



Editorial

Pioneering updates in vascular biology



Although more than a year has passed since that memorable time in the beautiful Swiss city of Geneva, EVBO aims to capture some selected topics which were discussed during the meeting, in the form of review papers, in this special issue of Vascular Pharmacology. We present a selection of papers prepared on the basis of presentations delivered during the joint meeting of the European Vascular Biology Organisation and the European Society for Microcirculation, held in Geneva, Switzerland from 29th May to 1st June 2017. This was the second joint conference of both societies, and corresponded to the 29th ESM and 9th EVBO meeting. The featured papers encompass a wide range of topics including angiogenesis, vascular imaging, atherosclerosis and miRNA regulation, topics of great relevance and interest to our vascular biology community.

While this issue is not intended to be comprehensive of the entire discipline, some important new trends in vascular research are concisely reviewed by leaders in the field. The first group of reviews addresses fundamental mechanisms of angiogenesis and key methods for their investigation. Hlushchuk et al. comprehensively review imaging of microvascular processes by micro-angiCT, – a major technological advance in imaging of blood vessels that allows non-destructive visualization of the vascular networks of whole organs down to the capillary level, enabling also automated quantifications of morphological parameters. Kotini et al. from the group of Markus Affolter explore the cellular mechanisms of branching morphogenesis and draw illuminating comparisons between the sprouting/anastomosis processes in the formation of the fruit fly tracheal system and the vertebrate vasculature. In fact, the establishment of these complex tubular networks share some fundamental mechanisms, but also exhibit distinctive differences that result in specific architectures. Oberkersch and Santoro address the very topical subject of the metabolic regulation of angiogenesis and specifically the role of amino acid metabolism in endothelial pathophysiology. Another topic recently receiving great interest is the regulation of cardiovascular development and disease by non-coding RNAs. This has been elegantly presented by Vacante et al in the Baker team, addressing the functions of both long non-coding and small RNAs in the MiR143HG locus in smooth muscle cell differentiation and cardiac specification during heart development, which could have significant impact in further understanding of many heart developmental deformities. The lymphatic system is comparatively less investigated than blood vascular networks, but it provides fundamental functions for tissue homeostasis and immune surveillance. A brief update on the mechanisms and regulation of immune cell traffic through lymphatic vessels is elegantly portrayed by Schineis, Runge and Halin, further describing how tumour cells hijack the same mechanisms to disseminate lymph-node metastasis.

Western societies experience a continuous increase in life

expectancy, but cardiovascular risk-factors associated with unhealthy lifestyles remain widespread. Therefore, the cardiovascular consequences of aging and metabolic diseases are bound to constantly increase their prevalence, with an associated need for better therapeutic options. The second group of reviews addresses these clinically relevant topics. Kloska, Kopacz et al. start by addressing the mechanisms of cell adaptations to aging and in particular the role of the Nrf2 transcription factor in the complex development of age-related atherosclerosis and vascular disease. New therapeutic targets are then presented to limit the atherosclerotic process and its cardiac sequelae, i.e. heart failure. Maguire, Pearce and Xiao discuss the cellular origin and molecular regulation of foam cells in atherosclerotic plaques, proposing strategies to inhibit their formation. On the other hand, Perrotta et al. focus on angiogenesis inside atherosclerotic lesions, which promotes plaque instability and rupture, and on recent results exploring strategies to prevent this dangerous process. Tomczyk et al. switch perspective to the serious sequelae of coronary artery disease, i.e. heart failure. They analyze the deleterious consequences of the overactive immune response to myocardial necrosis after infarction and the role of the stress-induced enzyme heme oxygenase-1 in modulating this process and limiting cardiac damage. Lastly, Laakkonen, Yla Herttuala and colleagues provide a state-of-the-art perspective on the biology of the Vascular Endothelial Growth Factor family of angiogenic master regulators in the broader context of cardiac, vascular and placenta biology.

We thank the authors for all the considerable time, effort and expertise they committed to the preparation of their manuscripts. Our selection has undoubtedly omitted worthy topics, but we believe the papers presented in this issue should provide considerable insight into a range of subjects, which we hope you will find both informative and stimulating. We remind readers of the upcoming next joint meeting of EVBO and ESM (<http://esm-evbo2019.org/>), to be held in Maastricht, The Netherlands, from 29th May to 1st June in 2019. We look forward to seeing you all there to share our interest and enthusiasm for vascular biology research.

M. Yvonne Alexander^{a,*}, Benedetta Bussolati^b, Andrea Banfi^c

^a Centre for Bioscience, Cardiovascular Research Group, Manchester Metropolitan University, United Kingdom

^b Dept. of Molecular Biotechnology and Health Sciences, via Nizza 52 10126, Torino. Italy.

^c Department of Biomedicine, University Hospital, University of Basel, DBM 407, Hebelstrasse 20, 4031 Basel, Switzerland.

E-mail addresses: Y.Alexander@mmu.ac.uk (M.Y. Alexander), benedetta.bussolati@unito.it (B. Bussolati), Andrea.Banfi@usb.ch (A. Banfi).

* Corresponding author.