

Figures of the Heart Failure Association: Professor Dr. med. Johann Bauersachs, Chair of the Clinical Science Section



Johann Bauersachs is member of the Executive Board of the Heart Failure Association (HFA) of the European Society of Cardiology (ESC), Chair of the Clinical Science Section, and Chair of the HFA Study Group on Peripartum Cardiomyopathy (PPCM). Johann is HFA Board member since 2013 and has longstanding experience in helping

to drive important activities within the ESC, e.g. as member of the Congress Programme Committee, Chair of the ESC Working Group on Myocardial Function, current Editorial Board member of *ESC Heart Failure*, and longstanding member of the Editorial Board and current Associate Editor of *Cardiovascular Research*.

Johann's background

Johann is a full professor of Internal Medicine/Cardiology at Hannover Medical School (MHH) and Director of the Department of Cardiology and Angiology since 2010.

He studied Medicine at the University of Freiburg. After training as Clinical and Research Fellow at the Universities of Frankfurt and Heidelberg/Mannheim, in 1999 he moved to the University Hospital Wuerzburg where he became Consultant and Lecturer in Internal Medicine and Cardiology, and was Associate Professor in the Department of Medicine from 2008 to 2010.

Professor Bauersachs is Fellow of the American Heart Association, of the ESC, and of the HFA.

Johann has longstanding experience in serving for the German Research Council (Deutsche Forschungsgemeinschaft, DFG) both as reviewer, and as recipient of funding for his research by the DFG. He was Scientific Secretary of the DFG Special Research Programs SFB 355 ('Pathophysiology of heart failure') from 1999 to 2004, and SFB 688 ('Cell–cell interaction in the cardiovascular system') from 2006 to 2010, both at the University of Wuerzburg.

From 2013 to 2018 he was Member of the Steering Committee of the DFG-funded Cluster of Excellence REBIRTH ('From REgenerative Biology to Reconstructive THERAPIES') in Hannover (www.rebirth-hannover.de/).

Since 2012 Johann is member, and since 2016 he is Chair of the Cardiovascular Section of the Fachkollegium Medizin of the DFG, and since 2016 Speaker of the DFG-funded Clinical Research Group (KFO) 311 '(Pre-) terminal heart and lung failure - mechanical unloading and repair' at MHH (<https://www.kfo311.de/>).

From 2015 to 2018 Johann was member of the Management Committee and Working Group Coordinator of the EU FP7 funded COST Action ADMIRE 'Aldosterone and Mineralocorticoid REceptor: Pathophysiology, clinical implication and therapeutic innovations'.

Since 2017 Professor Bauersachs is Board member of Cardior Pharmaceuticals (www.cardior.de/), an academic spin-off from MHH.

Professor Bauersachs is an interventional cardiologist with special interests in acute coronary syndromes, left ventricular (LV) healing and remodelling, acute and chronic heart failure, as well as intensive care. He is particularly interested in the pathophysiology and treatment of PPCM, in aldosterone and mineralocorticoid receptor (MR)-mediated mechanisms, and in the role of non-coding RNAs.

He is Study Chair of the DIGIT-HF study investigating the effect of digitoxin on morbidity/mortality in patients with advanced heart failure (<http://digit-hf.de/>), and is extensively involved in many other clinical trials.

Professor Bauersachs received several prestigious awards, e.g. from the German Cardiac Society (Deutsche Gesellschaft für Kardiologie) the Oskar-Lapp-Award in 2001, the Albert-Fraenkel-Award in 2004, and the Paul-Morawitz-Award in 2016. In addition, he received the Parmley-Award of the American College of Cardiology in 2006, and the Bernard and Joan Marshall Distinguished Investigator Award of the British Society for Cardiovascular Research in 2012.

He has co-authored more than 400 publications, his h-index is 68.

Johann has acted as a Task Force member and reviewer for several ESC guidelines, including the ESC guidelines on cardiovascular disease during pregnancy, the ESC guidelines for the management non-ST-elevation acute coronary syndromes, and the ESC guidelines on the diagnosis and treatment of acute and chronic heart failure.

Our questions to Johann

Q1. Who had the biggest impact on your career in cardiology?

J: Clearly the two most influential persons for my career were the vascular physiologist Rudi Busse, and the cardiologist Georg Ertl, former Head of the Department of Internal Medicine/Cardiology and current Medical Director of the University Hospital Wuerzburg.

