

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

Wisława Szymborska

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
mentions 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?
Is it 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.

Wisława 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



President of the City of Krakow
Jacek Majchrowski

Organized by



JAGIELLONIAN UNIVERSITY



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MEDICAL COLLEGE



Polish Society for Clinical
Hemorheology and Microcirculation

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Peter Butler USA, ISB Chair
Brian M. Cooke Australia, ISCH
Tomasz Grodzicki Poland, Jagiellonian Univ. Med. College, Rector
Sehyun Shin Korea, ISCH Chair

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Gregorio Caimi (Italy)

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Dirk Clevert (Germany)

Guy Cloutier (Canada)

Philippe Connes (France)

Zbigniew Dąbrowski (Poland)

Dmitry Fedosov (Germany)

Bingmei Fu (USA)

Jerzy Gąsowski (Poland)

Tommaso Gori (Italy)

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Norbert Nemeth (Hungary)

Lukas Prantl (Germany)

Axel Pries (Germany)

Alexander Priezzhev (Russia)

Michael Rampling (UK)

Walter Reinhart (Switzerland)

Eugene Roitman (Russia)

Carlota Saldanha (Portugal)

Masaaki Sato (Japan)

Geert Schmid-Schönbein (USA)

Tim Secomb (USA)

Sergey Shevkopyas (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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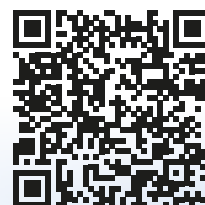


Venue

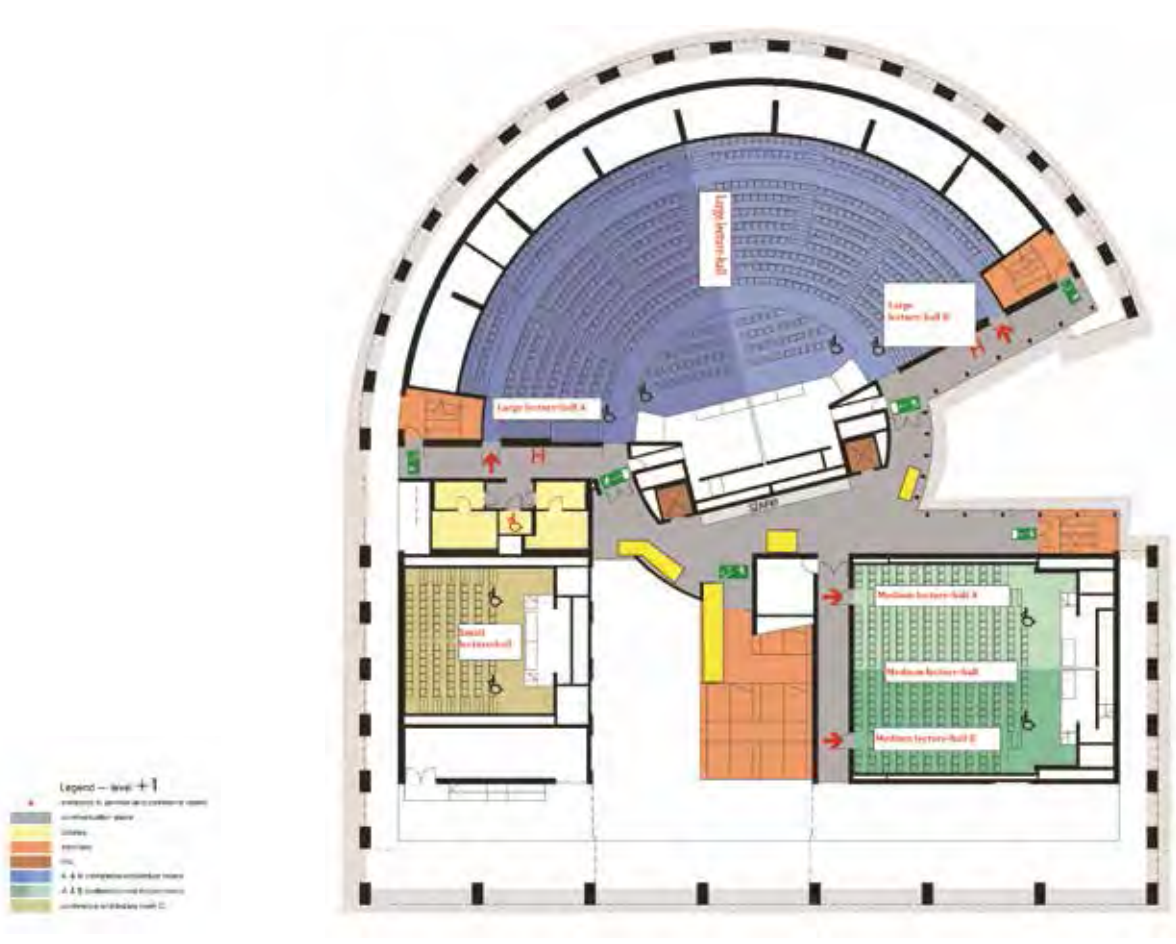
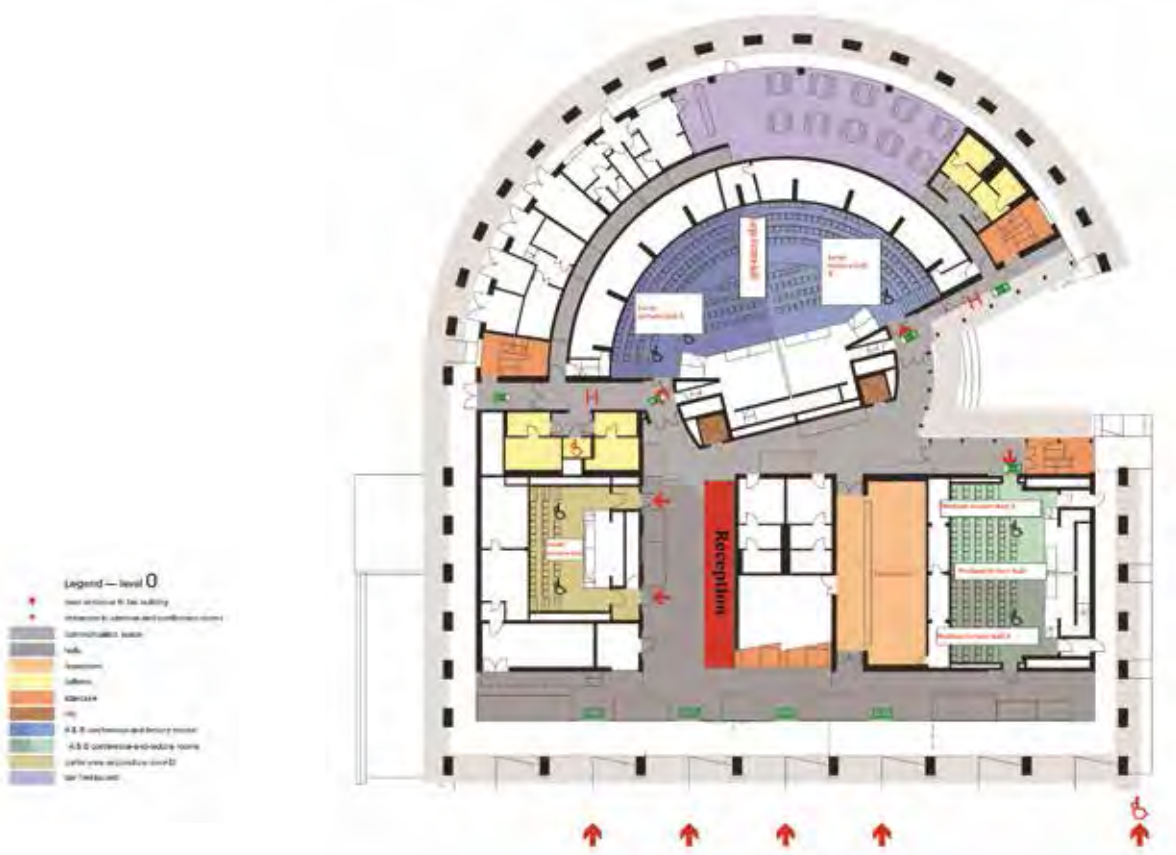
Auditorium Maximum of the Jagiellonian University

