Joint Meeting

of the

European Society for Microcirculation (ESM)
European Vascular Biology Organisation (EVBO)

June 3 - 6, 2015

Polo Carmignani - PISA, ITALY

www.esm-evbo2015.it
Under the auspices of

Università di Pisa

Azienda Ospedaliero-Universitaria Pisana

Comune di Pisa
CONTENTS

Welcome Note P. 2
The Conference Committees P. 3
General Information P. 4
Social Events P. 6
Program at a glance P. 7
Wednesday 3 June Program P. 9
Thursday 4 June Program P. 13
Friday 5 June Program P. 19
Saturday 6 June Program P. 27
Poster Session P. 31
Dear Friends and Colleagues,

We warmly welcome all of you to the Joint Meeting of the European Society for Microcirculation and the European Vascular Biology Organization. We are convinced, thanks to the presentations by many excellent and internationally renowned speakers (to whom go our acknowledgments), that we will offer you an interesting program which reflects the fascinating progress of microvascular and vascular biology science, including the latest developments in the various fields of interest. Our special acknowledgments also go to the Scientific Committees, the Coordinators of the symposia, the ESM and EVBO Executive Committees, as well as to the Meeting Secretariat.

We think that the planned symposia, the oral communication sessions and poster presentations will stimulate and promote the exchange of ideas relating to the various scientific topics of the Meeting.

This Meeting will also focus on presentations given by students and postdocs, to whom go our acknowledgments for their pivotal role for the success of this Meeting and present and future success of our societies.

We wish a pleasant stay in Pisa to all the participants of the Meeting, being aware that we can count on the “complicity” of a very beautiful town which offers impressive artistic, historical and architectural heritages to its visitors, besides the more famous “Piazza dei Miracoli”, near to which our Congress will take place.

We are delighted to welcome you here in Pisa. Enjoy its visit and the scientific program of the Meeting!

Best regards,

Jozef Dulak
President of EVBO

Marco Rossi
President of ESM
Presidents of the Meeting
Marco Rossi (Pisa, Italy)  Jozef Dulak (Krakow, Poland)
President of ESM  President of EVBO

Local Organizer
Marco Rossi

Core Scientific Committee
Jozef Dulak (Krakow, Poland)
Akos Koller (Budapest, Hungary)
Giovanni Mann (London, UK)
Anna Randi (London, UK)
Marco Rossi (Pisa, Italy)

Local Scientific Committee
Eleuterio Ferrannini (Pisa, Italy)
Carlo Palombo (Pisa, Italy)
Mario Petrini (Pisa, Italy)
Gino Santoro (Pisa, Italy)
Stefano Taddei (Pisa, Italy)

International Scientific Committee
Yvonne Alexander (Manchester, UK)
Giuseppe Maria Andreozzi (Padova, Italy)
Ferenc Bari (Szeged, Hungary)
Ed van Bavel (Amsterdam, Netherland)
Benedetta Bussoleti (Torino, Italy)
Gregorio Caimi (Palermo, Italy)
Antonio Colantuoni (Napoli, Italy)
Raffaele De Caterina (Chieti, Italy)
Elisabetta Dejana (Milano, Italy)
Britta Engelhardt (Bern, Switzerland)
Paul Evans (Sheffield, UK)
Ingrid Fleming (Frankfurt, Germany)
Sandro Forconi (Siena, Italy)
Sarah George (Bristol, UK)
Daniel Henrion (Anger, France)
Boy Houben (Maastricht, Netherland)
Paolo Madeddu (Bristol, UK)
Andriana Margariti (Belfast, UK)
Romeo Martini (Padova, Italy)
Daniela Negrini (Varese, Italy)
Andrew Newby (Bristol, UK)
Geerten P. van Nieuw Amerongen (Amsterdam, Netherland)
Salvatore Novo (Palermo, Italy)
Jeremy Pearson (London, UK)
Ulrich Pohl (Munich, Germany)
Axel Pries (Berlin, Germany)
Harald Schmidt (Maastricht, Netherland)
Angela Shore (Exeter, UK)
Richard Siow (London, UK)
Adriana Visonà (Castelfranco Veneto, Italy)
Johannes Waltenberger (Münster, Germany)
Seppo Ylä-Herttuala (Kuopio, Finland)
Zsolt Pécsvárády (Budapest, Hungary)

Local Scientific Committee
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Carlo Palombo (Pisa, Italy)
Mario Petrini (Pisa, Italy)
Gino Santoro (Pisa, Italy)
Stefano Taddei (Pisa, Italy)
GENERAL INFORMATION

Congress Venue
Polo Carmignani
Piazza dei Cavalieri, 6
56126 Pisa - IT

Organizing Secretariat
Meridiana Events & Education srl
Via G. Volpe, 126
56121 Ospedaletto, Pisa - Italy
Ph. +39 050 9711721  Fax +39 050 974148
Ilaria.Tonelli@meridianaevents.it
Zaira.Lombardo@meridianaevents.it
www.meridianaevents.it

Registration
On site registration will start on Wednesday, June 3 from 12,00 until 19,00.
In the subsequent days registration office will open at 08,00.

On site registration fees (22% VAT Included)
ESM-EVBO Members  Eur 440,00
Non Members  Eur 490,00
Student*  Eur 240,00
Day Rate  Eur 150,00

* Student registration must be accompanied by a letter or a scanned document issued by a University Organization, confirming student status

Registration fee includes: Access to the scientific session, Conference kit, Welcome Cocktail, Coffee breaks as specified in the program.
Registration fee does not include the attendance to the Social Dinner. Tickets can be purchased at the registration desk for Eur 90,00.

Badges
Delegates will receive their personalized name badge upon registration. They are kindly requested to wear it throughout the meeting.

Certificate of attendance
A certificate of attendance is available on a request basis. Please visit the registration desk.

Language
The official language of the conference is English. No simultaneous translation will be provided.
**Speaker Ready Room**
The Speaker Ready Room is available for all the speakers who are requested to load their slides in the Speaker Ready Room at least three hours before their presentation. Use of speakers’ own computer is discouraged, as it may cause significant delay and out-phasing of the parallel session.

**Posters**
The Poster Session is scheduled for 4 June 2015 from 17,00 to 18,30. The presenting author will be requested to be available for discussion during the poster viewing session. Posters cannot exceed these dimensions: 96 cm wide and 150 cm high. Fixing material will be provided. The congress organizers take no responsibility for posters that are not removed after the conference.

**WiFi**
The Congress venue, Polo Carmignani is an Eduroam-enabled institution as it belongs to Pisa University. Please visit the website for further information [www.eduroam.org](http://www.eduroam.org)

**CME Credit (for Italian delegates only)**
Provider Meridiana Events & Education srl (Nr. 1006) has assigned to the conference 1,5 CME credits according to the Italian Health Ministry’s criteria. CME credits will only be awarded to Italian delegates (Physicians) who will attend all the CME Accredited Sessions.

**Awards**
The following Awards will be given during the conference:

- Malpighi Award
- ESM Servier Award in Microcirculation 2015
- Young Investigator Awards
- International Travel Award for developing Countries
- JVR/ESM Award Lecture
SOCIAL EVENTS

Welcome Cocktail
Wednesday, June 3 - 19.00
Conference venue (Polo Carmignani)

The attendance to the welcome cocktail is included in the registration fee.

Social Dinner
Friday, June 5 - 20.00
National Museum Palazzo Reale
Lungarno Antonio Pacinotti, 46 - Pisa

Registration fee does not include the attendance to the Social Dinner. Tickets can be purchased at the registration desk for Eur 90.00.
## Program at a Glance

