

Curriculum Vitae

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Born 21. April 1971, married : Heike; two children (Julius and Lukas)



EDUCATION

P.I. BMBF- NEXT GENERATION OF BIOTECHNOLOGICAL PROCESSES – BIOTECHNOLOGY 2020+ - RESEARCH GROUP: MOLECULAR & SYNTHETIC

BIONANOTECHNOLOGY & BIONIC CHEMISTRY LAB, *2014 to current*
“Synthetic Biology in Biosystems Engineering & synthetic Biotechnology”:

- modular expansion of complex cellular parts towards a universal production organism, transforming biosynthetic processes & enzymes to molecular factories, bioprocess design
- nanostructured hierarchically assembled functional biomolecular systems & materials for novel catalytic, biotechnological, pharmaceutical and medical applications

GROUP LEADER & P.I. BIONIC CHEMISTRY LAB; INSTITUTE FOR MACROMOLECULAR CHEMISTRY & INSTITUTE FOR PHARMACEUTICAL SCIENCES, FRIAS JUNIOR RESEARCH FELLOW (08/2008-008/2013) FREIBURG INSTITUTE FOR ADVANCED STUDIES (FRIAS), UNI FREIBURG

2008 to 2014

- *“Bionic Chemistry & synthetic BioNanotechnology – Biohybrid Nanomaterials:*
nanostructured hierarchically assembled functional systems *in vitro* and *in vivo* for defined
structure-function molecular tecton libraries

POSTDOCTORAL RESEARCH;

THE SCRIPPS RESEARCH INSTITUTE, La Jolla, USA *2004 to 2008*
Host Professor Peter G. Schultz

- chemical biology & synthetic biology - unnatural amino acid incorporation into biomacromolecules

DISSERTATION

**MAX PLANCK INSTITUTE FÜR POLYMERFORSCHUNG, MAINZ
JOHANNES GUTENBERG UNIVERSITÄT MAINZ**

1998 to 2003

Advisors: Professor Wolfgang Knoll and Prof Horst Kunz

- Dissertation in Chemistry, Thesis title: „Biomimicry of Biological Membranes: Concept, Synthesis and Biophysical Characterization of a Hierarchical Set of Solid Supported

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Membrane Mimicry“

Manuel Lujan Los Alamos Neutron Scattering Center (LANSCE), 06/2001
Los Alamos, Ph.D. J. Majewski, Characterization of Glyco-Lipo-Polymer
Conjugates on solid substrates and at the air-water interface

Biotechnology Engineering Department, **Ben Gurion University of** 04/2001
the Negev, Beer Sheva, Israel, Research Group of Prof. A. Berman
Characterization of LPS-Structure derived Glycolipids

Research Fellow 09/1999-12/1999
Stanford University & IBM Almaden Research Center, CA
Profs. Curt Frank & Steve Boxer (Stanford) –structured tBLMs
& Ph. D. Craig Hawker (IBM Almaden), Synthesis & Characterization
of Glycolipopolymers.

Intern, BASF AG, Ludwigshafen, Germany - Drug development for coronary 06/1998-09/1998
diseases - „Synthesis of Endothelin Converting Enzyme (ECE) - Inhibitors“

DIPLOMA THESIS IN CHEMISTRY

JOHANNES GUTENBERG UNIVERSITÄT MAINZ 10/1992 to 06/1998
Advisor: Professor Horst Kunz

Diploma in Chemistry

- Thesis: „Selective Synthesis of a Sialyl-Tn-Glycoconjugate“ 04/1996-04/1997

Minor: Biochemistry & Macromolecular Chemistry

Researcher, **Max-Planck-Institute for Polymer Research** 05/1996-08/1996
Group: Prof. Dr. Hans-Wolfgang Spiess
Research Focus: Core-Shell Emulsion Polymerizations – Nanoparticles

Visiting Researcher, **University of Massachusetts**, Amherst 09/1995-03/1996
Polymer Chemistry, Research Project: „Biomembrane Templates
for Nanoscale Conduits and Networks“, Research Group of
Prof. David Tirrell

Vordiplom (Bachelors) in Chemistry, Justus Liebig University Giessen 10/1992-09/1994

PROFESSIONAL EXPERIENCE

August 2013 Group Leader & P.I. Synthetic Biology in Biosystems Engineering: synthetic
Bio*Nanotechnology* & Bionic Chemistry Lab, Freiburg Institute for Advanced
Studies (FRIAS), Inst. für pharmazeutische Chemie, Zentrum für
Biosystemanalyse
- current

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- Aug. 2008 to July 2013 Group Leader & Junior Research Fellow FRIAS, Lab for Bionic Chemistry, Uni Freiburg
- Feb 2004 to Aug.2008 Research Associate -Scripps Research Institute, La Jolla
Worked with Prof. Peter Schultz on expanding the amino acid repertoire of *E. coli* and *S. cerevisiae* with unnatural amino acids bearing carbohydrates or chemical linker. Artificial cell mimetics.
- Feb 2003 to Feb 2004 Project Leader Chemistry for DARPA Project „Engineered Bio-Molecular Nano Devices/Systems“- (MOLDICE) Program between MPIP Mainz-University at Florida at Gainesville
- Intern, BASF AG**, Ludwigshafen, Germany - Drug development for coronary diseases - „Synthesis of Endothelin Converting Enzyme (ECE) - Inhibitors“ 06/1998-09/1998
- Oct 1992 to Feb2003 Research and Teaching Assistant –University Mainz/MPIP Mainz – for research see above

HONORS AND AWARDS

- prize for the best Abitur - A-level equivalent 06/1991
- prize for the best exams to obtain the degree chem. techn. Assistent 06/1991
- Fellowship of the German Academic Exchange Service (DAAD) 08/1995 - 03/1996
- Fellowship of the German Academic Exchange Service (DAAD) 09/1999 - 12/1999
- DARPA Project „Engineered Bio-Molecular Nano-Devices/Systems“ (MOLDICE) Program 06/2003- 03/2004

5 Innovationspreise:

1. Förderung durch den Innovationsfonds der Albert-Ludwigs Universität Freiburg ("Chemische System-Biologie des Lipid-Codes")
2. RiSC-Programm (Research Seed Capital) des Ministerium für Wissenschaft, Forschung und Kunst Baden-Württemberg (MWK) fördert riskante Projekte (Blue Sky Research) von herausragenden Nachwuchswissenschaftlerinnen und Nachwuchswissenschaftlern ("Chemische System-Biologie des Lipid-Codes")
3. Ideenwettbewerb Biotechnologie & Medizintechnik MWK
4. BMBF Ideenwettbewerb Biotechnologie 2020+ Initiative: Neue Produkte für die Bioökonomie

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5. BMBF Forschungspreis 2014 "Nächste Generation biotechnologischer Verfahren" im Rahmen der Biotechnologie 2020+ Strategie Titel: „*Universell modularer Produktionsorganismus*“