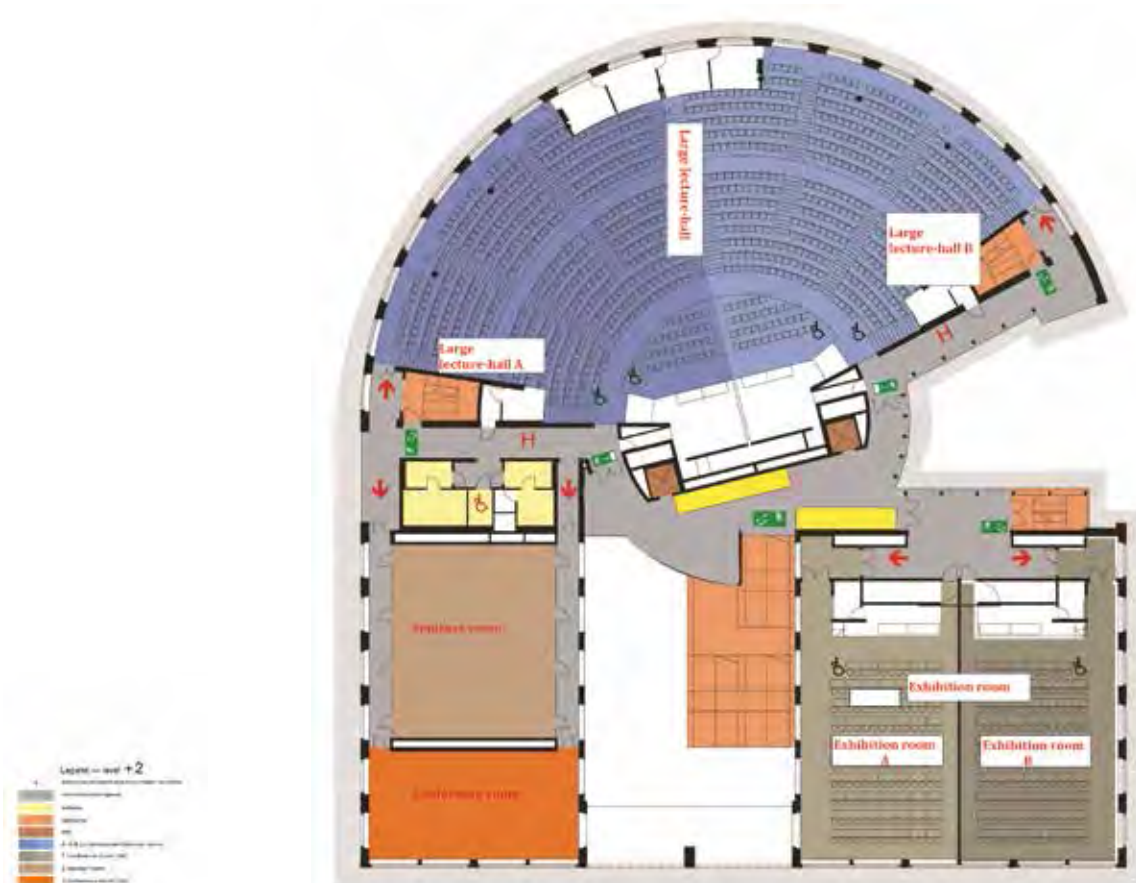
ul. Krupnicza 33, 31-351 Kraków, Poland

www.konferencje.uj.edu.pl/en_GB/obiekty-konferencyjne/auditorium-maximum



Floor Plan Auditorium Maximum UJ





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 Str.

