Christoph Maack, MD

Name: **Maack, Christoph**
Born: **09.08.1972**
marital status: **married, 2 children**

Scientific Career

1993-2000	Medical School, University of Cologne, Germany
2000	3rd (Final) Clinical Exam (Result: 1.0; Overall (1st-3rd): 1.99; range 1-6)
1996-2000	Doctoral Thesis (MD), Clinic III for Internal Medicine, University of Cologne: "Intrinsic activity and antioxidative effects of Ð-ad renoceptor antagonists in human myocardium" (Advisor: Prof. Dr. Michael Böhm) Grade: summa cum laude
06-10/2000	Clinical Fellow, Clinic III for Internal Medicine, University of Cologne, DE (Prof. E. Erdmann)
2000-2002	Clinical Fellow, Clinic for Internal Medicine III, University of the Saarland, Homburg, DE (Prof. Dr. Michael Böhm)
2002-2005	Post-Doctoral Research Fellow, Johns Hopkins University, Baltimore, USA; Dept. of Cardiology (Lab of Brian O'Rourke, PhD); supported by the Emmy Noether-Programme of the German Research Foundation (Deutsche Forschungsgemeinschaft; DFG)
2005-2011	Clinical Fellow, Clinic for Internal Medicine III, University of Saarland, Homburg, DE (Prof. M. Böhm)
2006-2011	Project leader of an independent Junior Research Group supported by the Emmy Noether-Programme of the DFG at the Clinic for Internal Medicine III, University of the Saarland, Homburg, DE
2007-2013	Project leader in the DFG Clinical Research consortium KFO-196
2008	Workshop Series "Science Management" (3-day events, respectively) (DFG and Zentrum für Wissenschaftsmanagement, Speyer, DE) • 07/2008: Human resource management • 08/2008: Project management, communication and presentation • 10/2008: Rhetorics and didacticts

since 01/11	Project leader in the DFG Collaborative Research Center SFB 894 (“Ca2+ signals: Molecular mechanisms and integrative functions”; Speaker: Jens Rettig, Homburg)
11/2011	Board Exam Internal Medicine
10/2015	Board Exam Cardiology
02/12-07/17	Senior physician (Oberarzt) at the Clinic for Internal Medicine III (Cardiology, Angiology and Intensive Care Medicine; Director: Prof. Dr. Michael Böhm)
11/12-07/17	Heisenberg Professor for Cardiovascular Physiology and Bioenergetics at the University of Saarland, Homburg, Germany
since 01/18	Project leader in the DFG Collaborative Research Center SFB 894 (“Ca2+ signals: Molecular mechanisms and integrative functions”; Speaker: Jens Rettig, Homburg)
04/2018	Board Exam Intensive Care Medicine

Current Positions

since 08/17	Chair of the Department for Translational Science, Comprehensive Heart Failure Center (CHFC), University Clinic Würzburg, Germany Senior physician at the Medical Clinic I for Internal Medicine, University Clinic Würzburg, Germany (Director: Prof. Stefan Frantz)
since 09/17	Spokesperson of the CHFC, University Clinic Würzburg, Germany

Honors and Awards

2000	Young Investigator Award of the European Society of Cardiology (Finalist)
2002	Emmy Noether Programm (DFG; Part I)
2005	Young Bioenergeticist Award (Biophysical Society)
2006	Emmy Noether Programm (DFG; Part II)
2007	Poster Price at the Winter Meeting of the Heart Failure Association (HFA) of the European Society of Cardiology (ESC; Runner-up)
2007	Franz-Maximilian-Groedel-Science Award of the German Cardiac Society (Deutsche Gesellschaft für Kardiologie; DGK)
2011	Heisenberg Professorship (DFG)

2013	Margret Elisabeth Strauß Research Project Award of the German Heart Foundation (Deutsche Herzstiftung)
2014	Albert-Fraenkel-Award (DGK)
2015	Arthur-Weber-Award (DGK)

