



Coverpage:  
Prof. Dr. Emmanuelle Charpentier received the Hansen Family Award 2015 in honor of her groundbreaking development of CRISPR/Cas9 – a powerful biotech tool for genome editing.

Foto: Hallbauer & Fioretti



Hansen Family Award Winner 2015 Emmanuelle Charpentier



## Science For A Better Life

Bayer Science & Education Foundation  
Kaiser-Wilhelm-Allee 1, 51373 Leverkusen  
Germany

[www.bayer-foundations.com](http://www.bayer-foundations.com)

Program Management:

Fon: 0049 214 30 46848

Fax: 0049 214 30 34893

Email: [foundationoffice@bayer-stiftungen.de](mailto:foundationoffice@bayer-stiftungen.de)

# BAYER FOUNDATIONS SCIENCE AWARDS

# PIONEERS IN SCIENCE & SOCIETY COMMITMENT TO PROGRESS



More information at:  
[www.bayer-foundations.com](http://www.bayer-foundations.com)

## Bayer Foundations – Partner of Pioneers Since 1897

The Bayer Foundations have been acting as catalysts for societal progress and frontier innovations ever since Friedrich Bayer Junior laid the basis for first activities in 1897. Today, two corporate foundations support pioneers all around the globe in six program areas ranging from frontier science to social innovation in health and agriculture related topics.

The **Bayer Science & Education Foundation** supports frontier research, talent development and science education in three program areas:

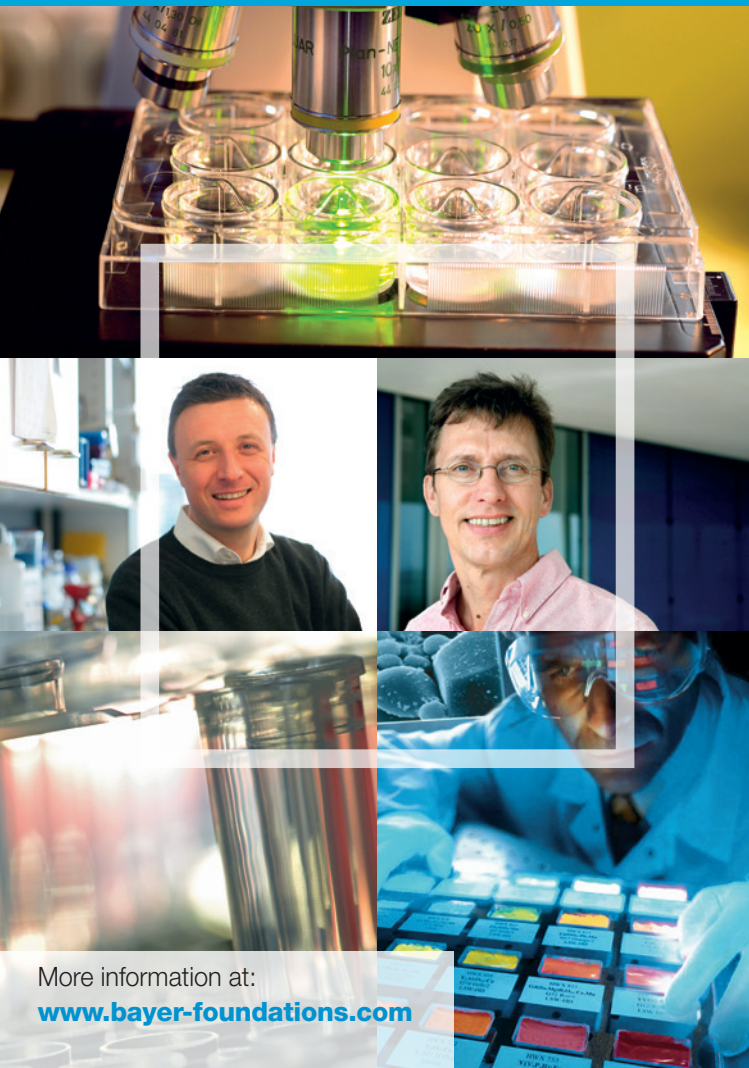
- In the **Science@School program** the foundation promotes science teachers who carry the spirit of innovation into the classroom and make young people feeling the fascination of sciences.
- In the **Bayer Fellowship program** the foundation enables outstanding talents to undertake out-of-the-box international study and research projects in scientific areas related to health and agriculture.
- With **Science Awards** the foundation honors frontier research and supports rising stars in life sciences, chemistry and medicine.