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

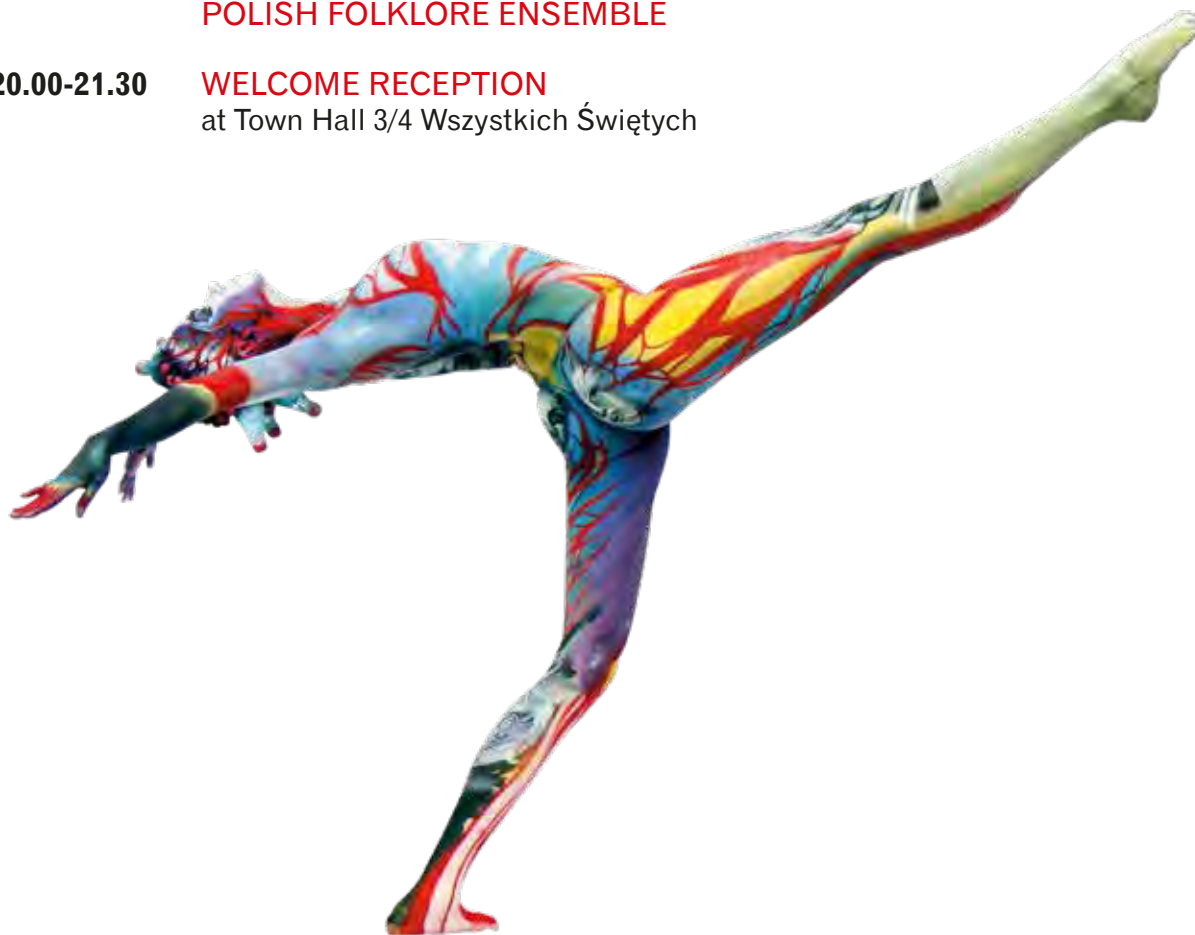
Jean-Frédéric Brun

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



LEGEND: L – Lecture S – Symposium O – Free Communications

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



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**

S1 MLH-A	S2 MLH-B	S3 SLH	O1 SR	O2 CR
<i>Vessels and Hemorheology</i> CHAIRS: Kalman Toth, Norbert Nemeth	<i>Platelet Adhesion</i> CHAIRS: Shinya Goto, Terumitsu Hasebe	<i>Advances in Hemorheological Measurements-1</i> CHAIRS: Sehyun Shin, Sung Yang	<i>Cellular Rheology and Biophysics</i> CHAIR: Peter Butler	<i>Clinical Hemorheology</i> CHAIR: Jean-Frédéric Brun
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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**

S4 MLH-A	S5 MLH-B	S6 SLH	S7 SR	O3 CR
<i>Glycocalyx – Its Structure and Function</i> CHAIRS: John Tarbell, Hans Vink	<i>Novel mechanisms regulating blood cell rheology</i> CHAIRS: Brian Cooke, Tamas Alexy	<i>Advances in Hemorheological Measurements-2</i> CHAIRS: Sehyun Shin, Sung Yang	<i>Hemorheology and blood coagulation</i> CHAIRS: Ursula Windberger, Resia Pretorius	<i>Endothelial Function and Shear Stress</i> CHAIR: Markos Klonizakis, Guixue Wang
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15.45-16.15 COFFEE BREAK

