredoa, K. Mueller-Peltzerb, P. Zengel, E. Gressera, J. Rübenthalerb, D.A. Cleverter
München

S13-6 New Horizons for Kidney Imaging: Dynamic Microvascularization in Contrast-enhanced Ultrasound (CEUS)
Franz Josef Putza, Anna Erlmeierb, Miriam Banasa, Bernhard Banasa, Ernst Michael Jungb
aDepartment of Nephrology, University Hospital of Regensburg, Germany, bDepartment of Radiology and Interdisciplinary Ultrasound, University Hospital Regensburg, Germany

SYMPOSIUM S14: CELL MECHANICS AND CELL MECHANOBIOLOGY - 1
MEDIUM LECTURE HALL B [MLH-B]
CHAIRS: Taiji Adachi, Yukiko Matsunaga

S14-1 Effect of Physical Environment on Cell Migration Using Microchannel Device
Toshiro Ohashia, Mazlee Bin Mazalanb, Ma Mingb, Jennifer H. Shinb
aFaculty of Engineering, Hokkaido University, Sapporo, Hokkaido, Japan; bGraduate School of Engineering, Hokkaido University, Sapporo, Hokkaido, Japan; cDepartment 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 Kudoa, Toshihiro Serab, Masataka Arai
Kyushu University, Japan

S14-3 Hydrostatic pressure-induced DNA breaks in chondrocytes and its relationship with chromatin architecture
Koichiro Makia, Katsuko Furukawab, Takashi Ushidaa
aThe University of Tokyo, Japan

S14-4 In situ, fluorescence lifetime-based measurements of cell membrane micromechanics
Seoyoung Sonb, Hari Muddana, Changjin Huangb, Sulin Zhangb, Peter Butlerb
aThe Pennsylvania State University, USA

SYMPOSIUM S15: HEMODYNAMIC FUNCTIONALITY OF RED BLOOD CELLS IN BLOOD MICROCIRCULATION: EXPERIMENTS AND MODELING
SMALL LECTURE HALL [SLH]
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*, Yulia Malysheva*, Nikolay Kislov*, Mihail Ryabov*
*Yaroslavl State Pedagogical University, Russia; **Yaroslavl Regional Cancer Hospital

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

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

S15-5 Red Blood Cell Aggregate Flow Characteristics in Bifurcating Microchannels
Efstathios Kaliviotis1, Joseph Sherwood2, Stavroula Balaban1
1Department of Mechanical Engineering and Materials Science, Cyprus University of Technology, Cyprus; 2Department of Bioengineering, Imperial College London, UK

FREE COMMUNICATIONS O4: RED BLOOD CELL DEFORMABILITY
SEMINARY ROOM [SR]
CHAIRS: Edgar O’Rear, Philippe Connes

O4-1 Beta-Estradiol and Ethinylestradiol enhance RBC deformability dependent on their blood concentration
Paulo Farber*, Teresa Freitas*, Carlota Saldanha*, Ana Silva-Herdade*
*Hospital da Luz de Aveiro, Portugal; **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*, Magali Faivre*, Amel Bessaa*, Philippe Joly*, Philippe Connes*
*LIBM EA742 / UCBL1, France; **INL-UMR5270 CNRS / UCBL1, France

O4-3 Proteomic analysis of the role of adenylyl cyclase-cAMP pathway in red blood cell mechanical response
Özlem Yalcın, 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
*University Medical Center Utrecht, The Netherlands; **RR Mechatronics, The Netherlands; ***The Children’s Hospital of Philadelphia, USA; +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

FREE COMMUNICATIONS O5: FLOW VISUALIZATION AND MODELING
CONFERENCE ROOM [CR]
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 Jancsó
University of Pécs, Hungary
**SYMPOSIUM S16: SPECIAL SYMPOSIUM TO CELEBRATE THE CENTENNIAL OF DISTINGUISHED PROFESSOR YUAN-CHENG B. FUNG (1)**