Along with the scientific programs of the **Bayer Science & Education Foundation**, the **Bayer Cares Foundation** supports new solutions for societal challenges related to health and agriculture. The focus is on passionate people who are closing gaps in society through volunteer work and social innovations. In addition, the foundation is engaged in relief and reconstruction projects following natural disasters.

**Both foundations share Bayer's ultimate goal: improving human life through innovation.**

# SCIENCE AWARDS

## WORLD TALENTS & FRONTIER RESEARCH



More information at:

[www.bayer-foundations.com](http://www.bayer-foundations.com)

### Science Awards: World Talents & Frontier Research

Frontier research is the foundation for future success in a technology based society. For this reason, the Bayer Science & Education Foundation presents two prestigious **scientific excellence awards**:

- The **Otto Bayer Award** for frontier research in innovative areas of chemistry and biochemistry (founded 1984), and
- the **Hansen Family Award** for outstanding research work related to medical science and medicine (founded 2000).

Both awards are among the most prestigious scientific awards within the German-speaking world. The presentation is every two years in alternation. Both awards come with a prize money of €75,000.

Two **talent awards** for upcoming research scientists complement the program in order to promote outstanding research work at an early career stage:

- The international **Bayer Early Excellence in Science Award** is presented in three categories (Biology, Chemistry, Medical Sciences) with a prize money of €10,000 each.
- The **Bayer Thrombosis Research Award** is presented for basic and clinical thrombosis research with a prize money of €30,000 every second year.

**All Bayer awards** are based on the premise that scientific pioneers deserve recognition and appreciation for their important work achievements. In addition, the foundation rewards scientific excellence with the aim to raise acceptance for technology in a broader public, and to make science and medicine more popular.



# OTTO BAYER AWARD



## FRONTIER RESEARCH IN CHEMISTRY & BIOCHEMISTRY

The **Otto Bayer Award** was founded in 1984 in memory of Prof. Otto Bayer, the inventor of polyurethane chemistry and long-standing head of research at Bayer.

The foundation presents the Otto Bayer Award to scientists in German-speaking countries for pioneering frontier research in **innovative fields of chemistry and biochemistry**, particularly in the following areas:

- Organic chemistry
- (Bio-)Catalysis
- Green biotechnology
- Genetic engineering
- Molecular biology
- Plant physiology
- White biotechnology

The foundation is particularly looking for frontier research with the potential to drive scientific progress for the long-term benefit of society.

The Otto Bayer Award is one of the most sought-after scientific awards in Germany. It carries a prize money of €75,000 and its presentation is every two years in alternation with the Hansen Family Award.

### *The Benefactor Otto Bayer*

*The Otto Bayer Award was established by one of the most successful researchers in the field of chemistry through a provision in his will: Prof. Otto Bayer (1902 to 1982), who was the director of research at Bayer AG for many years. Prof. Bayer joined the company in 1933. Although he was only 32 years old at that time, and the youngest member of the team, he soon succeeded in making a name for himself: His greatest achievement was ultimately the invention of polyurethane chemistry. He influenced the development of this versatile family of plastics for many years until his death at the age of nearly 80.*



More information at:

[www.bayer-foundations.com](http://www.bayer-foundations.com)

# WINNERS OF THE OTTO BAYER AWARD

**1984** Prof. Dr. Gerhard Wegner  
**MATERIAL SCIENCE**



In honor of his outstanding achievements in the field of polymer science and to support his future scientific research. The award thus recognizes his internationally leading work on structural property relationships in polymers, and also his findings with regard to the importance of interdisciplinary research for the further development of polymer science and techniques as well as the importance of cooperation between industry and universities.