16.15-17.45 **SYMPOSIA S8-S12**

S8 MLH-A	S9 MLH-B	S10 SLH	S11 SR	S12 CR
<i>Glycocalyx – Its Diversity</i> CHAIR: Herbert Lipowsky	<i>Molecular and mechanical markers of various pathologies</i> CHAIR: Małgorzata Lekka	<i>MiDAS Microcirculation Meeting (3M)</i> CHAIRS: Christian Lehmann, Vladimir Cerny	<i>Beyond Red cell stiffness</i> CHAIRS: Jean-Frédéric Brun, Carlota Saldanha	<i>Macro and micro hemorheology in vitro and in vivo</i> CHAIRS: Michael Simmonds, Jon Detterich
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18.00-19.30 **POSTER SESSION** ER-A

20.00-21.30 Walk through the Gardens of the Archaeological Museum (3, Senacka Street)

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
<i>Microcirculation of Inner Organs</i> CHAIRS: Ernst Michael Jung, Pamela Zengel	<i>Cell mechanics and cell mechano-biology - 1</i> CHAIRS: Taiji Adachi, Yukiko Matsunaga	<i>Hemodynamic Functionality of Red Blood Cells in Blood Microcirculation: Experiments and Modeling</i> CHAIRS: Saul Yedgar, Ming Dao	<i>Red Blood Cell Deformability</i> CHAIRS: Edgar O'Rear, Philippe Connes	<i>Flow Visualization and Modeling</i> CHAIRS: Sung Yang, Efstathios Kaliviotis
DETAILS: PAGE 21	DETAILS: PAGE 21	DETAILS: PAGE 21	DETAILS: PAGE 22	DETAILS: PAGE 22

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
<i>Special Symposium to Celebrate the Centennial of Distinguished Professor Yuan-Cheng B. Fung (1)</i> CHAIRS: Linhong Deng, Li Yang	<i>Rheology and Microcirculation</i> CHAIRS: Lukas Prantl, Gerhard Pindur	<i>Nanostructures in disease and health</i> CHAIRS: Květoslava Burda, Marek Cyrklaff	<i>Red blood cell Aggregation</i> CHAIRS: Dong-Guk Paeng, Norbert Nemeth
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17.00-19.30 Meet the old Krakow



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
<i>Interaction of blood cells / tissue engineering</i> CHAIRS: Friedrich Jung, Anna Block	<i>Flow Visualization of Cardiovascular Devices</i> CHAIRS: Keefe Manning, Ajit Yoganathan	<i>Macro- and microrheological blood characteristics under physiological and pathological conditions</i> CHAIRS: Nadia Antonova, Eugene V. Roitman	<i>The Glycocalyx – Its Role in Disease</i> CHAIRS: John Tarbell, Hans Vink	<i>Special Symposium to Celebrate the Centennial of Distinguished Professor Yuan-Cheng B. Fung - 2</i> CHAIRS: Linhong Deng, Li Yang
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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
<i>Clinical Studies in Hemorheology</i> CHAIRS: Byoung K. Lee, KyuChang Won	<i>Clinical Microcirculation</i> CHAIRS: Dirk-Andre Clevert, Isabel Wiesinger	<i>Red blood cell nitric oxide/rheology</i> CHAIRS: Michael Simmonds, Philippe Connes	<i>Disease and Hemorheology</i> CHAIRS: Gerard Nash, Sajad Ahmadizad	<i>Biorheology and Biotechnology-1</i> CHAIR: Guixue Wang
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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**

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

S27 MLH-A	S28 MLH-B	S29 SLH	O9 SR
<p><i>Cell mechanics and cell mechano-biology - 2</i></p> <p>CHAIRS: Toshiro Ohashi, Susumu Kudo</p>	<p><i>Rheology and microstructure of cellular blood flow</i></p> <p>CHAIRS: Masako Sugihara-Seki, Ken-ichi Tsubota</p>	<p><i>Role of gasotransmitters (NO, CO and H₂S) in blood cell functions and the molecular mechanisms of their microrheology alterations</i></p> <p>CHAIRS: Carlota Saldanha, Eugene Roitman</p>	<p><i>Biorheology and Biotechnology-2</i></p> <p>CHAIR: Jinxuan Wang</p>
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12.00-13.00 LUNCH BREAK

13.00-14.30 SYMPOSIA S30-S32

S30 SLH	S31 SR	S32 CR
<p><i>From Rheology to Microcirculation: New Insights</i></p> <p>CHAIRS: Gregorio Caimi, Antonio Colantuoni</p>	<p><i>Cardiovascular Biomechanics from Cells to Organs</i></p> <p>CHAIRS: Noriyuki Kataoka, Ryoko Otomo</p>	<p><i>Computational Models of Thrombosis</i></p> <p>CHAIRS: Keefe Manning, Shawn Shadden</p>
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14.30-15.30 CLOSING SESSION MLH-A+B



S1 MLH-A



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 Totsimon, 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 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

^aUniversity of Pécs, Medical School, Department of Anaesthesia and Intensive Care, Hungary; ^bUniversity of Pécs, Medical School, 1st Department of Internal Medicine, Hungary; ^cUniversity of Pécs, Medical School, Department of Languages for Specific Purposes, Hungary; ^dUniversity of Debrecen, Department of Pharmacology and Pharmacotherapeutics, Hungary; ^eUniversity of Pécs, Medical School, Department of Laboratory Medicine, Hungary; ^fUniversity 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

