



Boehringer Ingelheim  
Stiftung

2014

HEINRICH WIELAND PRIZE



**50TH ANNIVERSARY**

**OF THE HEINRICH WIELAND PRIZE**

Tuesday, October 21, 2014

Munich, Germany

## HEINRICH WIELAND PRIZE

The international Heinrich Wieland Prize honours distinguished scientists for their outstanding research on biologically active molecules and systems in the fields of chemistry, biochemistry, and physiology, as well as on their clinical importance. The prize is endowed with 100,000 euros by the Boehringer Ingelheim Foundation and named after Heinrich Wieland (1877–1957), Nobel Laureate in Chemistry in 1927.

Every year, the foundation invites scientists to make nominations in an open call. It entrusts the selection of the awardees to a Scientific Board of Trustees, all of whom work in an honorary capacity. Among the former awardees are four subsequent Nobel Laureates (see page 15).

In 2014, an international scientific symposium and a special festive award ceremony will mark the 50th anniversary of the Heinrich Wieland Prize. Among the renowned symposium speakers are Heinrich Wieland Laureate 2014 Professor Reinhard Jahn and Nobel Laureate Professor James Rothman.



# THE PRIZE

*“Heinrich Wieland was an outstanding scientist whose work has inspired and stimulated many young researchers. He also had close ties to our family and was instrumental in founding the first scientific department of the company Boehringer Ingelheim. Therefore, we, the shareholder family, are very proud to see his work and person remembered with a prize that honours groundbreaking research and highlights its importance for the benefit of society and each and every one of us.”*

**Otto Boehringer, Chair of the Executive Board of the Boehringer Ingelheim Foundation**

*“Every year it is a challenge as well as a privilege to select just one out of many worthy nominees to be honoured with this prize. With their pioneering research the 66 awardees to date have greatly advanced our knowledge in their respective fields.”*

**Professor Wolfgang Baumeister, Chair of the Scientific Board of Trustees of the Heinrich Wieland Prize**

## HISTORY OF THE PRIZE

In order to stimulate research on the role of lipids in human health and disease, the Margarine Institute, an organization dedicated to scientific information about lipids and nutrition, instigated the Heinrich Wieland Prize. In 1964, its first awardee was Professor Ernst Klenk of the University of Cologne, Germany. The prize was originally endowed with 8,000 Deutschmarks and honoured outstanding research in biochemistry and physiology, as well as studies of the clinical relevance of lipids. From the beginning, the selection was entrusted to a Scientific Board of Trustees.

On the occasion of the 25th anniversary of the Heinrich Wieland Prize in 1989, a Heinrich Wieland “Medal in Gold” was endowed. So far, it has been awarded four times.

From 2001 to 2010, the company Boehringer Ingelheim endowed the prize because of its close ties to its namesake Heinrich Wieland (see page 19). The company extended the scope of the prize and raised the prize money from 25,000 to 50,000 euros.

In 2011, the prize was transferred to the Boehringer Ingelheim Foundation, which further raised the prize money to 100,000 euros on the occasion of its 50th anniversary. This year’s awardee, Reinhard Jahn, is the 66th Laureate.

# PROGRAMME

October 21, 2014, Max Joseph Hall at the Munich Residence in Munich, Germany

## SCIENTIFIC SYMPOSIUM

8:30 A.M.	<b>Registration</b>
9:00 A.M.	<b>Welcome and opening remarks</b> Professor Dr Wolfgang Baumeister, Chair of the Board of Trustees of the Heinrich Wieland Prize, MPI of Biochemistry, Martinsried, Germany
9:10 A.M.	<b>“In vivo chemistry”</b> Professor Carolyn Bertozzi, PhD, University of California, Berkeley, CA, USA, Heinrich Wieland Laureate 2012 <sup>MtL</sup>
9:50 A.M.	<b>“Beyond the prokaryotic ribosome”</b> Professor Nenad Ban, PhD, Swiss Federal Institute of Technology (ETH), Zurich, Switzerland, Heinrich Wieland Laureate 2010 <sup>MtL</sup>
10:30 A.M.	<b>Coffee break</b>
11:10 A.M.	<b>“Molecular chaperones in protein folding and proteostasis”</b> Professor Dr F.-Ulrich Hartl, MPI of Biochemistry, Martinsried, Germany, Heinrich Wieland Laureate 2011
11:50 A.M.	<b>“Trafficking vesicles – what gives them their identity?”</b> Professor Dr Reinhard Jahn, MPI for Biophysical Chemistry, Göttingen, Germany, Heinrich Wieland Laureate 2014 <sup>MtL</sup>
12:30 P.M.	<b>Lunch break</b>
12:30 – 1:15 P.M.	<b>“Meet the Laureates” for registered students</b>
1:15 – 2:15 P.M.	<b>Poster session</b>
2:20 P.M.	<b>“Natural products: an inspiration for discovery”</b> Professor Steven Ley, PhD, University of Cambridge, UK, Heinrich Wieland Laureate 2009 <sup>MtL</sup>
3:00 P.M.	<b>“How are chromosomes held together?”</b> Professor Kim Nasmyth, PhD, University of Oxford, UK
3:40 P.M.	<b>Coffee break</b>
4:10 P.M.	<b>Poster prizes</b>
4:20 P.M.	<b>“Regulation of neurotransmitter release”</b> Professor James Rothman, PhD, Yale University, New Haven, CT, USA, Heinrich Wieland Laureate 1990 <sup>MtL</sup>
5:00 P.M.	<b>Final remarks &amp; end of symposium</b>

### Meet the Laureates

Selected students and junior scientists will meet with eminent scientists connected with the Heinrich Wieland Prize for a free exchange in a round table format. The available speakers are marked with “MtL” above. Also available is Professor Dr Petra Schwille, member of the Scientific Board of Trustees of the Heinrich Wieland Prize and Director at the MPI of Biochemistry in Martinsried, Germany.