**MEDIUM LECTURE HALL A [MLH-A]**

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*, Yang Jin*, Mingzhi Luo*, Lei Liu*, Jingjing Li*

*Institute of Biomedical Engineering and Health Sciences, Changzhou University, China; *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

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**SYMPOSIUM S17: RHEOLOGY AND MICROCIRCULATION**

**MEDIUM LECTURE HALL B [MLH-B]**

CHAIRS: Lucas Prantl, Gerhard Pindur

**S17-1** Longitudinal analysis of thrombin generation biomarkers in venous thromboembolism

Gerhard Pindur*, Aida Beye*, Bernhard Stephan*, Harald Helling*

*University Hospital of Saarland, Germany; *Centre Hospitalier CHNDS, France; *University Hospital of North Norway, Norway

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

Boris Schlenker*, Maria Apfelbeck*, Christian G. Stief*, Dirk-Andre Clevert*

*Department of Urology, University Hospital Grosshadern, Ludwig-Maximilians-University Munich, Munich, Germany; *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*, Florian Notter*, Dirk Andre Clevert*

*ENT Department Munich, LMU, Germany; *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. Kauffmann⁵, M. Troeltzsch¹, P. Brockmeyer¹, H. Bohnenberger¹, P. Stroebele¹, M. Manzke¹, R. Cordesmeyer¹, H. Schliephake¹, L. Prantl¹, T. Aung³
¹Department of Oral and Maxillofacial Surgery, Georgia Augusta University, Göttingen, Germany; ²Institute of Pathology, University Medical Centre, Göttingen, Germany; ³Department of Preventive Dentistry, Periodontology and Cariology, University Medical Center, Göttingen, Germany; ⁴Department of Orthodontics, University of Göttingen, Göttingen, Germany; ⁵Department of Plastic, Hand, and Reconstructive Surgery, University Medical Center Regensburg, Regensburg, Germany

**SYMPOSIUM S18: NANOSTRUCTURES IN DISEASE AND HEALTH**

**SMALL LECTURE HALL [SLH]**

**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 Gajos⁴, Aleksander Siniarski⁴, Joanna Natorska⁴, Michał Ząbczyk⁴, Jakub Siudut⁵, Aneta Undas⁶
⁴Jagiellonian University Medical College, Faculty of Medicine, Department of Coronary Artery Disease and Heart Failure, Poland; ⁵Institute of Cardiology, Jagiellonian University Medical College; Krakow Centre for Medical Research and Technologies, John Paul II Hospital, Poland; ⁶Institute of Cardiology, Jagiellonian University Medical College, Poland

**S18-3** Differentiation between various melanomas based on biophysical characterization of their properties
Justyna Bobrowska⁶, Joanna Pabijana⁶, Kamil Awiuk⁶, Jakub Rysz⁶, Andrzej Budkowski⁶, Małgorzata Lekka⁶
⁶Institute of Nuclear Physics, Polish Academy of Sciences, Kraków, Poland; ²Institute of Physics, Jagiellonian University, Kraków, Poland

**S18-4** Endothelial nanomechanics in vascular diseases – an ex vivo AFM nanoindentation study
Marta Targosz-Korecka¹, Magdalena Jaglarz¹, Katarzyna Malek-Ziętek¹, Stefan Chłopicki¹, Marek Szymoński¹
¹Department of Physics of Nanostructures and Nanotechnology, Faculty of Physics, Astronomy and Applied Computer Science, Jagiellonian University, Poland; ²Jagiellonian Centre for Experimental Therapeutics, JCET, Jagiellonian University; 2 Chair of Pharmacology, Jagiellonian University Medical College

