19th International Vascular Biology Meeting

Thrombosis

M001

Perturbations in the endothelial Angiopoietin-Tie2 pathway contribute to the pro-thrombotic microvascular phenotype in endotoxemia

Higgins, Sarah J; De Ceunynck, Karen; Flaumenhaft, Robert; Parikh, Samir M.
Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA, USA

- LPS-induced perturbations in the endothelium drive the pro-thrombotic microvascular phenotype in endotoxemia
- Disruption of Tie2 signaling results in significantly increased microvascular thrombus formation
- Tie2 activation by Angpt-1 delivery may counteract the pro-thrombotic mechanisms in endotoxemia

M002

Loss of endothelial epsins reduces LPS-Induced sepsis by stabilizing Thrombomodulin

Song, Kai[1]; Wu, Hao[1]; Rahman, Ashiqur[1]; Dong, Yunzhou[1]; Brophy, Megan[1]; Wen, Aiyun[1]; Kwak, Sukyoung[1]; Wong, Scott[1]; Chen, Hong[2]
1. Boston Children's Hospital, Boston, MA, USA
2. Boston Children's Hospital/Harvard Medical School, Boston, MA, USA

- Deletion of epsins protects mice from lipopolysaccharide (LPS)-induced death
- Loss of epsins in endothelial cells increases the anticoagulant protein, Thrombomodulin
- We will determine the molecular mechanism by which epsins regulate sepsis-associated coagulation and thrombus

M003

The effect of lifestyle on thrombosis - a focus on physical activity and obesity

Twomey, Laura[1]; Wallace, Robert[1]; Cummins, Philip M.[1]; Meade, Gerardene[1]; Moyna, Niall[1]; Custaud, Marc-Antoine[2]; Murphy, Ronan[1]
1. Dublin City University, Dublin 9, Ireland
2. University of Angers, Angers, France

- A Cross sectional study of arterial thrombosis risk factors and platelet function
- Physical inactivity, Dry Immersion platelet function and microRNA expression
- Cardiorespiratory fitness and platelet function in male adults and adolescents

M004

Context-specific post-transcriptional regulation of Tissue Factor mRNA expression by trisetraprolin (TTP) and poly (ADP-ribose) polymerase (PARP)-14: resistance of aortic adventitial fibroblasts to a regulatory mechanism seen in macrophages

Hyde, Gareth; Alonso, Aldara M.; Walrawens, Juliette; Yin, Li; Haskard, Dorian
Imperial College London, London, United Kingdom

M005

Phospholipase D regulates human platelet activation, adhesion, spreading, and thrombus formation

Lu, Wan-Jung[1]; Huang, Li-Ting[1]; Lin, Kuan-Hung[2]
1. Taipei Medical University Hospital, Taipei, Taiwan
2. Shin-Kong Wu Ho-Su Memorial Hospital, Taipei, Taiwan

- PLD is essential for human platelet activation
- PLD inhibition can prolong closure time in a model mimicking in vivo thrombosis
- Targeting PLD may provide a safe and alternative therapeutic approach to preventing thromboembolic disorders

M006

Development of benzimidazole derivatives to be a novel Anti-thrombotic drug: Structure-activity study

Hsia, Chih-Hsuan; Jayakumar, Thanasekaran; Sheu, Joen-Rong
Taipei Medical University, Taipei, Taiwan

- We investigated the comparative antiplatelet activity of newly synthesized benzimidazole derivatives
- A newly synthesized benzimidazole derivative, M3BIM inhibited thrombin and EPI induced-platelet activation
- M3BIM can be appraised as a prospective benzeimidazole compound for the treatment of specific related diseases

M007

Prevention of arterial thrombosis by nobiletin

Sheu, Joen-Rong
Taipei Medical University, Taipei, Taiwan

- Nobiletin, a bioactive polymethoxylated flavone isolated from citrus fruits
- Nobiletin exhibits potent antiplatelet activity through inhibition of PLC?2-PKC and hydroxyl radicals
- Nobiletin represents a potential therapeutic agent for preventing or treating thromboembolic disorders

M008

Functional ex vivo and in vivo studies of honokiol inhibits platelet activation

Chen, Ray-Jade[1]; Lee, Tzu-Yin[2]; Lu, Wan-Jung[1]
1. Taipei Medical University Hospital, Taipei, Taiwan
2. Taipei Medical University, Taipei, Taiwan

- Honokiol, derived from Magnolia officinalis, has various pharmacological properties
- Honokiol acts as a potent antagonist of collagen GP VI in human platelets
- Honokiol has therapeutic potential in the prevention of the pathological thrombosis

M009

The effects of edoxaban on thrombin generation and anti-coagulant systems in patients with acute venous thromboembolism

Yagi, Shusuke; Sata, Masataka
Tokushima University Graduate School, Tokushima, Japan

- Warfarin decreased the activity of protein C and protein S in VTE
- Edoxaban treatment increased the activity of protein C and Protein S in VTE
- Edoxaban improve VTE with restoring physiological anticoagulants.

M010

Sirt3 deficiency increases arterial thrombosis and elevates plasma tissue factor levels

Gaul, Daniel S.[1]; Winnik, Stephan[1,2]; Sluka, Susanna[1]; Weber, Julien[1]; Pasterk, Lisa[1]; van Tits, Lambertus J.[1]; Reiner, Martin F.[1]; Lohmann, Christine[1]; Tanner, Felix C.[1,2]; Camici, Giovanni G.[1]; Lüscher, Thomas F.[1,2]; Matter, Christian M.[1,2]
1. University of Zurich, Schlieren, Switzerland
2. University Hospital Zurich, Zurich, Switzerland

- Sirt3
- Thrombosis
- ACS

Angiogenesis/Arteriogenesis

M011

YAP1 stimulates angiogenesis and lung regeneration through the Angiopoietin-Tie2 pathway

Mammoto, Akiko; Mammoto, Tadanori
Boston Children's Hospital, Boston, MA, USA

- YAP1 controls angiogenesis through the Angiopoietin-Tie2 pathway
- YAP1 stimulates vascular and epithelial morphogenesis in the hydrogel implanted on the mouse lung
- YAP1 is necessary for lung regeneration in adult mice

M013

The role of miR-135a in ischemic vascular diseases

Icli, Basak
Brigham and Women's Hospital, Boston, MA, USA

- Angiogenesis
- MICRORNA
- Diabetic wound healing

M014

Hypoxia inducible factor in vascular smooth muscle cells contributes to peripheral perfusion recovery

Borton, Anna H.; Alaiti, M. Amer; Proweller, Aaron; Ramirez-Bergeron, Diana
Case Western Reserve University School of Medicine, Cleveland, OH, USA

- VSMC HIF deficient mice (ArntSM22-SMC) demonstrate decreased reperfusion in femoral artery ligation model
- Gastrocnemius muscles of ArntSM22-SMC ligated limbs show increased hypoxia, inflammation, and tissue damage
- Hypoxia induces proliferation and promotes survival in primary peripheral VSMCs

M015

New metabolic regulators of endothelial cell junctions dynamics in angiogenesis

Gómez Escudero, Jesus[1]; Garcia Weber, Diego[2]; Millan, Jaime[2]; Garcia Arroyo, Alicia[1]
1. Centro Nacional de Investigaciones Cardiovasculares Carlos III, Madrid, Spain
2. Centro Biologia Molecular Severo Ochoa, Madrid, Spain

- Cell junctions regulation
- Local ATP production
- Angiogenesis

M016

Methodology for assessing transcriptional regulation and translational landscape of Notch signaling in endothelial cells

Du, Jing [1]; Chaudhri, Reyhaan A.[2]; Feng, Huijuan[3]; Zhang, Chaolin[1]; Sims, Peter[1]; Kitajewski, Jan K.[2]
1. Columbia University, New York City, NY USA
2. University of Illinois at Chicago, Chicago, IL, USA
3. Qinghua University, Beijing, China

- tethered-ligand assay and RNAseq to identify novel Notch targets
- successful endothelial enrichment of transcripts in RiboTag profiling from tumor vasculature
- Apply RiboTag system into Endothelial-specific DnMAML mice

M017

Endothelial Tie1 regulates tumor angiogenesis, vascular normalization and metastatic dissemination

La Porta, Silvia [1]; Roth, Lise[1]; Sony, Savant[1]; Singhal, Mahak[1]; Spegg, Carleen [1]; Mogler, Carolin[1] Augustin, Hellmut[2]
1. DKFZ, Heidelberg, Germany
2. German Cancer Research Center, Heidelberg, Germany

- Tie1 targeting inhibits tumor angiogenesis
- Tie1 targeting normalises primary tumor vasculature and reduces tutor cells escape
- Tie1 targeting inhibits metastasis

M018

The serine protease HTRA1 controls microvascular and macrovascular remodeling by processing the Notch ligand JAG1

Klose, Ralph; Fischer, Andreas
German Cancer Research Center, Heidelberg, Germany

- The serine protease HTRA1 is involved in the pathogenesis of familial small vessel disease
- HTRA1 cleaves the Notch ligand JAG1 and thereby controls Notch signaling
- Loss of HTRA1 leads to excessive tumor angiogenesis and impaired vessel contractility

M019

Bone morphogenetic protein 4 regulated MicroRNAs miR-126-5p and miR-494 are in control of endothelial cell function in angiogenesis

Esser, Jennifer; Saretzki, Erika; Engert, Bianca; Pankratz, Franziska; Grundmann, Sebastian; Bode, Christoph; Moser, Martin; Zhou, Qian
Heart Center, Medical Faculty, University of Freiburg, Freiburg, Germany

- BMP4 regulates microRNAs in endothelial cells providing a new link between BMP4 and angiogenesis
- BMP4-stimulated endothelial cells display decreased miR-494 and increased miR-126-5p expression
- MiR-494 inhibits pro-angiogenic bFGF and BMPER, whereas miR-126-5p targets anti-angiogenic thrombospondin-1

M020

cAMP regulates VEGF-dependent angiogenesis via Epac1 and PKA

Garg, Jaspal[1]; Feng, Yuxi[2]; Lezoualc'h, Frank[3]; Schmidt, Martina[4]; Wieland, Thomas[2]
1. Heidelberg University, Mannheim, Germany
2. Experimental Pharmacology, Mannheim, Germany
3. Institute of Cardiovascular and Metabolic Diseases, Toulouse, France
4. Centre of Pharmacy, Groningen, Netherlands

- Increased cAMP by activation of ß2-adrenoceptors regulates endothelial sprouting via Epac1 and PKA
- Epac1 regulates sprouting angiogenesis by regulating VEGFR-2 protein levels
- PKA regulates sprouting angiogenesis by regulating VEGF secretion

M021

AIBP limits angiogenesis through gamma-secretase-mediated upregulation of Notch signaling

Mao, Renfang[1]; Gu, Qilin[1]; Yan, Qing[1]; Almazan, Felicidad[2]; Pownall, Henry J.[1]; Miller, Yury I[2]; Fang, Longhou[1]
1. Houston Methodist Research Institute, Houston, TX, USA
2. UC San Diego, La Jolla, CA, USA

- Absence of AIBP increases murine pathological and retinal angiogenesis and reduces Notch activity
- AIBP and HDL treatment redirects r-secretase and NOTCH from lipid raft to non-lipid raft fractions
- AIBP and HDL increase DLL4-stimulated Notch signaling

M022

Anti-angiogenic effect of xanthine oxidase inhibition on endothelial cells

Kushiyama, Akifumi[1]; Kikuchi, Takako[1]; Yamazaki, Hiroki[1]; Fukushima, Yoko[2]; Uemura, Akiyoshi[3]; Arima, Yuichiro[4]; Nishiyama, Koichi[4]; Kushiyama, Sakura[1]; Iwamoto, Yasuhiko[1]; Asano, Tomoichiro[5]
1. Institute for Adult Diseases, Asahi Life Foundation, Tokyo, Japan
2. Graduate School of Medicine, Osaka University, Osaka, Japan
3. Graduate School of Medical Sciences, Nagoya City University, Nagoya, Japan
4. Graduate School of Medical Sciences, Kumamoto University, Kumamoto, Japan
5. Institute of Biomedical & Health Sciences, Hiroshima University, Hiroshima, Japan