<table>
<thead>
<tr>
<th>Date</th>
<th>Program</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3 June</strong></td>
<td></td>
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</tr>
<tr>
<td>09.00-11.00</td>
<td>ESM Executive Committee Meeting</td>
<td>Grand Hotel Duomo</td>
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<tr>
<td>11.00-12.00</td>
<td>JVR Publication Committee Meeting</td>
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<tr>
<td>From 12.00</td>
<td>Registration</td>
<td>Polo Carmignani</td>
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<tr>
<td>14.00-14.30</td>
<td>Opening ceremony</td>
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<tr>
<td>14.30-16.10</td>
<td><strong>Parallel Session 1</strong></td>
<td>Galileo</td>
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<tr>
<td></td>
<td>Whatever happened to the endothelium-derived hyperpolarizing Factors?</td>
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<td>Organ specific relationship between blood flow and metabolism</td>
<td>Fibonacci</td>
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<td>MicroRNA regulation in vascular disease</td>
<td>Auditorium</td>
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<tr>
<td>16.10-16.50</td>
<td><strong>Opening Plenary Lecture - Antonio Colantuoni</strong></td>
<td>Auditorium</td>
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<tr>
<td>16.50-17.20</td>
<td>Coffee break</td>
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<tr>
<td>17.20-19.00</td>
<td><strong>Parallel Session 2</strong></td>
<td>Galileo</td>
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<td>Tumor angiogenesis: mechanisms and drugs</td>
<td>Auditorium</td>
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<td>Flowmotion, as a result of vasomotion, in clinical studies. Where do we stand?</td>
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<td>Fibonacci</td>
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<tr>
<td>19.00-20.00</td>
<td>Welcome Cocktail</td>
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<td><strong>4 June</strong></td>
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<tr>
<td>08.30-09.00</td>
<td><strong>Plenary Lecture - Ralf Adams</strong></td>
<td>Auditorium</td>
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<tr>
<td>09.00-10.40</td>
<td><strong>Parallel Session 3</strong></td>
<td>Auditorium</td>
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<td>Platelets and the microcirculation</td>
<td>Galileo</td>
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<td>Vascular Calcification</td>
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<td>Laser Doppler flowmetry in experimental and clinical settings</td>
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<td>10.40-11.10</td>
<td>Coffee break</td>
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<td>11.10-12.50</td>
<td><strong>Parallel Session 4</strong></td>
<td>Auditorium</td>
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<td></td>
<td>Novel mechanisms regulating angiogenesis and vascular development</td>
<td>Fibonacci</td>
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<td>Lymphatic vessel function – translational aspects</td>
<td>Galileo</td>
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<tr>
<td>12.50-14.30</td>
<td>Break</td>
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<td>14.30-16.10</td>
<td><strong>Parallel Session 5</strong></td>
<td>Auditorium</td>
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<td>Endothelial activation and endothelial-leukocyte interaction</td>
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<td>Improving microvascular function in diabetic patients: from the lab to the bedside</td>
<td>Fibonacci</td>
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<td>Novel Bioengineering approaches for regenerative medicine</td>
<td>Galileo</td>
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<tr>
<td>16.10-16.30</td>
<td>Coffee break</td>
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<tr>
<td>16.30-17.00</td>
<td><strong>Plenary Lecture: Peter Carmeliet</strong></td>
<td>Auditorium</td>
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<tr>
<td>17.00-18.30</td>
<td>Poster session</td>
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<td>08.30-09.00</td>
<td><strong>Plenary Lecture - Coen Stehouwer</strong></td>
<td>Auditorium</td>
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<td>09.00-10.40</td>
<td><strong>Parallel Session 6</strong></td>
<td>Auditorium</td>
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<td>Hemorheology and microcirculation: the main mechanisms of interaction</td>
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<td>Novel functions of antioxidant genes in vasculature</td>
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<td>Non-invasive imaging techniques (in addition to LDF) to assess novel aspects of Microcirculation</td>
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<td>10.40-11.00</td>
<td>Coffee break</td>
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<tr>
<td>11.00-11.30</td>
<td><strong>Plenary Lecture - Martin Bennett</strong></td>
<td>Auditorium</td>
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<tr>
<td>11.30-13.00</td>
<td><strong>Oral Communications</strong></td>
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<td>13.00-13.10</td>
<td>International Travel Award for developing Countries</td>
<td>Auditorium</td>
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<td>13.10-14.30</td>
<td>Break</td>
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<td>13.10-13.40</td>
<td>Italfarmaco Sponsored Session</td>
<td>Auditorium</td>
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<tr>
<td>13.30-14.30</td>
<td><strong>Parallel Session 7</strong></td>
<td>Galileo</td>
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<td>Microvascular changes in systemic sclerosis: the approach to the patients</td>
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<td>Leukocyte adhesion and migration: the key to the inflammatory response</td>
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<td>14.50-16.30</td>
<td>MIDAS Symposium</td>
<td>Auditorium</td>
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<tr>
<td>16.30-16.50</td>
<td>Coffee break</td>
<td>Auditorium</td>
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<tr>
<td>16.50-17.20</td>
<td><strong>Malpighi Award Lecture</strong></td>
<td>Auditorium</td>
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<tr>
<td>17.30-18.30</td>
<td>Business Meeting of ESM</td>
<td>Auditorium</td>
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<td>17.30-18.30</td>
<td>Business Meeting of EVBO</td>
<td>Galileo</td>
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<td>20.00</td>
<td>Social Dinner</td>
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<td>08.30-10.10</td>
<td><strong>Parallel Session 8</strong></td>
<td>Auditorium</td>
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<td>Targeting ischemia/reperfusion injury with complex compounds: mechanistic approaches</td>
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<td>von Willebrand factor in the vasculature</td>
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<td>Leukocyte trafficking in development and inflammation</td>
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<td>10.10-10.30</td>
<td>Coffee break</td>
<td>Galileo</td>
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<td>10.30-12.10</td>
<td><strong>Parallel Session 9</strong></td>
<td>Auditorium</td>
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<td>Control of vascular permeability</td>
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<td>Microvascular alterations and vascular aging</td>
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<td>Vascular progenitors: novel strategies and mechanisms</td>
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<tr>
<td>12.10-12.50</td>
<td><strong>Closing Plenary Lecture - Lena Claesson-Welsh</strong></td>
<td>Auditorium</td>
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<tr>
<td>12.50-13.00</td>
<td>Closing Ceremony</td>
<td>Auditorium</td>
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</tbody>
</table>
WEDNESDAY 3 JUNE

09.00 - 11.00  ESM Executive Committee Meeting *
11.00 - 12.00  JVR Publication Committee Meeting *

*Grand Hotel Duomo
Via Santa Maria, 94 - Pisa

From 12.00  Registration - Polo Carmignani
14.00 - 14.30  Opening ceremony

PARALLEL SESSION 1

14.30 - 16.10

Symposium 1 - ROOM GALILEO

Whatever happened to the endothelium-derived hyperpolarizing factors?

Chairs: Ingrid Fleming (Germany), Kim Dora (United Kingdom)

Delete the factor and focus on the hyperpolarization?
Kim Dora (United Kingdom)

Gap Junctional Communication
Cor de Wit (Germany)

Cytochrome P450 and vascular signalling
Ingrid Fleming (Germany)

The role of ROS in EDH
Paul Fraser (United Kingdom)
Symposium 2 - ROOM FIBONACCI

Organ specific relationship between blood flow and metabolism  
Chairs: Eleuterio Ferrannini (Italy), Angela Shore (United Kingdom)

Relationship between blood flow and metabolism at the level of adipose tissue  
Patricia Iozzo (Italy)

Relationship between blood flow and metabolism at the level of myocardial muscle  
Mario Marzilli (Italy)

Relationship between blood flow and metabolism at the level of skeletal muscle  
Andrea Natali (Italy)

Influence of glucagon-like peptide-1 on skeletal muscle microvasculature and insulin resistance  
Eugene J. Barrett (USA)

Symposium 3 - AUDITORIUM

MicroRNAs - mediators of function and regeneration of cardiovascular systems  
Chairs: Jozef Dulak (Poland), Rainier Boon (Germany)

Cardiovascular ageing: the role of non-coding RNA  
Rainier Boon (Germany)

MicroRNAs in atherosclerosis  
Christian Weber (Germany)

Inhibition of microRNA-92a prevents endothelial dysfunction and atherosclerosis in mice  
Xavier Loyer (France)

Short talks selected from abstracts:

Microrna-21 promotes matrix metalloproteinase-1 expression but does not modulate vascular smooth muscle cell invasion  
Alshanwani A., Riches K., Wood I., Turner N., Porter K. (United Kingdom)

TGFB triggers mir-143/5 transfer from smooth muscle cells to endothelial cells via tunneling nanotubes  
Climent M., Quintavalle M., Miragoli M., Condorelli G., Elia L. (Italy)
Session CME Accredited

16.10 - 16.50 Opening Plenary Lecture - AUDITORIUM

Chairs: Ulrich Pohl (Germany), Akos Koller (Hungary)

Arteriolar vasomotion and regulation of microvascular blood flow
Antonio Colantuoni (Italy)

16.50 - 17.20 Coffee break

PARALLEL SESSION 2

17.20 - 19.00

Symposium 4 - ROOM GALILEO

Tumor angiogenesis: mechanisms and drugs
Chairs: Claudine Kieda (France), Yasufumi Sato (Japan)

Role of vasohibin family in the regulation of angiogenesis and more
Yasufumi Sato (Japan)

Novel dual-action combination therapy enhances angiogenesis whilst reducing tumor growth and spread
Ping-Pui Wong (United Kingdom)

Targeting Angiopoietin/Tie signaling during tumor angiogenesis: where do we stand?
Hellmut Augustin (Germany)

Short talks selected from abstracts:

Trail armed with VEGF receptor antagonist overcomes trail-resistance and forcefully inhibits tumor growth

Sunitinib but not VEGF blockade inhibits cancer stem cell endothelial differentiation
Brossa A., Grange C., Mancuso L., Mazzone M., Camussi G., Bussolati B. (Italy)
**Symposium 5 - AUDITORIUM**

**Flowmotion, as a result of vasomotion, in clinical studies. Where do we stand?**

**Chairs:** Boy Houben (Netherland), Marco Rossi (Italy)

Local control of vasomotion  
*Christian Aalkjaer (Denmark)*

Central control of vasomotion  
*Gemma Lancaster (United Kingdom)*

Skin flowmotion in sedentary elderly  
*Martina Di Maro, Antonio Colantuoni (Italy)*

Flowmotion changes in obesity and hypertension: opposite directions of adaptation?  
*Boy Houben (Netherland)*