**FREE COMMUNICATIONS O6: RED BLOOD CELL AGGREGATION**

**SEMINARY ROOM [SR]**

**CHAIRS:** Dong-Guk Paeng, Norbert Nemeth

**O6-1** Alterations in RBC aggregation during incubation in glucose solution
Alicja Szoln-Chodz⁴, Paulina Grychtal, Bronisław Grzegorzwowski
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 Podgorski⁶, François Yaya¹, Gwennou Coupiere, Daniel Flormann⁶, Christian Wagner⁶
¹CNRS – LIPhy, France; ²Universität 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
**SYMPOSIUM S19: INTERACTION OF BLOOD CELLS / TISSUE ENGINEERING**

**MEDIUM LECTURE HALL A [MLH-A]**

**CHAIRS:** Friedrich Jung, Anna 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. Papagrigrorakes\textsuperscript{a,b}, N. Chirico\textsuperscript{a}, A. Blocki\textsuperscript{a,c}, F. Jung\textsuperscript{a,c}, N. Ma\textsuperscript{a,d}, A. Lendlein\textsuperscript{a,b,c}

\textsuperscript{a}Institute of Biomaterial Science, Helmholtz-Zentrum Geesthacht, Teltow, Germany; \textsuperscript{b}University of Potsdam, Potsdam, Germany; \textsuperscript{c}Berlin-Brandenburg Center for Regenerative Therapies (BCRT), Charité, Universitätsmedizin Berlin and Helmholtz-Zentrum Geesthacht, Teltow, Germany; \textsuperscript{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\textsuperscript{a}, Claudia Sperling\textsuperscript{b}, Manfred F. Maizt\textsuperscript{c}, Ulrich Steineisfe\textsuperscript{a}, Johanna Clauser\textsuperscript{a}, Bernhard Hiebl\textsuperscript{a}, Stefanis Krajewskis, Hans P. Wondes\textsuperscript{a}, Friedrich Jung\textsuperscript{a}

\textsuperscript{a}Helmholtz-Zentrum Geesthacht und Berlin-Brandenburger Centrum für Regenerative Therapien, Germany; \textsuperscript{b}Max Bergmann Center of Biomaterials Dresden, Leipzig University of Polymer Research Dresden, Germany; \textsuperscript{c}Department of Cardiovascular Engineering, Institute of Applied Medical Engineering Helmholtz-Institute, RWTH Aachen University, Germany; \textsuperscript{d}Institute for Animal Hygiene, Animal Welfare and Farm Animal Behaviour, University of Veterinary Medicine Hannover, Foundation, Germany; \textsuperscript{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\textsuperscript{a}, Sebastian Beyer\textsuperscript{a}, Friedrich Jung\textsuperscript{a}, Michael Raghunath\textsuperscript{c}

\textsuperscript{a}Institute for Tissue Engineering and Regenerative Medicine \& School of Biomedical Sciences, Faculty of Medicine, Chinese University of Hong Kong, China; \textsuperscript{b}Institute for Clinical Hemostasiology and Transfusion Medicine, University Saarland, Germany; \textsuperscript{c}Institute of Chemistry and Biotechnology, Zurich University of Applied Sciences, Switzerland

**S19-5** A facile way to achieve biomimetic laminin networks on substrates

Thanga Bhuvanes, 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

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**SYMPOSIUM S20: FLOW VISUALIZATION OF CARDIOVASCULAR DEVICES**

**MEDIUM LECTURE HALL B [MLH-B]**

**CHAIRS:** Keefe Manning, Ajit Yoganathan

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

Immanuel David Madakauwa-David\textsuperscript{a}, Vrishank Raghav\textsuperscript{b}, Prem A. Midha\textsuperscript{c}, Vahid Sadri\textsuperscript{d}, Phillip Trusty\textsuperscript{d}, Zhenglun Wei\textsuperscript{d}, Ajit Yoganathan\textsuperscript{d}

\textsuperscript{a}George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, USA; \textsuperscript{b}Department of Aerospace Engineering, Auburn University, USA; \textsuperscript{c}Biomedical Engineering Practice, Exponent Inc., USA; \textsuperscript{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
SYMPOSIUM S21: MACRO- AND MICRORHEOLOGICAL BLOOD CHARACTERISTICS UNDER PHYSIOLOGICAL AND PATHOLOGICAL CONDITIONS