**1985** Prof. Dr. Heinz Saedler  
**PLANT GENETICS**



In honor of his outstanding achievements in the field of plant genetics, particularly for the isolation in plants of so-called "transposable elements" and the analysis of their behavior at the molecular level. The application of "transposable elements" in the isolation and regulation of genes is a fundamental prerequisite for genetic engineering in plants.

**1985** Prof. Dr. Jozef St. Schell  
**PLANT GENETICS**



In honor of his outstanding achievements in the field of plant genetics, particularly for the development of a transfer and expression mechanism for new genetic information in plant cells. This provided a vital basis for developmental biology, plant-molecular biology and plant breeding.

**1985** Prof. Dr. Klaus Hahlbrock  
**PLANT GENETICS**



In honor of his outstanding achievements in the field of plant genetics, particularly for explaining the biochemical and molecular mechanisms with which plants are able to defend themselves against disease pathogens. This provided fundamental knowledge on resistance breeding in plants.

**1986** Prof. Dr. Horst Kessler  
**NMR TECHNIQUES**



In honor of his outstanding achievements in the field of dynamic stereochemistry and particularly for the development of two-dimensional NMR spectroscopy for conformation analysis and its use in bioactive molecules such as peptides. This method is an efficient alternative to X-ray structure analysis in conformation.

**1986** Prof. Dr. Manfred Reetz  
**ORGANOMETALLICS**



In honor of his outstanding achievements in the field of organic synthesis with organometallic compounds, and particularly for the development of stereoselective synthesis methods. These processes have provided crucial impulses to conventional organic chemistry and are now widely used in natural substance synthesis.

**1987** Prof. Dr. Arndt Simon  
**MATERIAL SCIENCE**



In honor of his outstanding work in the field of solid state research, with regards to cluster chemistry questions. Using special synthesis and analysis methods, he succeeded in gaining key insight into the general structural principles and properties of the analyzed systems.

**1987** Prof. Dr. Martin Jansen**MATERIAL SCIENCE**

In honor of his outstanding achievements in the field of solid state research – for the exploration of numerous oxidic and particularly binary systems. Partly through new preparatory methods, he succeeded in exploring and comprehensively characterizing previously unknown or insufficiently described products.

**1988** Prof. Dr. Johann Deisenhofer**PHOTOSYNTHESIS RECEPTORS**

In honor of his outstanding achievements in explaining the three-dimensional structure of the photosynthetic reaction center of the purple bacterium *Rhodospseudomonas viridis*. These findings have drawn tremendous international acclaim, providing key impulses both to research into other membrane proteins and to photosynthesis research (Nobel Prize in chemistry 1988).

**1988** Prof. Dr. Hartmut Michel**PHOTOSYNTHESIS RECEPTORS**

In honor of his outstanding achievements in explaining the three-dimensional structure of the photosynthetic reaction center of the purple bacterium *Rhodospseudomonas viridis*. These findings have drawn tremendous international acclaim, providing key impulses both to research into other membrane proteins and to photosynthesis research (Nobel Prize in chemistry 1988).

**1989** Prof. Dr. Helmut Schwarz**ORGANIC SYNTHESIS/REACTION MECHANISMS**

In honor of his outstanding achievements in the field of organic mass spectrometry – for explaining the decomposition of low-energy organic ions in the gas phase and the elementary processes that take place in this connection. By combining a wide variety of techniques, he succeeded in determining the structures of unusual rearrangement products through experiment and calculation.

**1990** Prof. Dr. Wolfgang A. Herrmann**CATALYSIS**

For his outstanding achievements in the field of synthesis and the characterization of transition metal complexes. By opening up new preparative methods, he also provided model compounds for stoichiometric and catalytic reactions that are of great importance in understanding the fundamental steps that take place on catalyst's surfaces.

**1990** Prof. Dr. K. Peter C. Vollhardt**ORGANIC SYNTHESIS**

In honor of his outstanding achievements in the field of organometallic synthesis, and particularly for the systematic expansion of cobalt-mediated [2+2+2] cycloaddition. He succeeded in using the high selectivity of this reaction to display theoretically interesting molecules and for the total synthesis of complex natural substances.