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**Symposium 6 - ROOM FIBONACCI**

**Extracellular vesicles: from to cell mediators to biomarkers**

**Chairs:** Benedetta Bussolati (Italy), Yvonne Alexander (United Kingdom)

Stem cell-derived vesicles in tissue repair and angiogenesis  
*Giovanni Camussi (Italy)*

Circulating extracellular vesicles  
*Edit Buzas (Hungary)*

Endothelial microparticles as biomarkers of inflammation  
*Yvonne Alexander (United Kingdom)*

**Short talks selected from abstracts**

Regulation of MIRNA expression under conditions of hypoxia in pericytes  
*Slater S., Rodriguez-Arabaolaza I., Alvino V., Madeddu P. (United Kingdom)*

Circulating microvesicles in peripheral artery occlusive disease  
*Giarretta I., Marcantoni M., Gatto I., Lupi G., Iezzi R., Pitocco D., Pola R. (Italy)*

19.00 - 20.00  
*Welcome Cocktail*
Session CME Accredited

08.30 - 09.00  
Plenary Lecture - AUDITORIUM

Chair: Anna Randi (United Kingdom)

Cellular and molecular principles of organ-specific blood vessel growth
Ralf Adams (Germany)

PARALLEL SESSION 3

09.00 - 10.40

Symposium 7 - AUDITORIUM

Platelets and the microcirculation

Chairs: Ingrid Fleming (Germany), Steve Watson (United Kingdom)

Role of chemokine receptor CXCR4/CXCR7 and their ligands for platelet function
Meinrad Gawaz (Germany)

Diabetes-induced alterations in platelet function
Voahanginirina Randriamboavonjy (Germany)

A novel inflammation driven mechanism of thrombosis
Steve Watson (United Kingdom)

Short talks selected from abstracts:

Platelet-localized FXI plays a pivotal role in angiotensin II-induced hypertension by promoting a coagulation inflammatory circuit and vascular injury

Human platelet lysate gel as a substrate for isolation and delivery of endothelial colony-forming cells
Fortunato T., Debank P., Pula G. (United Kingdom)
Symposium 8 - ROOM GALILEO

Vascular Calcification

Chairs: Yvonne Alexander (United Kingdom), Carlo Palombo (Italy)

Common aspects between bone health and vascular calcification
Cristina Vassalle (Italy)

New roles for Bone Morphogenetic Proteins in aortic medial calcification
Vicky E. Macrae (United Kingdom)

Advanced glycation endproducts in vascular calcification and atherosclerosis
Caspar G. Schalkwijk (Netherlands)

Short talks selected from abstracts:

Gla-Rich Protein (GRP) is a new player in mineralization-competence of extracellular vesicles involved in vascular calcification

Premature aging and DNA damage in smooth muscle cells from type 2 diabetes patients: role of Microrna-145
Riches K., O’Regan D., Porter K. (United Kingdom)

Symposium 9 - ROOM FIBONACCI

Laser Doppler flowmetry in experimental and clinical settings
Chairs: Andrey Fedorovich (Russian Federation), Adriana Visonà (Italy)

Optical imaging of intracellular pH changes with spreading depolarization in the intact and ischemic rat brain
Ferenc Bari (Hungary)

Vasomotor activity skin microcirculation as assessed by laser Doppler flowmetry in patients with microvascular angina
Galina Soboleva (Russian Federation)

Photoreactivity of microvessels of rat mesenteric vascular bed
Nikolay Petrishchev (Russian Federation)

Synchronization of polyfrequency oscillations of the microvascular blood flow under normal conditions
Arina Tankanag (Russian Federation)

10.40 - 11.10 Coffee break
Symposium 10 - AUDITORIUM


Chairs: Saul Yedgar (Israel), Axel Pries (Germany)

Biomechanical properties of RBC in health and disease towards microfluidics
Giovanna Tomaiuolo (Italy)

RBC hemodynamic functionality in the development of necrotizing entero-colitis (NEC) in premature neonates
Dan Arbell (Israel)

RBC storage duration in the clinical outcomes in pediatric cardiac surgery
Helmut Habazettl (Germany)

Hemodynamic functionality of transfused RBC in the microcirculation of transfusion recipients
Saul Yedgar (Israel)

Short talk selected from abstract:

The possibility of using of hemorheological parameters to predict recurrent stroke
Kruchinina M., Gromov A., Generalov V., Rabko A. (Russian Federation)

Concluding remarks and discussion
Axel Pries (Germany)

Symposium 11 - ROOM FIBONACCI

Novel mechanisms regulating angiogenesis and vascular development

Chairs: Arjan Griffioen (Netherland), Johannes Waltenberger (Germany)

Metabolic regulation of endothelial growth and quiescence
Michael Potente (Germany)

From identification of differing tie2 mutations with distinct cellular characteristics in four types of venous anomalies towards a murine model and a therapeutic pilot study
Miikka Vikkula (Belgium)

Regulation of vascular development and angiogenesis by the transcription factor ERG
Graeme Birdsey (United Kingdom)
Short talks selected from abstracts:

Deletion of the AMPKα1 subunit in endothelial cells impairs angiogenesis and endothelial function  
**Fisslthaler B., Abdel Malik R., Zippel N., Fleming I.** (Germany)

*Frizzled7 controls blood vessel formation through WNT/beta-catenin canonical signaling in DLL4/notch dependent and independent pathways*  
**Peghaire C., Bats M.L., Jeanningros S., Couffinhal T., Duplàa C., Dufourcq P.** (France)

**Symposium 12 - ROOM GALILEO**

**Lymphatic vessel function – translational aspects**  
**Chairs:** Helge Wiig (Norway), Daniela Negrini (Italy)

Organ-specific origins of lymphatic vasculature  
**Taija Mäkinen** (Sweden)

Sodium in interstitial fluids - from “done deal” equilibrium physiology to active control of biological barriers  
**Jens M. Titze** (USA)

Therapeutic insights to lymphangiogenic growth factors  
**Alexanteri Aspelund** (Finland)

Characterization of the electrical and contractile properties of human collecting lymphatics  
**Donna Briggs Bødkjer** (Denmark)

12.50 - 14.30  
**Break**
Symposium 13 - AUDITORIUM

Endothelial activation and endothelial-leukocyte interaction
Chairs: Ines Drenjančević (Croatia), Akos Koller (Hungary)

Endothelial cell adhesion molecules as markers of endothelial activation
Alberto Francisco Rubio-Guerra (Mexico)

Mitochondria regulation of vascular function: beyond ATP production
David William Busija (USA)

Neutrophils induce Alzheimer’s-like disease via LFA-1-integrin
Elena Zenaro (Italy)

Endothelial activation and endothelial-leukocyte interaction in hypertension
Ines Drenjančević (Croatia)

Symposium 14 - ROOM FIBONACCI

Improving microvascular function in diabetic patients: from the lab to the bedside
Chairs: Markos Klonizakis (United Kingdom), Marco Rossi (Italy)

Influence of G6PD on vascular phenotype in obese, obese-diabetics and T2D
Sachin A. Gupte (USA)

Exploring the effect of Diabetic microvascular dysfunction in Peripheral Arterial Disease prognosis
Markos Klonizakis (United Kingdom)

Hyperosmolarity as a mechanism for vascular disease in diabetes
Raffaele De Caterina (Italy)

Early microcirculatory changes with loss of glycocalyx in children with diabetes mellitus type I
Claudia Nußbaum (Germany)
Symposium 15 - ROOM GALILEO

**Novel Bioengineering approaches for regenerative medicine**

**Chairs:** Anna Randi (United Kingdom), Timothy O’Brien (Ireland)

Therapeutic Angiogenesis from Vascular Biology to Regenerative Medicine  
*Andrea Banfi (Switzerland)*

Therapeutic potential of MSCs in critical limb ischemia  
*Timothy O’Brien (Ireland)*

3D printing for blood vessels engineering  
*Günter Tovar (Germany)*

*Short talks selected from abstracts:*

**Lineage tracing of vascular smooth muscle cells in atherosclerosis**  
*Albarran Juarez J., Wettschureck N., Offermanns S. (Germany)*

**Murine IPSC differentiate towards endothelial cells more efficiently than MSC**  
*Kachamakova-Trojanowska N., Nowak W., Stepniewski J., Dulak J., Jozkowicz A. (Poland)*

16.10 - 16.30  
*Coffee break*

**Session CME Accredited**

16.30 – 17.00  
**Plenary Lecture - AUDITORIUM**

**Chair:** Jeremy Pearson (United Kingdom)

Targeting endothelial metabolism: principles and strategies  
*Peter Carmeliet (Belgium)*

17.00 - 18.30  
**Poster session**
Session CME Accredited

08.30 - 09.00  **Plenary Lecture - AUDITORIUM**

**Chair:** Stefano Taddei (Italy)

Microcirculatory dysfunction: a core feature of the metabolic syndrome-insights from physiology and epidemiology
Coen Stehouwer (Netherlands)

### PARALLEL SESSION 6

**09.00 - 10.40**

**Symposium 16 - AUDITORIUM**

**Hemorheology and microcirculation: the main mechanisms of interaction**

**Chairs:** Carlota Saldanha (Portugal), Gregorio Caimi (Italy)

Diabetes mellitus: evaluation of erythrocyte and polymorphonuclear leukocyte rheology
*Rosalia Lo Presti* (Italy)