# PROGRAMME

## AWARD CEREMONY

- 6:30 P.M.      **Welcome reception**
- 7:00 P.M.      **Festive award ceremony**
- Musical prelude***  
Edvard Grieg (1843–1907): “From Holberg’s Time”, op. 40: Prelude
- Welcome: Ingolf Baur**, TV science journalist
- “50th anniversary of the Heinrich Wieland Prize”**  
Dr Claudia Walther, Managing Director of the  
Boehringer Ingelheim Foundation
- Musical interlude***  
Maurice Ravel (1875–1937): “Le tombeau de Couperin”: Toccata
- Laudation**  
Professor Dr Herbert Jäckle, MPI for Biophysical Chemistry, Göttingen, Germany
- Award presentation**  
to Professor Dr Reinhard Jahn  
MPI for Biophysical Chemistry, Göttingen, Germany  
by Dr Claudia Walther and Professor Dr Wolfgang Baumeister,  
Chair of the Board of Trustees of the Heinrich Wieland Prize
- Interview with Professor Dr Reinhard Jahn**
- Performance by inmot!on***
- Keynote**  
“Mapping the brain”  
Professor Jeffrey Lichtman, MD, PhD, Harvard University, Cambridge, MA, USA
- Musical conclusion***  
Pedro Iturralde (1929): “Pequena Czarda”
- Closing remarks: Ingolf Baur**
- 08:30 P.M.      **Reception**
- 10:00 P.M.      **End of award festivities**

Music by SIGNUM saxophone quartet: Blaž Kemperle, soprano saxophone, Erik Nestler, alto saxophone, Alan Lužar, tenor saxophone, David Brand, baritone saxophone. The inmot!ion performers are Ivo Studer and Jan Schmutz, the 2012 world and 2012/13 European yo-yo champions.

# SPEAKERS

Below please find short profiles of all speakers at the symposium and the award ceremony.

## **Professor Nenad Ban, PhD**

Swiss Federal Institute of Technology (ETH), Zurich, Switzerland

### **Heinrich Wieland Prize 2010 for his definition of the molecular architecture of fatty acid synthase multi-enzymes**

Ban's research focuses on understanding the structural basis of how large cellular assemblies function using a combination of crystallographic and electron microscopic experiments. Ban's structural studies on bacterial and eukaryotic ribosomes and their functional complexes have provided groundbreaking insights into the process of protein synthesis in all kingdoms of life. His studies of giant multi-enzymes involved in fatty acid synthesis revealed their structure at atomic resolution and suggested the mechanism for substrate shuttling.

Ban was educated at the University of Zagreb, Croatia. He obtained his PhD degree at the University of California at Riverside, USA, in 1994. He went on to a postdoc at Yale University, Boston, USA, where he spearheaded the X-ray crystallographic structure determination of the large ribosomal subunit. In 2000, he joined the ETH Zurich, Switzerland, where he became a full professor in 2007.

## **Professor Carolyn Bertozzi, PhD**

University of California at Berkeley, CA, USA

### **Heinrich Wieland Prize 2012 for pioneering achievements in chemical biology, in particular the innovative use of bioorthogonal chemistry**

Bertozzi has founded the field of bioorthogonal chemistry situated at the intersection between synthetic chemistry and biology. As an innovative breakthrough method, she developed the biosynthesis and use of bioorthogonal labels, unique chemical biomarkers targeting specific macromolecules in vivo. Bertozzi thus identified sugar patterns on the cell surface which are specific to cancer, inflammation, or infection. She paved the way for novel diagnostic and therapeutic approaches to these diseases and is designing nanomaterials for drug delivery into living cells.

Bertozzi obtained her PhD in chemistry at the University of California (UC), Berkeley, USA, in 1993, followed by postdoctoral work at the UC San Francisco. In 1996, she joined the UC Berkeley faculty. In 2000, she became a Howard Hughes Medical Institute Investigator. She was the director of The Molecular Foundry, a nanoscience institute at the Lawrence Berkeley National Laboratory, from 2006 to 2010. She is professor of chemistry and molecular and cell biology at UC Berkeley.

## **Professor Dr F.-Ulrich Hartl**

MPI of Biochemistry, Martinsried, Germany

### **Heinrich Wieland Prize 2011 for work on chaperone-assisted protein folding and its impact on neurodegenerative diseases**

Hartl is at the forefront of research in cellular protein folding. He was the first to prove that proteins need the assistance of helper proteins, so-called molecular chaperones, in order to adopt their functional 3D structures in vivo. In seminal contributions Hartl deciphered the mechanism of action of essential cytosolic chaperones such as the Hsp70s and the chaperonins. His research also focuses on how aberrant protein folding and aggregation cause neurodegenerative diseases including Chorea Huntington or Morbus Alzheimer.