- Spheroid formation of HUVECs is inhibited by xanthine oxidase inhibitor febuxostat
- Elongation of branch sprouting and cell migration from spheroid are inhibited by febuxostat
- Among changes in HUVECs by co-culture with fibroblasts, ICAM-1 is directly suppressed by febuxostat

M023

Role of miR-378a in vascularization and inflammation in skeletal muscles

Florczyk, Urszula; Krist, Bart; Pietraszek-Gremplewicz, Katarzyna; Kozakowska, Magdalena; Jozkowicz, Alicja; Dulak, Jozef
Jagiellonian University, Krakow, Poland

- mir_378a role in blood vessel formation
- no effect of miR-378 knkockout on revascularisation in ischemic limb
- role of miR-378a in muscle physiology

M024

Akt1-mediated skeletal muscle growth enhances blood flow recovery after hind limb ischemia by activating heme Oxygenase-1 in macrophage

Izumiya, Yasuhiro; Onoue, Yoshiro; Hanatani, Shinsuke; Kimura, Yuichi
Kumamoto University, Kumamoto, Japan

- It has been recognized that resistance exercise has beneficial effects for PAD patients
- We investigated the mechanism by which skeletal muscle growth enhances angiogenesis in ischemic lesion
- We found that skeletal muscle growth improves blood flow recovery by enhancing HO-1 expression in macrophage

M025

Cyr61 regulates tip cell identity in vascular formation through VEGFR2-integrin avß3 signaling complex

Oh, Su-Young; Lee, Sun-Hee; Lee, Hye Eun; Lee, Se-Hyung; Jang, Gun-Hyuk; Kim, Ae Kyung; Lee, You Mie
Kyungpook National University, Daegu, Korea

- It has been recognized that resistance exercise has beneficial effects for PAD patients
- We investigated the mechanism by which skeletal muscle growth enhances angiogenesis in ischemic lesion
- We found that skeletal muscle growth improves blood flow recovery by enhancing HO-1 expression in macrophage

M026

Mast cells contribute to arteriogenesis by enhancing an early inflammatory response in a hind limb ischemia mouse model

de Vries, Margreet R.[1]; Kröner, Mara[2]; Kuiper, Johan[2]; Quax, Paul H.[1]; Bot, Ilze[3]
1. Leiden University Medical Center, Leiden, Netherlands
2. Leiden University, Leiden, Netherlands
3. LACDR/Leiden University, Leiden, Netherlands

- Mast cell activation increases during arteriogenesis in a hind limb ischemia mouse model
- Mast cell activation enhances the amount of Ly6C(high) inflammatory monocytes
- Mast cells, upon degranulation, actively contribute to arteriogenesis

M027

Profiling the in vivo endothelial translatome using AngioTag zebrafish

Miller, Mayumi
NIH, Bethesda, MD, USA

- Mining the endothelial translatome
- Endothelial transcriptome vs translatome
- Tool to discover novel genes in vascular development

M028

A crucial role for Senescence-associated glycoprotein (SAGP) in vascular senescence and angiogenesis

Suda, Masayoshi; Shimizu, Ippei; Yoshida, Yohko; Yuka, Hayashi; Minamino, Tohru
Niigata University Graduate School of Medical and Dental Sciences, Niigata, Japan

- endothelial senescence
- atherosclerotic diseases
- angiogenesis

M029

Tissue-engineered vascularized tumor microenvironment for preclinical testing of anticancer therapeutics

Mann, Henning
Nortis, Inc., Seattle, WA, USA

- Nortis' 3D microfluidic technology facilitates tissue engineered angiogenic microenvironments
- Vascularized microenvironments serve as a platform for testing of anticancer therapeutics
- A variety of tissue-specific microenvironments can be created using Nortis' microfluidic technology

M030

Myeloid Angiogenic Cells reparative function is impaired by Pentraxin 3

Medina, Reinhold J.[1]; O'Neill, Christina[1]; Chambers, Sarah[1]; Guduric-Fuchs, Jasenka[1]; Bottazzi, Barbara[2]; Stitt, Alan[1]
1. Queen's University Belfast, Belfast, United Kingdom
2. Humanitas Research Hospital, Milan, Italy

- MACs at high densities switch from pro-angiogenic to anti-angiogenic
- Endothelial cells, exposed to high density MACs, secrete PTX3
- PTX3 inhibits angiogenesis in an autocrine manner by blocking FGF2 signaling

M031

Vascular regeneration following skeletal muscle ischemia occurs via intussusceptive angiogenesis and differential VEGFR2 activation

Arpino, John-Michael[1]; Nong, Zengxuan[1]; Li, Fuyan[1]; Yin, Hao[1]; Balint, Brittany[1]; Milkovich, Stephanie[2]; Ellis, Christopher G.[2]; Pickering, J. Geoffrey[1]
1. Robarts Research Institute, Western University, London, Ontario, Canada
2. Western University, London, Ontario, Canada

- We elucidated the dynamics of microvessel regeneration in ischemic skeletal muscle with intravital microscopy
- Microvessel network regeneration entails intussusceptive angiogenesis by endothelial pillar formation
- Confocal reconstruction revealed pillar EC selection proceeds via heterogeneous VEGFR2 activation

M032

Endomucin controls retinal vascular development by modulating VEGFR2 signaling

Park-Windhol, Cindy; Ng, Yin-Shan; Yang, Jinling; Primo, Vincent; Saint-Geniez, Magali; D'Amore, Patricia A.
Schepens Eye Research Institute/MEEI/Harvard Medical School, Boston, MA, USA

- Endothelial cells express O-glycoproteins that are believed to play important roles in vascular development
- Endomucin is a sialic-rich glycoprotein, specifically expressed by venous and capillary endothelium
- Endomucin may be an attractive therapeutic/preventive strategy to treat retinopathy

M033

Vimentin is required for successful angiogenesis during pregnancy

Duran, Camille L.[1]; White, Bryan[2]; Seo, Heewon[2]; Kang, Hojin[1]; Johnson, Gregory A[2]; Kaunas, Roland[2]; Bayless, Kayla[1]
1. Texas A&M Health Science Center, College Station, TX, USA
2. Texas A&M University, College Station, TX, USA

- Vimentin null mice have smaller litters and reduced uterine angiogenic vessel density during pregnancy
- Vimentin silencing decreased wall shear stress and proangiogenic factor-induced sprouting in vitro
- Vimentin complexes with and appear to reinforce complex formation between VE-cad and PECAM-1

M034

LRG1 is a novel determinant of dysfunctional neovascularization in disease

Greenwood, John[1]; Kallenberg, David [2]; O'Connor, Marie [2]; Dowsett, Laura[2]; George, Jestin[2]; Davies, Sterenn[2]; Tripathi, Vineeta[2]; Jeffs, Natasha[2]; Gourlaouen, Morgane[2]; Hoeh, Alexandra[2]; Moss, Stephen E.[1]

1. UCL Institute of Ophthalmology, London, United Kingdom

2. University College London, London, United Kingdom

- Identifying the role of LRG1 in promoting dysfunctional neovascularization
- Demonstration that LRG1 subverts normal angiogenesis
- Demonstration that inhibition of LRG1 normalises vasculature in tumours and enhances drug delivery

M035

The applicability of precision-cut liver slices (PCLS) as a model to study fibrosis-associated angiogenesis

Adlia, Amirah; Inci, Safiye; de Graaf, Inge A.; Starokozhko, Viktoriia; de Jager, Marina H.; Poelstra, Klaas; Groothuis, Geny M.

University of Groningen, Groningen, Netherlands

- Three different methods were developed to create liver-specific ex vivo angiogenesis models using PCLS
- VEGF-A and Sunitinib changed CD31 mRNA level and its protein expression increased along with fibrosis
- Collagen-embedded PCLS sprouted CD31-positive cells and this model can be used to study liver angiogenesis

M036

PDGFRßCreERT2 driver: A novel tool to target pericytes in mice

Cuervo, Henar[1]; Pereira, Brianna[2]; Kitajewski, Jan[1]; Lin, Chyuan-Sheng[2]

1. University of Illinois at Chicago, Chicago, IL, USA

2. Columbia University Medical Center, New York, NY, USA

- We have generated a novel mouse line driving tamoxifen inducible Cre recombinase via the PDGFRß promoter
- Crossing this line with two different reporters showed successful targeting of pericytes in retina and brain
- We also observed efficient recombination in perivascular cells associated with tumor vasculature

M037

VEGF-A splice variants bind VEGFR1 and VEGFR2 with differential affinities

Mamer, Spencer B.; Wittenkeller, Ashley; Imoukhuede, P. I.

University of Illinois at Urbana-Champaign, Urbana, IL, USA

- Binding affinities between of angiogenic growth factors
- Splice variants can regulate angiogenic signaling
- VEGF produced in variants with different binding affinities

M038

An Allosteric inhibitor of Glycogen Synthase Kinase-3ß protects the heart from ischemia-reperfusion injury

Baruah, Jugajyoti; Hitzman, Ryan; Zhang, Jane; Wary, Kishore K.

University of Illinois at Chicago, Chicago, IL, USA

- Wnt signaling in Myocardial Ischemia-Reperfusion Injury
- Allosteric Glycogen Synthase Kinase-3ß inhibitor provides cardio-protective benefit
- Wnt signaling induced NANOG in endothelial cells, partially regulates neovascularization

M039

Small molecule-mediated targeting of myocardin related transcription factor and its downstream target profilin inhibits endothelial cell migration and angiogenesis

Gau, David[1]; Veon, William[1]; Joy, Marion[1]; Capasso, Teresa[1]; Roman, Beth L.[2]; Koes, David[1] ; Roy, Partha[1]

1. University of Pittsburgh, Pittsburgh, PA, USA

2. University of Pittsburgh Graduate School of Public Health, Pittsburgh, PA, USA

- We have identified transcriptional factor MKL and its target profilin as important angiogenesis mediators
- We have delineated a novel signaling pathway that connects MKL activity and Pfn regulation
- We have identified novel small molecule strategies to suppress endothelial cell migration and angiogenesis

M040

Lipids in the regulation of angiogenesis: oxLDL both stimulates and inhibits endothelial angiogenesis and migration potentially via a sphingosine-1-phosphate dependent mechanism

Olding, Michael; Lim, Wen Chean; Nyirenda, Tiwonge; Ardern-Jones, Michael; Healy, Eugene; Millar, Timothy M.

University of Southampton, Southampton, United Kingdom

- oxLDL has a biphasic effect on angiogenesis
- Serum lipid depletion inhibits endothelial migration
- oxLDL controls angiogenesis via sphingosine-1-phosphate

M041

Anti-Angiogenic VEGF165b Regulates Vascular Remodeling by Inducing M1-Macrophage Polarization in Experimental Peripheral Arterial Disease

Ganta, Vijay C.; Choi, Min
University of Virginia, Charlottesville, VA, USA

- VEGF165b induction in ischemic muscle decreases VEGFR1-STAT3 signaling to induce M1-Macrophage (Mac) phenotype
- VEGF165b over-expressing or VEGFR1+/- Macs (M1 polarized) impair angiogenesis and perfusion in ischemic muscle
- VEGF165b inhibition induced VEGFR1 dependent M2-Mac polarization to promote angiogenesis and perfusion

M042

The angiogenic Micro-RNA-93 displays cell and context-dependent effects on target gene expression

Hazarika, Surovi
University of Virginia, Charlottesville, VA, USA

- Angiogenesis
- micro-RNAs
- Cell and Context-dependent Effects

M043

Endothelial cell and pericyte Connexin43 expression and phosphorylation are modulated by the VEGF Receptor Flt-1

Savelli, Alyssa C.; Darden, Jordan; Taylor, Sarah; Chappell, John
Virginia Tech, Roanoke, VA, USA

- Loss of Flt-1 leads to increased VEGF-A during angiogenesis, leading to increased vascular dysmorphogenesis
- Loss of Flt-1 leads to dysfunction of Cx43, a hemichannel which aids in pericyte-endothelial cell interactions
- Aberrant communication through gap junctions may lead to changes in pericyte coverage and vessel stability

M044

Modulation of endothelial BMPR2 activity by VEGFR3 in endothelial cells

Jin, Suk-Won
Yale University, New Haven, CT, USA

- VEGFR3 serves as a critical co-receptor for BMPR2 to promote endocytosis
- VEGFR3 promotes BMP signaling in endothelium
- VEGFR3 activity may contribute to the PAH symptoms.