Vasculopathy in Thalassemia: new approaches to an old problem
*Patrizia Caprari* (Italy)

Red blood cell (RBC) microrheology and microcirculation under physiological and pathological conditions: molecular change mechanisms
*Anna Akhapkina* (Russian Federation)

Hemorheological and Biochemical Parameters in Amyotrophic Lateral Sclerosis
*Carlota Saldanha* (Portugal)

**Symposium 17 - ROOM FIBONACCI**

**Novel functions of antioxidant genes in vasculature**

**Chairs:** Alicja Józkowicz (Poland), Agnes Görlich (Germany)

Nitric oxide synthase phosphorylation and redox signaling
*Ingrid Fleming* (Germany)
Regulation and therapeutic manipulation of anti-oxidant enzymes in the vasculature
*Justin Mason (United Kingdom)*

Skeletal muscle and vessel regeneration: role of antioxidant genes and microRNAs
*Jozef Dulak (Poland)*

*Short talks selected from abstracts:*

Deregulation of Thioredoxin system contributes to monocyte dysfunction in diabetes mellitus
*Waltenberger J., Godfrey R., Schulten H., Shanmuganathan S., Boehmer F.D. (Germany)*

Redox-dependent stimulation of angiogenesis and tissue repair by pentose phosphate derivatives
*Vara D., Mace K., Mellor H., Wheeler-Jones C., Pula G. (United Kingdom)*

**Symposium 18 - ROOM GALILEO**

**Non-invasive imaging techniques (in addition to LDF)**
assessing novel aspects of Microcirculation
*Chairs: Francesca Ingegnoli (Italy), Ariane Herrick (United Kingdom)*

Nailfold capillaroscopy to detect microangiopathies
*Francesca Ingegnoli (Italy)*

Emerging technologies
*Andrea Murray (United Kingdom)*

Use of infrared thermography in the assessment of peripheral microvascular dysfunction in Raynaud's phenomenon and systemic sclerosis
*John D. Pauling (United Kingdom)*

Applications of laser speckle contrast analysis in microvascular disease: the case of systemic sclerosis
*Barbara Ruaro (Italy)*

10.40 - 11.00  **Coffee break**

**Session CME Accredited**

11.00 - 11.30  **Plenary Lecture - AUDITORIUM**

*Chair: Andrew Newby (United Kingdom)*

Vascular smooth muscle cell senescence in vascular disease
*Martin Bennett (United Kingdom)*

**FRIDAY 5 JUNE**
ORAL COMMUNICATIONS
11.30 - 13.00

SESSION 1 - ROOM GALILEO

Chairs: Zsold Pécsvárady (Hungary), Giuseppe Maria Andreozzi (Italy)

OC 1  Prediabetes is associated with impaired retinal vasodilation: the Maastricht Study
Sörensen B., Houben B., Berendschot T., Schouten J., Kroon B., Van Der Kallen C.,
Henry R., Koster A., Dagnelie P., Schaper N., Schram M., Stehouwer C. (Netherlands)

OC 2  Short-term high salt diet impairs microvascular endothelial function in young healthy
salt-resistant women
Cavka A., Rasic L., Cosic A., Lenasi H., Jukic I., Drenjancevic I. (Croatia)

OC 3  Hemorheological and Sublingual Microcirculation Profiles in Patients with Sepsis
Potapova E., Oliveira I., Napoleão P., Messias A., Saldanha C. (Portugal)

OC 4  Hypocaloric diet effects on microvascular dysfunction
Mastantuono T., Nasti G., Battiloro L., Starita N., Chirazz M., Cesarelli M.,
D’Addio G., Iuppariello L., Lapi D., Colantuoni A. (Italy)

OC 5  Potential role of endothelin-1 in pericardial fluid of cardiac patients in eliciting
arterial constriction
Nemeth Z., Cziraki A., Szabados S., Seffer I., Horvath I., Koller A. (Hungary)

OC 6  Cutaneous microvascular response during local cold exposure - the effect of
female sex hormones
Cankar K., Music M., Finderle Z. (Slovenia)

OC 7  Skin microcirculation and intrathyroid arteries in women with Graves disease
Lenasi H., Bedernjak N., Zaletel K., Gablešcek S. (Slovenia)

OC 8  Microcirculation amd blood rheology in cancer
Tikhomirova I., Malsheva Y., Kislov N., Lileev D., Gordeev I., Schekaleva M.,
Petrochenko E. (Russian Federation)

OC 9  Endothelial microparticles; a novel biomarker of carotid disease?
(United Kingdom)

OC 10 Comparing different non-invasive methods to the study of human in vivo
peripheral microcirculation
Silva H., Ferreira H., Antunes J., Bujan J., Rodrigues L. (Portugal)
SESSION 2 - ROOM FIBONACCI

Chairs: Patrizia Caprari (Italy), Richard Siow (United Kingdom)

OC 11 Non-canonical role of NRF2 transcription factor in GDF-15 and SDF-1-induced angiogenesis

OC 12 Gene expression analysis in small arteries of spontaneously hypertensive rats
  Palao T., Swärd K., Jongejan A., Moerland P.D., De Vos J., Arribas S.M., Groma G.,
  Vanbavel E., Bakker E.N.T.P. (Netherlands)

OC 13 Insulin receptor marks the tumor endothelium; its role during tumor angiogenesis
  and angiostatic treatment
  Nowak-Sliwinska P., Van Beijnum J., Mans L., Kapel S., Wong T., Griffioen A. (Switzerland)

OC 14 HTATIP2 and MAPK3: potential targets for enhancing the angiogenic activity of
  monocytes from critical limb ischaemia (CLI) patients

OC 15 Enhancement of VEGF-mediated angiogenesis by inhibition of the plasma membrane
  calcium Atpase 4 protein with aurintricarboxylic acid
  Kurusamy S., Baggott R., Lopez-Maderuelo D., Little R., Oceandy D., Cartwright E.,

OC 16 Cleaved high molecular weight kininogen counteracts the inflammatory response
  and neointima formation following vascular injury
  Dutzmann J., Daniel J.M., Reich F., Bauersachs J., Preisssner K., Sedding D. (Germany)

OC 17 Sonic hedgehog controls adventitial fibroblast activation and neointima formation
  Dutzmann J., Koch A., Bauersachs J., Sedding D., Daniel J.M. (Germany)

OC 18 VEGFC acts as a glomerular protectant and ameliorates the progression of diabetic
  nephropathy
  Buckner N., Baker S., Gamez M., Onions K., Ramnath R., Bates D., Welsh G.,
  Satchell S., Foster R. (United Kingdom)

OC 19 Stromal cell-derived factor 2 is required for Enos activation
  Siragusa M., Fröhlich F., Park E.J., Schleicher M.J., Walther T.C., Sessa W.C. (Germany)

OC 20 Development of MIRNA eluting stents
  Stepto H., Dakin R., Mcdonald R., Kennedy S., Cronin L., Oldroyd K., Baker A. (United Kingdom)
SESSION 3 - AUDITORIUM

Chairs: Benedetta Bussolati (Italy), Justin Mason (United Kingdom)

OC 21 Angiotensin-(1-9) in vascular remodeling: effects on vascular smooth muscle cell proliferation, migration and neointima formation

McKinney C.A., Kennedy S., Baillie G., Milligan G., Nicklin S.A. (United Kingdom)

OC 22 Sympathetic inhibition improves inflammation and endothelial dysfunction in brain microcirculation of rats with metabolic syndrome

Estato V., R Nascimento A., Antunes B., Gomes F., Obadia N., Freitas F., Daliry A., Bousquet P., Tibiriçá E. (Brazil)

OC 23 Inhibition of the soluble epoxide hydrolase attenuates diabetic retinopathy in ins2akita mice

Hu J., Popp R., Dziumbla S., Devraj K., Lin J., Hammes H.P., Fleming I. (Germany)

OC 24 Acutely elevated luminal glucose levels disrupt conducted dilation in mouse resistance arteries

Sepulveda Kattan E., Ding H., Triggle C., Dora K., Garland C. (United Kingdom)

OC 25 Cerebral and systemic microangiarchitectural impairments precede cognitive deficits in an app/ps1 mouse model of Alzheimer’s disease

Kelly P., Ackermann M., Konerding M., Mitchell C. (United Kingdom)

OC 26 Acute exhausting exercise session affects microvascular endothelial function in young healthy athletes

Stupin M., Cavka A., Rasic L., Cosic A., Lenasi H., Drenjancevic I. (Croatia)

OC 27 Mechanisms of vascular responses to changes in flow in cerebral resistance arteries of healthy sprague-dawley rats


OC 28 Viscosity induced hematocrit partition in microcirculation

Shen Z., Coupier G., Podgorski T., Kaoui B., Harting J., Misbah C. (France)

OC 29 Hydrogen sulfide (H2S)-induced arterial relaxation: differential modes of action of sodium hydrogen sulfide and metal organic frameworks as putative H2S