Memberships and active involvement in organizations

since 1998	European Society of Cardiology (ESC) Working Group On Myocardial Function (of the ESC)
since 2001	Deutsche Gesellschaft für Kardiologie (DGK)
since 2003	Biophysical Society
since 2004	Heart Failure Association of the ESC
since 2006	Working Group on Myocardial Function and Energetics of the DGK (AG13)
since 2007	Working Group on Cellular Electrophysiology of the DGK (AG18)
since 2007	American Heart Association (AHA)
2008-2011	Vice-Chairman of the Working Group on Myocardial Function and Energetics of the DGK (AG13)
2010-2016	Board member of the HFA of the ESC
2011-2013	Chairman of the Working Group on Myocardial Function and Energetics of the DGK (AG13)
2011-2014	Coordinator Translational Research Committee of the HFA of the ESC
since 2013	Committee for Education and Support of Junior Scientists, German Society for Internal Medicine (Deutsche Gesellschaft für Innere Medizin, DGIM)
2014-2016	Chair of the Basic Science Section, HFA
2015	LS4 Panel member of the European Research Commission (ERC)
since 2015	Congress Programme Committee of the DGK
2016	Election as vice chair (for 2018) and chair (for 2020) of the Gordon Research Conference on Cardiac Regulatory Mechanisms in New London, NH, USA
2017	LS4 Panel member of the European Research Commission (ERC)
since 2018	Member of the Council of the International Society of Heart Research (ISHR), European Section (ES)

(Co-) Organization of Meetings

Since 2011	Basic Science Meetings of the DGK (so far 8 Meetings): 2011 Düsseldorf, 2012 Hamburg, 2013 Dresden, 2014 Düsseldorf, 2015-2018 Berlin.
2011 – 2017	Basic Science Program of the Heart Failure Congress (Annual Congress of the Heart Failure Association of the ESC)
04/2012	HFA Translational Research Workshop "Mitochondria and Metabolism – Targets for the treatment of heart failure", Brussels, BE
2013 - 2016	Main organizer of the HFA Winter Research Meeting, Les Diablerets, CH
03/2014	HFA Translational Research Workshop on "Treatments targeting Inotropy" in Brussels, BE
01/2017	Co-Organizer of the HFA Winter Research Meeting, Les Diablerets, CH
03/2017	HFA Translational Research Workshop on "Diabetes and Heart Failure" in Brussels, BE

Scientific Support

2003-2004	DFG, Emmy Noether-Programme, Phase I
2004	DFG, Travel Grant
2006-2011	DFG, Emmy Noether-Programme
2006-2010	Various Intramural Grants by the Universität des Saarlandes
2007-2013	DFG, Clinical Research Group (KFO 196: „Signal transduction of adaptive and maladaptive cardiac remodeling", Head: Prof. Dr. M. Böhm)
2011-2014	DFG, Collaborative Research Center (CRC 894: "Ca2+ signalling: molecular mechanisms and integrative function"; Phase I)
2012-2015	Heisenberg Professorship (W3)
2013	Large Instrumentation Grant
2013	Margret Elisabeth Strauß Research Project Award of the German Heart Foundation (Deutsche Herzstiftung)
2015-2017	Corona Foundation ("Cellular Mechanisms and prevention of cardiovascular senescence"; collaborative grant)
2015-2018	DFG, Collaborative Research Center (CRC 894: "Ca2+ signalling: molecular mechanisms and integrative function"; Phase II)

2016 – 2018	Project grant (DFG, Ma 2528/7-1)
2017	BMBF Funding in the context of the Comprehensive Heart Failure Center, Würzburg, Germany.
2018	DFG Transregional Collaborative Research Center TRR-219 ("Mechanisms of cardiovascular complications in chronic kidney disease"; Co-Speakers: Danilo Fliser, Homburg; Joachim Jankowski, Aachen)
2019-2022	DFG, Collaborative Research Center (CRC 894: "Ca2+ signalling: molecular mechanisms and integrative function"; Phase III)

Total: ~ € 7.000.000,-

Reviewer Activities

Nature Medicine, Cell Metabolism, PNAS, Circulation, Circulation Research, European Heart Journal, Journal of Molecular and Cellular Cardiology, European Journal of Heart Failure, Cardiovascular Research, Basic Research in Cardiology, British Journal of Pharmacology, Trends in Pharmacological Science (TiPS), etc.; DFG, INSERM, The Netherlands Organisation for Scientific Research (NWO), Fonds Wetenschappelijk Onderzoek (FWO; Belgian Research Organization). European Research Council (ERC).

