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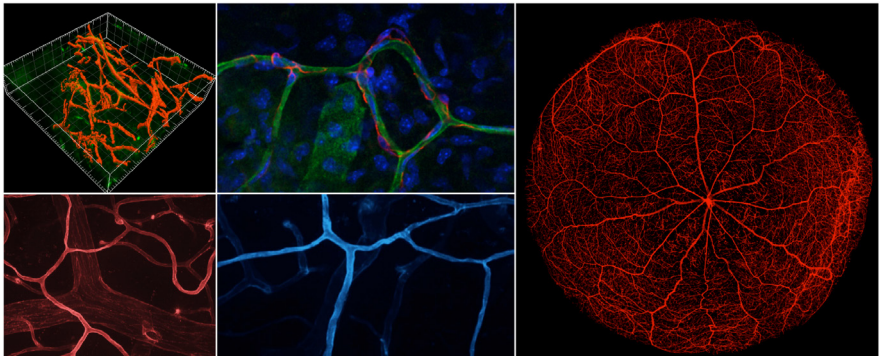
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MAX-PLANCK-GESELLSCHAFT

# SYMPOSIUM 12 YEARS SFB/Transregio23

HEIDELBERG, GERMANY, MARCH 27-28, 2017



# VASCULAR DIFFERENTIATION AND REMODELING



# 12 years SFB/TR 23: `From **Vascular** Differentiation and Remodeling to Organotypic **Vasculature**`

Heidelberg, Germany, March 27-28, 2017

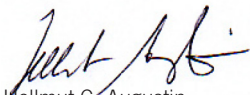
## **Vascular biology: Ad multos annos!**

Welcome to Heidelberg for the International Symposium “12 years SFB-TR23: From Vascular Differentiation and Remodeling to Organotypic Vasculature”. The SFB-TR23 has during the last 12 years in 3 funding periods strongly shaped vascular biology research at the Universities of Heidelberg and Frankfurt. Today, we look back with great pride on the accomplishments of these 12 years. At the same time, we look ahead to make plans for the future.

Vascular dysfunction constitutes the single most important cause of human mortality. The devastating consequences of hypertensive, atherosclerotic, coagulation-related and pathologic angiogenesis-associated diseases account for more than 70% of deaths. Similarly, important and socioeconomically relevant chronic diseases are caused by vascular dysfunction, e.g., ophthalmologic disease or the complications of diabetes. As such, there is plenty more to be done. We are excited about the recent progress in the higher resolution analysis of different vascular beds, both with improved imaging technology as well as with high-end omics techniques all the way to the single cell level. It is increasingly appreciated that the vessel wall is much more than a passive barrier and responsive interface. Instead, the vasculature acts as dynamic gatekeeper of its microenvironment controlling organ development, tissue homeostasis, metabolism and the response to pathogens.

We would like to thank all participants of the meeting for coming to Heidelberg for the presentation and discussion of some of the latest work in the field, the speakers, the poster presenters, the PIs of the SFB-TR23, the postdocs and the graduate students – or simply, everybody who is here, because his/her ‘heart is burning for blood vessels’. We would particularly like to acknowledge the Deutsche Forschungsgemeinschaft for its continued support during all those years that also made this meeting possible.

Please enjoy the science presented during these two days of think tanking, be it in the oral sessions or during individual discussions at the posters. Join the crowd for the evening social activities to meet old and new friends for stimulating discussions of the latest findings and plans for collaborative experiments.