Kelsall C., Mccormick L., Whitfield P., Doherty M., Morris R., Megson I. (United Kingdom)

OC 30 Challenging the paradigm that NRF2 always protects endothelial cells at elevated shear stress

Teasdale J., Hazell G., Newby A., White S. (United Kingdom)
13.00 - 13.10  International Travel Award for developing Countries - AUDITORIUM  
**Chairs:** Marco Rossi (Italy), Jozef Dulak (Poland)

13.10 - 14.30  *Break*

13.10 - 13.40  **SPONSORED SESSION - AUDITORIUM**

Restenosis after endovascular therapy: the role of cilostazol  
Gianmarco de Donato (Italy)  
*With an unrestricted educational grant of ITALFARMACO*

A packet lunch will be offered to the participants of the session

13.30 - 14.30  EVBO Council Meeting - ROOM GALILEO

14.00 - 14.30  **EUROPEAN RESEARCH COUNCIL - ROOM FIBONACCI**

European Research Council modus operandi, tips, rumors and the truth  
Elisabeth Renney (Sweden)

14.30 - 14.40  ESM Servier Award in Microcirculation 2015 - AUDITORIUM  
**Chairs:** Akos Koller (Hungary), Angela Shore (United Kingdom)

14.40 - 14.50  Young Investigator Awards - AUDITORIUM  
**Chairs:** Anita Cosic (Croatia), Helena Lenasi (Slovenia)
PARALLEL SESSION 7

14.50 - 16.30

Symposium 19 - ROOM FIBONACCI

**Microvascular changes in systemic sclerosis: the approach to the patients**

**Chairs:** Gabriele Valentini (Italy), Giovanni Mann (United Kingdom)

- Pre-Systemic Sclerosis: the need for an early approach
  Gabriele Valentini (Italy)

- Clinical and Capillaroscopic Features predictive of severe disease
  Yannick Allanore (France)

- Serological Features predictive of severe disease
  Gabriela Riemekasten (Germany)

- Prevention and treatment of scleroderma ulcers
  Antonella Marcoccia (Italy)

Symposium 20 - AUDITORIUM

**Leukocyte adhesion and migration: the key to the inflammatory response**

**Chairs:** Jeremy Pearson (United Kingdom), Britta Engelhardt (Switzerland)

- Peptide Inhibitor of Trans-Endothelial Migration: PEPITEM
  A new immune-regulatory peptide and its roles in homeostatic and pathogenic T-cell trafficking
  Ed Rainger (United Kingdom)

- Genetic defects in leukocyte migration
  Raffaele Badolato (Italy)

- Molecular mechanisms controlling the cellular pathway of immune cell diapedesis across the blood-brain barrier
  Britta Engelhardt (Switzerland)

*Short talks selected from abstracts:*

- F-Actin-Rich endothelial pores prevent vascular leakage during leukocyte diapedesis through local rhoa signaling in vivo
  Van Buul J. (Netherlands)

- Role of the transcriptional co-regulator RIP140 in the regulation of inflammation in endothelial cells
  Calay D., Nadkarni S., Dufton N., Parker M., Haskard D., Mason J. (United Kingdom)
Symposium 21 - ROOM GALILEO

3rd International MiDAS Microcirculation Meeting:
“Microcirculation - from the lab to the bedside”

Chairs: Christian Lehmann (Canada), Vladimir Cerny (Czech Republic)

Microcirculation in the lab - what you see is what you get?
Christian Lehmann (Canada)

Microcirculation at the bedside - why and when?
Vladimir Cerny (Czech Republic)

LDF measurement – from the lab to the bedside
Kim Gooding (United Kingdom)

First experiences with automated microcirculation analysis software
Nivin Sharawi (Egypt)

16.30 - 16.50 Coffee break

Session CME Accredited

16.50 - 17.20 Malpighi Award Lecture - AUDITORIUM

Chair: Akos Koller (Hungary), Marco Rossi (Italy)

From Capillary to End Organ Damage
Angela Shore (United Kingdom)

17.30 - 18.30 Business Meeting of ESM - AUDITORIUM

Business Meeting of EVBO - ROOM FIBONACCI

20.00 - 23.00 Social Dinner

FRIDAY 5 JUNE
Symposium 22 - AUDITORIUM

Targeting ischemia / reperfusion injury with complex compounds: mechanistic approaches

Chairs: Akos Koller (Hungary), Jing Yan Han (China)

Cardiotonic pills®, a compound Chinese medicine, ameliorates ischemia-reperfusion induced rat myocardial microcirculatory disturbances, myocardial damage and fibrosis

Jin-Yan Han (China)

Caffeic Acid Attenuated Liver Microcirculation Dysfunction and Liver Injury induced by Ischemia/ Reperfusion in Rat

Hong-Na Mou (China)

Microvascular effects and mechanisms of action of Salvia miltiorrhiza: a literature review

Akos Koller (Hungary)

Cerebralcare Granule® and its major ingredients ameliorated microcirculatory disturbance and neuron injury induced by middle cerebral artery occlusion

Xiao-Wei Mao (China)

Symposium 23 - ROOM FIBONACCI

von Willebrand factor in the vasculature

Chairs: Anna Randi (United Kingdom), Stefan Schneider (Germany)

Role of VWF in tumor progression and inflammation

Stefan Schneider (Germany)

A new role for VWF in the control of angiogenesis

Anna Randi (United Kingdom)

Endothelial control of the functional architecture of VWF

Daniel Cutler (United Kingdom)
Short talks to be selected from abstracts:

Enhanced cardiac MCP-1 and monocyte expansion impede the injured heart recovery in heme oxygenase-1-deficient mice
Tomczyk M., Bukowska-Strakova K., Szade K., Jozkowicz A., Dulak J., Jazwa A. (Poland)

Hedgehog signaling in brain arteriovenous malformations
Pola R., Gatto I., Giarretta I., Marcantoni M., Sturiale C., Puca A. (Italy)

Symposium 24 - ROOM GALILEO

Leukocyte trafficking in development and inflammation
Chairs: Markus Sperandio (Germany), Barbara Walzog (Germany)

Sequential maturation process towards hematopoietic stem cell production in the mouse embryo
Catherine Robin (Netherlands)

Direct and indirect roles of leukocyte signaling in inflammatory cell recruitment
Attila Mocsai (Hungary)

Integrin signaling and neutrophil trafficking in innate immunity
Barbara Walzog (Germany)

The role of Mrp8/14 on leukocyte recruitment during inflammation in vivo
Markus Sperandio (Germany)

10.10 -10.30 Coffee break
PARALLEL SESSION 9

10.30 - 12.10

Symposium 25 - AUDITORIUM

Control of vascular permeability

Chairs: Dorian Haskard (United Kingdom), Dietmar Vestweber (Germany)

Control of leukocyte extravasation and vascular permeability by endothelial junctions
Dietmar Vestweber (Germany)

New insights into control of vascular permeability by VEGF
Patric Turowski (United Kingdom)

Role of JAMs in leukocyte transendothelial migration and stem cell niche maintenance: two sides of the same coin?
Michel Aurrand-Lions (France)

Short talks to be selected from abstracts:

Forced expression of TIE2 enhances the angiogenic potential of monocytes/macrophages
Furmston J., Patel A., Ludwinski F., Prakash S., Adnan B., De Palma M., Smith A., Modarai B.,
(United Kingdom)

ABL2 mediates endothelial barrier disruption by modulating integrin ?5?1 distribution
(Netherlands)

Symposium 26 - ROOM FIBONACCI

Microvascular alterations and vascular aging

Chairs: Stefano Taddei (Italy), Ed van Bavel (Netherland)

Pathophysiology of cerebromicrovascular agin
Zoltan Ungvari (USA)

Assessment of microvascular functional and structural changes
Damiano Rizzoni (Italy)

Vascular aging in humans: mechanism and clinical significance
Agostino Virdis (Italy)

Insulin-like growth factor (IGF)-1: a potential early life therapeutic intervention for cerebrovascular diseases
William Sonntag (USA)
Symposium 27 - ROOM GALILEO

Vascular progenitors: novel strategies and mechanisms
**Chairs:** Andrew Newby (United Kingdom), Geerten P. van Nieuw Amerongen (Netherlands)

Therapeutic Implication of Vascular Stem Cells in Restenosis
*Qingbo Xu (United Kingdom)*

Pericyte treatment of myocardial ischemia: pathway to the clinic
*Paolo Madeddu (United Kingdom)*

Heme oxygenase-1 in endothelial cells: beyond angiogenesis
*Alicja Józkowicz (Poland)*

**Short talks to be selected from abstracts:**

Soluble CD146 priming boosts survival and regenerative properties of endothelial colony-forming cells
*Stalin J., Nollet M., Essaadi A., Leroyer A., Guillet B., Bardin N., Dignat-George F., Blot-Chabaud M. (France)*

Vasculogenic properties of endothelial colony forming cells (ECFCS) in hypoxia are regulated by MIR-130
*Guduric-Fuchs J., O’Neill C., James B., Chambers S., Medina R., Stitt A. (United Kingdom)*

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**Session CME Accredited**

12.10 - 12.50  **Closing Plenary Lecture - AUDITORIUM**

**Chair:** Jozef Dulak (Poland)

New frontiers in VEGF/VEGFR biology
*Lena Claesson-Welsh (Sweden)*

12.50 - 13.00  Closing Ceremony
POSTER SESSION

The Poster Session is scheduled for 4 June 2015 from 17:00 to 18:30. The presenting author will be requested to be available for discussion during the poster viewing session. Posters cannot exceed these dimensions: 96 cm wide and 150 cm high. Fixing material will be provided. The congress organizers take no responsibility for posters that are not removed after the conference.

