Institute of Medical Biology
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Seminar Announcement

- All Are Welcome -



Speaker: **Prof. Klaus T. Preissner**
Justus-Liebig-University, JLU, Giessen

Title : **"The Role of Perivascular Cells and Extracellular RNA in Arteriogenesis / Collateral Vessel Formation"**

Date : **08 February 2017 (Wednesday)**
Time : **1.00pm – 2.00pm**
Venue : **IMB Seminar Room, Neuros Level 6, Biopolis**
Host : **Prof Zee Upton**
(Tel: 6407 0153, email: zee.upton@imb.a-star.edu.sg)

Abstract of the Seminar:

Previous collaborative studies from our group have shown that extracellular RNA (eRNA, mainly ribosomal RNA) as well as extracellular DNA (as nucleosomal complex with histones, designated NETs: neutrophil extracellular traps) become released in the cardiovascular system under conditions of stress (such as hypoxia), tissue injury or during inflammation. Self-extracellular nucleic acids not only serve as new "Danger-associated molecular patterns" (DAMPs) in innate immunity, but provide several unexpected functional properties in the context of thrombosis and cardiovascular diseases. In particular, cell damage-derived eRNA can initiate an endogenous inflammatory cascade by promoting M1-polarisation of monocytes, thereby inducing the expression and release of various inflammatory cytokines. For example, the damaging axis between eRNA and TNF-α was characterized in the context of cardiac ischemia/reperfusion injury, whereby administration of RNase1 serves as potent anti-inflammatory and cardio-protective regimen. Upon stimulation by various inflammatory agonists, NETs become ejected from neutrophils and form a supramolecular scaffold to catch and kill microbes. Likewise, activated platelets induce NETosis and thereby promote procoagulant reactions relevant for venous and arterial thrombosis to occur. The underlying mechanisms also in context with "immunothrombosis" will be discussed. The administration of DNase as a new anti-thrombotic intervention appears to be a feasible and safe treatment. Thus, extracellular endonucleases provide great potential as new versatile drugs in cardiovascular diseases.

About the Speaker:

Klaus T. Preissner studied Chemistry/Biochemistry in Cologne (Germany) and there he received his PhD in 1978 for research on HDL-structure. He was a postdoctoral fellow at the Department of Immunology at the Scripps Clinic and Research Foundation, La Jolla, CA (1980-1983), working on regulatory mechanisms of complement attack. Thereafter, he became principal group leader at the "Clinical Research Unit for Blood Coagulation and Thrombosis" in Giessen (1983-1997), followed by the position as associate professor (habilitation) in 1987 (Justus-Liebig-University, JLU, Giessen). Since 1998 he is a Professor for Biochemistry and Pathobiochemistry at the Depart. Biochemistry, JLU-Medical School in Giessen. His previous research was devoted to cell adhesion, communication and proteolytic mechanisms in vascular and wound healing context, particularly involving vitronectin and its receptors. His current scientific activities are concerned with innate immunity mechanisms in cardiovascular diseases, particularly with respect to the role of self-extracellular nucleic acids and new therapeutic concepts using endonucleases as cardio-protective drugs. He served as editor-in-chief (2003-2010) for "Thrombosis and Haemostasis" and was chairman (2009-2014) of an international graduate program "PROMISE" (Protecting the heart against ischemia), between Barcelona (Spain) and Giessen. He is (co)author of more than 320 peer-reviewed publications, including cooperative projects with several international groups.