SMALL LECTURE HALL [SLH]

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, Vasilka Paskova, Irena Velcheva, Nino Chaushiev, Sergey Podtarev, Kirill Tsiberkin
*Institute of Mechanics to the Bulgarian Academy of Sciences, Bulgaria; †University Hospital of Neurology and Psychiatry “St. Naum, Bulgaria; ‡Perm State University, Russia; †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, Nadia Antonova, Alexei Muravyov, Ekaterina Uzikova
*Department of Biomechanics, Institute of Mechanics, Bulgarian Academy of Sciences, Bulgaria; †Department of Medicine and Biology, State Pedagogical University, Russia

S21-3 Hemorheological disturbances as the thrombosis-developing factor
Eugene Roitman, Alla Shabalina, Marine Tanashyan, Irina Kolesnikova
*Pirogov Russian National Research Medical University, Russia; †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, Nadia Antonova, Tsacho Kmetski, Galina Tsonevska, Anika Alexandrova
*Department of Neurology, University Hospital, Bulgaria; †Department Biomechanics, Institute of Mechanics, Bulgarian Academy of Sciences, Bulgaria

SYMPOSIUM S22: THE GLYCOCALYX – ITS ROLE IN DISEASE

SEMINARY ROOM [SR]

CHAIRS: John Tarbell, Hans Vink

S22-1 Role of the Glycocalyx in Atheroprotective vs. Atheropermisive 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, Margien Boels, Angela Kouidi, Cristina Avramut, Wendy Sola Annemarie van Oeveren-Rietdijk, Hetty de Boer, Cees van Kooten, Dirk Eulberg, Johan Van der Vlag, Daphne Ijpeelaar, Ton Rabellink
*LUMC/Internal Medicine-Division of Nephrology, France; †NOXXON Pharma AG, France; ‡Radboud University Medical Center / Dept of Nephrology, France

SYMPOSIUM S23: SPECIAL SYMPOSIUM TO CELEBRATE THE CENTENNIAL OF DISTINGUISHED PROFESSOR YUAN-CHENG B. FUNG (2)

CONFERENCE ROOM [CR]

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
**SYMPOSIUM S23: CLINICAL STUDIES IN HEMORHEOLOGY**

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

**S23-4** 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

**S23-5** 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

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**SYMPOSIUM S24: CLINICAL STUDIES IN HEMORHEOLOGY**

**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*, Jung Min Youn*, Eun Gi Ko*  
*Department of Anesthesiology and Pain Medicine, Korea University Medical Center, South Korea; ‡Korea University Medical School, South Korea

**S24-3** Decrease myocardial perfusion associated with hemorheologic parameters in patients with type 2 Diabetes  
*Byoung Kwon Lee*, Minhee Cho*, Sehyun Shin*  
*Gangnam Severance Hospital, Department of Internal Medicine, Yonsei University Medical College, South Korea; ‡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  
*International Laser Center of M.V. Lomonosov Moscow State University, Russia; ‡Department of Physics of M.V. Lomonosov Moscow State University, Russia; †Medical Research and Education Center of M.V. Lomonosov Moscow State University, Russia

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**SYMPOSIUM S25: CLINICAL MICROCIRCULATION**

**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)  
*Department of Plastic, Hand and reconstructive Surgery, University Medical Center Regensburg, Germany; ‡Department of Radiology, University Medical Center Regensburg, Germany

**S25-2** The Use of Indocyanine green (ICG) imaging technique in the groin lymphocele microsurgical resection  
*Department of Plastic, Hand and reconstructive Surgery, University Medical Center Regensburg, Germany; ‡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. Plat Batista da Silva, E.M. Jung, L. Prantl, V. Mandlik*  
Regensburg, Germany
**SYMPOSIUM S26: RED BLOOD CELL NITRIC OXIDE/RHEOLOGY**