P01 EXPRESSION OF RENIN-ANGIOTENSIN SYSTEM COMPONENTS IN THE BROWN AND WHITE PERIVASCULAR ADIPOSE TISSUE IN OBESE MICE
Inada A., Hashimoto C., Silva R., Santos R., Carvalho M.H., Akamine E. (Brazil)

P02 ACTIVATION OF MROS-AMPK-CREB-NRF2 BY CELECOXIB INDUCES ENDOTHELIAL HO-1 AND ATTENUATES NF-KB ACTIVITY
Alrashed F., Calay D., Thornton C., Kiprianos A., Haskard D., Boyle J., Mason J. (United Kingdom)

P03 USE OF MICROFLUIDICS TO DETERMINE VASCULATURE BEHAVIOR DURING AN INFLAMMATORY RESPONSE
Ambruzová B., Vitecek J., Kolarova H., Bino L., Kubala L. (Czech Republic)

P04 ROLE OF PI3K/AKT AND MEK/ERK SIGNALLING IN CAMP/EPAC-MEDIATED ENDOTHELIAL BARRIER STABILISATION
Guenduez D., Aslam M. (Germany)

P05 OPPOSING EFFECTS OF CAMP/PKA AND CAMP/EPAC SIGNALLING ON IN VITRO ANGIOGENESIS: ROLE OF RHO GTPASES
Aslam M., Hamm C., Guenduez D. (Germany)

P06 EFFECT OF HYPOTHERMIA AND N-ACETYL CYSTEINE ON MICROCIRCULATION AFTER CARDIAC ARREST IN PIGS
Astapenko D., Skulec R., Pinterova N., Hovanec T., Truhlar A., Cerna Parizkova R., Lehmann C., Cerny V. (Czech Republic)

P07 IMPACT OF ACTOVEGIN ON MICROCIRCULATION IN PATIENTS SUFFERING CHRONIC OBLITERATING DISEASES OF LOWER LIMB ARTERIES
Bagdasaryan A., Uchkin I., Zudin A., Fedorovich A. (Russian Federation)

P08 SENESCENCE-INDUCED OXIDATIVE STRESS CAUSES ENDOTHELIAL DYSFUNCTION
Bhayadia R. (Germany)

P09 EPIGENETIC CHANGES ASSOCIATED WITH BICUSPID- AND TRICUSPID AORTIC VALVE ANEURYSMS
P10 EFFECT OF RESVERATROL AND ORCHIDECTOMY ON THE VASORELAXING INFLUENCE OF PERIVASCULAR ADIPOSE TISSUE
Boydens C., Pauwels B., Van De Voorde J. (Belgium)

P11 THE STORAGE ALTERATIONS OF RED BLOOD CELLS WITH HEREDITARY SPHEROCYTOSIS: A RHEOLOGICAL APPROACH
Caprari P., Bozzi C., Panicale S., Caforio M.P., Tarzia A., Luchetti L., Girelli G., Grazzini G. (Italy)

P12 ATOMIC FORCE MICROSCOPY (AFM): MODULATION OF BREAST CANCER CELL AND BONE MICROENVIRONMENT ADHESION IN VITRO
Albon J., Hobbs J., Meininger G., Sun L., Reeves K., Brown N.J. (United Kingdom)

P13 SHORT-TERM IN VIVO ADMINISTRATION OF CABOZANTINIB INDUCES RAPID MODIFICATION OF THE BONE MARROW VASCULARITY
Haider M.T., Holen I., Brown N.J., Hunter K. (United Kingdom)

P14 A NOVEL OBESTATIN ANALOGUE IMPROVES METABOLIC AND ENDOTHELIAL FUNCTION IN A DIET-INDUCED MODEL OF PRE-DIABETES
Burch K., Cowan E., Green B., Grieve D. (United Kingdom)

P15 THE CHRONIC HYPERTENSIVE ACTIONS OF VANDETANIB AND PAZOPANIB IN VIVO
Carter J.J., Woolard J. (United Kingdom)

P16 DELETERIOUS EFFECTS OF AGING ON CAROTID REACTIVITY AFTER LATE-ONSET OF ESTROGEN TREATMENT IN SENESCENT FEMALE MICE
Costa T., Dantas A.P., Jimenez-Altayó F., Fortes Z., Akamine E., Vila E., Carvalho M.H. (Brazil)

P17 DOES GLYCAEMIC CONTROL AFFECT MICROVASCULAR FUNCTION INDEPENDENT OF BLOOD PRESSURE IN TYPE 2 DIABETES?
Casanova F., Adingupu D., Gooding K., Strain D., Shore A. (United Kingdom)

P18 TEMPORAL EVALUATION OF SMC PHENOTYPE AND FUNCTION IN A BIOREACTOR MODEL OF ABDOMINAL AORTIC ANEURYSM (AAA)
Clark E., Riches K., Jennings L., Porter K. (United Kingdom)

P19 CUTANEOUS IONTOPHORESIS OF TREPROSTINIL INCREASES MICROVASCULAR BLOOD FLUX IN DIABETIC MALLEOLUS AREA
Hellmann M., Roustit M., Gaillard-Bidot F., Cracowski J. (France)

P20 EFFECTS OF COMBINED THERAPY WITH METFORMIN AND INSULIN IN LIVER DISEASE DUE TO DIABETES: THE ROLE OF AGE-RAGE PATHWAY
Daliry A., Rangel Silvares R., Eduardo Ilaquita Flores E., Nunes Pereira E., Estato V., Ribeiro Garzoni L., Tibiriça E. (Brazil)

P21 ROLE OF HYDROGEN PEROXIDE IN MEDIATION OF MYOGENIC RESPONSE OF RAT SKELETAL MUSCLE VENULES
Debreczeni B., Tamas R., Kolier A. (Hungary)
P22 A NOVEL ISOLATED GLOMERULAR ALBUMIN PERMEABILITY ASSAY BASED ON QUANTITATIVE FLUORESCENCE MICROSCOPY
Desideri S., King M., Salmon A., Satchell S., Foster R. (United Kingdom)

P23 OVEREXPRESSION OF CALCIFICATION-RELEVANT FACTORS: RUN2 AND SOST IN HUMAN ABDOMINAL AORTIC ANEURYSM
Dubis J., Zuk N., Litwin M., Baczynska D., Michalowska D., Grendziak R., Witkiewicz W. (Poland)

P24 PUTATIVE MECHANISMS UNDERLYING TRANSMIGRATION OF HUMAN UMBILICAL MESENCHYMAL STEM CELLS ACROSS UTERINE MICROVASCULAR ENDOTHELIAL CELLS
Ebrahim N., Leach L. (United Kingdom)

P25 EXERCISE TRAINING IMPROVES FUNCTIONAL AND STRUCTURAL MICROVASCULAR ALTERATIONS IN A RAT MODEL OF DIABETES
Fernando Lanza Martins R., Pereira Borges J., Vinicius Machado M., Estato De Freitas Almeida V., Ribeiro Antunes B., Vera Tibiriçá E. (Brazil)

P26 THE IMPACT OF EARLY OR LATE EXERCISE TRAINING ON THE CEREBRAL MICROVASCULAR ALTERATIONS INDUCED BY CEREBRAL HYPOPERFUSION
Tristão M., Estato V., Borges J., Freitas F., Tibiriçá E. (Brazil)

P27 AGONIST-DEPENDENT UTILISATION OF NAD+ FOR METABOLIC REGULATION OF TUBULGENESIS BY HUMAN ENDOTHELIAL CELLS

P28 FEATURES OF CUTANEOUS MICROCIRCULATORY BLOOD FLOW IN PATIENTS WITH IDIOPATHIC PULMONARY ARTERIAL HYPERTENSION ASSESSED BY LASER DOPPLER FLOWMETRY
Dolgova E., Fedorovich A., Martynyuk T., Rogoza A., Chazova I. (Russian Federation)

P29 MYOGENIC TONE OF THE MICROVASCULAR RESISTANT ARTERIES AND MUSCULO-ELASTIC VESSELS RIGIDITY
Mordvinova E., Fedorovich A., Oschepkova E., Rogoza A. (Russian Federation)

P30 SYSTEMS BIOLOGY APPROACHES FOR DISCOVERING NEW GLUCOCORTICOID-MEDIATED PATHWAYS AT THE BLOOD-BRAIN BARRIER
Shityakov S., Foerster C. (Germany)

P31 SIMVASTATIN IMPROVES CEREBRAL ARTERIOLAR ENDOTHELIAL FUNCTION AND REVERSES CEREBRAL FUNCTIONAL MICROVASCULAR RAREFACTION IN A MODEL OF PRIMARY HYPERTENSION
Freitas F., Estato V., Lessa M.A., Reis P., Castro-Faria H., Tibiriçá E. (Brazil)