Editorial Boards

Since 2013	Basic Research in Cardiology
2014-2017	BBA Clinical
since 12/14	Clinical Research in Cardiology
2015-16	Circulation Research
Since 2018	Heart Failure Reviews
Since 2018	Nature Reviews in Cardiology (Advisory Board)

Selected publications

Key original papers

Kohlhaas M, Nickel AG, Bergem S, Casadei B, Laufs U, **Maack C.**
Endogenous nitric oxide formation in cardiac myocytes does not control respiration during ß-adrenergic stimulation.
J Physiol. 2017;595:3781-3798.

Lehmann LH, Jebessa ZH, Kreusser MM, Horsch A, He T, Kronlage M, Dewenter M, Sramek V, Oehl U, Krebs-Haupenthal J, von der Lieth AH, Schmidt A, Sun Q, Ritterhoff J, Finke D, Völkers M, Jungmann A, Sauer SW, Thiel C, Nickel A, Kohlhaas M, Schäfer M, Sticht C, **Maack C**., Gretz N, Wagner M, El-Armouche A, Maier LS, Londoño JEC, Meder B, Freichel M, Gröne HJ, Most P, Müller OJ, Herzig S, Furlong EEM, Katus HA, Backs J.
A proteolytic fragment of histone deacetylase 4 protects the heart from failure by regulating the hexosamine biosynthetic pathway.
Nat Med. 2017 Dec 11. doi: 10.1038/nm.4452. [Epub ahead of print]

Stapel B, Kohlhaas M, Ricke-Hoch M, Haghikia A, Erschow S, Knuuti J, Silvola JMU, Roivainen A, Saraste A, Nickel AG, Saar JA, Sieve I, Pietzsch S, Müller M, Bogeski I, Kappl R, Jauhiainen M, Thackeray JT, Scherr M, Bengel FM, Hagl C, Tudorache I, Bauersachs J, **Maack C.***, Hilfiker-Kleiner D*.
Low STAT3 expression sensitizes to toxic effects of ß-adrenergic receptor stimulation in peripartum cardiomyopathy.
Eur Heart J. 2017;38:349-361. (*equal contribution)

Nickel AG, von Hardenberg A, Hohl M, Löffler JR, Kohlhaas M, Becker J, Reil JC, Kazakov A, Bonnekoh J, Stadelmaier M, Puhl SL, Wagner M, Bogeski I, Cortassa S, Kappl R, Pasieka B, Lafontaine M, Lancaster CR, Blacker TS, Hall AR, Duchen MR, Kaestner L, Lipp P, Zeller T, Müller C, Knopp A, Laufs U, Böhm M, Hoth M, **Maack C.**
Reversal of Mitochondrial Transhydrogenase Causes Oxidative Stress in Heart Failure.
Cell Metab. 2015;22:472-84.

Hohl M, Wagner M, Reil JC, Müller SA, Tauchnitz M, Zimmer AM, Lehmann LH, Thiel G, Böhm M, Backs J, **Maack C.**
HDAC4 controls histone methylation in response to elevated cardiac load.
J Clin Invest. 2013;123:1359-70.

Chen Y, Csordas G, Jowdy C, Schneider TG, Csordas N, Wang W, Liu Y, Kohlhaas M, Meiser M, Bergem S, Nerbonne JM, Dorn GW, 2nd, **Maack C.**
Mitofusin 2-containing mitochondrial-reticular microdomains direct rapid cardiomyocyte bioenergetic responses via interorganelle Ca2+ crosstalk.
Circ Res. 2012;111:863-75.

Kohlhaas M, Liu T, Knopp A, Zeller T, Ong MF, Böhm M, O'Rourke B, **Maack C.**
Elevated cytosolic Na+ increases mitochondrial formation of reactive oxygen species in failing cardiac myocytes.
Circulation. 2010;121:1606-13.

Kohlhaas M & **Maack C.**
Adverse bioenergetic consequences of Na+-Ca2+ exchanger-mediated Ca2+ influx in cardiac myocytes.
Circulation. 2010;122:2273-80.

Maack C, Dabew ER, Hohl M, Schäfers HJ, Böhm M.
Endogenous activation of mitochondrial KATP channels protects human failing myocardium from hydroxyl radical-induced stunning.
Circ Res. 2009;105:811-7.