M045

Amigo2 serves as a membrane anchor of PDK1 to promote Akt-mediated angiogenesis

Park, Hyojin; Lee, Sungwoon; Park, Jeong Ae; Kwon, Young-Guen
Yonsei University, Seoul, Korea

- Adhesion molecule with IgG-like domain 2 (Amiog2)
- phosphoinositide-dependent kinase-1 (PDK1)
- angiogenesis

M046

Tissue resident Endovascular Progenitors (EVP) define a novel endothelial hierarchy that contribute to blood vessel regeneration via the re-expression of Sox18

Patel, Jatin; Seppanen, Elke J.; Rodero, Mathieu P.; Wong, Ho Yi; Donovan, Prudence; Fisk, Nicholas M.; Francois, Mathias; Khosrotehrani, Kiarash
The University of Queensland, Brisbane, Australia

- endothelial progenitor cells
- neovasculogenesis
- angiogenesis

M047

VEGFA-driven pathological angiogenesis requires the proteoglycan syndecan-4

De Rossi, Giulia[1]; Cristante, Enrico[2]; Vahatupa, Maria[3]; Bainbridge, James[4]; Jarvinen, Tero A.H.[3]; Whiteford, James[1]
1. Queen Mary University of London, London, United Kingdom
2. University College London, London, United Kingdom
3. University of Tampere, Tampere, Finland
4. Moorfields Eye Hospital and UCL Institute of Ophthalmology, London, United Kingdom

- VEGFA is considered the most potent driver of neovascularisation during both development and pathology
- We describe an essential role for the proteoglycan Syndecan-4 during pathological neovascularisation
- Syndecan-4 appears to facilitate endothelial cell responses to VEGFA, possibly acting as VEGFR2 co-receptor

Drug Discovery/Gene Therapy

M048

A syndecan-derived peptide for the treatment of Wet age-related macular degeneration

De Rossi, Giulia [1]; Cristante, Enrico [2]; Bainbridge, James [3]; Bland, Elliot[1]; Whiteford, James[1]
1. Queen Mary University of London, London, United Kingdom
2. University College London, London, United Kingdom
3. Moorfields Eye Hospital and UCL Institute of Ophthalmology, London, United Kingdom

- Wet age-related macular degeneration is the leading cause of vision loss amongst the aging population
- Blocking angiogenesis via targeting VEGF/VEGFR has shown therapeutic benefit but also patient non-response
- We have discovered a syndecan-based peptide which can block angiogenesis in the eye in a VEGF-independent way

M049

A novel Antibody-Guided, Lcn2 siRNA encapsulating Nanotherapeutic for the Anti-Angiogenic treatment of triple negative breast cancer

Guo, Peng[1]; Yang, Jiang[1]; Auguste, Debra[2]; Moses, Marsha[1]
1. Boston Children's Hospital and Harvard Medical School, Boston, MA, USA
2. The City College of New York, New York, NY, USA

- Targeted Anti-Angiogenic Therapy
- Cancer Nanomedicine
- Triple Negative Breast Cancer Treatment

M050

Anti-inflammatory mRNA delivery to endothelial cells in vivo using endotropic nanoparticles

Kowalski, Piotr S.[1]; Khan, Omar F.[1]; Jin, Chengcheng[1]; Kauffman, Kevin J.[1]; Anderson, Daniel G.[2]
1. David H. Koch Institute for Integrative Cancer Research / MIT, Cambridge, MA, USA
2. MIT/Harvard Medical School, Cambridge, MA, USA

- Development of mRNA based nanotherapeutics for vascular diseases
- mRNA delivery to endothelial cells
- anti-inflammatory mRNA-based approach to interfere with disease associated endothelial activation

M051

Translational research of novel angiogenic peptide for wound healing drug; From discovery to clinical trial

Nakagami, Hironori
Graduate School of Medicine, Osaka University, Suita-sity, Osaka, Japan

- Translational research
- novel functional peptide
- severe skin ulcer in patients

M052

EMAPII neutralizing antibodies ameliorate Influenza A virus induced lung injury

Bogatcheva, Natalia; March, Keith L.; Clauss, Matthias
Indiana University School of Medicine, Indianapolis, IN, USA

- To treat influenza induced lung injury (ARDS)
- To target EMAP II induced edema formation
- To further develop neutralizing antibody to investigational new drug (IND)

M053

Novel Pro-angiogenic Ginsenoside variants inhibit vascular leakage

Kang, Ji In; Lee, Dong Sun; Kim, Sun Chang; Kim, Ho Min
Korea Advanced Institute of Science and Technology (KAIST), Daejeon, Korea

- Ginsenoside variants stimulated in vitro angiogenic behaviors of human vascular endothelial cells
- Ginsenoside variants effectively inhibited VEGF-induced vascular leakage both in vitro and in vivo
- Ginsenoside variants might be the potential compounds for the treatment of vascular-related diseases

M054

Developing a novel cell-selective therapy for the prevention of restenosis

Lockhart, John H. [1]; Canfield, John[1]; Mong, Ezinne F.[1]; VanWye, Jeffrey[2]; Totary-Jain, Hana[1]
1. University of South Florida, Tampa, FL, USA
2. Morsani College of Medicine, University of South Florida, Tampa, USA

- mRNA-based vectors offer a safer alternative to viral vectors for gene replacement therapies
- mRNA-based vectors can be selectively expressed by leveraging endogenous microRNA
- Cell-selective mRNA-base vectors hold great promise for the treatment of cardiovascular diseases

Pulmonary Hypertension

M055

Contribution of BMP9 to pulmonary arterial hypertension

Bailly, Sabine [1]; Ly, Tu [2]; Mallet, Christine[1]; Guignabert, Christophe[3]; Humbert, Marc[3]
1. INSERM, Grenoble, France
2. Université Paris-Sud, Le Plessis-Robinson, France
3. INSERM, Le Plessis-Robinson, France

- Experimental models of pulmonary hypertension (PH)
- Bmp9-KO mice are protected against experimental PH
- BMPR2 and ACVRL1 mutations in PAH

M056

HMGB1 signaling mediates HIMF-induced pulmonary hypertension

Lin, Qing [1]; Fan, Chunling [1]; Kegan, Kazuyo [2]; Skinner, John T. [1]; Van Raemdonck, Katrien[1] ; Fang, Xia [1]; Yang, Wei [1]; Johns, Roger A.[2]
1. Johns Hopkins University School of Medicine, Baltimore, MD, USA
2. Johns Hopkins University, Baltimore, MD, USA

- HIMF (hRETN) induces the expression of HMGB1 and RAGE in hypoxic mouse lung tissues and human cells
- HIMF (hRETN) promotes HMGB1 acetylation and nuclear translocation, thereby contributing to PH pathogenesis
- HIMF/HMGB1-signaling axis enhances PVSMC proliferation by mediating autophagy and BMPR2 downregulation

M057

Hemodynamic stress alters fetal pulmonary artery endothelial cell gene expression in vitro: A potential role in intrauterine growth restriction

Dodson, Blair [1]; Tan, Wei [2]; Powers, Kyle N. [1]; Gien, Jason[1]; Seedorf, Gregory[1]; Abman, Steven H.[1]; Crombleholme, Timothy M.[1]
1. University of Colorado Denver Anschutz Medical Center, Aurora, CO, USA
2. University of Colorado Boulder, Boulder, CO, USA

- Intrauterine growth restriction (IUGR) is a major risk factor for the development of infant lung disease
- IUGR in pulmonary artery endothelial cells (PAEC) results in altered pathway gene expression
- In vitro hemodynamic stress in fetal sheep PAECs induces a gene expression pattern similar to IUGR

M058

c-Myc inhibition improves cor pulmonale through epigenetic regulation and changes in pro-inflammatory and -fibrotic mechanisms in experimental pulmonary hypertension

Pinto, Mariana T.[1]; Kanashiro-Takeuchi, Rosemeire M.[1]; Young, Karen C.[1]; Florea, Victoria[1]; Taylor, Christy N.[1]; Zigmond, Zachary[1]; Hehre, Dorothy A.[1]; Huang, Jian[1]; Takeuchi, Lauro M.[1]; Kurlansky, Paul A.[2]; Rodrigues, Claudia O.[3]
1. University of Miami Miller School of Medicine, Miami, FL, USA
2. Columbia University, New York, NY, USA
3. University of Miami, Miami, FL, USA

- Treatment for Pulmonary Hypertension
- c-Myc Inhibition
- Inflammation and Fibrosis

M059

Novel cell-selective therapy for pulmonary hypertension

Canfield, John ; Lockhart, John ; Mong, Ezinne F. ; VanWye, Jeffrey ; Totary-Jain, Hana
University of South Florida, Tampa, FL, USA

- Exploiting microRNA to selectively inhibit smooth muscle cell or endothelial cell proliferation
- Role of smooth muscle cells or endothelial cells in pulmonary hypertension progression
- Selective inhibition of vascular remodeling may be potential treatment for pulmonary hypertension

Large Vessel Disease Outside the Heart

M060

A microRNA program responsible for the aged phenotype of aorta

Nicholson, Christopher J.; Lee, Sophie; Liang, Stephanie; Mohan, Shivani M.; Seta, Francesca; Morgan, Kathleen G.
Boston University, Boston, MA, USA

- Aortic stiffness
- Focal adhesion
- MicroRNA

M061

Non-canonical Wnt signaling promotes abdominal aortic aneurysm formation and growth

Fuster, Jose J.[1]; Zuriaga, Maria A.[1]; Silver, Marcy[1]; MacLauchlan, Susan[1]; Sano, Soichi[1]; Martin-Ventura, Jose L.[2] ; Zou, Ming-Hui [3]; Golledge, Jon [4]; Walsh, Kenneth[1]
1. Boston University School of Medicine, Boston, MA, USA
2. Fundacion Jimenez Diaz, Madrid, Spain
3. Georgia State University, Atlanta, GA, USA
4. James Cook University, Townsville, Australia

- Wnt5a expression is significantly increased in mouse and human AAA specimens
- Genetic ablation of Wnt5a in the mouse suppresses experimental AAA formation and growth
- Myeloid-restricted Wnt5a-overexpression in the mouse accelerates experimental AAA development

M062

PPARa activation by K-877 attenuates the development of and macrophage burden in mouse vein graft lesions

Decano, Julius L.[1]; Zhang, Hengmin[2]; Singh, Sasha[1]; Mlynarchik, Andrew[1]; Mattson, Peter C.[2] ; Choi, Jung[1]; Creager, Michael[1]; Wang, Jian-Guo[2]; Libby, Peter[1]; Ozaki, C. Keith[1]; Aikawa, Elena[1]; Aikawa, Masanori[1]
1. Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA
2. Center for Interdisciplinary Cardiovascular Sciences, Brigham and Women's Hospital, Boston, MA, USA

- Proteomics and network analysis reveal PPAR alpha as putative therapeutic target for vein graft disease
- Highly selective PPAR alpha agonist K-877 reduces lesion development and inflammation in vein graft disease
- K-877 reduces macrophage pro-inflammatory activation in vitro and in vivo vein graft lesions

M063

The role of IL-27 receptor signaling in the development of abdominal aortic aneurysm

Peshkova, Iuliia; Aghayev, Turan; Fatkhullina, Aliia; Sykes, Stephen; Koltsova, Ekaterina
Fox Chase Cancer Center, Philadelphia, PA, USA

- Pathogenic of anti-inflammatory cytokine IL27 in AAA
- IL27R deficiency protects from AAA and reduces inflammation and immune cells accumulation in AAA area
- IL27R signaling is required to control the survival of myeloid precursors in bone marrow in response to AngII

M065

Defects in Type 1 Regulatory T (Tr1) cells contribute to abdominal aortic aneurysm expansion and can be corrected by administration of mesenchymal stem cells (MSCs)

Green, Linden A.[1]; Wang, Keisin[1]; DiStasi, Matthew R.[2]; Murphy, Michael [3]
1. Indiana University, Indianapolis, IN, USA
2. Indiana University, Purdue University, Indianapolis, IN, USA
3. Indiana University School of Medicine, Carmel, IN, USA