F. Ulrich Hartl studied medicine and obtained his doctoral degree in Heidelberg, Germany, in 1985. He moved to the laboratory of Walter Neupert in Munich, first as a postdoc and then as a group leader. In 1991, he accepted a professorship in cell biology and genetics at Memorial Sloan-Kettering Cancer Center and Cornell Medical College in New York, USA. Hartl returned to Germany in 1997 to take up his present position as director at the MPI of Biochemistry.

# SPEAKERS

## **Professor Dr Herbert Jäckle**

MPI for Biophysical Chemistry, Göttingen, Germany

### **Laudation for Reinhard Jahn**

Jäckle's pioneering work has provided important insights into how the early development of the fruit fly *Drosophila melanogaster* is regulated on the molecular level and which control mechanisms keep the insect's energy metabolism in balance. He and his colleagues have identified a number of genes and molecular regulatory mechanisms which are also essential for organ formation and energy homeostasis in humans. His work has important implications for human diseases including obesity and diabetes.

Jäckle received his PhD in biology from the University of Freiburg, Germany, in 1977. He subsequently worked at the University of Texas at Austin, USA, the European Molecular Biology Laboratory in Heidelberg, Germany, and the MPI of Developmental Biology Tübingen, Germany. Since 1987, he has served as a professor for genetics at the University of Munich (LMU), Germany. Since 1991, he has headed the Department of Molecular Developmental Biology at the MPI for Biophysical Chemistry in Göttingen, Germany. From 2002 to 2014, he was vice-president of the Max Planck Society. For 17 years, he has been a fellow MPI director of Reinhard Jahn.

## **Professor Dr Reinhard Jahn**

MPI for Biophysical Chemistry, Göttingen, Germany

### **Heinrich Wieland Prize 2014 for paradigmatic studies on membrane fusion, synaptic vesicles and neurotransmitter release**

Reinhard Jahn has pioneered research into membrane fusion and neurotransmitter release. In the brain, nerve cells send chemical signals to each other by releasing neurotransmitters from their storage place within the cell, the synaptic vesicles. For release, the membranes of the vesicle and its cell need to fuse. Jahn was among the first to discover that so-called SNARE proteins drive membrane fusion by showing that tetanus and botulinum toxins inhibit the process by cleaving these proteins. He was also the first to describe synaptic vesicles by analyzing their building blocks. Membranes fuse in all body cells that grow, transport substances, or signal, making Jahn's paradigmatic results relevant for a wide range of fields.

Jahn studied biology and chemistry at the University of Göttingen, Germany. He subsequently worked for four years at Yale University and Rockefeller University in the USA. He returned to Germany in 1986 and served as a junior group leader at the MPI for Psychiatry in Martinsried until 1991. After holding a professorship at the Yale University School of Medicine with a joint appointment at the Howard Hughes Medical Institute for six years, he once again made his way back to Germany to assume his current position as director at the MPI for Biophysical Chemistry.

## **Professor Steven Ley, PhD**

University of Cambridge, UK

### **Heinrich Wieland Prize 2009 for outstanding achievements in the synthesis of key natural products**

Steven Ley is one of the leading scientists in developing chemical methods for the synthesis of natural products. In particular, his work on iron chemistry, encapsulated reagents, microbial oxidation, spiroketals, organic catalysis, and microwave chemistry has been groundbreaking. Ley has pioneered the use of immobilized reagents in multi-step organic synthesis to make compounds in a cleaner and more effective way. He has devised many practical protecting groups using acetal chemistry and he was one of the inventors of TPAP, a widely used catalytic oxidant.

Ley started as a lecturer at Imperial College in London, UK, in 1975, was promoted to professor in 1983, and became head of department in 1989, before moving to Cambridge University, UK, in 1992.

# SPEAKERS

## **Professor Jeffrey Lichtman, MD, PhD**

Harvard University, Cambridge, MA, USA

### **Keynote speaker at award ceremony**

Lichtman, a leader in the emerging field of connectomics of the brain, studies the mechanisms that underlie synaptic competition between neurons that innervate the same target cell. Such interactions are responsible for sharpening the patterns of neural connections during growth and may also be important in learning and memory formation. His lab developed revolutionary techniques such as “Brainbow” transgenic mice to visualize neural connections and how they change over time. He also develops electron microscopy methods to map the complete wiring diagram of entire brains.

Lichtman received his MD/PhD from Washington University School of Medicine in St. Louis, USA, in 1980. After his postdoc in neurobiology at Harvard Medical School, he returned to St. Louis. In 2004, after 30 years, he moved his lab to Cambridge, USA, to become the Jeremy R. Knowles Professor of Molecular and Cellular Biology and Ramon Y. Cajal Professor of Arts and Sciences at Harvard University, as well as a member of the newly established Center for Brain Science.

## **Professor Kim Nasmyth, PhD**

University of Oxford, UK

Nasmyth is a world-leading expert in chromosomes, the packages of DNA found within our cells, and the proteins that control them. In the 1990s, he discovered cohesin, an important ring-shaped protein complex holding chromosomes together as cells divide. In 2008, he showed that cohesin actually traps chromosomes within its ring before it is cleaved to allow precise segregation of chromosomes. Professor Nasmyth has dominated the field of mitotic regulation and has also made a big leap forward for cancer research.