**SMALL LECTURE HALL [SLH]**

**CHAIRS:** Michael Simmonds, Philippe Connes

**S26-1 Nitric oxide synthase activity at various levels and durations of shear stress**
Mike 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 Nadar a, Marijke Grau b, Romain Fort c, Nicolas Guillot d, Cyril Martin e, Giovanna Cannas e, Soiène Pottel e, Arnaud Hot e, Alexandra Gauthier e, Wilhelm Bloch f, Marc Romana. Philippe Connes a*

a Laboratory 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 Cicrik a, Ozlem Yalcin b
a Ordu University, Faculty of Medicine, Department of Physiology, Turkey; b Koc University, School of Medicine, Department of Physiology, Turkey

**FREE COMMUNICATIONS O7: DISEASE AND HEMORHEOLOGY**

**SEMINARY ROOM [SR]**

**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 Dabrowski a, Anna Marchewka a, Aneta Teleglow a, Maria Fornal ab
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 a, 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 Girasoli a, Simone Dinarello a
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 Aghaeei Bahmanbeglo
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-Fréderic Brun⁴, Emmanuelle Varlet-Marie⁴, Bénédicte Marion⁴, Céline Roques⁴, Marlène Richou⁴, Eric Raynaud de Mauverger⁴⁴  
*U1046 INSERM, UMR 9214 CNRS Physiopathologie & Médecine Expérimentale du Cœur et des Muscles - PHYMEDEX, Unité d’Explorations Métaboliques (CERAMM), Université de Montpellier, Département de Physiologie Clinique, Hôpital Lapeyronie CHRU Montpellier, France; ²Institut 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 Drenjancević
Faculty of Medicine Osijek, University of Osijek and Croatian National Scientific Center of Excellence for Personalized Health Care Josip Juraj Strossmayer University of Osijek, Croatia

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**FREE COMMUNICATIONS 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 Bioreheological 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 Bioreheological 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 Bioreheological Science and Technology of Ministry of Education, State and Local Joint Engineering Laboratory for Vascular Implants, Bioengineering College of Chongqing University, China
SYMPOSIUM S27: CELL MECHANICS AND CELL MECHANOBIOLOGY - 2
MEDIUM LECTURE HALL A [MLH-A]
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
*Institute for Frontier Life and Medical Sciences, Kyoto University, Japan; **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

SYMPOSIUM S28: RHEOLOGY AND MICROSTRUCTURE OF CELLULAR BLOOD FLOW
MEDIUM LECTURE HALL B [MLH-B]
CHAIRS: Masako Sugihara-Seki, Ken-ichi Tsubota

S28-1 Effect of internal viscosity on suspension rheology of red blood cells
Naoki Takeishi*, Marco Rost*, Yohsuke Ima*, Shigeo Wada*, Luca Brandt*
*Osaka University, Japan; **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 Otsomo, 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 Sugashii, 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

SYMPOSIUM S29: ROLE OF GASOTRANSmitters (NO, CO AND H2S) IN BLOOD CELL FUNCTIONS AND THE MOLECULAR MECHANISMS OF THEIR MICRORHEOLOGY ALTERATIONS
SMALL LECTURE HALL [SLH]
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 microcirculation 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 microcirculatory characteristics of erythrocytes under the influence of donors of gasotransmitters NO and H2S: in vitro study
Yulia Malyshева, Alexei Muravyov
Yaroslavl State Pedagogical University named after K.D. Ushinsky, Russia
FREE COMMUNICATIONS O9: BIORHEOLOGY AND BIOTECHNOLOGY-2
SEMINARY ROOM [SR]
CHAIR: Jinxuan Wang

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

O9-4 PI3-nos2b Signaling is Crucial for Simulated Microgravity-mediated angiogenesis in Zebrafish CVP Network
   Daoxi Lei, Guixue Wang
   Bioengineering College of Chongqing University, China