^aUniversity of Pécs, Medical School, 1st Department of Medicine, Hungary; ^bUniversity of Pécs, Medical School, Centre for Occupational Medicine, Hungary; ^cUniversity 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

^aDepartment of Operative Techniques and Surgical Research, Faculty of Medicine, University of Debrecen, Hungary; ^bDepartment 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 MLH-B



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^b, Shunto Maegawa^a, Kenta Bito^a, Tomohiro Matsumoto^b, Tetsuya Suzuki^a

^aKeio University, Japan; ^bTokai University, 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

^aPennsylvania State University, USA; ^bPennsylvania 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

^aTokai University; ^bKeio University





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

S3 SLH



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
^aBioengineering College, Chongqing University, China; ^bInstitute 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
^aBiorheology Research Laboratory, Griffith University, Australia; ^bSchool of Engineering, Griffith University, Australia; ^cBiorheology 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
^aBiorheology Research Laboratory, Griffith University, Australia; ^bSchool of Engineering, Griffith University, Australia; ^cBiorheology 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
^aUniversity of Montreal Hospital Research Center, Canada; ^bINSERM, 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 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

O1 SR



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 CR



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**^aDepartment of Physical Analysis and Therapeutic Sciences, Graduate School of Biomedical and Health Sciences, Hiroshima University, Japan; ^bFaculty 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**^aDepartment of Biophysics UM Poznań, Poland; ^bDepartment of Neurology UM Poznań, Poland; ^cDepartment of Neurology 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**^aDepartment of Physiology, Akdeniz University, Antalya, Turkey; ^bDepartment of Plastic and Reconstructive Surgery, Akdeniz University, Antalya, Turkey; ^cDepartment of Plastic Surgery Department of Plastic Surgery, Sahlgrenska University Hospital, Gothenburg, Sweden.; ^dDepartment of Biochemistry, Akdeniz University, Antalya, Turkey; ^eDepartment 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**^aDepartment of Physiology, Medical Faculty, Akdeniz University, Antalya, Turkey; ^bDepartment of Medical Microbiology, Medical Faculty, Akdeniz University, Antalya, Turkey; ^cDepartment 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^a, Asma Alanazi, Lewis Ward^a, Julie Rayes^a, Mohammed Alassiri, Steve Watson^a, Gerard Nash^a**^aInstitute of Cardiovascular Sciences, College of Medical and Dental Sciences, University of Birmingham, United Kingdom;^bMedical 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, Maimouna 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

^aUniversity Lyon 1, France; ^bLaboratoire de physiologie et explorations fonctionnelles, FMPO, UCAD, Senegal; ^cClinique Médicale II, Centre Hospitalier Abass Ndao, Senegal; ^dLaboratoire d'Excellence GR-Ex, Paris, France; UMR INSERM 970, Université Paris Descartes; Service de Médecine Interne, Hôpital Europe en Georges Pompidou, France; ^eLaboratoire de Biochimie Pharmaceutique, Faculté de Médecine, de Pharmacie et d'Odontologie, Université Cheikh Anta Diop, Senegal; ^fLaboratoire d'hémo-immunologie, FMPO, UCAD, Senegal; ^gLaboratoire 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



SYMPOSIUM S6: ADVANCES IN HEMORHEOLOGICAL MEASUREMENTS-2

SMALL LECTURE HALL [SLH]

CHAIRS: **Sehyun Shin, Sung Yang**

S6 SLH

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

^aDepartment of Physics and International Laser Center, M.V. Lomonosov Moscow State University, Russia; ^bUlsan National Institute of Science and Technology, South Korea; ^cExperimental 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, Sehyun Shin^e, Evgeny Shirshin^a, Alexander Priezzhev^b

^aDepartment of Physics of M.V. Lomonosov Moscow State University, Russia; ^bInternational Laser Center of M.V. Lomonosov Moscow State University, Russia; ^cUlsan National Institute of Science and Technology, South Korea; ^dK.D.Ushinsky Yaroslavl State Pedagogical University, Russia; ^eKorea University, South Korea

S6-3 Electrochemical impedance spectroscopy of blood for blood aggregation, sedimentation, and hematocrit

Alexander Zhanov, 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

^aKorea University, South Korea; ^bUNIST, South Korea; ^cLomonosov Moscow State University, Russia



SYMPOSIUM S7: HEMORHEOLOGY AND BLOOD COAGULATION

SEMINARY ROOM [SR]

CHAIRS: **Ursula Windberger, Resia Pretorius**

S7 SR

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

^aPirogov Russian National Research Medical University, Russia; ^bResearch Center of Neurology, Russia



O3 CR



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 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

^aUniversity of Sheffield, United Kingdom; ^bSheffield Hallam University, United Kingdom

S8 MLH-A



SYMPOSIUM S8: GLYCOCALYX – ITS DIVERSITY

MEDIUM LECTURE HALL A [MLH-A]

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

^aUniv. Cal. San Diego, USA; ^bThe City College of New York, USA; ^cMGH/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

^aInstitute for Tissue Engineering and Regenerative Medicine, Chinese University of Hong Kong, Hong Kong Special Administrative Region of China; ^bDepartment 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 MLH-B