- AAA is an autoimmune disease. It is critical to understand the role of regulatory cells in AAA
- Tr1 cells are less numerous and functionally defective in AAA
- We can correct the Tr1 defects and prevent aneurysm expansion in vivo by administration of MSCs

M066

Osteopontin expression is deranged in the local and peripheral environment of the abdominal aortic aneurysm patient

Wang, Keisin[1]; Green, Linden A.[1]; Murphy, Michael[2]
1. Indiana University, Indianapolis, IN, USA
2. Indiana University School of Medicine, Carmel, IN, USA

- Osteopontin levels are abnormally elevated in the AAA patient both in the local diseased aorta and periphera
- AAA serum inhibits the induction of healthy naïve CD4 cells corresponding to a diminished Tr1 cell populatio
- Osteopontin promotes inflammation by inhibition of Tr1 cell induction

M067

Macrophage-derived IGF-1 contributes to aortic fibrosis and stiffening in hypertensive mice

Chan, Christopher[1]; Ilinykh, Alexei[1]; Lewis, Caitlin[1]; Lieu, Maggie[1]; Vinh, Antony[1]; Ferens, Dorota[1]; Moodley, Seyuri[1]; Krishnan, Shalini[1]; Diep, Henry[1]; Evans, Megan[1]; Samuel, Chrishan[1]; Pinto, Alexander[2]; Sobey, Christopher[1]; Drummond, Grant[1]
1. Monash University, Melbourne, Australia
2. The Jackson Laboratory, Bay Harbor, ME, USA

- Inflammation and hypertension
- Macrophages and vascular remodelling
- IGF-1 and macrophage polarization

M068

Porphyromonas gingivalis induces proinflammatory thrombus formation in a mouse model of abdominal aortic aneurysm

Boulaftali, Yacine; Delbosc, Sandrine; Bouton, Marie-Christine; Michel, Jean-Baptiste; Jandrot-Perrus, Martine; Ho-Tin-Noe, Benoit
INSERM, Paris, France

- Porphyromonas gingivalis (Pg) increases abdominal aortic diameter in elastase-treated mice
- Pg induces abdominal aneurysm with platelet-leukocyte rich thrombi in elastase-treated mice
- Platelet-leukocyte interactions play a critical role in abdominal aortic aneurysm development

M069

Unraveling mechanisms in vascular patterning during stroke using in vivo imaging in mouse

Mathivet,Thomas[1,2,3]; Bouleti, Claire[1,2]; de Boer, Antina[4,5]; Lemmens, Robin[4,5]; Eichmann, Anne[3]; Gerhardt, Holger[1,2,6]
1. Vesalius Research Center, VIB, Leuven, Belgium
2. Vesalius Research Center, KU Leuven, Leuven, Belgium
3. PARCC Paris - Centre de recherche Cardiovasculaire à l'HEGP Inserm - UMR 970, Paris, France.
4. University Hospitals Leuven, Leuven, Belgium
5. Leuven Research Institute for Neuroscience and Disease, KU Leuven–University of Leuven, Leuven, Belgium
6. Max-Delbrück-Center for Molecular Medicine in the Helmholtz Association, Berlin, Germany

- blood vessel patterning in vascular disease: stroke
- endothelial cell / myeloid cell cross-talk in vascular disease
- in vivo live-imaging

M070

p38 MAPK-Dependent smooth muscle cell senescence in dilated aortas in bicuspid aortic valve patients

Balint, Brittany[1]; Yin, Hao[1]; Nong, Zengxuan[1]; Fox, Stephanie[2]; O'Neil, Caroline[1]; Chu, Michael MW[2]; Bursill, Christina[3]
1. Robart's Research Institute, Western University, London, Canada
2. London Health Sciences Centre, London, Canada
3. Heart Research Institute, Sydney, NSW, Australia

- We identified senescent SMCs in the medial layer of dilated ascending aortas from BAV patients
- DNA damage, active p38 MAPK, and collagenase expression (MMP-1, -8, -13) were increased in BAV aortas
- In vitro inhibition of p38 MAPK decreased senescence and collagenase expression in BAV aortic SMCs

M071

Roles of hydrogen peroxide–inducible clone 5 in pathogenesis of thoracic aortic aneurysm in Marfan Syndrome

Lei, Xiao-Feng[1]; Kim-Kaneyama, Joo-ri[2]; Miyazaki, Takuro[2]; Haraguchi, Shogo[1]; Miyazaki, Akira[1]
1. Showa University, Tokyo, Japan
2. Showa University School of Medicine, Tokyo, Japan

- Hic-5
- aneurysm
- marfan

M072

Role of syndecan-1 in thoracic aortic aneurysm formation

Soumaya, Jadoui[1]; Sophie, Vo[1]; Arocas, Véronique[2]; Louedec, Liliane[2]; Deschildres, Catherine[2]; Park, Pyong[3]; Michel, Jean-Baptiste[2]; Charnaux, Nathalie[1]; Richard, Benjamin[1]

1. Université Paris 13, Paris, France

2. INSERM, Paris, France

3. Boston Children's Hospital, Boston, MA, USA

- The transmembrane proteoglycane syndecan-1 is upregulated in human thoracic aorta aneurysm (TAA)
- Syndecan-1 overexpression in human smooth muscle cells increases TGF-beta responses
- Syndecan-1 deficiency protects against TAA formation in mice

M073

Inflammasome blockade by a Cross-class protease inhibitor Serp-2 reduces liver ischemia reperfusion injury (LIRI), significantly improving outcomes

Ambadapadi, Sriram; Chen, Hao; Wakefield, Dara; Fuentes, Jorge; Davids, Jennifer; Marques, Bruno; Dixon, Laura; Clapp, William; Lucas, Alexandra

University of Florida, Gainesville, FL, USA

- Immunomodulatory proteins derived from viruses
- Inflammasome activation
- Inhbition of apoptosis

M074

Altered response to mechanical stretch in aortic smooth muscle cells from patients with bicuspid aortic valve aortopathy

Billaud, Marie[1]; Richards, Tara D.[2]; Hill, Jennifer C.[2]; Buchwald, Julianna E.[2]; Bryant, Fisher W.[2]; Vorp, David A[2]; Phillippi, Julie[2]; Gleason, Thomas G.[2]

1. University of Pittsburgh School of Medicine, Pittsburgh, PA, USA

2. University of Pittsburgh, Pittsburgh, PA, USA

- Hemodynamic disturbances are increased in patients with bicuspid aortic valve (BAV)
- Mechanical stretch-induced gene expression of ECM-related proteins was impaired in BAV SMC
- BAV SMC were less contractile and mechanical stretch did not restore their phenotype

M075

Deficiency of smooth muscle a-actin leads to NF-kB-Dependent hypersensitivity to angiontensin II and aortic enlargement

Kwartler, Callie[1]; Chen, Jiyuan[1]; Peters, Andrew[1]; Papke, Christina[1]; Villamizar, Carlos[1]; Ringuette, Léa-Jeanne[2]; Cao, Jiumei[1]; Wang, Shanzhi[1]; Ma, Shuangtao[1]; Gong, Limin[1]; Byanova, Katerina[1]; Madonna, Rosalinda[1]; Kee, Patrick[1]; Geng, Yong-Jian[1]; Brasier, Allan[3]; Davis, Elaine C.[2]; Prakash, Siddharth[1]; Milewicz, Dianna[1]

1. The University of Texas Health Sciences Center at Houston, Houston, TX, USA

2. McGill University, Montreal, PQ, CAN

3. University of Texas Medical Branch, Galveston, TX, USA

- Acta2-/- mice have aortic root dilation, which is blunted by losartan, an angiotensin II receptor agonist
- Acta2-/- SMCs have increased basal NF-kB signaling and increased sensitivity to exogenous AngII
- Disruption of SM a-actin filaments in SMCs activates NF-kB signaling and increases expression of At1a

M077

Interleukin-21 improves perfusion recovery after hindlimb ischemia in a receptor dependent manner

Wang, Tao; Yang, Liang; Yuan, Mingjie; Annex, Brian H.

University of Virginia, Charlottesville, VA, USA

- Peripheral arterial disease
- Therapeutic angoigenesis
- Interleukin-21 receptor

M078

IL-23 attenuates ascending aortic aneurysm formation in a gender independent manner in a Novel Model using ß-aminopropionitrile(BAPN)

Salmon, Morgan D.; Fashandi, Anna; Hawkins, Robert; Spinosa, Michael; Su, Gang; Lu, Guanyi; Sharma, Ashish; Upchurch, Gilbert; Ailawadi, Gorav

University of Virginia, Charlottesville, VA, USA

- Aortic aneurysms
- inflammation
- gender

Microcirculation

M079

A novel approach for the in vitro study of tone coordination along resistance vessels

Palao Garcia, Teresa; van Weert, Angela; de Leeuw, Anne; de Vos, Judith; Bakker, Erik NTP; van Bavel, Ed
Academic Medical Center, Amsterdam, Netherlands

- Proper control of local perfusion requires coordination of tone along resistance vessels
- We developed a novel in vitro setup to study this
- Vasoconstrictors induced remarkably small distal responses

M080

Characterization of the novel pericyte markers S1PR3 and PTGER2

Ruckdeschel, Tina[1]; Schlereth, Katharina[1]; Hasanov, Zulfiyya[1]; Hertel, Stella[1]; Augustin, Hellmut[2]
1. DKFZ, Heidelberg, Germany
2. German Cancer Research Center, Heidelberg, Germany

- PTGER2 and S1PR3, two G-protein-coupled receptors, are novel, highly pericyte-enriched transcripts
- PTGER2 and S1PR3 control pericyte function (proliferation and transmigration)
- PTGER2 and S1PR3 are involved in the crosstalk between endothelial cells and pericytes

M081

Differential immunostaining of DARC/ACKR1 distinguishes venular from non-venular endothelial cells in murine tissues and allows identification of regulators of the venular phenotype

Thiriot, Aude[1]; Perdomo, Carolina[1]; Cheng, Guiying[1]; Novitzky-Basso, Igor [2]; mcArdle, Sara [3]; Barreiro, Olga[1]; Mazo, Irina[1]; Triboulet, Robinson[4]; Nemoto, Yasuhiro[1]; Kishimoto, Jamie[1]; Omid, Shaida[1]; Ley, Klaus F.[3]; Rot, Antal [2]; von Andrian, Ulrich[1]
1. Harvard Medical School, Boston, MA, USA
2. University of York, York, United Kingdom
3. La Jolla Institute for Allergy & Immunology, La Jolla, CA, USA
4. Boston Children's Hospital, Boston, MA, USA

- Characterization of DARC expression on microvasculature using a new rat-anti-mouse DARC monoclonal antibody
- Isolation of DARC+ venular endothelial cells by flow cytometry
- Identification and characterization of molecules involved in the maintenance of the venular phenotype

M082

Study of systemic and microvascular responses to progressive hemolytic anemia in rats

Nugent, William H.[1]; Carr, Danuel A.[1]; Ormond, Aimee[2]; Selwood, Simon P.[2]; Song, Bjorn K.[1]
1. Song Biotechnologies, LLC, Timonium, MD, USA
2. SoBran BioScience, Inc., Baltimore, MD, USA

- Microcirculation
- Tissue Oxygenation
- Hemolytic Anemia

M083

Traumatic brain injury causes inward rectifier potassium channelopathy and alters flow mediated dilations in rat mesenteric resistance arteries

Sackheim, Adrian; Villalba, Nuria; Freeman, Kalev
University of Vermont, Burlington, VT, USA

- Signaling pathways of agonist and flow induced dilations in rat mesenteric resistance arteries
- The role of the inward rectifier potassium channel (KIR) in flow induced dilations
- The effect of traumatic brain injury on vascular endothelial cell physiology and shear stress signaling

M084

Spironolactone can act on pannexin1 channels in smooth muscle cells to regulate vasoconstriction and blood pressure