O9-5 Ferric iron, lipopolysaccharide and lipoteichoic acids can induce anomalous fibrin amyloid formation: an assessment with novel amytracker™ stains and thioflavin T
   Martin Page*, Douglas Kell*, Ethesia Pretorius*
   *Stellenbosch University, South Africa; *University of Manchester, United Kingdom

SYMPOSIUM S30: FROM RHEOLOGY TO MICROCIRCULATION: NEW INSIGHTS
SMALL LECTURE HALL [SLH]
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, Antonio Colantuoni
   UOC Angiologia; Azienda Ospedaliera Universitaria di Padova, Italy
SYMPOSIUM S31: CARDIOVASCULAR BIOMECHANICS FROM CELLS TO ORGANS
SEMINARY ROOM [SR]
CHAIRS: Noriyuki Kataoka, Ryoko Otomo

**S31-1** Bioreheology of bile
Minh Nguyen Ngoc, Hiromichi Obara, Kenji Shimokasa, Junfang Zhu
-Mechanical Engineering Department, Tokyo Metropolitan University, Japan; *Faculty of Industrial Technology, National University Corporation of Tsukuba University of Technology, Japan; *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, Songshi Li, Michiko Sugawara, Hiromichi Obara, Masahiro Takei
-Chiba University, Japan; *Tokyo Metropolitan University, Japan

**S31-3** Matrix metalloprotease production of vascular endothelial cells under extremely high wall shear stress condition
Naoya Sakamoto, Yuki Oyama, Yuta Horie, Masanori Nakamura, Naoyuki Kimura
-Tokyo Metropolitan University, Japan; *Nagoya Institute of Technology; *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, Sadao Omata, Yasuhide Nakayama
-Hirosaki University, Japan; *CYBERDYNE, INC., Japan; *National Cerebral and Cardiovascular Center Research Institute, Japan

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

SYMPOSIUM S32: COMPUTATIONAL MODELS OF THROMBOSIS C
CONFERENCE ROOM [CR]
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 / University 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
Posters

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

Fatholah Havila, Afshar Jafari, Sajad Ahmadizadeh, Saeed Nikoukheh.*

* Faculty of Sports Sciences, Tabriz University, Iran
* Department of Physical Education, Faculty of Imam Ali, Safadasht Branch, Technical and Vocational University, Iran
* 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


* Graduate School of Health Sciences, Turkey
* Koç University, 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-Frédéric Brun, Emmanuelle Varlet-Marie, Pierre Boulot, Bénédicte Marion, Céline Roques, Eric Raynaud de Mauverger.

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**P6** Leg electrical resistance predicts venous blood viscosity and hematocrit

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

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

Katarzyna Bulat, Jakub Dybas, Aneta Blat, Mateusz Mardyla, Anna Rygula, Stefan Chlopicki, Małgorzata Baranska, Katarzyna M. Marzec.

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Posters

**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*
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**P10** Measurement of Glycocalyx Volume: An Unreliable Biomarker

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2. Imperial College, London, United Kingdom

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

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

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

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

*Tatyana Grishacheva*, Dinara Faizullina, Nickolay Petrishchev, Irina Mikhailova
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**P16** Analysis of Flow and Thrombus Development Within PDMS Channels of Varying Geometry

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**P17** Measurement of blood viscosity by measuring flows in microfluidic channel

*Hyeonji Hong, Eunseop Yeon*
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**P18** Repeated whole body cryotherapy treatments does not cause changes in hemorheological parameters in healthy people

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**P19** Correlation between certain biochemical plasma factors and rheological properties of white blood cells in stroke

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P20 Cell volume regulation via the Calcium-activated Potassium channel KCa3.1 contributes to red blood cell compliance under shear

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P21 Effects of rowing on rheological properties of blood

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P22 Impaired Deformability of Erythrocytes in Hypertensive Rats and Patients: Investigation by Nickel Mesh Filtration Technique

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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
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P24 Susceptibility to mechanical damage of density-fractionated red blood cells