Nasmyth studied at the University of Edinburgh, UK, followed by postdoctoral training at the University of Washington, USA. After two years at Cold Spring Harbor Laboratory, he became a staff member at the Laboratory for Molecular Biology in Cambridge, UK, in 1982. He joined the Institute of Molecular Pathology in Vienna, Austria, as a senior scientist in 1988 and became director in 1997. In 2005, he was appointed head of the Biochemistry Department at the University of Oxford, UK.

## **Professor James Rothman, PhD**

Yale University, New Haven, MA, USA

### **Heinrich Wieland Prize 1990 for groundbreaking work on the enzymology of intracellular membrane fusion**

Rothman excels in his research on vesicular transport and intracellular membrane fusion. He has described key molecular processes explaining how transport vesicles carrying various cargo-like hormones or neurotransmitters are built, find their correct destination within cells, and fuse with their target membrane to release their contents. Studying the Golgi apparatus, Rothman discovered the so-called NSF, SNAP, and SNARE proteins necessary for membrane fusion. He also revealed principles of synaptic transmission in nerve cells. For his achievements, he was honoured with the Nobel Prize last year.

Rothman received his PhD in biological chemistry at Harvard University in 1976 and worked at the Massachusetts Institute of Technology before holding professorships at Stanford and Princeton Universities, all USA. Rothman is widely credited as a key force in the rise to pre-eminence of science at Sloan-Kettering, where he stayed from 1991 to 2004 and served as vice-chairman. Prior to coming to Yale in 2008, he was director of Columbia University's Sulzberger Genome Center in New York, USA.



# POSTER SESSION

Please find titles and authors of the presented posters below.

The presenting author is marked in bold, equal contribution is denoted by “\*”.

- 1 Molecular mechanism in the formation of COPI and COPII vesicles**  
**Adolf F**, Rhiel M, Hellwig A, Wieland FT  
Heidelberg University, Germany
- 2 Structure of the large ribosomal subunit from human mitochondria**  
**Amunts A**, Brown A, Bai X, Sugimoto Y, Edwards P, Murshudov G, Scheres SHW, Ramakrishnan V  
MRC Laboratory of Molecular Biology, Cambridge, UK
- 3 Functional expression, purification and biophysical characterization of the chemokine receptor CCR3 for structural biology**  
**Apel AK**, Velazquez-Carrasco L, Pautsch A, Schnapp G  
Boehringer Ingelheim Pharma GmbH & Co. KG, Biberach, Germany
- 4 Growth and chondrogenic differentiation of multipotent mesenchymal stem cells on bioactive self-assembled peptide nanofibers**  
**Arslan E**, Ustun S, Sardan M, Tekinay AB, Guler MO  
Bilkent University, Ankara, Turkey
- 5 Structural studies of the 26S proteasome in situ by electron cryotomography**  
**Asano S**, Fukuda Y, Beck F, Aufderheide A, Förster F, Danev R, Baumeister W  
MPI of Biochemistry, Martinsried, Germany
- 6 Synthesis and conjugation of linker molecules for biopolymer models via copper catalyzed click chemistry reaction for bioengineering purposes**  
**Ataol S**, Tezcaner A, Keskin D, Akdag A  
Middle East Technical University, Ankara, Turkey
- 7 Deletion of a kinesin I motor disrupts retinotectal synaptic transmission and unmasks a mechanism of homeostatic branching control by neurotrophin-3**  
**Auer TO\*** (1,2,3,6), Xiao T\* (4), Bercier V\* (1,2,3), Gebhardt C (1,2,3), Duroure K (1,2,3), Concordet JP (2,4,5), Wittbrodt J (6), Baier H (5,7), Del Bene F (1,2,3)  
(1) Institut Curie, (2) CNRS UMR 3215, (3) INSERM U934, (4) Muséum National d'Histoire naturelle, (1-4) Paris, France; (5) University of California, San Francisco, USA, (6) University of Heidelberg, Germany, (7) MPI of Neurobiology, Martinsried, Germany
- 8 Stop or go? The immediate sequence context of stop codons decides between read-through and termination of translation.**  
**Brunner SF** (1,2), Gaillard A (3), Chin JW (1,2)  
(1) MRC Laboratory of Molecular Biology, Cambridge, UK, (2) University of Cambridge, UK, (3) Massachusetts Institute of Technology, Cambridge, USA
- 9 Bone marrow-derived multipotent stromal cells attenuate inflammation in obliterative airway disease in mouse tracheal allografts**  
Casey A (1), **Dirks F** (1,2), Liang OD (1), Harrach H (1,3) Schuette-Nuetgen K (1,4), Leeman K (1) Kim CF (1) Gerard C (1), Subramaniam M (1)  
(1) Harvard Medical School, Boston, MA, USA, (2) University of Witten/Herdecke, Witten, Germany, (3) University Children's Hospital, Bonn, Germany, (4) University of Münster, Germany
- 10 Monoaminergic signalling regulates arousal from sleep in *Caenorhabditis elegans***  
**Eichler T**, Nichols AL, Zimmer M  
Research Institute of Molecular Pathology (IMP), Vienna, Austria
- 11 Histone variant H3.3 provides an epigenetic feedback loop for retroelement silencing**  
**Elsässer SJ\*** (1,2), Noh KM (3), Diaz N (3), Goldberg AD (3), Li C (3), Allis CD (3), Banaszynski LA\* (3)  
(1) MRC Laboratory of Molecular Biology, Cambridge, UK, (2) SciLifeLab, Karolinska Institutet, Stockholm, Sweden, (3) The Rockefeller University, New York, USA
- 12 Bst2-mediated HIV restriction and its viral antagonism in primary macrophages**  
**Giese S**, Marsh M  
University College London, UK
- 13 Two parallel pathways guide the transition from translation initiation into elongation**  
**Goyal A**, Benardinelli R, Maracci C, Milon P, Rodnina MV  
MPI for Biophysical Chemistry, Göttingen, Germany
- 14 Genome-wide analysis of DNA postreplication repair in *S. cerevisiae***  
**Gralievska N**, Ulrich H  
Institute of Molecular Biology, Mainz, Germany