Rudi was an early mentor, whose Institute in Freiburg I joined as a young medical student almost 30 years ago to perform experimental studies for my medical thesis. He was interested in nitric oxide and cyclic GMP mediated vascular dilatation, and was a marvelous academic teacher and mentor. In fact, only with his continuous support and enthusiasm I started my academic career in cardiovascular medicine. Later I joined again his Department of Physiology at the University Hospital Frankfurt for a postdoc. However, despite the fact that Rudi wanted me to become a physiologist, I always wanted to go to clinical medicine, and was lucky to meet Georg Ertl at the Department of Internal Medicine/Cardiology at University Hospital Heidelberg/Mannheim; he was the most influential person for my clinical academic career. After a few years I moved with Georg to Wuerzburg, where he became Head of the large Department of Internal Medicine. There I worked with him for more than 10 years; we did amazing work on LV remodelling and heart failure after myocardial infarction both in animal models and patients. He always supported my scientific and clinical development, and I became also the scientific secretary of two large special research programmes in Wuerzburg. This experience was of outstanding importance for my further career.

Q2. What papers are you most proud of?

J: My first paper published in *Circulation* was the result of the hard work as a postdoc in Rudi Busse's lab in Frankfurt. We could show that in the absence of the dominating vasorelaxing factor nitric oxide, the release of another novel relaxing factor, the so-called endothelium-derived hyperpolarizing factor, increased, and compensated at least partially for the loss of nitric oxide.¹

In Wuerzburg, Thomas Thum joined my group in 2004, and we quite soon started to work on so-called microRNAs in the cardiovascular system. MicroRNAs are non-coding RNAs that had been discovered not long before, and only a few researchers investigated their role in the cardiovascular system. We established and patented microRNAs and downstream targets for diagnostic and therapeutic purposes in heart diseases (PCT/EP2007/008772; PCT/EP2009/051986).² We were the first to define the role of microRNAs in the human heart, and especially for foetal gene reprogramming in heart failure.³ We also for the first time showed the therapeutic potential of interference with microRNAs in myocardial fibrosis.⁴ The ongoing work of Thomas, now as head of his own Institute at MHH, lead to the foundation of Cardior Pharmaceuticals, the largest academic spin-off from MHH, with the focus on the development and clinical validation of noncoding RNA therapeutics for patients with myocardial infarction and heart failure.

The third area I am engaged for more than 20 years now are aldosterone- and MR-mediated mechanisms in cardiac remodelling and failure.⁵ After working with MR antagonists in animal models to elucidate MR-mediated effects on LV remodelling and vascularization capacity,^{6,7} we focused on the investigation of mice with cell-specific deletion of the MR in cardiomyocytes and myeloid cells: we were able to show that deletion of the MR in cardiomyocytes resulted in a marked improvement of LV remodelling after myocardial infarction, associated

with less hypertrophy and fibrosis as well as attenuated myocardial oxidative stress.⁸ This paper was the first to demonstrate that MR activation in the heart is an essential driver of cardiac remodelling and inferred that MR antagonism considerably affects the heart independently of renal actions. The seminal contributions of two postdocs in my lab, Drs Daniela Fraccarollo and Paolo Galuppo,^{9,10} to the studies on aldosterone/MR for more than 20 years also lead to a recent important publication¹¹: using cell specific deletion of the MR in macrophages, we could decipher its decisive role for the modulation of myocardial infarct healing.

Q3. What was the role of the ESC during your scientific and clinical career?

J: ESC was of utmost importance throughout my career, especially ESC meetings and congresses as well as ESC bodies like the Working Group on Heart Failure, later HFA, or the Working Group on Myocardial Function. I profited a lot, both from learning from high-rank researchers and clinicians as well as from networking. Almost 25 years ago I attended my first ESC meeting and was thrilled by the stimulating environment and discussions; just to name a few: the Lenzerheide, and Varenna meetings of the Working Group on Myocardial Function, the HFA Winter meeting on basic and translational research, the HFA Congress, and also the ESC main congress.

I have been honoured to serve on influential committees and task forces for the development of ESC congress and meeting programmes, guidelines, position papers, reviews and also the EORP Registry on PPCM.^{12–19}

Q4. What have you been working on recently?

J: My interests in cardiology are broad, with a major focus on acute and chronic heart failure. I am chairing the DIGIT-HF study together with Professor Udo Bavendiek,²⁰ a large randomized outcome study using the digitalis glycoside digitoxin in patients with advanced heart failure funded by the German Ministry of Research and Education (BMBF). This study will end the digitalis controversy.²¹

Acute heart failure and the use of mechanical circulatory support as part of a standardized treatment approach is a major research topic of Professor Andreas Schaefer and myself,^{22,23} in cooperation with several other Departments in the Clinical Research Group (KFO) 311 'Pre- terminal heart and lung failure - mechanical unloading and repair' funded by the DFG at MHH.

During the last years we also intensively investigated the pathophysiology and treatment of PPCM, based on seminal work of Professor Denise Hilfiker-Kleiner who is head of the Division of Molecular Cardiology in my Department.^{12–15,23–27}

I am very proud to work and have worked with some very bright and productive co-workers and collaborators.^{28–33} I am particularly proud of their recent research output, which demonstrates their excellence.



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