Antony McNamee, Kieran Richardson, Lennart Kuck, Kai Robertson, Michael Simmonds
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P25 Clinical Evaluation of Laser Doppler Flowmetry for diagnosis of microcirculatory disorders

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P25 Erythrocytes aggregation index correlate with oxidative stress and hydrogen sulfide plasma concentration in diabetes mellitus

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P26 Effects of carboxylated multiwall carbon nanotubes on erythrocytes stability and functionality

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P27 Influence of different rhythms sound wave to serotonin concentration in rats hippocampus

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P28 Physical properties of erythrocytes improve in hemochromatosis patients with repeated venesection therapy

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P29 Experimental Characterization of the Embolus Trapping Efficiency of the U.S. FDA Generic Inferior Vena Cava Filter

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P30 Effects of pentoxifylline on hemodynamic and hemorheological parameters in SHRs during arterial hypertension development
Alexander Shamanaev, Oleg Aliev, Anastasia Sidekhmenova, Anna Anischenko, Mark Plotnikov
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P31 EFFECT OF CHOLESTEROL-RICH DIET ON HEMATOLOGICAL AND HEMORHEOLOGICAL PARAMETERS IN RABBITS
Bence Tanczos, Viktoria Somogyi, Mariann Bombicz, Bela Juhasz, Norbert Nemeth, Adam Deak
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P32 Effect of cholesterol-rich diet on hematological and hemorheological parameters in rabbits
Bence Tanczos*, Viktoria Somogyi*, Mariann Bombicz*, Bela Juhasz*, Norbert Nemeth*, Adam Deak*
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P33 Changes in biochemical properties of the blood in winter swimmers
Aneta Teleglowa, Jakub Marchewka, Anna Marchewka, Zbigniew Dąbrowski, Bartłomiej Ptaszek, Mateusz Mardyń
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P34 The paraclinical evolution in diabetic hypertensive patients with increased abdominal circumference
Cornel Cezar Tudorica, Ana Maria Vintila, Stefan Dragos Tudorica, Mirela Gherghe
* Coltea Clinical 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
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P36 Shear-dependency of the predicted ideal hematocrit
Emmanuelle Varlet-Marie, Laurent Vachoud, Bénédicte Marion, Céline Roques, Marlène Richou, Eric Raynaud de Mauverger
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Monday, July 2
OPENING CEREMONY
18.00-19.30  OPENING CEREMONY
with LECTURE about Krakow and Polish folklore
show in Auditorium Maximum UJ,
(33 Krupnicza Street)

20.00-21.30  WELCOME RECEPTION AT TOWN HALL
(3/4, Wszystkich Świętych)

Tuesday, July 3
WALK IN THE GARDEN
20.00-21.30  WALK THROUGH THE GARDENS
OF THE ARCHAEOLOGICAL MUSEUM
(3, Senacka Street)

Wednesday, July 4
MEET THE OLD KRAKOW
17.00-19.30  SIGHTSEEING OF COLLEGIUM MAIUS
(the Jagiellonian University Museum)
and WALKING TOUR AROUND THE OLD TOWN
of Krakow with city guide

20.00-21.00  SIGHTSEEING AND ORGAN CONCERT
IN THE ST. MARY’S BASILICA
(Main Market Square in Krakow)

Thursday, July 5
SALT MINE TOUR AND BANQUET IN THE WIELICZKA
17.30 pm  meeting at the conference venue
– bus transportation to the Salt Mine

18.00-20.00  AROUND TOUR IN THE SALT MINE
(return to Krakow)

20.00-23.00  BANQUET (return to Krakow)
Social program for accompanying persons

July 2, 2018
18.00-20.00  OPENING CEREMONY in Auditorium Maximum (33, Krupnicza, Kraków)
20.00-22.00  WELCOME RECEPTION at Town Hall

July 3, 2018
10.00  JEWISH CULTURE ROUTE – conference walking tour

Departure point: conference venue – Auditorium Maximum (33, Krupnicza, Kraków)