Hellmut G. Augustin  
Mannheim/Heidelberg  
Speaker of the SFB-TR23



Karl H. Plate  
Frankfurt  
Vice-Speaker of the SFB-TR23

07:30 **Registration**

08:30 - 08:45 **Opening**  
Hellmut Augustin (Mannheim/Heidelberg)

08:45 - 10:15 **Session I: VASCULAR DEVELOPMENT**  
Chair: Ingrid Fleming

08:45 Organ-specific and functional specialization of blood vessels  
Ralf Adams (Münster, Germany)

09:15 Guidance of intestinal vessel development  
Anne Eichmann (New Haven, USA)

09:45 Developmental signaling in cardiovascular disease  
Martin Moser (Freiburg, Germany)

10:15 - 10:45 **Coffee Break**

10:45 - 12:45 **Session II: VASCULAR DIFFERENTIATION**  
Chair: Sergij Goerdts

10:45 Vascular stem cell niches  
Eli Keshet (Jerusalem, Israel)

11:15 SEMA3F: An antilymphangiogenic metastasis suppressor  
J. Silvio Gutkind (San Diego, USA)

11:45 Maintenance and organ-specific functions of lymphatic vessels  
Tatiana Petrova (Lausanne, Switzerland)

12:15 Mechanisms and mechanics in vascular patterning  
Holger Gerhardt (Berlin, Germany)

12:45 - 14:00 **Lunch Break**

13:30 - 15:30 **Poster Session I**

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15:30 - 16:30

## **Session III: SIGNALLING IN THE VESSEL WALL**

Chair: Carmen Ruiz de Almodóvar

15:30

Blood flow, vessel diameter and vascular permeability induced by VEGF

Lena Claesson-Welsh (Uppsala, Sweden)

16:00

VEGFR2 and NRP1 cooperate for VEGF-induced vascular permeability signalling

Christiana Ruhrberg (London, UK)

16:30 - 17:00

## **Coffee Break**

17:00 - 18:30

## **Session IV: METABOLIC REGULATION OF VASCULAR DEVELOPMENT**

Chair: Nina Wettschureck

17:00

Roles of Yap/Taz in sprouting angiogenesis and vascular metabolism

Gou Young Koh (Daejeon, Korea)

17:30

Regulation of endothelial quiescence

Michael Potente (Frankfurt, Germany)

18:00

Angiogenesis revisited: Role and (therapeutic) implications of endothelial metabolism

Peter Carmeliet (Leuven, Belgium)

18:30 - 20:30

## **Poster Session II**

19:45

## **Dinner**

09:00 - 10:30      **Session V: CELL-CELL INTERACTIONS  
IN THE VESSEL WALL**  
Chair: Thomas Korff

- 09:00      A Rho-GTPase regulatory circuit controls transendothelial platelet biogenesis by megakaryocytes  
Bernhard Nieswandt (Würzburg, Germany)
- 09:30      Regulating endothelial collective cell behaviour in vascular morphogenesis  
Claudio Franco (Lisbon, Portugal)
- 10:00      A novel link between hemangioblasts and heart development  
Eldad Tzahor (Rehovot, Israel)

10:30 - 11:15      **Coffee Break**

11:15 - 12:15      **Session VI: VASCULAR CONTROL OF DISEASES**  
Chair: Jens Kroll

- 11:15      Liver, lipids and arteriosclerosis  
Stephan Herzig (Munich, Germany)
- 11:45      Role of VEGF-B signalling in diabetic complications  
Ulf Eriksson (Stockholm, Sweden)

12:15 - 13:45      **Lunch Break**

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13:45 - 14:45

**Session VII: THE VASCULATURE AS GATEKEEPER OF ITS MICROENVIRONMENT**  
**Chair: Andreas Fischer**

13:45

Regulation of endothelial phenotype by fluid shear stress  
Martin Schwartz (New Haven, USA)

14:15

Tertiary sprouting and vascularisation of the nervous system  
Ferdinand Le Noble (Karlsruhe, Germany)

14:45 - 15:30

**Coffee Break**

15:30 - 16:30

**Session VIII: ORGANOTYPIC VASCULATURE**  
**Chair: Stefan Liebner**

15:30

Differentiation of endothelial cells and formation of organ-specific vessels  
Karina Yaniv (Rehovot, Israel)

16:00

Transcriptional regulation of endothelial heterogeneity in organ regeneration  
Shahin Rafii (New York, USA)