Maack C, Cortassa S, Aon MA, Ganesan AN, Liu T, O'Rourke B.
Elevated cytosolic Na+ decreases mitochondrial Ca2+ uptake during excitation-contraction coupling and impairs energetic adaptation in cardiac myocytes.
Circ Res. 2006;99:172-82.

Maack C, Ganesan A, Sidor A, O'Rourke B.
Cardiac sodium-calcium exchanger is regulated by allosteric calcium and exchanger inhibitory peptide at distinct sites.
Circ Res. 2005;96:91-9.

Maack C, Kartes T, Kilter H, Schäfers HJ, Nickenig G, Böhm M, Laufs U.
Oxygen free radical release in human failing myocardium is associated with increased activity of rac1-GTPase and represents a target for statin treatment.
Circulation. 2003;108:1567-74.

Maack C, Böhm M, Vlaskin L, Dabew E, Lorenz K, Schäfers HJ, Lohse MJ, Engelhardt S.
Partial agonist activity of bucindolol is dependent on the activation state of the human beta1-adrenergic receptor.
Circulation. 2003;108:348-53.

Maack C, Elter T, Nickenig G, LaRosee K, Crivaro M, Stäblein A, Wuttke H, Böhm M.
Prospective crossover comparison of carvedilol and metoprolol in patients with chronic heart failure.
J Am Coll Cardiol. 2001;38:939-46.

Flesch M*, **Maack C***, Cremers B, Bäumer AT, Südkamp M, Böhm M.
Effect of beta-blockers on free radical-induced cardiac contractile dysfunction.
Circulation. 1999;100:346-53. (*equal contribution)

Position Papers and Treatment Guidelines

Maack C, Eschenhagen T, Hamdani N, Heinzel FR, Lyon AR, Manstein DJ, Metzger J, Papp Z, Tocchetti CG, Birhan Yilmaz M, Anker SD, Balligand JL, Bauersachs J, Brutsaert D, Carrier L, Chlopicki S, Cleland JG, de Boer RA, Dietl A, Fischmeister R, Harjola VP, Heymans S, Hilfiker-Kleiner D, Holzmeister J, de Keulenaer G, Limongelli G, Linke WA, Lund LH, Masip J, Metra M, Mueller C, Pieske B, Ponikowski P, Ristic A, Ruschitzka F, Seferovic PM, Skouri H, Zimmermann WH and Mebazaa A.
Treatments targeting inotropy.
Eur Heart J. 2018.

Maack C, Lehrke M, Backs J, Heinzel FR, Hulot JS, Marx N, Paulus WJ, Rossignol P, Taegtmeyer H, Bauersachs J, Bayes-Genis A, Brutsaert D, Bugger H, Clarke K, Cosentino F, De Keulenaer G, Dei Cas A, Gonzalez A, Huelsmann M, Iaccarino G, Lunde IG, Lyon AR, Pollesello P, Rena G, Riksen NP, Rosano G, Staels B, van Laake LW, Wanner C, Farmakis D, Filippatos G, Ruschitzka F, Seferovic P, de Boer RA and Heymans S.
Heart failure and diabetes: metabolic alterations and therapeutic interventions
A state-of-the-art review from the Translational Research Committee of the Heart
Failure Association-European Society of Cardiology.
Eur Heart J. 2018

Lourenco AP, Leite-Moreira AF, Balligand JL, Bauersachs J, Dawson D, de Boer RA, de Windt LJ, Falcao-Pires I, Fontes-Carvalho R, Franz S, Giacca M, Hilfiker-Kleiner D, Hirsch E, **Maack C**, Mayr M, Pieske B, Thum T, Tocchetti CG, Brutsaert DL and Heymans S.
An integrative translational approach to study heart failure with preserved ejection fraction
A position paper from the Working Group on Myocardial Function of the European
Society of Cardiology.
Eur J Heart Fail. 2018;20:216-227.

van Bilsen M, Patel HC, Bauersachs J, Bohm M, Borggrefe M, Brutsaert D, Coats AJS, de Boer RA, de Keulenaer GW, Filippatos GS, Floras J, Grassi G, Jankowska EA, Kornet L, Lunde IG, **Maack C**, Mahfoud F, Pollesello P, Ponikowski P, Ruschitzka F, Sabbah HN, Schultz HD, Seferovic P, Slart R, Taggart P, Tocchetti CG, Van Laake LW, Zannad F, Heymans S and Lyon AR.
The autonomic nervous system as a therapeutic target in heart failure
A scientific position statement from the Translational Research Committee of the Heart Failure Association of the European Society of Cardiology.
Eur J Heart Fail. 2017;19:1361-1378