**1991** Prof. Dr. Martin Quack  
**PHYSICAL CHEMISTRY**



In honor of his outstanding achievements in the field of intramolecular molecular dynamics and kinetics – for new approaches in connection with the theory of unimolecular processes and with the mechanism for infrared photochemistry, as well as for taking into account dynamic aspects in high-resolution spectroscopy. In this way he provided key impulses for understanding elementary chemical reactions.

**1992** Prof. Dr. Herbert Jäckle  
**DEVELOPMENTAL BIOLOGY**



In honor of his outstanding achievements in the field of developmental biology. His molecular-biological characterization of the first segmentation genes active in the *Drosophila* embryo and their interplay as the basis for further pattern formation led to embryological insight of fundamental importance.

**1992** Prof. Dr. Christiane Nüsslein-Vollhard  
**DEVELOPMENTAL BIOLOGY**



In honor of her outstanding achievements in the field of developmental biology. Her groundbreaking analysis of the pattern formation mutants of the fruit fly *Drosophila* played a key role in explaining the genetic steering of embryonic development (Nobel Prize in physiology or medicine 1995).

**1993** Prof. Dr. François Diederich  
**ORGANIC SYNTHESIS**



In honor of his outstanding achievements in connection with molecular identification using cyclophane-type receptors and with the chemistry of low-molecular and polymeric carbon allotropes and carbon-rich compounds, for which he enabled widespread and fundamentally new preparative access.

**1993** Prof. Dr. Dieter Hoppe  
**ORGANIC SYNTHESIS**



In honor of his outstanding achievements in the development of extraordinarily effective and practical methods for enantio- and diastereoselective active substance synthesis based on carbanion chemistry in connection with chiral identification through supramolecular interactions. The synthesis building blocks he created represent fundamentally new developments and provide solutions for previously unresolved synthetic problems.

**1994** Prof. Dr. Robert Schlögl  
**CATALYSIS**



In honor of his outstanding achievements in the field of heterogeneous catalysis. His research into the characterization of the microstructure of industrial catalysts' enabled surface-physical analyses with model systems that are of elementary importance for understanding catalytic processes.

**1995** Prof. Dr. Gerhard Erker  
**ORGANIC SYNTHESIS**



In honor of his outstanding achievements in the field of organometallic chemistry. His research particularly into organozirconium chemistry led to the implementation of mechanistic concepts in reactions of preparatory importance for organic chemistry and polymer chemistry. Also of fundamental importance are his analyses of the elementary steps of important organometallic reactions with respect to the reactivity behavior and mechanism.

**1998** Prof. Dr. Ulrich Koert  
**ORGANIC SYNTHESIS**



In honor of his outstanding achievements in the field of preparative chemistry. The stereoselective synthesis of oligotetrahydrofurans enables the buildup of complex molecular structures. Embedded in membranes, such structures enable the simulation and study of natural phenomena such as sodium or potassium transport in ion channels.

**1995** Prof. Dr. Paul Knochel  
**ORGANIC SYNTHESIS**



In honor of his outstanding achievements in the field of organometallic chemistry. His research particularly into functionalized zinc and copper organyles provided astoundingly simple solutions for many reactivity and chemoselectivity problems. In this way, he opened up new and efficient synthesis paths to polyfunctional molecules that were previously difficult to access by traditional means.

**1998** Prof. Dr. Carsten Bolm  
**CATALYSIS**



In honor of his outstanding achievements in the field of preparative chemistry. As a result, the spectrum of enantioselective reactions – particularly as regards aspects of oxidation and carbon-carbon linkages – has been expanded to include a wide range of new chiral ligands, thus considerably broadening knowledge about asymmetric metal catalysis.

**1996** Prof. Dr. Stefan Jentsch  
**UBIQUITINYLATION**



In honor of his outstanding achievements in the field of cell biochemistry. Based on his molecular biological analyses on the makeup of the ubiquitin proteasome system in yeasts, his research led to the conclusion that the systematic breakdown of protein is vital and of critical regulative importance for the organism of all living things, including humans.