16:30

**Concluding remarks**  
Hellmut Augustin (Mannheim/Heidelberg)

16:45

**End of meeting**

**Poster Session I**  
**March 27, 13:30 – 15:30**



- I-1 Aging modulates endothelial matrix protein expression thereby promoting endothelial cell senescence and endothelial mesenchymal transition  
Julian Wagner, Institute for Cardiovascular Regeneration, Frankfurt, GER
- I-2 Atrial asymmetry precedes the evolution of the multichambered heart and is controlled by meis2b  
Sven Reischauer, MPI Bad Nauheim, Bad Nauheim, GER
- I-3 Caspase-8 as a novel regulator of developmental angiogenesis  
Nathalie Tisch, Biochemistry Center Heidelberg, Heidelberg, GER
- I-4 Catecholamines facilitate VEGF-dependent angiogenesis via  $\beta$ 2-adrenoceptor-induced activation of Epac1 and PKA  
Jaspal Garg, Heidelberg University, Mannheim, GER
- I-5 Chronic elevation of the venous filling pressure is sufficient to drive development of varicose veins  
Hanna Kuk, Institute of Physiology and Pathophysiology, Heidelberg, GER
- I-6 Endothelial cation channel PIEZO1 controls blood pressure by mediating flow-induced ATP release  
ShengPeng Wang, MPI for Heart and Lung Research, Bad Nauheim, GER
- I-7 Semaphorins cooperate to establish vascular boundaries  
Alice Plein, University College London, London, UK
- I-8 Functional analysis of focal adhesion factors during zebrafish embryonic valve morphogenesis  
Felix Gunawan, MPI for Heart and Lung Research, Bad Nauheim, GER
- I-9 Genetic prevention of PDGFB-dependent mural cell recruitment does not alter lymph vessel identity  
Yixin Wang, Karolinska Institutet, Stockholm, SWE
- I-10 Hhex regulates sprouting angiogenesis through regulation of the Vegfc/Vegfr3 signaling pathway  
Sebastien Gavrut, MPI for Heart and Lung Research, Bad Nauheim, GER
- I-11 Hif1 $\alpha$  regulates macrophage-endothelial interactions during blood vessel development  
Claudia Gerri, MPI for Heart and Lung Research, Bad Nauheim, GER
- I-12 Hippo signalling pathway transducers Yap1/Wwtr1 are involved in secondary sprouting during vascular development  
Jason Lai, MPI-HLR, Bad Nauheim, GER
- I-13 Hypoxia-induced long non-coding RNA Hyp\_up\_3 regulates alternative splicing and controls angiogenesis in endothelial cells  
Youssef Fouani, Institute for Cardiovascular Regeneration, Frankfurt, GER
- I-14 Impact of the endothelial transcription factors GATA2 and GATA6 on angiogenesis in mice  
Melanie Hofmann, Hannover Medical School, Hannover, GER
- I-15 Inhibition of endothelial Notch signaling impairs fatty acid transport and causes heart failure  
Markus Jabs, DKFZ, Heidelberg, GER
- I-16 Integrin-mediated binding of endothelium to laminin 511 is crucial in shear sensing  
Anna-Liisa Luik, University of Münster, Münster, GER