Good, Miranda E.[1]; Poon, Ivan K H [1]; Chiu, Yu-Hsin[1]; Butcher, Joshua T.[1]; DeLalio, Leon J.[1]; Mendu, Suresh [1]; Jaffe, Iris Z.[2]; Leitinger, Norbert[1]; Desai, Bimal N.[1]; Bayliss, Douglas A.[1]; Ravichandran, Kodi S.[1]; Isakson, Brant E.[1]
1. University of Virginia, Charlottesville, VA, USA
2. Tufts Medical Center, Boston, MA, USA

- Spironolactone, a potent anti-hypertensive, is able to block pannexin1 (Panx1) channels
- Spironolactone inhibits a-adrenergic induced vasoconstriction via smooth muscle cell Panx1
- Panx1 is a novel target of spironolactone and may contribute to this drug's anti-hypertensive effect

M085

Negative feedback regulation of TRPV4 channel function by nitric oxide in small pulmonary arteries

Marziano, Corina; Hong, Kwangseok; Cope, Eric; Sonkusare, Swapnil
University of Virginia, Charlottesville, VA, USA

- Elementary TRPV4 sparklets dilate small pulmonary arteries via NOS activation and NO release
- NO activates guanylyl cyclase-protein kinase G pathway to limit TRPV4 sparklet activity
- This negative feedback mechanism may be important in preventing calcium overload and cell death

M086

Endothelial cell secreted MIF regulates pericyte contractility to decrease barrier function

Pellowe, Amanda[1]; Sauler, Maor[2]; Liu, Rebecca[2]; Calderon, Brenda[1]; Harris, Mariah[1]; Pober, Jordan S.[2]; Bucala, Richard[2]; Lee, Patty J.[2]; Gonzalez, Anjelica[1]
1. Yale University, New Haven, CT, USA
2. Yale School of Medicine, New Haven, CT, USA

- Exogenous and EC secreted MIF reduces the formation of focal adhesions and actin stress fibers in PC, and also
- Exogenous and EC secreted MIF reduces PC barrier function to increase TNFa mediated PMN transmigration
- The loss of EC secreted MIF in vivo reduces PMN transmigration

Smooth Muscle Cells

M087

Notch ligand specificity dictates opposing arterial vasoregulatory functions

Basu, Sanchita; Calderon, Alex; Barbur, Iulia; Banerjee, Suhanti; Zhang, Rongli; Proweller, Aaron
Case Western Reserve University, Cleveland, OH, USA

- Arterial vasoreactivity is a major determinant of blood flow and pressure
- Arterial smooth muscle Notch signaling controls vasoregulatory functions in a Notch ligand dependent manner
- Pharmacological strategies aimed at ligand manipulation may lead to strategies for managing vascular disease

M088

A vascular smooth muscle-specific long non-coding RNA interacts with Myocardin-Related transcription Factor A and promotes inflammation

Zhang, Wei
Albany Medical College, Albany, NY, USA

- vascular smooth muscle cell phenotypic plasticity
- smooth muscle specific long non-coding RNA
- Myocardin-Related Transcription Factor A and inflammation

M089

Regulation and function of an Aorta-enriched long noncoding RNA (Ael1) in mouse

Choi, Mihyun ; Wu, Wen; Zhao, Jinjing; Miao, Lianjie; Wu, Minfu; Lu, Yao Wei; Schwarz, John
Albany Medical College, Albany, NY, USA

- Aorta-enriched lncRNA1 (Ael1) is MYOCD/SRF/CArG-dependent VSMC and cardiomyocytes-selective lncRNA
- Ael1 is associated with regulation of expression of vascular smooth muscles contractile genes
- Ael1 may play important roles in vascular or cardiac diseases

M090

Vascular CaMKIIgamma expression is controlled via promoter methylation

Liu, YongFeng; Sun, LiYan; Singer, Diane V; Singer, Harold A.
Albany Medical College, Albany, NY, USA

- vascular smooth muscle
- CaMKIIgamma
- TET and DNA methylation

M091

TGFß/SMAD and MYOCD/SRF- regulated TSPAN2 is a novel modulator to antagonize vascular smooth muscle phenotypic modulation

Wu, Wen[1]; Zhao, Jinjing[1]; Zhang, Wei[1]; Tou, Emiley[1]; Ye, Jiemei[1]; Choi, Mihyun[1]; Long, Xiaochun[2]
1. Albany Medical College, Albany, NY, USA
2. University of Rochester, West Henrietta, NY, USA

- TSPAN2 is a direct target of both TGFß/SMAD and MYOCD/SRF pathways in VSMCs
- TSPAN2 is an important component of the molecular signature of the SMC contractile phenotype
- TSPAN2 plays critical roles in antagonizing VSMC phenotypic modulation

M092

The atypical cadherin Fat1 controls mitochondrial function and growth of vascular smooth muscle cells

Riascos-Bernal, Dario F.[1]; Cao, Longyue[1]; Chinnasamy, Prameladevi[1]; Dunaway, Charlene[1]; Pujato, Mario[2]; O'Rourke, Brian[1]; Miskolci, Veronika[1]; Hodgson, Louis[1]; Fiser, Andras[1]; Sibinga, Nicholas E.S.[1]
1. Albert Einstein College of Medicine, New York, NY, USA
2. Cincinnati Children's Hospital Medical Center, Cincinnati, OH, USA

- Fragments of Fat1 accumulate in SMC mitochondria and inhibit oxidative phosphorylation
- Fat1 interacts with and controls respiratory complex I and II activity and supercomplex assembly
- Fat1 limits mitochondrial respiration, SMC proliferation, and neointima formation after injury

M093

Cytosolic phospholipase A2 is required for human smooth muscle cell proliferation but not migration to platelet derived growth factor BB

Carnevale, Kevin
Des Moines University, Des Moines, IA, USA

- Role of cPLA2 in Smooth muscle proliferation
- Role of cPLA2 in Smooth muscle migration
- Role of iPLA2 in Smooth muscle migration and proliferation

M094

Clearance of plasmin-PN-1 complexes by vascular smooth muscle cells in human aneurysm of the ascending aorta

Boukais, Kamel[1]; Borges, Luciano[2]; Touat, Ziad[1]; Venisse, Laurence[1]; François, Déborah[1]; Arocas, Véronique[1]; Jondeau, Guillaume[3]; Declerck, Paul[4]; Bouton, Marie-Christine[1]; Michel, Jean-Baptiste[1]
1. INSERM 1148, Paris, France
2. University, São Paulo, Brazil
3. INSERM, Bichat Hospital, Paris, France
4. Laboratory for Therapeutic and Diagnostic Antibodies, Leuven, Belgium

- Biology of vascular smooth muscle cells
- human aneurysm of the ascending aorta
- Clearance of protease/antiprotease complexes by vascular smooth muscle

M095

Prelamin A impairs 53BP1 nuclear entry by mislocalising NUP153 and disrupting the Ran gradient in VSMCs

Cobb, Andrew M.[1]; Larrieu, Delphine[2]; Warren, Derek T.[1]; Liu, Yiwen[1]; Srivastava, Sonal[1]; Smith, Andrew J.O.[3]; Bowater, Richard P.[3]; Jackson, Stephen P.[2]; Shanahan, Catherine M.[1]
1. King's College London, London, United Kingdom
2. University of Cambridge, Cambridge, United Kingdom
3. University of East Anglia, Norwich, United Kingdom

- The accumulation of prelamin A in aged VSMCs causes VSMC dysfunction and genomic instability
- Prelamin A mislocalises NUP153 and disrupts Ran-dependent import of 53BP1, leading to defects in DNA repair
- Defects associated with prelamin A expression were reduced by treatment with a small molecule termed Remodelin

M096

A vascular smooth muscle cell Biohybrid system – High content screening platform for atherogenicity

Jaminon, Armand[1]; van Gorp, Rick H.[1]; Jahnen-Dechent, Willi[2]; Floege, Jürgen[2]; Reutelingsperger, Chris[2]; Schurgers, Leon J.[2]
1. Maastricht University, Maastricht, Netherlands
2. RWTH Aachen University Clinics, Aachen, Germany

- The Biohybrid-system is a promising screening platform to predict atherogenecity of patients
- Vitamin K supplementation in CKD patients shows reduced calcification
- CKD patients after dialysis show marked reduced calcification compared to before dialysis

M097

Oral anticoagulant agents as modulators of vascular smooth muscle cells in the pathogenesis of atherothrombosis

van Gorp, Rick H.; Spronk, Henri M.H.; Reutelingsperger, Chris; Schurgers, Leon J.
Maastricht University, Maastricht, Netherlands

- Warfarin increases calcification, oxidative stress and exosome secretion in primary human VSMC
- Dabigatran did not alter calcification but reduces exosome secretion in primary human VSMC
- Long-term warfarin treatment aggravates atherogenesis by increasing plaque size, calcification and oxidative

M098

Progerin impairs vascular smooth muscle cell growth via the DNA damage response pathway

Nagasawa, Ayako; Shimizu, Ippei; Yoshida, Yohko; Tuchida, Masanori; Minamino, Tohru
Niigata University Graduate School of Medical and Dental Sciences, Niigata, Japan

- We performed an interactome analysis using progerin and found that progerin cannot interact with proteins related to the DNA damage response
- Our results suggest that progerin is causal for the activation of DNA damage response and growth arrest
- Modulation of progerin is essential to suppress pathologies in HGPS

M099

Nad regeneration in smooth muscle cells is required to maintain aortic integrity

Watson, Alanna[1]; Nong, Zengxuan[2]; O'Neil, Caroline[1]; Leo, Oberdan[3]; Bursill, Christina[4]
1. The University of Western Ontario, London, ON, Canada
2. Robart's Research Institute, Western University, London, Canada
3. Universite Libre De Bruxelles, Gosselies, Belgium
4. Heart Research Institute, Sydney, NSW, Australia

- Mice with a SMC-specific deficiency in Nampt are vulnerable to aortic dissection
- Loss of Nampt in SMCs disrupts vascular NAD+ homeostasis in vivo
- Nampt-deficient aortas have a global shift in ECM expression from collagen to mechanically vulnerable proteoglycan-based E

M100

Alcohol feeding inhibits hedgehog-stimulated Sca1 adventitial progenitor cell expansion and carotid remodeling

Liu, Weimin[1]; Fitzpatrick, Emma[2]; Cahill, Paul A.[2]; Redmond, Eileen M.[3]
1. University of Rochester, Rochester, NY, USA
2. Dublin City University, Dublin 9, Ireland, United Kingdom
3. University of Rochester Med Center, Rochester, NY, USA

- Alcohol is a negative risk factor for vascular disease but the cells/mechanisms targeted are not fully understood
- We show that alcohol inhibits hedgehog and Sca1+ progenitor cell expansion and arterial remodeling after ligation injury
- Regulation of resident vascular stem cells may be an important novel mechanism contributing to alcohol's alcohol's cardiovascular effects

M101

Correction of marfan mutation C1242Y in human IPS cells using CRISPR/CAS9 technology reestablish normal phenotype in human neural crest-derived smooth muscle cells

Serrano, Felipe; Granata, Alessandra; Bernard, William; McNamara, Madelaine; Sinha, Sanjay
University of Cambridge, Cambridge, United Kingdom

- Disease modeling
- Gene correction with CRISPR/CAS9 technology
- Vascular smooth muscle cells

M102

Nuclear targeting of apelin promotes smooth muscle cell phenotypic transition. Implications in atherosclerosis

Chaabane, Chiraz[1]; König, Stéphane[1]; Brun, Cécile[1]; Audigier, Yves[2]; Baertschi, Alex J.[1]; Bochaton-Piallat, Marie-Luce[1]
1. University of Geneva, Geneva, Switzerland
2. University of Toulouse, Toulouse, France

- Nuclear apelin induces a smooth muscle cell phenotypic transition toward the synthetic phenotype
- Nuclear apelin acts on S100A4 (marker of synthetic phenotype) expression, release and localization
- Apelin could act as a pro-atherogenic factor

M103

Extracellular S100A4 and PDGF-BB act in synergy to induce smooth muscle cell activation. Implications in atherosclerosis

Sakic, Antonija[1]; Chaabane, Chiraz[1]; Ambartsumian, Noona[2]; Grigorian, Mariam[2]; Bochaton-Piallat, Marie-Luce[1]
1. University of Geneva, Geneva, Switzerland
2. University of Copenhagen, Copenhagen, Denmark