- 15 Multifunctional self-assembled peptide nanostructures mimic alkaline phosphatase activity**  
**Gulseren G (1)**, Garip IC (1), Ustahuseyin O (1), Tekin ED (2), Tekinay AB (1), Guler MO (1)  
 (1) Bilkent University, Ankara, Turkey, (2) University of Turkish Aeronautical Association, Ankara, Turkey
- 16 Three-dimensional arrangements of membrane associated *E. coli* polysomes**  
**Hoffmann T (1)**, Ortiz JO (1), Persson F (2), Elf J (2), Hartl FU (1), Baumeister W (1)  
 (1) MPI of Biochemistry, Martinsried, Germany, (2) Uppsala University, Sweden
- 17 Ultra-high throughput LC-MS/MS protein interaction analysis? Processing 96 pull-downs in a single day**  
**Hosp F\* (1)**, Scheltema RA\* (1), Eberl HC\* (1,2), Kulak NA\* (1), Keilhauer EC (1), Mayr K (1), Mann M (1)  
 (1) MPI of Biochemistry, Martinsried, Germany, (2) Cellzome AG, Heidelberg, Germany
- 18 SNARE-mediated membrane fusion: Where does it all start?**  
**Jakhanwal S**, Jahn R  
 MPI for Biophysical Chemistry, Göttingen, Germany
- 19 Spontaneous activity governs olfactory representations in spatially organized habenular microcircuits**  
**Jetti SK**, Vendrell Llopsi N, Yaksi E  
 Neuro-Electronics Research Flanders, Leuven, Belgium
- 20 Phase contrast cryo-electron tomography with a volta phase plate**  
**Khoshouei M**, Danev R, Gerisch G, Ecke M, Ortiz J, Plitzko J, Baumeister W  
 MPI of Biochemistry, Martinsried, Germany
- 21 Ephrins as a target in lung fibrosis? First insights**  
**Lefèvre S**, Lämmle B, Quast K, Schnapp A, Schymeinsky J  
 Boehringer Ingelheim Pharma GmbH & Co. KG, Biberach, Germany
- 22 Control of membrane gaps by synaptotagmin-Ca<sup>2+</sup> measured with a novel membrane distance ruler**  
**Lin CC (1)**, Seikowski J (1), Pérez-Lara A (1), Jahn R (1), Höbartner C (1), Walla PJ (1,2)  
 (1) MPI for Biophysical Chemistry, Göttingen, Germany, (2) Technical University of Braunschweig, Germany
- 23 STED nanoscopy of synaptic transmission**  
**Milovanovic D**, Honigman A, Hell SW, Jahn R  
 MPI for Biophysical Chemistry, Göttingen, Germany
- 24 Organization of the mitochondrial translation machinery studied in situ by cryo-electron tomography**  
**Pfeffer S (1)**, Woellhaf MW (2), Herrmann JM (2), Förster F (1)  
 (1) MPI of Biochemistry, Martinsried, Germany, (2) University of Kaiserslautern, Germany
- 25 Ligand-binding mechanism and substrate delivery in ATP-binding cassette transporters at the single-molecule level**  
**Plötz E**, Gouridis G, Schuurman-Wolters GK, Husada F, Vietrov R, Cordes T, Poolman B  
 University of Groningen, The Netherlands
- 26 “BaKillus” – Engineering a pathogen-hunting microbe**  
 Alzinger L (1), Bartels J (1), Dotzler M (1), Eder T (1), Englmeier R (1), Fröhlich F (2), Heckmann J (1), Herzog R (1), Hörl D (1), Kobras C (1), Kretschmer S (3), Peschek N (1), Popp P (1), Radeck J (1), Reith P (1), **Riemer F (1)**, Sichert A (1), Sommer A (1), Zinn S (1)  
 (1) University of Munich (LMU), (2) TU Munich, (3) MPI for Biochemistry, Martinsried, all Germany
- 27 Multi-protein assemblies underlie the meso-scale organization of the plasma membrane**  
**Saka SK (1)**, Honigmann A (2), Eggeling C (3), Hell SW (2), Lang T (4), Rizzoli SO (1)  
 (1) University Medical Centre Göttingen, Germany, (2) MPI for Biophysical Chemistry, Göttingen, Germany, (3) Weatherall Institute of Molecular Medicine, Oxford, UK, (4) University of Bonn, Germany
- 28 Remodelling of the active presequence translocase drives motor-dependent mitochondrial protein translocation**  
**Schulz C (1)**, Rehling P (1,2)  
 (1) University Medical Center Göttingen, Germany, (2) MPI for Biophysical Chemistry, Göttingen, Germany
- 29 Reconstitution of a minimal module for polarity generation**  
**Sonal S**, Schwille P  
 MPI of Biochemistry, Martinsried, Germany
- 30 Synthetic studies toward (+)-stephadiamine**  
**Vrielink N (1)**, Hager A (1), Hager D (1), Stoltz BM (2), Trauner D (1)  
 (1) University of Munich (LMU), Germany, (2) California Institute of Technology, Pasadena, USA