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- I-17 MEF 2 transcription factors are key regulators of sprouting angiogenesis  
Kira Chouliaras, Ludwig Cancer Research, Oxford, UK
- I-18 NFAT5 controls vessel wall remodeling during pulmonary artery hypertension  
Thomas Korff, Heidelberg University, Heidelberg, GER
- I-19 PKM2 controls the methylation capacity and growth of endothelial cells  
Oliver Stone, MPI Bad Nauheim, Bad Nauheim, GER
- I-20 Regulatory mechanism of front-rear polarization and directional migration of endothelial tip cells during angiogenesis in zebrafish  
Yuki Wakayama, National Cerebral and Cardiovascular Center Research Institute, Suita, JPN
- I-21 Revascularization after ischemia is mediated by clonally expanding endothelial cells and is impaired by aging  
Yosif Manavski, Institute of Cardiovascular Regeneration, Frankfurt, GER
- I-22 Role for Junb in lymphangiogenesis  
Marina Schorpp-Kistner, DKFZ, Heidelberg, GER
- I-23 Role of FOXOs in the maintenance of endothelial quiescence  
Chenyue Shi, MPI for Heart and Lung Research, Bad Nauheim, GER
- I-24 Studying cell rearrangement in blood vessels driven by VE-cadherin junctional remodeling  
Minkyong Lee, Biozentrum, University of Basel, Basel, CH
- I-25 The biomechanical properties of an epithelial tissue determine the location of its vasculature  
Haiko Karsjens, Deutsches Diabetes-Zentrum (DDZ), Düsseldorf, GER
- I-26 The cell junction-associated protein MPDZ inhibits sprouting angiogenesis by facilitating Dll4/Notch1 signaling  
Fabian Tetzlaff, DKFZ, Heidelberg, GER
- I-27 The role of polyunsaturated fatty acids - derived epoxides and diols in angiogenesis and lymphangiogenesis  
Sarah Dziumbila, Institute for Vascular Signaling, Frankfurt, GER
- I-28 Upstream modulators of cloche expression and early angioblast specification  
Michele Marass, MPI for Heart and Lung Research, Bad Nauheim, GER
- I-29 VEGF165-induced vascular permeability requires NRP1 for ABL-mediated SRC family kinase activation  
Anastasia Lampropoulou, University College London, London, UK
- I-30 Wall stress-mediated RGS5 expression in vascular smooth muscle cells controls arterial remodeling during hypertension  
Caroline Arnold, Heidelberg University, Heidelberg, GER
- I-31 YAP/TAZ as new regulatory hub of VEGF signaling  
Xiaohong Wang, Heidelberg University, Heidelberg, GER
- I-32 von Willebrand factor-mediated endothelial cell-platelet-monocyte interaction in atherosclerosis – role of ADAMTS13  
Miruna Popa, Heidelberg University, Heidelberg, GER
- I-33 Differentiating Macrophages in atherosclerotic plaques using matrix-assisted laser desorption/ionization mass spectrometry imaging  
Pegah Khamehghir, Heidelberg University, Heidelberg, GER

**Poster Session II**  
**March 27, 18:30 – 20:30**



- II-1 GATA4-dependent organ-specific endothelial differentiation controls liver development and embryonic hematopoiesis  
Philipp-Sebastian Koch, University Medical Center Mannheim, Mannheim, GER
- II-2 Angiocrine Bmp2 signaling in murine liver controls normal iron homeostasis  
Victor Olsavszky, University Medical Center Mannheim, Mannheim, GER
- II-3 Angiotensin-2 induced blood-brain barrier compromise and increased stroke size is rescued by VE-PTP dependent restoration of Tie2 signaling  
Yvonne Reiss, Goethe University Medical Faculty, Frankfurt, GER
- II-4 Anks6(p.R823W) overexpression in kidney affects retinal vasoregression  
Jihong Lin, Heidelberg University, Mannheim, GER
- II-5 BMPER-deficiency impairs vascular smooth muscle cell phenotype switching and vascular regeneration  
Jennifer Esser, Heart Center University Freiburg, Freiburg, GER
- II-6 Deficiency in nucleoside diphosphate kinase B aggravates the development of diabetic retinopathy through upregulation of angiotensin-2 via FOXO1  
Yi Qiu, Medical Faculty Mannheim, Heidelberg University, Mannheim, GER
- II-7 Delta like ligand4 regulates vascular remodeling in chronic liver disease  
Honglei Weng, Heidelberg University, Mannheim, GER
- II-8 Duplicated vegfa genes control early central nervous system vascularization  
Martin Lange, MPI for Molecular Biomedicine, Münster, GER
- II-9 Endothelial cell-derived Angiotensin-2 is a therapeutic target in treatment-naive and Bevacizumab-resistant glioblastoma  
Mariangela Di Tacchio, Goethe University Medical Faculty, Frankfurt, GER
- II-10 Endothelial Notch1 activity facilitates tumor metastasis in mice  
Juan Rodriguez Vita, DKFZ, Heidelberg, GER
- II-11 Exploring mutant/morphant discrepancies: The case of tie-2  
Claudia Carlantoni, MPI for Heart and Lung Research, Bad Nauheim, GER
- II-12 Flow dynamics and HSPC homing in bone marrow microvessels  
Gabriele Bixel, MPI for Molecular Biomedicine, Münster, GER
- II-13 Hepatic stellate cell (HSC)-derived bone morphogenetic protein (BMP)-9 controls functions of liver sinusoidal endothelial cells (LSEC)  
Katja Breitkopf-Heinlein, University Medical Center Mannheim, Mannheim, GER
- II-14 Increased vascular permeability in the bone marrow microenvironment contributes to disease progression and drug response in acute myeloid leukemia  
Diana Passaro, The Francis Crick Institute, London, UK
- II-15 Inhibition of the soluble epoxide hydrolase attenuates diabetic retinopathy in Ins2Akita mice  
Jiong Hu, Frankfurt University, Frankfurt, GER
- II-16 Macrophages as important players for colon cancer metastasis  
Aida Freire, University Hospital Heidelberg, Heidelberg, GER
- II-17 Motor neurons control blood vessel patterning in the developing spinal cord  
Patricia Himmels, Heidelberg University, Heidelberg, GER