**2001** Prof. Dr. Herbert Waldmann  
**CHEMICAL BIOLOGY**



In honor of his outstanding achievements in the field of bioorganic chemistry. By combining organic chemistry and biological methods, he developed important findings on signal transduction in cells that make an important contribution to the understanding of these highly complex biological processes.



**2003** Prof. Dr. Christian Griesinger  
**NMR TECHNIQUES**



In honor of his outstanding achievements in the field of magnetic resonance spectroscopy. The method he developed for three-dimensional magnetic resonance spectroscopy enabled the identification of highly complex protein structures. This in turn has made possible important findings on the function of enzymes and key contributions to understanding biological activity in cells.

**2006** Prof. Dr. Alois Fürstner  
**ORGANIC SYNTHESIS**



In honor of his outstanding work in the field of organo-metallic chemistry, including especially catalysis research and its application in the production of complex natural substances. At the focus of these activities are extensive studies on the metathesis of alkenes and alkynes, and the development of new concepts for homogeneous catalysis. The breakthroughs achieved here enable elegant total synthesis of numerous natural substances such as macrolides, alkaloids and glycoconjugates.

**2008** Prof. Dr. Thomas Carell  
**DNA RESEARCH**



In honor of his outstanding work on understanding the development of damage to deoxyribonucleic acid – particularly through UV light – and DNA repair processes, development of cancer and aging processes. These research findings could have tremendous practical significance, for example in the detection of chemical compounds as mutagens, and the analysis of resistance development in drugs whose mode of action – as with many cancer treatments – is based on an interaction with the DNA.

**2010** Prof. Dr. Dettlef Weigel  
**PLANT GENETICS**



In honor of his outstanding contributions to the understanding of molecular-biological principles governing the variability of plants. His results in genome research enhance the predictability of the responses from crop plants to rapid environmental changes, and thus help to understand how apparent genetic disadvantages might become advantages under changing environmental conditions. This understanding will accelerate the use of green genetic engineering in crop science technologies and agricultural strategies.

**2012** Prof. Dr. Benjamin List  
**ORGANOCATALYSIS**



In honor of his outstanding achievements in the field of organocatalysis. Around 80 percent of all chemical products are manufactured with the help of catalyst, making processes efficient and help to save resources. List's work on enamine catalysis and symmetric counteranion directed catalysis (ACDC) opens up a new path towards more sustainable chemistry.

**2014** Prof. Dr. Frédéric Merkt  
**MOLECULAR SPECTROSCOPY**



In honor of his outstanding contributions in Molecular Spectroscopy and the characterization of highly-electronically excited atoms and molecules by high-resolution spectroscopic and XUV laser technology developments. The work of Prof. Merkt made significant contributions to the understanding of the basic chemical structure, bonding and physical behavior of molecules and ions, and to the investigation of unusual properties in high molecular Rydberg states.

**2016** Prof. Dr. Dirk Trauner  
**PHOTOPHARMACOLOGY**



In honor of pioneering contributions in Photopharmacology and Chemical Optogenetics. Trauner developed novel synthetic photoswitches that can sensitize a wide variety of cellular receptors toward light. His work has potential to open new chemotherapeutical treatment opportunities, including chemical treatment strategies to cure blindness and cancer.

# HANSEN FAMILY AWARD

## FRONTIER RESEARCH IN MEDICAL SCIENCES & MEDICINE



The **Hansen Family Award** was launched in 2000 by Prof. Kurt Hansen – former Chairman of the Board of Management and Supervisory Board of Bayer AG.

The foundation presents the Hansen Family Award with prize money of €75,000 to scientists in German-speaking countries for pioneering research in scientific areas related to **medical science and medicine**, particularly in the following fields:

- Medicinal chemistry
- Human genetics
- Active substance research
- Red biotechnology
- Genetic engineering
- Cell physiology
- Structural biology
- Bioinformatics

The foundation is particularly looking for frontier research with the potential to drive innovation in medicine for the long-term benefit of patients.