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<b>Bode, Christian, Professor em. Dr</b>	Stuttgart, Germany
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<b>Engerer, Peter</b>	Technical University Munich (TUM), Munich, Germany
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# HEINRICH WIELAND LAUREATES 1964–2014

<b>Year</b>	<b>Laureate</b>	<b>Affiliation (time of award)</b>	<b>Achievement</b>
2014	<b>Prof. Reinhard Jahn</b>	MPI for Biophysical Chemistry, Göttingen, Germany	Paradigmatic studies on membrane fusion, synaptic vesicles and neurotransmitter release
2013	<b>Prof. Tony Kouzarides</b>	The Gurdon Institute, Cambridge, UK	Groundbreaking research on chromatin modifications and their role in cancer
2012	<b>Prof. Carolyn Bertozzi</b>	University of California, USA	Pioneering achievements in chemical biology, in particular the innovative use of bioorthogonal chemistry
2011	<b>Prof. Franz-Ulrich Hartl</b>	MPI of Biochemistry, Martinsried, Germany	Chaperone-assisted protein folding and its impact on neurodegenerative diseases
2010	<b>Prof. Nenad Ban</b>	ETH Zurich, Switzerland	Definition of molecular architecture of fatty acid synthase multi-enzymes
2009	<b>Prof. Steven Ley</b>	University of Cambridge, UK	Outstanding achievements in the synthesis of key natural products
2008	<b>Prof. Markus Stoffel</b>	ETH Zurich, Zurich, Switzerland	Milestone discoveries on the development of diabetes
2007	<b>Prof. Joachim Herz</b>	University of Texas, Dallas, USA	Uncovering novel functions for lipoprotein receptors
2006	<b>Prof. Alois Fürstner</b>	MPI für Kohlenforschung, Mülheim an der Ruhr, Germany	Identification of the molecular structure of many relevant glycolipids using metal catalysed methodology
2005	<b>Prof. Helen H. Hobbs</b>	University of Texas, Dallas, USA	Genetic Factors Contributing to Cholesterol Accumulation and Atherosclerosis
2004	<b>Prof. Roger Nicoll</b>	University of California San Francisco, USA	Role of endogenous cannabinoids as neurotransmitters
2004	<b>Prof. Raphael Mechoulam</b>	Hebrew University Jerusalem, Israel	Chemistry and Biochemistry of Cannabis and Endocannabinoids
2003	<b>Prof. David J. Mangelsdorf</b>	University of Texas, Dallas, USA	Nuclear receptors as lipid sensors
2002	<b>Prof. Stephen O’Rahilly</b>	Addenbrook’s Hospital, Cambridge, UK	Insights into molecular mechanisms in human obesity and insulin resistance
2001	<b>Prof. Felix Wieland</b>	University of Heidelberg, Germany	The mechanism of the formation of transport vehicles
2000	<b>Prof. Lewis Clayton Cantley</b>	Harvard Institutes of Medicine, Boston, USA	Signalling ligands and the discovery of the phosphoinositide-3-kinase pathway
1999	<b>Prof. Ernst Heinz</b>	University of Hamburg, Germany	Genetical modification of the biosynthesis of plant membrane and reserve lipids – possible importance for human nutrition
1998	<b>Prof. Thomas E. Willnow</b>	Max Delbrück Center for Molecular Medicine, Berlin, Germany	Characterisation of LDL receptor gene family in transgenic animal models
1997	<b>Prof. Bruce M. Spiegelman</b>	Dana-Farber Cancer Institute, Boston, USA	PPAR $\gamma$ and the Transcriptional Basis of Adipogenesis