P32 PHYSICAL ACTIVITY PREVENTS NITROSATIVE STRESS IN ELDERLY PEOPLE
Fusi J., Guidotti E., Rossi M., Galetta F., Santoro G., Franzoni F. (Italy)

P33 NITRIC OXIDE (NO) AND MICROCIRCULATION CHANGES DURING CRUSH SYNDROME
Gamkrelidze N., Otarashvili R., Pavlashvili N., Kipiani V., Sanikidze T. (Georgia)
P34 MICROVASCULAR ACTIONS OF GLUCAGON-LIKE PEPTIDE-1 AND ITS ANALOGUES IN LEAN AND OBESE PARTICIPANTS AND PARTICIPANTS WITH TYPE 2 DIABETES
Gooding K., Aung M.M., Kos K., Shore A. (United Kingdom)

P35 MICROVASCULAR ENDOTHELIAL GLYCOCALYX AND CONDITION OF BLOOD VESSELS IN PATIENTS WITH ARTERIAL HYPERTENSION
Gorshkov A., Sergey B., Natalia G. (Russian Federation)

P36 ARTERIAL STIFFNESS IS ASSOCIATED WITH TELOMERE LENGTH IN HYPERTENSIVE PATIENTS
Vladimir G., Olesya I., Gorshkov A. (Russian Federation)

P37 THE DYSREGULATION OF THE AXIS BACE1/BACE1-AS IN HEART FAILURE
Greco S., Voellenkle C., Zaccagnini G., Manteiga J., Martelli F. (Italy)

P38 HOW A GESTATIONAL DIABETES MELLITUS AFFECTS NEWBORNS’ MICROCIRCULATION AND VASOMOTION
Grzybowski A.K., Puchwein-Schwepcke A., Genzel-Boroviczény O. (Germany)

P39 IDENTIFICATION OF ACTIN-REMODELING REGULATORS CRITICAL FOR EPINEPHRINE-INDUCED VON WILLEBRAND FACTOR (VWF) SECRETION
Han X., Lee P., Yang Z., Wei G., Luo Y., Luo J. (China)

P40 INVOLVEMENT OF PROSTANOIDS IN SKIN POSTOCCCLUSIVE HYPEREMIA IN HUMANS
Hellmann M., Gaillard-Bigot F., Roustit M., Cracowski J. (Poland)

P41 RECRUITMENT OF RGS5 TO MECHANICALLY ACTIVATED AT1R IN VSMC
Hong K., Li M., Meininger G., Hill M. (United States)

P42 SERUM CXCL4 IS INCREASED IN PATIENTS WITH PRIMARY SJÖGREN’S SYNDROME AND IS ASSOCIATED WITH FEATURES OF MICROVASCULAR IMPAIRMENT
Irace R., Riccardi A., Iacono D., Valentini G., Vettori S. (Italy)

P43 ALTERNATING RELAXATION TO PACAP 1-38 AND 1-27 IN ARTERIES OF PACAP DEFICIENT MICE
Ivic I., Vamos Z., Tamas A., Reglodi D., Koller A. (Hungary)

P44 ADAPTATION TO PHYSIOLOGICAL O2 LEVELS ALTERS AGONIST-INDUCED SIGNAL TRANSDUCTION IN HUMAN ENDOTHELIAL CELLS: IMPLICATIONS FOR NO AND PGI2 SYNTHESIS
Keeley T.P., Chapple S.J., Jacob R., Siow R.C., Mann G.E. (United Kingdom)

P45 EFFECT OF CONTINUOUS VS PULSED IONTOPHORESIS OF TREPROSTINIL ON SKIN BLOOD FLOW
Kotzki S., Roustit M., Arnaud C., Godin-Ribuet D., Cracowski J.L. (France)

P46 DOES THE SEX MATTER IN VASCULAR RESEARCH?
Kowalewska M., Zegrocka-Stendel O., Duktiewicz M., Maciejko D., Fogtman A., Koziak K. (Poland)
P47 RAT MODEL OF PARKES WEBER SYNDROME
Bojakowski K., Janusz G., Grabowska I., Zegrocka-stendel O., Surowiecka-Pastewka A.,
Kowalewska M., Maciejko D., Koziak K. (Poland)

P48 INTERACTION OF MYELOPEROXIDASE WITH ENDOTHelial CELL SURFACE
Kubala L., Kolárová H., Jan V., Barbora A., Silvie K., Anna K., Stephan B. (Czech Republic)

P49 ISCHEMIA REPERFUSION BLOOD FLOW OSCILLATORY PATTERNS IN SINGLE VESSELS
ON RAT PIAL MICROCIRCULATION
Lapi D., Mastantuono T., Cesarelli M., D’Addio G., Gorbach A., Starita N., Verone P.,
Colantuoni A. (Italy)

P50 EFFECTS OF MANDIBULAR EXTENSION ON CEREBRAL MICROCIRCULATION IN
HYPERTENSIVE RATS
Lapi D., Colantuoni A., Varanini M., Scuri R. (Italy)

P51 THE REGULATION OF ETS FACTORS IN THE DIFFERENTIATION AND MAINTENANCE
OF PLURIPOTENT STEM CELL-DERIVED ENDOTHelial CELLS
Lawlor K., Harding S., Randi A., Foldes G. (United Kingdom)

P52 THE EFFECT OF CANNABINOID 2 RECEPTOR ACTIVATION AND ABSENCE DURING
OCULAR INFLAMMATION
Toguri James T., Szczesniak A., Kelly M., Lehmann C. (Canada)

P53 IMPACT OF CB2 RECEPTOR INHIBITION ON LEUKOCYTE RECRUITMENT WITHIN
THE MICROCIRCULATION IN CNS-INJURY INDUCED IMMUNODEFICIENCY
Burkovskiy I., Zhou J., Robertson S G., Lehmann C. (Canada)

P54 DIBI, A NOVEL IRON CHELATOR, REDUCES OCULAR INFLAMMATION AND IMPROVES
THE MICROVASCULAR PERFUSION IN ENDOTOXIN-INDUCED UVEITIS IN MICE

P55 CANNABINOID 2 RECEPTOR ACTIVATION IMPROVES INTESTINAL MICROCIRCULATION
IN EXPERIMENTAL SEPSIS
Yang H., Zhou J., Cerny V., Lehmann C. (Canada)

P56 ASSESSMENT OF THE NAILFOLD SKIN MICROCIRCULATION BY HIGH-FREQUENCY
ULTRASOUND DOPPLER FLOWMETRY: A COMPARISON TO LASER DOPPLER
FLOWMETRY
Lenasi H., Potočnik N., Egorkina A., Papp M., Girina M. (Slovenia)

P57 ENDOTHELIAL PROGENITOR CELLS AS A PREDICTIVE MARKER OF THE RESPONSE
TO NEOADJUVANT SUNITINIB IN METASTATIC RENAL CELL CARCINOMA (MRCC)
PATIENTS (PREINSUT TRIAL)
Mauge L., Bouaboula M., Pereira H., Gille A.S., Tartour E., Fournier L., Oudard S., Helley D.
(France)

P58 ADHESION DYNAMICS OF BREAST CARCINOMA CELLS TO BONE MARROW
ENDOTHELIAL CELLS ASSESSED BY ATOMIC FORCE MICROSCOPY
Xie L., Sun Z., Hong Z., Brown N., Glinski O., Meininger G., Glinsky V. (United States)
P59 SUBSTRATE STIFFNESS ALTERS THE MECHANICAL AND PHYSIOLOGICAL FUNCTION OF VASCULAR SMOOTH MUSCLE CELLS Meininger G., Hong Z., Jin M., Li Z. (United States)

P60 THE ROLE OF CAFFEINE ON CUTANEOUS MICROCIRCULATION IN MEN Melik Z., Satej M., Cankar K. (Slovenia)

P61 SHORT TERM HIGH SALT DIET SUPPRESSES T CELL ACTIVATION AND TREG EXPANSION IN SPRAGUE DAWLEY RATS Mihalj M., Novak S., Cosic A., Drenjancevic I. (Croatia)

P62 PANNEXIN CHANNELS - THE PATHWAY TO SMOOTH MUSCLE COMMUNICATION IN RESISTANCE ARTERIES Mokori E., Ralevic V., Dunn W. (United Kingdom)

P63 MAINTENANCE OF ENDOTHELIAL NO RELEASE AFTER INHIBITION OF NADPH OXIDASE 4 Eickholt C., Brunssen C., Brux M., Goettsch C., Langbein H., Goettsch W., Morawietz H. (Germany)

P64 ANGIOTENSIN II REGULATES MICRORNA-132 EXPRESSION IN VASCULAR SMOOTH MUSCLE CELLS Mckinney C.A., Mcarthur L., Milligan G., Nicklin S.A. (United Kingdom)

P65 ACUTE CHAGAS DISEASE INDUCES CEREBRAL MICROVASCULOPATHY IN MICE Nisimura L., Estato V., De Souza E., Reis P., Lessa M., Castro-Faria-Neto H., Pereira M., Tibirica E., Garzoni L. (Brazil)