More information
- 4-hour Jewish history and heritage tour of Kraków
- Trace the story of Kraków’s Jewish community through the centuries and during WWII
- Explore Kazimierz, the city’s historical Jewish district, with its synagogues, monuments and kosher restaurants
- Hear about Kazimierz during WWII, and how its people were herded into the Jewish ghetto
- Learn how Steven Spielberg filmed Schindler’s List here and see some of the locations
- Travel with the trams to feel the city atmosphere

For many centuries Jews played their part in creating the history and culture of the city of Kroke, as Kraków is known in Yiddish. Before World War II they made up as much as 25% of the city’s population. A tour around Kazimierz - the former Jewish district, preserved in excellent condition until today - will introduce you to the world of their rich culture, customs and history. It was there that the renowned philosopher Mojżesz Isserles (called Remuh) taught, Helena Rubinstein was born, who is considered to have been one of the richest women in the world, and the esteemed director, actor and screenwriter Roman Polanski spent his childhood. The old Jewish district, included on the UNESCO World Heritage List in 1978, became an even more recognisable landmark in Europe following the release of the famous „Schindler’s List”. You will be introduced to the history of the extermination of the Jews of Kraków, which is the background for the events described in the Spielberg’s film, as you will be wandering the streets of the former ghetto. That is the place where Jews were locked up during World War II, and they were sent to death camps from there. A display in the Schindler’s Factory Museum will complement the information, which is the story of Kraków and the fate of the Polish and Jewish population during World War II, but also about the Germans - occupiers who arrived here on 6th September, 1939 and brutally stopped a centuries-old history of Polish-Jewish Kraków. The story of World War II mingles with everyday life there, and private life with the tragedy that affected the whole world.

Additional information
- Outdoor tour, please dress appropriately
- Comfortable walking shoes are recommended
- Children must be accompanied by an adult

20.00-21.30  WALK THROUGH THE GARDENS OF THE ARCHAEOLOGICAL MUSEUM
(3, Senacka Street)

July 4, 2018
17.00  MEET THE OLD KRAKOW. Sightseeing of Collegium Maius the Jagiellonian
and walking tour around the Old Town of Krakow with city guide

20.00-21.00  SIGHTSEEING AND ORGAN CONCERT in the St. Mary’s Basilica
(Main Market Square in Krakow)

July 5, 2018
17.30  SALT MINE TOUR & BANQUET

Departure point: Auditorium Maximum

Going down into the salt mine you may have the impression of entering a magical underground city, full of mysterious caves, amazing underground lakes, majestic designs and unique salt carvings. The tourist route in the Salt Mine, included on the UNESCO World Heritage List in 1978, is almost 3 km long and consist of winding corridors, 800 steps and a descend to a depth of 135 metres underground. Our tour will be a half shorter. It begins at the Daniłowicz Shaft, where the visitors meet their guide who, while showing them around, will tell them about the history and secrets of the mine, forces of nature that rule the mine, and the ethos of hard work of many generations of miners. Going down deeper and deeper, the visitors will see unusual places, take pleasure in watching the light spectacle on the banks of one of the saline lakes, and learn the famous legend of Princess Kinga, who brought a wealth of salt into the Polish soil. In the middle of the route there is St. Kinga’s Chapel, a wonderful chapel dedicated to the patron saint of salt miners, decorated with extraordinary salt artworks. Our evening will end in the beautiful interior of the Haluszka Chamber, where a conference dinner will be served.

Additional information
- Wieliczka Salt Mine tour & banquet is not recommended for participants with walking disabilities and for participants with claustrophobia.
- The temperature in the Wieliczka Salt Mine, though constant is low (14C or 57F). That is why even in summer, warm clothes should be worn.
- Children must be accompanied by an adult.
- Not wheelchair accessible.
The Organizers thank all Sponsors of the Joint Meeting of the ESCHM-ISB-ISCH 2018