S9-1 Early stage of essential hypertension monitoring**Kvetoslava Burda^a, Magdalena Kaczmarek^a, Maria Fornal^b, Franz Messerli^c, Jozef Korecki^a, Tomasz Grodzicki^b**^aAGH University of Science and Technology, Faculty of Physics and Applied Computer Science, Poland; ^bCollegium Medicum, Department of Internal Medicine and Gerontology, Jagiellonian University, Poland; ^cDivision 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, Czesława Paluszkiwicz^a, Maria Fornal^b, Tomasz Grodzicki^b, Wojciech Kwiatek^a**^aInstitute of Nuclear Physics Polish Academy of Sciences, Poland; ^bJagiellonian 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**^aAGH-University of Science and Technology, Faculty of Physics and Applied Computer Science, Department of Medical Physics and Biophysics, Poland; ^bJagiellonian University Medical College, Faculty of Medicine, Department of Coronary Artery Disease and Heart Failure, Poland**SYMPOSIUM S10: MIDAS MICROCIRCULATION MEETING (3M)**

SMALL LECTURE HALL [SLH]

CHAIRS: **Christian Lehmann, Vladimir Cerny**

S10 SLH

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**^aInterdisciplinary Ultrasound Department, University Hospital Regensburg; ^bCenter 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

**SYMPOSIUM S11: BEYOND RED CELL STIFFNESS**

SEMINARY ROOM [SR]

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

S11 SR

S11-1 RBC deformability: an exquisite homeostasis**Jean-Frédéric Brun^a, Emmanuelle Varlet-Marie^b**^aINSERM U1046 Université Montpellier, France; ^bFaculty 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^g

^aLaboratoire LIBM EA7424, Equipe « Biologie Vasculaire et du Globule Rouge », Université Claude Bernard Lyon 1, France; ^bCarMeN Laboratory, INSERM 1060, INRA 1397, Université Claude Bernard Lyon1, INSA Lyon, Villeurbanne, France; ^cLaboratoire ACTES EA3596, Université des Antilles, Pointe-à-Pitre, France; ^dUnité Transversale de la Drépanocytose, Centre Hospitalier Universitaire de Pointe-à-Pitre, Pointe-à-Pitre, Guadeloupe; ^eLaboratoire ACTES EA3596, Université des Antilles, Pointe-à-Pitre, France; ^fUMR 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

^aIMAG. CNRS UMR 5149 - University of Montpellier, France; ^bINRA Rennes and CBS. CNRS UMR 5048 - INSERM UMR 1054 - University of Montpellier, France; ^cInstitute of Complex Systems and Institute for Advanced Simulation, Forschungszentrum Juelich, Germany; ^dCBS. CNRS UMR 5048 - INSERM UMR 1054 - University of Montpellier, France

S12 CR



SYMPOSIUM S12: MACRO AND MICRO HEMORHEOLOGY IN VITRO AND IN VIVO

CONFERENCE ROOM [CR]

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, 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

^aDivision of Cardiology, Children's Hospital Los Angeles, University of Southern California Keck School of Medicine, USA;

^bGriffith 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 Putz^a, Anna Erlmeier^b, Niklas Verloh^b, Bernhard Banas^a, Christian Stroszczynski^b, Ernst Michael Jung^b

^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 Zengel^a, Florian Notter^a, Dirk Andre Clevert^b

^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 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

^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 Ohashi^a, Mazlee Bin Mazalan^b, Ma Mingb, Jennifer H. Shin^c

^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 C 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

^aThe 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

^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

S13 MLH-A

S14 MLH-B

S15 SLH



S15-2 Microvascular blood flow peculiarities in cancer**Irina Tikhomirova^a, Yulia Malysheva^a, Nikolay Kislov^b, Mihail Ryabov^b**^aYaroslavl State Pedagogical University, Russia; ^bYaroslavl 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**^aForschungszentrum Juelich, Germany; ^bTechnical 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**^aHebrew University Medical School; ^bCharité-Universitätsmedizin; ^cHadassah University Hospital**S15-5** Red Blood Cell Aggregate Flow Characteristics in Bifurcating Microchannels**Efstathios Kaliviotis¹, Joseph Sherwood², Stavroula Balabani³**¹Department of Mechanical Engineering and Materials Science, Cyprus University of Technology, Cyprus; ²Department of Bioengineering, Imperial College London, UK; ³Department of Mechanical Engineering, University College of London, UK

O4 SR

**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^a, Teresa Freitas^b, Carlota Saldanha^b, Ana Silva-Herdade^b**^aHospital da Luz de Aveiro, Portugal; ^bInstitute 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**^aLIBM EA7424 / UCBL1, France; ^bINL-UMR5270 CNRS / UCBL1, France**O4-3** Proteomic analysis of the role of adenylyl cyclase-cAMP pathway in red blood cell mechanical response**Özlem 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 Merckx^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**^aUniversity Medical Center Utrecht, The Netherlands; ^bRR Mechatronics, The Netherlands; ^cThe Children's Hospital of Philadelphia, USA; ^dVirginia 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, Özlem Yalcin^a**^aKoc University School of Medicine, Turkey; ^bThe University of Texas at San Antonio, USA

O5 CR

**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 Pasiias, 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**^aThe University of Oklahoma, USA; ^bVADovations, USA; ^cThe 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

**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 MLH-A

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**^aInstitute of Biomedical Engineering and Health Sciences, Changzhou University, China; ^bBioengineering 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

**SYMPOSIUM S17: RHEOLOGY AND MICROCIRCULATION**

MEDIUM LECTURE HALL B [MLH-B]

CHAIRS: **Lucas Prantl, Gerhard Pindur**

S17 MLH-B

S17-1 Longitudinal analysis of thrombin generation biomarkers in venous thromboembolism**Gerhard Pindur^a, Aida Beye^b, Bernhard Stephan^a, Harald Helling^c**^aUniversity Hospital of Saarland, Germany; ^bCentre Hospitalier CHNDS, France; ^cUniversity 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**^aDepartment of Urology, University Hospital Grosshadern, Ludwig-Maximilians-University Munich, Munich, Germany;^bDepartment 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**^aENT Department Munich, LMU, Germany; ^bInstitut 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. Troeltzsch¹, P. Brockmeyer¹, H. Bohnenberger², P. Stroebel², M. Manzke³, R. Cordesmeier¹, H. Schliephake¹, L. Prantl⁵, T. Aung⁵