# HEINRICH WIELAND LAUREATES 1964–2014

<b>Year</b>	<b>Laureate</b>	<b>Affiliation (time of award)</b>	<b>Achievement</b>
1996	<b>Prof. Jeffrey M. Friedman</b>	The Rockefeller University, New York, USA	Leptin, Lipatosis, and the Control of Body Weight
1995	<b>Prof. Jean E. Schaffer</b>	Massachusetts Institute of Technology, Cambridge, MA, USA	A Novel Adipocyte Long Chain Fatty Acid Transport Protein
1995	<b>Prof. Dennis E. Vance</b>	University of Alberta, Edmonton, Canada	Phosphatidylethanolamine N-Methyltransferase – Unexpected Findings from Curiosity Driven Research
1994	<b>Prof. Joachim Seelig</b>	University of Basel, Switzerland	Lipids in biological membranes – more than a simple piece of fat!
1993	<b>Prof. Walter Neupert</b>	University of Munich (LMU), Munich, Germany	Protein transport across the membranes of mitochondria
1992	<b>Prof. Lev D. Bergelson</b>	Russian Academy of Sciences, Moscow, Russia	Glycolipids and Antitumor Immunity
1991	<b>Prof. Jan L. Breslow</b>	The Rockefeller University, New York, USA	Apolipoprotein Genes and Atherosclerosis
1991	<b>Prof. Wolfgang J. Schneider</b>	University of Vienna, Austria	Lipoprotein Receptors in Oocyte Growth
1990	<b>Prof. James E. Rothman</b>	Princeton University, New Jersey, USA	Enzymology of Intracellular Membrane Fusion
1990	<b>Prof. Karel W.A. Wirtz</b>	Rijksuniversiteit Utrecht, Netherlands	Phospholipid Transfer Proteins: From Lipid Monolayers to Cells
1989	<b>Prof. Ching-Hsien Huang</b>	University of Virginia, Charlottesville, USA	Asymmetric Phospholipids and Interdigitated Bilayer Systems
1988	<b>Prof. Lawrence C.B. Chan</b>	Department of Cell Biology and Medicine, Houston, USA	Apolipoprotein Multigene Family: Structure, Expression, Evolution, and Molecular Genetics
1987	<b>Prof. Akira Endo</b>	Tokyo Noko University, Tokyo, Japan	Chemical, Biochemical and Pharmacological Studies of Cholesterol-Lowering Drugs Inhibiting HMG-CoA Reductase
1987	<b>Prof. Dietrich Keppler</b>	German Cancer Research Center (DKFZ), Heidelberg, Germany	Metabolism and analysis of leukotrienes
1986	<b>Prof. Eugene P. Kennedy</b>	Harvard Medical School, Boston, USA	Metabolism and Function of Membrane Lipids
1985	<b>Prof. Guy Ourisson</b>	Université Louis Pasteur, Strasbourg, France	From petroleum to the evolution of biomembranes: the Hopanoides, a new class of bacterial lipids
1984	<b>Priv.-Doz. Olaf Adam</b>	University Hospital, Munich, Germany	Nutrition physiological investigations with specific diets: The metabolism of poly unsaturated fatty acids and the prostaglandin
1984	<b>Prof. Gerhart Kurz</b>	University Freiburg, Germany	Investigations on the transcellular transport of cholic acids using photo affinity labeling



# HEINRICH WIELAND LAUREATES 1964–2014

<b>Year</b>	<b>Laureate</b>	<b>Affiliation (time of award)</b>	<b>Achievement</b>
1983	<b>Prof. John. M. Dietschy</b>	University of Texas, Dallas, USA	The Regulation of Cholesterol Balance Across the Differentiated Tissues of the Whole Animal
1982	<b>Prof. Hansjörg Eibl</b>	MPI for Biophysical Chemistry, Göttingen, Germany	Phospholipids as functional components of biological membranes
1982	<b>Prof. Robert William Mahley</b>	San Francisco General Hospital, San Francisco, USA	Apolipoprotein E and Cholesterol Metabolism
1981	<b>Prof. Bengt Samuelsson</b>	Karolinska Institute, Stockholm, Sweden	Leukotrienes: Novel Mediators in Allergy and Inflammation
1980	<b>Prof. H. Bryan Brewer</b>	National Institutes of Health, Bethesda, USA	Molecular Structure and Metabolism of Human Apolipoproteins and Lipoproteins
1980	<b>Prof. Barry Lewis</b>	St. Thomas' Hospital, Medical School, London, UK	Genes and Nutrition in the Regulation of Plasma Lipoprotein Metabolism
1979	<b>Prof. Konrad Sandhoff</b>	University of Bonn, Germany	Lipid-protein-interactions: mechanisms of enzymatic glycolipid degradation and its genetic caused deregulations
1978	<b>Prof. Olga Stein</b> <b>Prof. Yechezkiel Stein</b>	Hadassah University Hospital, Jerusalem	Interaction of Lipoproteins with Cellular Components of the Arterial Wall
1977	<b>Priv.-Doz. Gerd Assmann</b>	Medical University Hospital, Cologne, Germany	On the pathophysiology of the Tangier disease
1977	<b>Prof. Helmut K. Mangold</b>	Federal Institute for Lipid Research, Münster, Germany	Synthesis and biosynthesis of alkoxylipids
1976	<b>Prof. Dietrich Seidel</b>	Medical University Hospital, Heidelberg, Germany	Origine and structural properties of Lipoprotein X, an abnormal lipoprotein in cholestasis
1976	<b>Prof. Eckhart Schweizer</b>	University Erlangen-Nürnberg, Erlangen, Germany	Biosynthesis and structure of the fatty acid synthetase complex in yeast
1975	<b>Priv.-Doz. Ernst Ferber</b>	MPI of Immunology, Freiburg, Germany	Phospholipid metabolism in stimulated Lymphocytes: The activation of membrane bound Acyl-Co A: lysolecithin, acyltransferases
1975	<b>Priv.-Doz. Klaus Resch</b>	Heidelberg University, Germany	Phospholipid metabolism in stimulated lymphocytes: The importance of the plasma membrane for the cell activation
1974	<b>Prof. Michael S. Brown</b> <b>Prof. Joseph L. Goldstein</b>	University of Texas, Dallas, USA	Lipoprotein Receptors and the Genetic Control of Cholesterol Metabolism in Cultured Human Cells
1973	<b>Prof. Shosaku Numa</b>	Kyoto University, Kyoto, Japan	Regulation of lipid formation in the animal: Relationships to diabetes
1972	<b>Priv.-Doz. Heiner Greten</b>	Medical University Hospital, Heidelberg, Germany	Metabolism and function of human plasma lipoproteins
1972	<b>Prof. Kurt Oette</b>	Medical University Hospital, Cologne, Germany	Experimental investigations on lipid metabolism using human liver biopsies