P66 HYPERBARIC OXYGENATION TREATMENT MODULATES GENE EXPRESSION IN AORTAS OF HEALTHY AND DIABETIC MALE SPRAGUE DAWLEY RATS Novak S., Cosic A., Unfirer S., Drenjancevic I. (Croatia)

P67 FINDING THE OPTIMAL BALANCE: VASCULAR MODULATION PRIOR TO CHEMO-OR PHOTODYNAMIC THERAPY IN CANCER TREATMENT Weiss A., Griffioen A.W., Nowak-Sliwinska P. (Switzerland)

P68 CIRCULATING ANGIogenic CELLS (CACS) AT HIGH CELLULAR DENSITIES REPRESS ANGIogenesis THROUGH PTX3 O’Neill C.L., O’Doherty M.T., Chambers S.E., Guduric-Fuchs J., Bottazzi B., Stitt A.W., Medina J. (United Kingdom)

P69 ANEURYSM DEVELOPMENT IN PATIENTS WITH A BICUSPID AORTIC VALVE IS NOT ASSOCIATED WITH TRANSFORMING GROWTH FACTOR-? ACTIVATION Paloschi V., Gadin R.J., Björck H.M., Maleki S., Du L., Franco-Cereceda A., Eriksson P. (Sweden)

P70 NOVEL ENDOTHELIAL ISOFORMS OF THE ETS TRANSCRIPTION FACTOR ERG Payne L., Bastos B., Haskard D., Randi A., Birdsey G. (United Kingdom)
THE INHIBITORY EFFECT OF NO ON GAP JUNCTIONAL CALCIUM TRANSFER IS MEDIATED BY CHANGING THE PHOSPHORYLATION STATE OF TYROSINE 332 IN THE C-TERMINUS OF CONNEXIN37
Kameritsch P., Pogoda K., Pohl U. (Germany)

RHOGTPASE RHOC, A NEW KEY REGULATOR IN ENDOTHELIAL BARRIER FUNCTION!

INDUCTION OF ANTIOXIDANT GENES BY KLOTHO AND SULFORAPHANE IN HUMAN AORTIC SMOOTH MUSCLE CELLS: ROLE OF NRF2 AND SULFORAPHANE
Psefteli P.M., Maltese G., Rizzo B., Hrelia S., Siow R. (United Kingdom)

AMPK DILATES RESISTANCE ARTERIES VIA ACTIVATION OF SERCA AND BKCA CHANNELS IN SMOOTH MUSCLE
Schneider H., Blodow S., Schubert K.M., Wiedenmann M., Qiu J., Erdogmus S., Mederos Y., Schnitzler M., Gudermann T., Pohl U. (Germany)

GENDER DIFFERENCE IN MICROVASCULAR REACTIVITY AFTER OMEGA-3 ENRICHED FOOD DIET PROTOCOL
Rasic L., Kralik Z., Kralik G., Cavka A., Drenjancevic I. (Croatia)

IN VITRO TREATMENT WITH SODIUM NITROPRUSSIDE IMPROVED THE ENDOTHELIAL FUNCTION IN AORTIC RINGS WITH ENDOTHELIAL DYSSFUNCTION
Rodrigues G.J., Oishi J.C., Buzinari T.C., De Moraes T.F. (Brazil)

ENDOTHELUM AND PERIVASCULAR ADIPOSE TISSUE DIFFERENTIALLY MODULATE CONTRACTION IN THE THORACIC AND ABDOMINAL AORTA
Fontes M.T., Couto G.K., Davel A.P.C., Rossoni L.V. (Brazil)

THEORETICAL MODEL OF LUNG OXYGEN UPTAKE AS A FUNCTION OF HEMATOCRIT AND CAPILLARY DIAMETER
Roy T., Secomb T. (United States)

RESISTANCE TO THE GLP-1 EFFECTS ON PLATELETS IN TYPE 2 DIABETES MELLITUS
Barale C., Cavalot F., Mattiello L., Guerrasio A., Russo I. (Italy)

IDENTIFICATION OF CORONIN 1A AS NOVEL MOLECULAR PLAYER IN NEUTROPHIL TRAFFICKING DURING THE ACUTE INFLAMMATORY RESPONSE
Salvermoser M., Pick R., Brechtefeld D., Stocker T., Vlaovic T., Weckbach L., Walzog B. (Germany)

ALDOSTERONE-RENIN RATIO AND RENAL HEMODYNAMICS IN ESSENTIAL HYPERTENSION
Schütten M., Houben B., Kroon B., Stehouwer C., De Leeuw P. (Netherlands)

TETRAHYDROBIOPTERIN IMPROVES INTESTINAL MICROCIRCULATION IN EXPERIMENTAL SEPSIS IN THE RAT
P83  EXPLORING CUTANEOUS REACTIVITY UNDER DIFFERENT PERFUSION CONDITIONS WITH METHYL NICOTINATE
Silva H., Rosado C., Antunes J., Rodrigues L. (Portugal)

P84  RECIPROCAL REGULATION OF ANGIOPOIETIN 2 & VON WILLEBRAND FACTOR EXPRESSION IN ENDOTHELIAL CELLS
Smith K., Starke R.D., McKinnon T.A.J., Laffan M.A., Randi A.M. (United Kingdom)

P85  SOLUBLE CD146 PROMOTES ANGIOGENIC EFFECTS ON ENDOTHELIAL COLONY-FORMING CELLS THROUGH BINDING ON ANGIOMOTIN
Stalin J., Nollet M., Essaadi A., Leroyer A., Guillet B., Bardin N., Dignat-George F., Blot-Chabaud M. (France)

P86  EXPERIMENTAL NEUROVASCULAR UNCOUPLING PROMOTES COGNITIVE IMPAIRMENT IN MICE: IMPLICATIONS FOR BRAIN AND CEREBROMICROVASCULAR AGING

P87  SELECTION OF CD34+ ENDOTHELIAL-COLONY FORMING CELLS FOR TISSUE ENGINEERING

P88  REGULATION OF ENDOTHELIAL TIE2 EXPRESSION IN EXPERIMENTAL SEPSIS
Thamm K., Haller H., David S. (Germany)

P89  OBSTRUCTIVE SLEEP APNOEA SYNDROME AFFECTS BLOOD FLOW AND OXYGENATION OF ADIPOSE TISSUE
Thorn C.E., Knight B., Mcculloch Laura J., Patel B., Shore A., Kos K. (United Kingdom)

P90  THE EVALUATION OF PENILE MICROVASCULAR ENDOTHELIAL FUNCTION USING LASER SPECKLE CONTRAST IMAGING IN HEALTHY VOLUNTEERS
Verri V., Brandão A., Tibirica E. (Brazil)

P91  A CORRELATION BETWEEN COMPLICATIONS AND GLYCEMIC TARGET IN A CROSS SECTIONAL STUDY IN PEOPLE WITH TYPE 2 DIABETES
Tudorica C.C., Florentiu A., Vintila A.M., Gurghean A., Tudorica S. (Romania)

P92  THE EFFECT ON MICROCIRCULATION OF TELMISARTANUM IN HYPERTENSIVE PATIENTS
Tudorica C.C., Vintila A.M., Gurghean A., Tudorica S. (Romania)

P93  ROLE OF EXOSTOSIN (EXT)-1 AND 2 IN BLOOD PRESSURE RESPONSES TO AN ACUTE AND CHRONIC NACL LOAD
P94 RHOGTPASES AND RNAI: A LARGE-SCALE SCREEN USING ECIS® TO MEASURE ENDOTHELIAL INTEGRITY IN REAL-TIME

P95 DYSFUNCTION OF SKELETAL MUSCLE PERICYTES FROM TYPE 2 DIABETIC PATIENTS WITH CRITICAL LIMB ISCHEMIA IS ASSOCIATED WITH ALTERED OXIDATIVE STATUS
Vono R., Gargioli C., Sangalli E., Maselli D., Gotti A., Losa S., Spinetti G., Madeddu P. (Italy)

P96 LUNG TUMOUR CELL SECRETED VEGF AND TNF-? DEGRADE GLYCOCALYX AND INCREASE SURFACE E-SELECTIN ON HUMAN CEREBRAL ENDOTHELIAL CELLS
Whatmore J., Rai S., Gutowski N. (United Kingdom)

P97 CYTO-PROTECTIVE AND PRO-REPAIR ACTIONS OF N-3 PUFA AND THEIR OXYGENATED METABOLITES: ROLES FOR ENDOTHELIAL NOX4 AND FPR2/ALX

P98 ANGIOGENESIS IN THE RETINA: STUDYING TIP CELL REGULATION
Yetkin-Arik B., Klaassen I., Van Noorden R., Schlingemann R. (Netherlands)

P99 TAFI -438G/A GENE POLYMORPHISM AND PLASMA ACTIVITY OF THROMBIN ACTIVATABLE FIBRINOLYSIS INHIBITOR IN PATIENTS WITH ABDOMINAL AORTIC ANEURYSM
Zuk N., Dubis J., Michalowska D., Buda A., Arczynska K., Zapotoczny N., Witkiewicz W. (Poland)