Konstantinides SV, Torbicki A, Agnelli G, Danchin N, Fitzmaurice D, Galie N, Gibbs JS, Huisman MV, Humbert M, Kucher N, Lang I, Lankeit M, Lekakis J, **Maack C**, Mayer E, Meneveau N, Perrier A, Pruszczyk P, Rasmussen LH, Schindler TH, Svitil P, Vonk Noordegraaf A, Zamorano JL, Zompatori M, Task Force for the D and Management of Acute Pulmonary Embolism of the European Society of C.
2014 ESC guidelines on the diagnosis and management of acute pulmonary embolism.
Eur Heart J. 2014;35:3033-69, 3069a-3069k.

Key Reviews

Bertero E, Canepa M, **Maack C**, Ameri P.
Linking heart failure to cancer – Background evidence and research perspectives-
Circulation 2018;138:735–742.

Bertero E, **Maack C**.
Metabolic remodeling in heart failure
Nat Rev Cardiol 2018; doi: 10.1038/s41569-018-0044-6

Bertero E, **Maack C**.
Calcium signaling and reactive oxygen species in mitochondria.
Circ Res 2018;122:1460-1478

Bertero E, Roma L, Ameri P, **Maack C**.
Cardiac effects of SGLT2 inhibitors: The sodium hypothesis.
Cardiovasc Res. 2018;114:12-18.

Kohlhaas M, Nickel AG, **Maack C**.
Mitochondrial energetics and calcium coupling in the heart.
J Physiol. 2017;595:3753-3763.

Münzel T*, Camici GG*, **Maack C***, Bonetti NR, Fuster V, Kovacic JC.
Impact of Oxidative Stress on the Heart and Vasculature.
J Am Coll Cardiol. 2017;70:212-229. (*equal contribution)

Dietl A & **Maack C**.
Targeting Mitochondrial Calcium Handling and Reactive Oxygen Species in Heart Failure.
Curr Heart Fail Rep. 2017;14:338-349.

Dudek J & **Maack C.**
Barth syndrome cardiomyopathy.
Cardiovasc Res. 2017. doi: 10.1093/cvr/cvx014

Maack C & Murphy E.
Metabolic cardiomyopathies: fighting the next epidemic.
Cardiovasc Res. 2017;113:367-369.

von Hardenberg A & **Maack C**.
Mitochondrial Therapies in Heart Failure.
Handb Exp Pharmacol. 2017;243:491-514.

Clancy CE, Chen-Izu Y, Bers DM, Belardinelli L, Boyden PA, Csernoch L, Despa S, Fermini B, Hool LC, Izu L, Kass RS, Lederer WJ, Louch WE, **Maack C**, Matiazzi A, Qu Z, Rajamani S, Rippinger CM, Sejersted OM, O'Rourke B, Weiss JN, Varro A and Zaza A.
Deranged sodium to sudden death.
J Physiol. 2015;593:1331-45.

Münzel T, Gori T, Keaney JF, Jr., **Maack C**, Daiber A.
Pathophysiological role of oxidative stress in systolic and diastolic heart failure and its therapeutic implications.
Eur Heart J. 2015;36:2555-64.

Nickel A, Kohlhaas M, **Maack C**.
Mitochondrial reactive oxygen species production and elimination.
J Mol Cell Cardiol. 2014;73:26-33.

Kohlhaas M & **Maack C**.
Calcium release microdomains and mitochondria.
Cardiovasc Res. 2013;98:259-68.

Nickel A, Löffler J, **Maack C**.
yocardial energetics in heart failure.
Basic Res Cardiol. 2013;108:358.

Bay J, Kohlhaas M, **Maack C**.
Intracellular Na+ and cardiac metabolism.
J Mol Cell Cardiol. 2013;61:20-7.

Kohlhaas M & **Maack C**.
Interplay of defective excitation-contraction coupling, energy starvation, and oxidative
stress in heart failure.
Trends Cardiovasc Med. 2011;21:69-73.

Maack C & O'Rourke B.
Excitation-contraction coupling and mitochondrial energetics.
Basic Res Cardiol. 2007;102:369-92