# HEINRICH WIELAND LAUREATES 1964–2014

Year	Laureate	Affiliation (time of award)	Achievement
1971	<b>Prof. Laurens L.M. van Deenen</b>	Rijksuniversiteit, Utrecht, Netherlands	Chemistry of Phospholipids in Relation to Biological Membranes
1970	<b>Priv.-Doz. Christian Bode</b> <b>Priv.-Doz. Harald Goebell</b>	Medical University Hospital, Marburg, Germany	Pathogenesis of acute fatty liver induced by alcohol and other liver diseases caused by alcohol
1969	<b>Prof. Werner Seubert</b>	University Göttingen, Germany	On the mechanism of mitochondrial fatty acid synthesis and pathological ketone body formation
1968	<b>Prof. David Adriaan van Dorp</b>	Unilever Research Laboratories, Vlaardingen, Netherlands	On the biosynthesis and synthesis of prostaglandins
1967	<b>Priv.-Doz. Heinrich Wagener</b> <b>Dr. Bruno Frosch</b>	Medical University Hospital, Heidelberg, Germany	Methods and results of the quantitative determination of conjugated cholic acids in serum during liver diseases
1966	<b>No award</b>		
1965	<b>Priv.-Doz. Wilhelm Stoffel</b>	University of Cologne, Germany	Biosynthesis of unsaturated fatty acids and mechanism of oxidation of these acids
1964	<b>Prof. Ernst Klenk</b>	University of Cologne, Germany	First award presented, also honouring his lifetime achievements

## MEDALS IN GOLD:

**Prof. Nepomuk Zöllner**, University of Munich, (LMU), Germany (2008)

**Prof. Karl Decker**, University of Freiburg, Germany (2005)

**Prof. Theodor Wieland**, MPI for Medical Research, Heidelberg, Germany (1995)

**Prof. Gotthard Schettler**, Medical University Hospital, Heidelberg, Germany (1989)

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# HEINRICH WIELAND

**Heinrich Otto Wieland** was born on July 4, 1877, in Pforzheim, a small town in southern Germany. Wieland studied chemistry at the Ludwig Maximilian University in Munich (LMU), Germany, where he received his doctorate in 1901 and was appointed “außerordentlicher Professor” in 1909. At this time he was already interested in oxidation processes in the living cell, one of the foundation stones of the field of biochemistry. He worked at the Technical University of Munich and the LMU until 1921, with a two-year stint at the Kaiser Wilhelm Institute in Berlin-Dahlem. In 1921, he accepted a call to the University of Freiburg, but returned to the LMU in 1925 to succeed Richard Willstätter as Chair of Chemistry. He retired in 1952 and died in Munich on August 5, 1957.

Heinrich Wieland received numerous awards, including the Goethe Medal for Art and Science, the Otto Hahn Prize of the Society of German Chemists (GDCh), and the Order of Merit. He was also elected a member of various scientific societies. In 1927 he was awarded the Nobel Prize in Chemistry for his pioneering investigations of bile acids and related substances.

Heinrich Wieland and his brother Hermann Wieland, a pharmacologist and professor in Königsberg, were the cousins of Helene Boehringer, who was married to Albert Boehringer, the founder of the company Boehringer Ingelheim. In 1915, the company and the Wieland brothers started a close cooperation, which two years later resulted in the company founding its first scientific department dedicated to innovative research. This department had just four employees. Out of this small seed, planted in the early 1920s, grew Boehringer Ingelheim’s pharmaceutical research and development activities. The scientific findings of the Wieland brothers made it possible, for example, to produce bile acid, the basis for manufacturing drugs for the treatment of cardiovascular diseases. Heinrich Wieland also isolated and analyzed the alkaloid lobeline from the Indian tobacco plant (*Lobelia inflata*). Starting in 1921, an extract from the plant was sold as a respiratory analeptic under the name Lobelin®. In honour of Wieland’s contribution to its research activities, the company named its first research building after him in 1938.



# 2014 HEINRICH WIELAND PRIZE

## BOEHRINGER INGELHEIM FOUNDATION

The Boehringer Ingelheim Foundation is an independent, non-profit organization committed to the promotion of the medical, biological, chemical, and pharmaceutical sciences. It was established in 1977 by Hubertus Liebrecht (1931–1991), a member of the shareholder family of the company Boehringer Ingelheim. With the Plus 3 Perspectives Programme and the Exploration Grants, the foundation supports independent junior group leaders. It also endows the internationally renowned Heinrich Wieland Prize as well as awards for up-and-coming scientists. In addition, the foundation will donate 100 million euros over a period of ten years to finance the scientific running of the Institute of Molecular Biology (IMB) at the University of Mainz. In 2013, the Boehringer Ingelheim Foundation donated a further 50 million euros to the University of Mainz.



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