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- II-18 Characterization of the novel pericyte markers S1PR3 and PTGER2  
Tina Ruckdeschel, DKFZ, Heidelberg, GER
- II-19 Pericyte-expressed Tie2 controls vessel maturation  
Laura Milde, DKFZ, Heidelberg, GER
- II-20 Endothelial Tie1 promotes tumor angiogenesis, inhibits vascular normalization and enhances metastatic dissemination  
Silvia La Porta, DKFZ, Heidelberg, GER
- II-21 Rhodocetin- $\alpha\beta$  selectively breaks the tumor vessel wall barrier in vivo  
Stephan Niland, Münster University, Münster, GER
- II-22 Role of the astrocyte-derived Wnt growth factors at the Blood-Brain Barrier  
Sylvaine Guerit, Edinger Institute, Frankfurt, GER
- II-23 Specific targeting of PDGFR $\beta$  kinase activity in host cells inhibits growth and angiogenesis of tumors with high PDGF-BB expression  
Maria Tsioumpkou, Uppsala University, Uppsala, SWE
- II-24 Synergistic interaction of sonic hedgehog and Wnt signaling pathways in the Blood-Brain Barrier function  
Kavi Devraj, Goethe Univ. Clinic Frankfurt, Frankfurt, GER
- II-25 Targeting von Willebrand factor fibers attenuates hematogenic but not lymphatic metastasis in malignant melanoma  
Alexander Bauer, Medical Faculty MA, Heidelberg University, Mannheim, GER
- II-26 The role of Angiopoietin-like 4 during tumor progression  
Martin Petkov, DKFZ, Heidelberg, GER
- II-27 The role of Cyp2c44 / sEH in tumour formation and metastasis  
Rushendhiran Kesavan, Institute for Vascular Signalling, Frankfurt, GER
- II-28 The role of laminin a5 and laminin a4 in vascular smooth muscle (VSM) contraction  
Gunita Apsite, Münster University, Münster, GER
- II-29 The role of Wnt/ $\beta$ -catenin-signalling for cell fate decision in the haematopoietic system  
Burak Hasan Yalcin, Edinger Institute, Frankfurt, GER
- II-30 Tie2-receptor is expressed in Purkinje neurons and contributes to the development of its dendritic arbor  
Robert Luck, BZH, Heidelberg, GER
- II-31 Wnt signaling regulates vascular pattern formation in the CNS  
Kathleen Huebner, University of Muenster, Muenster, GER
- II-32 Endothelial Gq/G11 mediate inflammatory signaling induced by disturbed flow  
Julián Albarrán-Juárez, MPI for Heart and Lung Research, GER
- II-33 Loss of erythropoietin aggravates hyperglycemia induced renal damage and alters embryonic renal development via induction of apoptosis in zebrafish  
Jens Kroll, Medical Faculty Mannheim, Mannheim, GER

## Venue

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