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

S18 SLH



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 Gajos^a, Aleksander Siniarski^a, Joanna Natorka^b, Michał Ząbczyk^c, Jakub Siudut^c, Aneta Undas^b

^aJagiellonian University Medical College, Faculty of Medicine, Department of Coronary Artery Disease and Heart Failure, Poland; ^bInstitute of Cardiology, Jagiellonian University Medical College; Krakow Centre for Medical Research and Technologies, John Paul II Hospital, Poland; ^cInstitute 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 Awskiuk^b, Jakub Rysz^b, Andrzej Budkowski^b, Małgorzata Lekka^a

^aInstitute of Nuclear Physics, Polish Academy of Sciences, Kraków, Poland; ^bInstitute 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

^aDepartment of Physics of Nanostructures and Nanotechnology, Faculty of Physics, Astronomy and Applied Computer Science, Jagiellonian University, Poland; ^bJagiellonian Centre for Experimental Therapeutics, JCET, Jagiellonian University; 2 Chair of Pharmacology, Jagiellonian University Medical College

O6 SR



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 Sołna-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, Minhoo 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

^aCNRS – LIPhy, France; ^bUniversität 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 MLH-A

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. Papagrigrakes^{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}

^aInstitute of Biomaterial Science, Helmholtz-Zentrum Geesthacht, Teltow, Germany; ^bUniversity of Potsdam, Potsdam, Germany; ^cBerlin-Brandenburg Center for Regenerative Therapies (BCRT), Charité, Universitätsmedizin Berlin and Helmholtz-Zentrum Geesthacht, Teltow, Germany; ^dInstitute 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

^aHelmholtz-Zentrum Geesthacht und Berlin-Brandenburger Centrum für Regenerative Therapien, Germany; ^bMax Bergmann Center of Biomaterials Dresden, Leibniz Institute of Polymer Research Dresden, Germany; ^cDepartment of Cardiovascular Engineering, Institute of Applied Medical Engineering Helmholtz-Institute, RWTH Aachen University, Germany; ^dInstitute for Animal Hygiene, Animal Welfare and Farm Animal Behaviour, University of Veterinary Medicine Hannover, Foundation, Germany; ^eDepartment 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

^aInstitute for Tissue Engineering and Regenerative Medicine & School of Biomedical Sciences, Faculty of Medicine, Chinese University of Hong Kong, China; ^bInstitute for Clinical Hemostasiology and Transfusion Medicine, University Saarland, Germany; ^cInstitute of Chemistry and Biotechnology, Zurich University of Applied Sciences, Switzerland

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



SYMPOSIUM S20: FLOW VISUALIZATION OF CARDIOVASCULAR DEVICES

MEDIUM LECTURE HALL B [MLH-B]

CHAIRS: **Keefe Manning, Ajit Yoganathan**

S20 MLH-B

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

^aGeorge W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, USA; ^bDepartment of Aerospace Engineering, Auburn University, USA; ^cBiomedical Engineering Practice, Exponent Inc., USA; ^dWallace 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 SLH

**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^a, Vasilka Paskova^a, Irena Velcheva^b, Nino Chaushev^b, Sergey Podtaev^c, Kirill Tsiberkin^d**^aInstitute of Mechanics to the Bulgarian Academy of Sciences, Bulgaria; ^bUniversity Hospital of Neurology and Psychiatry "St. Naum, Bulgaria; ^cPerm State University, Russia; ^dInstitute 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**^aDepartment of Biomechanics, Institute of Mechanics, Bulgarian Academy of Sciences, Bulgaria; ^bDepartment 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**^aPirogov Russian National Research Medical University, Russia; ^bResearch 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**^aDepartment of Neurology, University Hospital, Bulgaria; ^bDepartment Biomechanics, Institute of Mechanics, Bulgarian Academy of Sciences, Bulgaria

S22 SR

**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. Atheropermissive Endothelium Function**Eno Ehong, 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 Sola 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**^aLUMC/Internal Medicine-Division of Nephrology, France; ^bNOXXON Pharma AG, France; ^cRadboud University Medical Center / Dept of Nephrology, France

S23 CR

**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



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 shear 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



SYMPOSIUM S24: CLINICAL STUDIES IN HEMORHEOLOGY

MEDIUM LECTURE HALL A [MLH-A]

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

^aDepartment of Anesthesiology and Pain Medicine, Korea University Medical Center, South Korea; ^bKorea 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

^aGangnam Severance Hospital, Department of Internal Medicine, Yonsei University Medical College, South Korea; ^bSchool 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

^aInternational Laser Center of M.V. Lomonosov Moscow State University, Russia; ^bDepartment of Physics of M.V. Lomonosov Moscow State University, Russia; ^cMedical Research and Education Center of M.V. Lomonosov Moscow State University, Russia



SYMPOSIUM S25: CLINICAL MICROCIRCULATION

MEDIUM LECTURE HALL A [MLH-B]

CHAIRS: **Dirk Andre Clevert, Isabel 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. Aung¹, C. Taeger¹, S. Geis¹, A. Kehrer¹, L. Prantl¹, E.M. Jung²

¹Department of Plastic, Hand and reconstructive Surgery, University Medical Center Regensburg, Germany; ²Department 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*}

