

## Foreword

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# Perspectives in Clinical Hemorheology and Microcirculation: Review of the Conference of the German Society for Clinical Microcirculation and Hemorheology 2010

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During the 29th conference of the German Society for Clinical Microcirculation and Hemorheology – held in the Freie Universität Berlin - a broad range of different topics of experimental and clinical studies in the field were presented. A special spotlight was dedicated to the Conference President's (Prof. Dr. J. Plendl, Head of the Department of Veterinary Anatomy) scientific area "Anatomical and Experimental Microcirculation" [5, 6, 9, 13]. Of special interest were the angiogenetic studies: Examinations of the influence of PDGF-BB on adipose-tissue derived stem cells and how these influence angiogenesis [9] and the angiogenesis and healing with non-shrinking, fast degradable PLGA/CaP scaffolds in critical-sized defects in the rabbit femur with or without osteogenically mesenchymal stem cells were evaluated [6]. The influence of angiopoetins on angiogenesis was also analyzed [5]. In an anatomical study, it was then shown how the specific vascular anatomy of pigs allows acute infrarenal aortic occlusion without hind limb ischemia and stepwise occlusion without clinical signs [13].

Thereafter, studies from the field of Clinical Hemorheology were presented. A study of Franke et al. showing for the first time the different impact of radiographic contrast media on the morphology of human arterial versus venous endothelial cells was presented [8]. In addition, talks on monocytes – the influence of the sorting process on cell function [17] and on monocyte adhesion to endothelium exposed to non-uniform shear stress [2] - were given. Also the shear stress required for tether formation of neonatal and

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adult erythrocytes was discussed [18]. Another interesting paper addressed an old question in the field of Clinical Hemorheology, that is, which rheological parameter influences the capillary perfusion [15]. A multivariate regression analysis showed that under resting conditions there was no correlation between rheological parameters and their erythrocyte velocity in capillaries. The blood flow regulation seemed to have such importance that pathological changes of the blood fluidity showed no effect on the velocity of capillary perfusion. During vessel paralysis in the early phase of the postischemic hyperemia following a stasis of three minutes in the vasculature, a very clear correlation between the plasma viscosity and the maximum postischemic erythrocyte velocity in cutaneous capillaries could be observed while none of the other rheological parameters seemed to play a role. A first clinical examination showed that a significant influence of the hyperbaric oxygen therapy on the tissue oxygen tension in free flaps [10].

The number of studies using Contrast Enhanced Ultrasound (CEUS) to detect microcirculatory disorders has been continuously growing throughout the last years [3, 4, 7, 11, 14, 16, 19]. During this year's conference, seven presentations about CEUS studies were presented. The technical progress in combination with the development of a new contrast agent (SonoVue™, Bracco, Italy [12]) allows nowadays the visualization of organ perfusion down to the microcirculation. Studies about flap failure, gland and renal microcirculation, carotid plaque vascularisation and the detection of stenosis in stents were presented.

Last but not least, the biological *in vitro* evaluation of novel degradable, stimuli-sensitive multiblock copolymers having polydepsipeptide- and poly( $\epsilon$ -caprolactone) segments was shown [1], promising candidates for soft substrates in use as multifunctional cell culture devices or *in vivo* implants.

Overall, the quality of the speakers and of the data presented continues to bear witness to the vitality of our field of research and our Society. We look forward to further improvements.

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