The foundation presents the award every second year in alternation with the Otto Bayer Award.

### *The Benefactor Prof. Kurt Hansen*

*Prof. Kurt Hansen, who served as Chairman of the Board of Management of Bayer AG from 1962 to 1974, was the driving force for a large expanding of Bayer's international position, particularly outside of Europe. For the natural scientist and certified management assistant, support for research in the fields of science and medicine, was of central importance for the long-term success of the company.*

Prof. Dr. Stefan W. Hell received the Hansen Family Award 2011 in honor of his breakthroughs in the field of light microscopy (Nobel prize 2014 in chemistry).



More information at:

[www.bayer-foundations.com](http://www.bayer-foundations.com)

# WINNERS OF THE HANSEN FAMILY AWARD

**2000** Prof. Dr. Dr. Thomas Jürgen Jentsch  
**ION CHANNELS**



In honor of his outstanding achievements in the field of molecular neurobiology. He was the first to clone the gene for a voltage-dependent chloride channel from the electric organ of the electric ray, thereafter expanding his research to include human ion channels. Here he was able to demonstrate that certain hereditary diseases are caused by changes in ion channels. This in turn revealed new therapeutic approaches for these and other diseases.

**2002** Prof. Dr. Ralf Baumeister  
**ALZHEIMER'S MECHANISM**



In honor of his outstanding achievements in Alzheimer's disease research. The presenilin 1 and 2 genes were characterized and their function explained in cell culture models and transgenic mice, as well as with the help of the nematode *Caenorhabditis elegans*. These genes enable the proteolytic generation of the beta-amyloid peptide, which is responsible for the formation of amyloid plaques. This research revealed new approaches for the treatment of Alzheimer's disease.

**2002** Prof. Dr. Christian Haass  
**ALZHEIMER'S MECHANISM**



In honor of his outstanding achievements in Alzheimer's disease research. The presenilin 1 and 2 genes were characterized and their function explained in cell culture models and transgenic mice with the help of the nematode *Caenorhabditis elegans*. These genes enable the proteolytic generation of the beta-amyloid peptide, which is responsible for the formation of amyloid plaques. This research revealed new approaches for the treatment of Alzheimer's disease.

**2005** PD Dr. Rüdiger Klein  
**NERVE GROWTH**



In honor of his outstanding achievements in the field of neurobiology. His multifaceted and outstanding research into the development of the nervous system resulted in important findings on known and new nerve growth factors and their intracellular signal transduction paths. Understanding of these processes is of tremendous importance for the complex interaction between biological cells during the development of organisms, and thus serves as the basis for new therapeutic approaches.

**2007** Prof. Dr. Magdalena Götz  
**NEUROBIOLOGY**



In honor of her outstanding achievements in the field of neurobiology. Through her multifaceted and outstanding research, she found that radial gliacells are not fully mature supporting cells, but rather can themselves develop into highly differentiated neurons and display the self-regeneration characteristic of stem cells. These findings revolutionized the conventional wisdom and are of central importance for new approaches to treating brain injuries and diseases.

**2009** Prof. Dr. Patrick Cramer  
**GENETIC RESEARCH**



In honor of his outstanding research into the dynamic processes of gene transcription and regulation. His research has played a key role in explaining the structure and function of cellular RNA polymerase, thus opening up completely new methods for understanding the molecular mechanisms of gene regulation, the elementary process of life.

**2011** Prof. Dr. Stefan W. Hell  
**LIGHT MICROSCOPY**



In honor of his breakthroughs in the field of light microscopy that provide insights into living cells and tissue that were inconceivable before. With his invention and development of Stimulated Emission Depletion (STED) microscopy, Hell revolutionized fluorescence microscopy and was the first person to find a way of radically overcoming the light microscope's resolution barrier of 200 nanometers as established by Ernst Abbe in 1873 (Nobel Prize in chemistry 2014).