- Multimeric extracellular S100A4 is responsible for the establishment of the synthetic phenotype
- Extracellular S100A4 acts to some extent through RAGE and NFkappaB
- S100A4 and PDGF-BB act in synergy to induce a pro-inflammatory-like smooth muscle cell phenotype

M104

Cytochrome b5 Reductase 3 modulates cGMP signaling and vascular smooth muscle function

Straub, Adam[1]; Nguyen, Anh[2]; Rahaman, Mizanur[1]; Miller, Megan[1]; Hahn, Scott[1]; Sparacino-Watkins, Courtney[1]; Gladwin, Mark[1]; Martin, Emil[3]; Gordeuk, Victor[4]
1. University of Pittsburgh, Pittsburgh, PA, USA
2. Robert M. Berne Cardiovascular Center, Charlottesville, VA, USA
3. University of Texas Houston, Houston, TX, USA
4. University of Illinios-Chicago, Chicago, IL, USA

- smooth muscle
- cGMP
- nitric oxide

M105

Integrative genetics of vascular smooth muscle cell phenotypes

Aherrahrou, Redouane; Chen, Lisa; Asby, Nicholas; Nagraj, Vijay Peter; Hinkle, Jameson; Civelek, Mete
University of Virginia, Charlottesville, VA, USA

- Study the impact of the CAD-associated genetic factors on the cellular and molecular SMC phenotypes
- The identification of the novel genetic factors that are associated with SMC function will provide insights in
- Better understand Coronary artery disease (CAD)

M106

Role of Rap1 guanine nucleotide exchange factor, RapGEF1, in signaling through sodium dependent phosphate transporter, PiT-1, in vascular smooth muscle cells

Chavkin, Nicholas W.[1]; Giachelli, Cecilia M.[2]
1. Yale University, New Haven, CT, USA
2. University of Washington, Seattle, WA, USA

- PiT-1 mediated response to elevated Pi requires RapGEF1 in vascular smooth muscle cells
- Silencing of RapGEF1 mRNA eliminates elevated Pi-induced ERK1/2 phosphorylation
- RapGEF1 silencing eliminates elevated Pi-induced SM22a mRNA down-regulation

Endothelial Cells I

M107

Separation of human microvascular blood and lymphatic endothelial cells using ESAM-Coupled dynabeads

Lowery, Anthony M.; Vincent, Peter A.
Albany Medical College, Albany, NY, USA

- Microvascular endothelial cultures are often a mixture of lymphatic and blood endothelial cells
- ESAM (Endothelial cell-Selective Adhesion Molecule) is highly expressed in blood, not lymphatic, endothelium
- ESAM-coupled Dynabeads can be used to efficiently isolate blood endothelial cells from a mixed culture

M108

FOXO1/Sprouty-2 pathway inhibits endothelial cell tumor growth

Phung, Thuy Linh
Baylor College of Medicine, Houston, TX, USA

- Biology of endothelial cell tumors (vascular tumors)
- Role of the transcriptional factor FOXO1 in the pathogenesis of vascular tumors
- Role of Sprouty2 in the pathogenesis of vascular tumors

M109

Human trabecular bone endothelial cells have unique osteoinductive properties and can autonomously regulate osteogenic differentiation of mesenchymal stem cells in vivo

Lee, Chin Nien[1]; Lin, Ruei-Zeng[1]; Maclellan, Reid A.[1]; Padwa, Bonnie[1]; Greene, Arin K.[2]; Melero-Martin, Juan M.[1]
1. Boston Children's Hospital, Boston, MA, USA
2. Boston Children's Hospital/Harvard Medical School, Boston, MA, USA

- Sustaining proximity to endothelial cells (ECs) is critical to preserve the osteogenic potential of bmMSCs.
- Human trabecular bone ECs (bECs) induce osteogenic potential of bone marrow-derived MSCs spontaneously
- Several osteoinductive genes are differentially upregulated in human trabecular bECs

M110

Selective targeting of a novel Epsin-VEGFR2 interaction promotes VEGF-mediated angiogenesis

Rahman, Habibunnabi A.
Boston Children's Hospital, Boston, MA, USA

- Epsin
- Ubiquitination
- Angiogenesis

M111

GPR124, an Orphan G-protein coupled Receptor, promotes cell adhesion by regulating GEFs for the RhoGTPases Cdc42 and Rac1

Hernandez, Magda[1]; Chidiac, Rony[2]; Reyes Cruz, Guadalupe[1]; Gratton, Jean-Philippe[2]; Côté, Jean-Francois[3]; Vázquez Prado, José[1]
1. CINVESTAV-IPN, Mexico City, Mexico
2. Université de Montréal, Montreal, PQ, Canada
3. Institut de Researches Cliniques de Montreal, Montreal, Canada

- GPR124 promotes cell adhesion and filopodia formation
- GPR124 interacts with conventional and atypical Guanine Exchange Factors for Cdc42 and Rac GTPases
- GPR124 localizes with ITSN and Elmo/Dock complex during cell adhesion in endothelial cells

M112

Chloride Intracellular Channels function in Sphingosine-1-phosphate signaling cascade to regulate endothelial cell behavior and angiogenesis

Mao, De Yu[1]; Jilishitz, Irina[1]; Hla, Timothy[2]; Kitajewski, Jan K.[3]
1. Columbia University Medical Center, New York, NY, USA
2. Harvard Medical School, Boston, MA, USA
3. University of Illinois Chicago, College of Medicine, Chicago, IL, USA

- CLIC4 and CLIC1 function in S1P signaling regulating endothelial cell behavior
- Chimeric protein with CLIC4 N-terminus and CLIC1 C-terminus behaves similarly as wild-type CLIC1
- C-terminus of CLIC proteins is responsible for its function in endothelial S1P signaling

M113

ß-arrestin 1/2 interacts with Akt, eNOS and caveolin-1 and is required for acute shear stress-induced nitric oxide production in human vascular endothelial cells

Fonseca-Alaniz, Miriam Helena; Carneiro, Ana Paula; Miyakawa, Ayumi Aurea; Dallan, Luís Alberto; Krieger, José Eduardo
Heart Institute (InCor), University of Sao Paulo Medical School, São Paulo, Brazil

- Beta-arrestin
- Mechanotransduction of Shear Stress
- Endothelial Cells

M114

Cyclic stretch disrupt actin filament fibers without induction of endothelial to mesenchymal transition in human saphenous vein endothelial cells

Girão-Silva, Thais[1]; Miyakawa, Ayumi A.[1]; Harmsen, Martin[2]; Krieger, Jose E[1]
1. Heart Institute of University of Sao Paulo, Sao Paulo, Brazil
2. University Medical Centre Groningen, Groningen, Netherlands

- Cyclic strain do not induce endothelial-to-mesenchymal transition in venous endothelial cell
- 15% stretch disrupts actin fibers in saphenous vein endothelial cells
- Pathological stretch (15%) induce an inflammatory profile in saphenous vein endothelial cells

M115

Role of the transcriptional co-regulator Receptor Interacting Protein 140 (RIP140) in the regulation of inflammation in endothelial cells

Calay, Damien[1]; Nadkarni, Suchita[2]; Dufton, Neil[1]; Parker, Malcolm[1]; Haskard, Dorian[1]; Mason, Justin[1]
1. Imperial College London, London, United Kingdom
2. Barts and the London School of Medicine, London, United Kingdom

- The co-regulator RIP140 regulates LPS signalling in human endothelium
- RIP140 is required for LPS-mediated inflammation and leukocyte adhesion
- Depletion of RIP140 protects against LPS-induced apoptosis

M116

Endothelium-protective effects of KLF-2-induced micro RNAs: implications for treatment of pulmonary hypertension

Sindi, Hebah; Mato Prado, Mireia; Wojciak-Stothard, Beata
Imperial College London, London, United Kingdom

- Endothelial dysfunction is a key feature of pulmonary hypertension
- KLF2-induced exosome-mediated miR transfer prevents pulmonary endothelial damage
- Therapeutic supplementation of KLF-2-induced miRs may help alleviate endothelial dysfunction in PAH

M117

From protein kinase C epsilon to vascular endothelial homeostasis: a signalling map to cytoprotection

Wilson, Garrick; Calay, Damien; Mason, Justin
Imperial College London, London, GBR

- PKCe fine-tunes NF-κB(Rel A, Rel B and C-Rel) signalling to promote anti-inflammatory pathways
- PKCe controls gene expression via targeted recruitment of transcriptional and enhancer proteins
- PKCe protects against the negative effects of pro-inflammatory cytokines

M118

Murine circulating endothelial colony forming cells are derived from resident endothelial cells and an participate in vessel formation in vivo

Lin, Yang[1]; Prasain, Nutan[1]; Yoshimoto, Momoko[1]; Tarnawsky, Stefan[1]; Ferkowicz, Michael[1]; Shelly, William[1]; Kim, Hyojin[1]; Kalinichenko, Vladimir[2]; Zheng, Yi[2]; Yoder, Mervin[1]
1. Indiana University School of Medicine, Indianapolis, IN, USA
2. Cincinnati Children's Hospital Medical Center, Cincinnati, OH, USA

- Murine neonatal/juvenile peripheral blood contains endothelial colony forming cells (ECFC)
- Murine ECFC are derived from vascular endothelium, not hematopoietic cells
- Both murine peripheral blood and human cord blood ECFC can form in vivo vessels without prior in vitro culture

M119

Neutrophil-Endothelial cell interactions guide the regulation of neutrophil activities by platelets

Gros, Angèle ; Ollivier, Véronique ; Guimier, Fanny ; Jandrot-Perrus, Martine; Ho-Tin-Noe, Benoit
Inserm 1148, Paris, France

- Platelets inhibit the cytotoxic activities of unstimulated and stimulated neutrophils in suspension
- Platelets activate neutrophils engaged and primed by interaction with endothelial cells (EC)
- Neutrophil-EC interactions determine the regulation of neutrophil activities by platelets

M120

Dabigatran, a direct thrombin inhibitor, prevents the development of endothelial dysfunction in diabetic mice

Salim, Hotimah Masdan; Fukuda, Daiju; Yagi, Shusuke; Soeki, Takeshi; Shimabukuro, Michio; Sata, Masataka
Institute of Biomedical Sciences Tokushima University Graduate School, Tokushima-shi, Japan

M121

The effect of 1-methylnicotinamide (MNA) on the intracellular transport of arachidonic acid (AA) under flow and static conditions

Sternak, Magdalena[1]; Kosowska, Marta[2]; Zakrzewska, Agnieszka[2]; Kij, Agnieszka[2]; Walczak, Maria[2,3]; Chlopicki, Stefan[2,3]
1. Jagiellonian University, Krakow, Poland
2. Jagiellonian Centre for Experimental Therapeutics (JCET), Krakow, Poland
3. Jagiellonian University, Medical College, Krakow, Poland

- MNA facilitates intracellular transport of AA in static and flow conditions
- AA stimulation with or without MNA resulted in lipid droplets formation
- AA stimulation with or without MNA resulted in modulated endothelial function

M122

A functional role for the RNA binding protein ADAR2 in ischemic tissue recovery in mice

Gatsiou, Aikaterini[1]; Lunella, Federica Francesca[1]; Sachse, Marco[1]; Amrhein, Carolin[1]; Garcia Gonzalez, Claudia[2]; Günther, Stefan[2]; Schneider, Andre[2]; Söhnlein, Oliver[3]; Braun, Thomas[2]; Zeiher, Andreas[1]; Dimmeler, Stefanie[1]; Stellos, Konstantinos[1]

1. JW Goethe University Frankfurt, Frankfurt, Germany

2. Max-Planck Institute, Bad Nauheim, Bad Nauheim, Germany

3. LMU Munich, Munich, Germany

- Endothelial cells
- Inflammation
- RNA-binding proteins and miRNAs

M123

Jagged1 is required for endothelial cell growth and maintenance

Hankeova, Simona[1]; Lendahl, Urban[1]; Bryja, Vitezslav[2]; Andersson, Emma[1]

1. Karolinska Institutet, Stockholm, Sweden

2. Masaryk University, Brno, Sweden

- Impact of vascular defects identified in a new and faithful mouse model of Alagille syndrome
- Jagged1 regulates development and maintenance of blood vessels
- Single cell RNA sequencing of endothelial cells identifies Jagged1-regulated mechanisms