^aDepartment of Plastic, Hand and reconstructive Surgery, University Medical Center Regensburg, Germany; ^bDepartment 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

S24 MLH-A

S25 MLH-B



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 standardized clinical study

C. Strauss, A. Anker, V. Brébant, L. Prantl, D. Schiltz, R. Kemper, S. Geis, T. Aung
Regensburg, Germany

S26 SLH



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

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

^aLaboratoire LIBM, Université Claude Bernard Lyon 1, France; ^bMolecular and Cellular Sport Medicine, Deutsche Sporthochschule Köln, Germany; ^cService de Médecine Interne, Hôpital Edouard Herriot, Hospices Civils de Lyon, France; ^dLaboratoire Carmen Inserm 1060, Université Claude Bernard Lyon 1, France; ^eService de Médecine Interne, Hôpital Edouard Herriot, Hospices Civils de Lyon, France; ^fInstitut d'hématologie et d'oncologie pédiatrique - Hospices Civils de Lyon, Lyon, France; ^gUMR 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, Özlem Yalcın^b
^aOrdu University, Faculty of Medicine, Department of Physiology, Turkey; ^bKoc University, School of Medicine, Department of Physiology, Turkey

O7 SR



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 Dąbrowski^a, Anna Marchewka^a, Aneta Telegtów^a, Maria Fornal^b

^aAcademy of the Physical Education in Cracow, Poland; ^bJagiellonian 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

^aInstitute of Cardiovascular Sciences, College of Medical and Dental Sciences, University of Birmingham, United Kingdom; ^bInstitute 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

^aHuman, Social and Health Department, University of Cassino and Lazio Meridionale, Italy; ^bInstitute 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 Sedentary 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**^aU1046 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; ^bInstitut 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 Strossmayer University of Osijek, Croatia

**FREE COMMUNICATIONS O8: BIORHEOLOGY AND BIOTECHNOLOGY-1**
CONFERENCE ROOM [CR]CHAIR: **Guixue Wang**

O8 CR

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



S27 MLH-A

**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**^aInstitute for Frontier Life and Medical Sciences, Kyoto University, Japan; ^bDepartment 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 MLH-B

**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^a, Marco Rosti^b, Yohsuke Imai^a, Shigeo Wada^a, Luca Brandt^b**^aOsaka University, Japan; ^bLinne 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 SLH

**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 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 H₂S: in vitro study****Yulia Malysheva, 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 SR

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 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^a, Douglas Kell^b, Ethersia Pretorius^a

^aStellenbosch University, South Africa; ^bUniversity of Manchester, United Kingdom



SYMPOSIUM S30: FROM RHEOLOGY TO MICROCIRCULATION: NEW INSIGHTS

SMALL LECTURE HALL [SLH]

CHAIRS: **Gregorio Caimi, Antonio Colantuoni**

S30 SLH

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



S31 SR



SYMPOSIUM S31: CARDIOVASCULAR BIOMECHANICS FROM CELLS TO ORGANS

SEMINARY ROOM [SR]

CHAIRS: **Noriyuki Kataoka, Ryoko Otomo**

S31-1 Biorheology of bile

Minh Nguyen Ngoc^a, Hiromichi Obara^a, Kenji Shimokasa^b, Junfang Zhu^c

^aMechanical Engineering Department, Tokyo Metropolitan University, Japan; ^bFaculty of Industrial Technology, National University Corporation of Tsukuba University of Technology, Japan; ^cNational 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

^aChiba University, Japan; ^bTokyo 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

^aTokyo Metropolitan University, Japan; ^bNagoya Institute of Technology; ^cJichi 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

^aHirosaki University, Japan; ^bCYBERDYNE, INC., Japan; ^cNational 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

^aUniversity of Montreal Hospital Research Center, Canada; ^bINSERM, France

S32 CR



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



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, Özlem Yalcin^b

^a Graduate School of Health Sciences, Turkey

^b 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^{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,

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^d Université de Montpellier

^e 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^d, Eric Raynaud de Mauverger^e, Jean-Frédéric Brun^e

^a Institut des Biomolécules Max Mousseron (IBMM) UMR CNRS 5247, Université de Montpellier, Ecole Nationale Supérieure de Chimie de Montpellier, France

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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*

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

^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

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^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 Chlopicki^{a,d}, Małgorzata Baranska^{a,b}, Katarzyna M. Marzec^{a,e}

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^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 Ahmadzad^a, Ali Daraei^a, Minoo Bassami^b, Hiwa Rahmani^a

^a 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

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^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 Szygufa^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 Mardyla^{a,b}, Aneta Telegtów^a, Zbigniew Dąbrowski^{a,c}, Jakub Marchewka^{a,c}, Jacek Głodzik^{a,d}, Bartłomiej Ptaszek^{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

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^e Institute of Biomaterial Science and BCRT, HZG, Teltow, Germany

^f University of Applied Science Fulda, Germany

P25 *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

P26 *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

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

Yang Ren, Zhidan Deng, Xiang Wang

BME Department of Chongqing University, China

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

Kieran Richardson, Antony McNamee, Michael Simmonds

Griffith University/ Biorheology Research Laboratory, Australia

P29 *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 Aycocock^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



P30 *Effects of pentoxifylline on hemodynamic and hemorheological parameters in SHR 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

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

University of Debrecen, Hungary

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 Teległó^a, Jakub Marchewka^a, Anna Marchewka^a, Zbigniew Dąbrowski^a, Bartłomiej Ptaszek^b, Mateusz Mardyla^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-Frédéric Brun^d

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Social Events

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 Danilowicz 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



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