M124

Inactivation of ROCK by Afadin through ArhGAP29 facilitates VEGF-induced network formation and migration of cultured vascular endothelial cells

Rikitake, Yoshiyuki[1]; Tagashira, Toru[2]; Hirata, Ken-ichi[2]

1. Kobe Pharmaceutical University, Kobe, Japan

2. Kobe University Graduate School of Medicine, Kobe, Japan

- signaling
- Rho-associated kinase
- vascular endothelial growth factor

M125

Endothelial-to-Mesenchymal transition-induced vasculature after radiation therapy

Choi, Seo-Hyun[1]; Nam, Jae-Kyung[2]; Kim, A-Ram[3]; Lee, Yoon Jin[2]

1. Memorial Sloan Kettering Cancer Center, NY, USA

2. Korea Institute of Radiological & Medical Sciences, Seoul, Korea

3. Division of Basic Radiation Bioscience, Seoul, Korea

- Radiation-induced endothelial-to-mesenchymal transition
- CD44v6+ cancer stem cells
- Pericytes recruitment

M126

Neutralizing L1CAM antibody regulates the cardiac vascular damage after radiation therapy

Lee, Yoon Jin[1]; Kim, A-Ram[1]; Choi, Seo-Hyun[2]; Nam, Jae-Kyung[1]; Hong, Hyo Jeong[3]

1. Korean Institute of Radiological & Medical Sciences, Seoul, Korea

2. Memorial Sloan Kettering Cancer Center, New York, NY, USA

3. Kangwon National University, Chuncheon, Korea

- Radiation-induced cardiovascular damage is one of the side effects of thoracic radiotherapy
- L1CAM expression was increased in vascular endothelial cells of irradiated mouse heart
- Endothelial L1CAM may be an efficient therapeutic target to prevent radiation-induced cardiovascular injury

M127

Metabolic regulation of endothelial hyaluronan biosynthesis

van den Berg, Bernard[1]; Wang, Gangqi[1]; Sol, Wendy[1]; Cantelmo, Anna Rita[2]; van Zonneveld, Anton Jan[1]; Carmeliet, Peter[3]; Aird, William C.[4]; Rabelink, Ton J.[1]

1. Leiden University Medical Center, Leiden, Netherlands

2. University of Leuven, Leuven, Belgium

3. University of Leuven/Flanders Interuniv Inst for Biotechnology, Leuven, Belgium

4. Beth Israel Deaconess Med Center, Boston, MA, USA

- Quiescent endothelium
- Hyaluronan biosynthesis
- Glucose metabolism and substrate availability

M128

Endothelial Gq/G11 mediate inflammatory signaling induced by disturbed flow

Albarran Juarez, Julian[1]; Althoff, Till[2]; Wettschureck, Nina[1]; Offermanns, Stefan[1]
1. Max-Planck-Institute for Heart and Lung Research, Bad Nauheim, Germany
2. Charité, Berlin, Germany

- Endothelial Gq/G11 are not only essential for sensing laminar flow but also disturbed flow
- Loss of endothelial Gaq/Ga11 reduces the expression of pro-inflammatory mediators upon disturbed flow in vitro
- Loss of endothelial Gaq/Ga11 protects against atherosclerosis formation in vivo

M129

A novel vascular-associated cell population

Venero-Galanternik, Marina[1]; Castranova, Daniel A.[1]; Swift, Mathew[2]; Weinstein, Brant M.[1]
1. NICHD, NIH, Bethesda, MD, USA
2. Georgetown University, Washington, DC, USA

- We have discovered a novel cell population exclusively associated with blood vessels
- These cells are similar to previously reported perivascular macrophages, but have a lymphovenous origin
- These cells may play an important supporting role in the vasculature

M130

Disturbed flow, endothelial glycocalyx, and pro-atherosclerotic oxLDL uptake

Harding, Ian; Mensah, Solomon; Ahn, Irina; Ebong, Eno
Northeastern University, Boston, MA, USA

- Endothelial Glycocalyx
- Disturbed Flow
- low density lipoprotein

M131

Glycocalyx and its impact of communication in endothelium

Mensah, Solomon[1]; Homayoni, Homa[1]; Cheng, Ming[1]; Plouffe, Brian[2]; Ebong, Eno[1]
1. Northeastern University, Boston, MA, USA
2. Regis College, Weston, MA, USA

- Endothelial Cell Function
- Glycocalyx
- Gap Junctions

M132

Glycocalyx and endothelial cell LDL versus oxLDL uptake in vitro and in high fat fed mice

O.Neil, Gerard L.[1]; Ahn, Irina[1]; Cheng, Ming J.[1]; Hua, Ning[2]; Harding, Ian C.[1]; Hamilton, James A.[2]; Ebong, Eno E.[1]
1. Northeastern University, Boston, MA, USA
2. Boston University, Boston, MA, USA

- Endothelial Cells
- Glycocalyx
- Low density lipoprotein uptake

M133

Venous endothelial marker COUP-TFII regulates the distinct pathologic potentials of adult arteries and veins

Dai, Guohao
Rensselaer Polytechnic Institute, Troy, NY, USA

- Venous marker COUP-TFII regulates the inflammatory potential of adult arteries and veins
- COUP-TFII plays a critical role in EndoMT and osteogenic differentiation of endothelial cells
- Adult arteries and veins in vivo have distinct expression of vascular calcification related gene pathways

M134

Mitonchondrial antioxidant MnSOD inhibits eNOS, reduces vasorelaxation and EC proliferation

Colantuono, Bonnie[1]; Rodrigues, Fernanda[2]; McCormack, Isabella[2]; Nur, Nasifa[1]; Zeeshan, Khawaja[1]; Harrington, Elizabeth O.[3]; Sellke, Frank W.[1]; Abid, M. Ruhul[1]
1. Rhode Island Hospital, Providence, RI, USA
2. Brown University Alpert Medical School, Providence, RI, USA
3. Providence VA Medical Center, Providence, RI, USA

- Role of subcellular oxidants in the metabolism of Endothelial Cell (EC) as it relates to EC phenotype
- Spatial and Temporal effects of subcellular oxidants on EC function
- Animals models with regulatable oxidant-levels specifically in vascular endothelium

M135

Endothelial cell receptor Tie1 protein in blood correlates with improved survival in murine model of indirect ARDS

Lomas-Neira, Joanne[1]; Zhu, Jiali[2]; Chung, Chun-Shiang[1]; Cai, Kaylee[3]
1. Rhode Island Hospital/Brown University, Providence, RI, USA
2. Rhode Island Hospital/Second Military Medical University, Providence, RI, USA
3. Rhode Island Hospital/University of Miami, Providence, RI, USA

- Interaction of receptors, Tie1 & Tie2 impacts Ang-1 & 2 regulation of endothelial cell activation
- Expression of Tie1 and Tie1/Tie2 interactions increase in murine hemorrhage/sepsis model of ARDS
- Tie1 protein detected in plasma increases in mice that survive hemorrhage/sepsis induced ARDS

M136

Long-term activation of cyclic AMP pathway in endothelial cells leads to R-Ras transcriptional repression and endothelial barrier disruption

Perrot, Carole; Komatsu, Masanobu
Sanford Burnham Prebys Medical Discovery Institute, Orlando, FL, USA

- Cyclic AMP pathway controls the expression of small GTPase R-Ras in endothelial cells
- Prolonged activation of cyclic AMP pathway increased vascular permeability and VE-cadherin destabilization
- Dual and antagonistic role of cyclic AMP in endothelial barrier stability

Development

M137

Coronary artery anomaly and ischemic heart disease in young mice lacking POFUT1

Wang, Yidong[1]; Wu, Bingruo[1]; Lu, Pengfei[1]; Zhang, Donghong[1]; Xiao, Feng[1]; Varshney, Shweta[1]; Zhuang, Zhen W.[2]; Sibinga, Nicholas E.S.[1]; Frangogiannis, Nikolaos G.[1]; Kitsis, Richard[1]; Sharp, David[1]; Stanley, Pamela[1]; Zhou, Bin[1]
1. Albert Einstein College of Medicine, Bronx, NY, USA
2. Yale University School of Medicine, New Haven, CT, USA

- Loss of POFUT1 causes coronary artery anomaly and ischemic heart disease in young mice
- POFUT1 regulates formation of tip cells by endocardium and their proliferation
- POFUT1 controls DLL4-VEGFR2 signaling for coronary vasculogenesis and arteriogenesis

M138

A novel reporter line for monitoring Dll4 expression in the embryonic mouse

Wythe, Joshua; Rhyner, Alexander M.
Baylor College of Medicine, Houston, TX, USA

- We have created a novel Dll4 reporter line
- We document, in vivo, Dll4 expression and Notch activity in the embryonic and postnatal mouse
- This novel tool is free from feedback effects present in Dll4-lacZ knock-in mice

M139

Junction based lamellipodia drive endothelial cell rearrangements via a VE-cadherin/F-actin based ratchet mechanism in vivo

Paatero, Ilkka[1]; Sauteur, Loic[1]; Lee, Mink-Young[1]; Heutschi, Daniel[1]; Bieli, Dimitri[1]; Lagendijk, Anne[2]; Hogan, Benjamin M.[3]; Affolter, Markus[1]; Belting, Heinz-Georg[1]
1. Biozentrum/Universität Basel, Basel, Switzerland
1. University of Queensland, St Lucia, QLD, Australia
3. Institute for Molecular Bioscience, Brisbane, QLD, Australia

- ECs form oscillating junction-based lamellipodia, which drive cell rearrangements
- High-resolution imaging reveals dynamic and differential subcellular localization of junctional proteins
- JBL consist of a ratchet mechanism based on VE-cadherin/F-actin interaction

M140

Neurovascular remodelling in the developing central nervous system is controlled by microglia through CD95/CD95L signalling

Chen, Si [1]; Hermann, Robert[1]; Yerbes, Rosario[2]; Hudalla, Hannes[3]; Zuliani, Cecilia[4]; Ruiz de Almodovar, Carmen[2]; Martin-Villalba, Ana[1]
1. German Cancer Research Center, Heidelberg, Germany
2. Heidelberg University Biochemistry Center, Heidelberg, Germany
3. Harvard Medical School, Boston, MA, USA
4. EMBL, Heidelberg, Germany

- Neurovascular development is orchestrated by CD95 in the developing central nervous system
- CD95 signals through Src and PI3K to mediate neuronal branching and vascular growth
- Microglia participate in remodelling of neurons and vessels by secreting CD95L

M141

Endothelial cell specific-and organ specific-early growth response-3 promoter activation revealed diverse patterns in developmental and postnatal vascular remodeling stages

Muramatsu, Masashi[1]; Makihara, Chihiro[1]; Suehiro, Jun-ichi[2]; Spokes, Kate[3]; Aird, William C.[4]; Minami, Takashi[1]
1. Kumamoto University, Kumamoto, Japan
2. The University of Tokyo, Tokyo, Japan
3. Beth Israel Deaconess Medical Center/ Harvard Medical School, Boston, MA, USA
4. Beth Israel Deaconess Med Center, Boston, MA, USA

- A 2.5 kbp of Egr-3 promoter specifically expresses in the endothelium in vitro and in vivo
- Additional vascular remodeling (activation) phase controlled by Egr-3 might be exist around E16
- Tissue factor would contribute to the vascular-bed specific regulations in developmental stage

M142

Molecular mechanism underlying front-rear polarization and directional migration of endothelial tip cells during sprouting angiogenesis

Fukuhara, Shigetomo[1]; Wakayama, Yuki[2]; Mochizuki, Naoki[2]
1. Nippon Medical School, Kanagawa, Japan
2. Natl. Cerebr. and Cardiovasc. Ctr. Res. Inst., Osaka, Japan

- In angiogenesis, Tip cells established polarity by contact with stalk cells to promote directional migration
- VEGFR2 was recruited by KIF13B to the leading edge of migrating endothelial cells
- Directional tip cell migration is promoted by localization and activation of Vegfr2 at the leading edge

M143

Early embryonic hemodynamic load alters endothelial-mesenchymal cell transition in outflow tract cushions

Midgett, Madeline; Rugonyi, Sandra
Oregon Health & Science University, Portland, OR, USA

- Blood flow in early embryonic stages creates hemodynamic forces that modulate cardiac morphogenesis
- Abnormal hemodynamics lead to cardiac defects, but mechanisms remain unclear
- Our study suggests that increased hemodynamic load alters endothelial-mesenchymal cell transition

M144

Maturation of the zebrafish facial lymphatic involves the sequential addition of lymphangioblasts

Eng, Tiffany[1]; Misa, Pauline[1]; Okuda, Kazuhide[2]; Crosier, Kathryn[1]; Crosier, Phil[1]; Astin, Jonathan[1]
1. University of Auckland, Auckland, New Zealand
2. Cancer Research Malaysia, Selangor, Malaysia

- Three sources of lymphangioblasts contribute to facial lymphatic development in the zebrafish head
- The PHS contains distinct lymphangioblast domains that are initially derived from a string of Prox1+ cells
- Vessel migration occurs via a ‘relay-like’ mechanism that mediates the formation of a mature lymphatic vessel

M145

Asymmetric division coordinates collective cell migration in angiogenesis

Costa, Guilherme[1]; Harrington, Kyle I.[2]; Lovegrove, Holly E.[1]; Page, Donna J.[1]; Chakravartula, Shilpa[2]; Bentley, Katie[2]; Herbert, Shane[1]
1. University of Manchester, Manchester, United Kingdom
2. Harvard Medical School, Boston, MA, USA

- Endothelial tip cell divisions are intrinsically asymmetric and generate daughters of distinct size
- Asymmetric division differentially partitions VEGFR2 generating daughters with distinct tip and stalk identity
- Asymmetric division integrates cell proliferation with seamless re-establishment of the tip-stalk hierarchy

M146

Morphological development of the feline placenta and its association with dynamics of VEGF family gene expression during gestation

Gudenschwager, Erwin K.; Huckle, William R.
Virginia Tech, Blacksburg, VA, USA

- Development of normal placental vasculature involves concerted action of modulators of angiogenesis
- Expression of VEGF-A peaked at the onset of expansion of feline placental trabecular vascularization
- The PlGF:VEGF ratio rose in the third trimester, suggesting modulation of VEGF bioavailability

M147

Shear-induced Notch-Cx37-p27 axis arrests endothelial cell cycle to enable arterial specification

Fang, Jennifer S.[1]; Coon, Brian G.[1]; Gillis, Noelle[2]; Qiu, Jingyao[3]; Chen, Zehua[4]; Chittenden, Tom[4]; Burt, Janis M.[5]; Schwartz, Martin A.[1]; Hirschi, Karen K.[1]

1. Yale University School of Medicine, New Haven, CT, USA
2. Yale Cardiovascular Research Center, New Haven, CT, USA
3. Yale University, New Haven, CT, USA
4. NextCode, Cambridge, MA, USA

- Shear stress suppresses endothelial cell proliferation via Notch signaling
- Notch regulates endothelial cell cycle status and artery formation via upregulation of Cx37 and p27
- Notch-Cx37-p27 signaling enables arterial specification by arresting endothelial cells in G1

M148

Mutagenesis of microRNA genes uncovers trait variance as a unique vascular phenotype that confers stress sensitization

Kasper, Dionna[1]; Ristori, Emma[1]; Moro, Albertomaria[1]; Narayanan, Anand[1]; Guillermina Hill-Teran, Guillermina[1]; Fleming, Elizabeth[1]; Moreno-Matos, Miguel[1]; Vejnar, Charles[1]; Zhang, Jing[2]; Gu, Mengting[2]; Gerstein, Mark[2]; Giraldez, Antonio[1]; Nicoli, Stefania[1]

1. Yale University School of Medicine, New Haven, CT, USA
2. Yale University, New Haven, CT, USA

- Mechanisms that limit cell variability are vital for tissue homeostasis, but are still not well defined
- We discover that distinct miRNAs limit cell variance in vascular tissue during zebrafish development
- miRNA mutants with aberrant endothelial cell variability were sensitized to diverse sources of stress

M149

Effect of therapeutic cell sheet on a novel magnet-implanted refractory cutaneous ulcer murine model

Takeuchi, Yuriko; Ueno, Koji; Mizoguchi, Takahiro; Nishimoto, Arata; Hosoyama, Tohru; Hamano, Kimikazu
Yamaguchi University Graduate School of Medicine, Ube, Japan

- Magnet-implanted model had good inflammatory properties and impairing TGF-ß signaling
- Magnet-implanted model may be a clinically relevant model of human ulcer
- Cell sheets comprising peripheral blood mononuclear cells was effective for magnet-implanted model

M150

The pro-angiogenic properties of isolated mouse embryonic macrophages

Yosef, Nejla[1]; Vadakkan, Tegy J.[1]; Park, June Hee[2]; Thomas, Jean-Leon[2]; Dickinson, Mary E.[1]

1. Baylor College of Medicine, Houston, TX, USA
2. Yale School of Medicine, New Haven, CT, USA

- mouse embryonic macrophages
- Flow cytometry, immunocytochemistry, qPCR, western blotting
- Angiogenesis

Lymphatics

M151

A novel population of podoplanin-expressing cells is associated with lymphatic hyperplasia and fibrogenic responses in the acutely and chronically infarcted myocardium

Cimini, Maria; Cannata, Antonio; MacRae, Calum A.; Rota, Marcello; Goichberg, Polina
Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA

- Myocardial infarction causes a robust accumulation of podoplanin-expressing cells in the ischemic region
- Podoplanin labeling in the scar detects endothelial as well as interstitial cells of heterogeneous phenotypes
- Podoplanin-presenting cells in the heart might exhibit plasticity in lymphendothelial or profibrotic potential

M152

Optimization and repeatability of lymphatic pumping pressure measurement in mice tail model

Cribb, Matthew; Dixon, J. Brandon
Georgia Institute of Technology, Atlanta, GA, USA

- Current method of lymphatic pumping pressure measurement takes too much time
- New methods were tested in mice with NIR imaging and automatic control of pressure cuff
- A 12 minute pressure measurement method is not significantly different from longer methods

M153

Remodeling leads to lymphatic pump failure in an animal model of lymphedema

Dixon, J. Brandon; Weiler, Michael; Nepiyushchikh, Zhanna; Razavi, Mohammad; Caulk, Alex; Nelson, Tyler; Gleason, Rudolph L.
Georgia Institute of Technology, Atlanta, GA, USA

- Lymphatic function and animal models of lymphatic disease
- Computational growth and remodeling
- Near infrared in vivo imaging

M154

Imaging of spatial and temporal lymphatic growth with single-cell resolution by tissue decolorization

Styevkóné Dinnyés, Andrea; Jakus, Zoltan
Hungarian Academy of Sciences and Semmelweis University, Budapest, Hungary

- The tissue decolorization approach appeared to be efficient to make the organs completely transparent
- The whole body tissue decolorization allows us to visualize the lymphatics with single cell resolution
- The approach provides new perspectives for the studies on spatial and temporal lymphatic growth

M155

Indispensable role of Prox1 in maintaining lymphatic integrity in intestine and lymph node

Kim, Yoo Hyung[1]; Cho, Hyunsoo[1]; Suh, Sang Heon[2]; Park, Dae-Young[2]; Kubota, Yoshiaki[3]; Oliver, Guillermo[4]; Koh, Gou Young[1]
1. KAIST, Daejeon, Korea
2. Center for Vascular Research, Daejeon, Korea
3. Keio University, Tokyo, Japan
4. Northwestern University, Chicago, IL, USA

- Lacteal Prox1 plays critical roles in keeping homeostasis of the intestine and mesentery
- The entire micro-environment of villi was also dramatically affected in Prox1-ablated mice
- Prox1 plays a key role in the prevention of LEC reprogramming and thereby keeps a critical function

M156

Expansion of adipose tissue lymphatic vasculature through local, inducible overexpression of VEGF-D

Rutkowski, Joseph M.
Texas A&M College of Medicine, College Station, TX, USA

- Local inducible VEGF-D expression drives adipose lymphangiogenesis
- Stopping VEGF-D expression causes regression of new lymphatic structures
- Increased functional lymphatic vessel density improves adipose tissue health in obesity

M157

Hypoxia inducible factor (HIF) promotes metabolic remodeling and proliferation in lymphatic endothelial cells isolated from an ovine model of congenital heart disease (CHD) with increased pulmonary blood flow

Datar, Sanjeev A.[1]; Maltepe, Emin[1]; Boehme, Jason[1]; Kameny, Rebecca J.[1]; Raff, Gary W.[2]; Fineman, Jeffrey R.[1]
1. UCSF, San Francisco, CA, USA
2. UC Davis, Sacramento, CA, USA

- Pulmonary lymphatic development is disrupted in a model of CHD with increased pulmonary blood flow
- Associated with altered lymphatic endothelial cell metabolism and increased proliferation in vitro
- These lymphatic endothelial cells have enhanced expression of HIF and its target genes

M158

Post-Effect of surgical intervention on isolated sheep popliteal lymphatic vessels contractility (Sheep lymphedema model)

Nepiyushchikh, Zhanna [1]; Nelson, Tyler [1]; Hooks, Joshua [1]; Razavi, Mohammad [1]; Peroni, John F.[2] Dixon, J. Brandon[1]
1. Georgia Institute of Technology, Atlanta, GA, USA
2. University of Georgia, Athens, GA, USA

- Sheep lymphedema model
- Impaired response of lymphatic vessels from post-surgical site to transmural pressure and flow
- Impaired response of lymphatic vessels from post-surgical to nitric oxide inhibition

M159

Identification of integrin-linked kinase as a gatekeeper for VEGFR3 signaling and lymphatic vascular growth

Urner, Sofia[1]; Planas-Paz, Lara[1]; Kelly-Goss, Molly[2]; Falke, Marcel[1]; Hilger, Laura Sophie[1]; Stanczuk, Lukas[3]; Peirce-Cottler, Shayn[2]; Mäkinen, Taija[3]; Lammert, Eckhard[1]

1. Heinrich Heine University, Dusseldorf, Germany

2. University of Virginia, Charlottesville, VA, USA

3. Uppsala University, Uppsala, Sweden

- VEGFR3 is important in blood and lymphatic vascular development, and in adult lymphangiogenesis
- We show that Integrin-linked kinase (ILK) inhibits VEGFR3 signaling, and lymphatic vascular growth
- ILK inhibits VEGFR3 and ß1 integrin interaction, thereby attenuating VEGFR3 signaling

M160

Angiopoietin/Tie2 signaling contributes to the development and maintenance of lymphatic phenotype of Schlemm's canal mediated by Prox1

Jang, Seung Pil [1]; Kim, Jaeryung[1]; Park, Dae-Young[1]; Han, Sangyeul[1]; Kubota, Yoshiaki[2]; Hong, Young-Kwon[3]; Oliver, Guillermo[4]; Koh, Gou Young[1]

1. KAIST(IBS), Daejeon, Korea

2. Keio University, Tokyo, Japan

3. University of Southern California, Los Angeles, CA, USA

4. Northwestern University, Chicago, IL, USA

- Development and maintenance of lymphatic phenotype of Schlemm's canal
- Angiopoietin/Tie2 signaling in the development and maintenance of Schlemm's canal
- Molecular mechanism of dysfuncton of Schlemm's canal, which is underlying etiology of glaucoma

M161

Cross-regulation of the lympahtic and immune system in inflammation

Cromer, Walter E.

Texas A&M University Health Science Center, Temple, TX, USA

- Lymphatic Biology
- Inflammation
- Immunity

M162

The extracellular matrix association of VEGF-C and CCBE1 regulates the lymphangiogenic activity of VEGF-C

Jha, Sawan Kumar Kumar[1]; Kärpänen, Terhi[2]; Alitalo, Kari[3]; Jeltsch, Michael[1]

1. University of Helsinki, Helsinki, Finland

2. University of Oslo, Oslo, Norway

3. Biomedicum Helsinki/Univ Helsinki, Helsinki, Finland

- Extracellular matrix regulates VEGF-C activity through C-terminal pro-peptide
- CCBE1 affects the redistribution of VEGF-C
- CCBE1 can interact with other VEGF-C activating proteases