2013

Prof. Dr. Hans-Georg Rammensee  
**CANCER IMMUNOLOGY**



In honor of his pioneering contributions in cancer immunotherapy. Through active immunization of cancer patients with synthetic “tumor-associated” peptides, Prof. Rammensee was able to demonstrate the importance of personalized medicine, tailor-made to the specific genetic constellation of a tumor disease. This opens up new opportunities for the treatment of cancer patients by activating the body’s immune system – an important contribution to medical progress.

2015

Prof. Dr. Emmanuelle Charpentier  
**GENOME EDITING**



In honor of her pioneering contributions in harnessing the ancient immune defense system of bacteria – called CRISPR/Cas9 – into a powerful biotech tool which can cut any DNA at any desired position by designing the appropriate guide-RNA. This is an ingenious development with enormous impact on all life science areas.

2017

Univ.-Prof. Dr. med Matthias H. Tschöp  
**DIABETES/OBESITY**



For paradigm shifting discoveries about gut-brain communication pathways related to hunger signals. His pioneering combination of physiology research with human biology and peptide-based pharmacology has led to break-through discoveries resulting in multiple novel drug candidates with unprecedented potential to stop the worldwide obesity and type-2-diabetes pandemic.

2017

Prof. Dr. Jens Brüning  
**DIABETES/OBESITY**



For groundbreaking insights into the physiology of insulin action and the pathophysiology of insulin resistance. His fundamental discoveries about the role of insulin action in the CNS and his research on systemic feeding control signals and obesity-induced deregulation pathways paved the ground for novel treatment options in obesity and type-2-diabetes mellitus.

# BAYER EARLY EXCELLENCE IN SCIENCE AWARD

## The Bayer Early Excellence in Science Award – World Talents in Science

The international **Bayer Early Excellence in Science Award** was launched in 2009 in order to encourage the work of promising **research talents in sciences** at an early stage of their academic career.

The award is presented annually with a prize money of €10,000 in each of the following three categories:

- Biology
- Chemistry
- Medical sciences

Suitable candidates have accomplished their PhD not longer than five years ago, and they should have a proven track record of creativity and research excellence, with significant contributions already made in their distinguished fields of science.



More information at:

[www.bayer-foundations.com](http://www.bayer-foundations.com)



# WINNERS OF THE BAYER EARLY EXCELLENCE IN SCIENCE AWARD

**2009** Dr. Jürgen Groll  
**MATERIALS**



In recognition of his outstanding contributions to the development of new types of biocompatible polymeric hydrogels. The new hydrogels enable more targeted drug transport and controlled release in target tissues, thereby facilitating lower dosages of drugs and helping to reduce their side effects.

**2009** Prof. Dr. Tobias Ritter  
**CHEMISTRY**



In recognition of his detailed investigations into fluorination reactions. His new method of integrating fluorine highly selectively in aromatic substances by mild and simple means is a significant advance for active ingredient research in medicinal chemistry and crop protection.

**2009** Dr. Noriyuki Nishimura  
**BIOLOGY**



In recognition of his outstanding contributions to the identification and characterization of specific stress hormone receptors in plants. These receptors ensure that plants are better able to survive stress conditions such as drought. The work of Dr. Nishimura greatly facilitates the ability to discover new ways to ensure food supplies for a growing world population.

**2010** Dr. Andreas Walther  
**MATERIALS**



For the development of innovative, pearlescent biomimetic materials that exhibit impressive properties in terms of their mechanical stability and flame retardance. This makes them very interesting for use in maritime, aviation and aerospace applications.

**2010** Prof. Dr. Nicolai Cramer  
**CHEMISTRY**



For the developments of new catalytic organometallic reactions for activation of carbon-hydrogen and carbon-carbon bonds. With his research he contributes to the field of production of complex active and natural substances.

**2010** Prof. Dr. Oliver Daumke  
**BIOLOGY**



In recognition of his contributions to the understanding of the structure and function of GTP-binding (G) proteins. G proteins can act as molecular switches that control growth signals in biological cells. Other G proteins function as molecular motors that deform cellular membranes. Prof. Daumke investigates the differences and similarities between these two classes of G proteins.

**2011** Dr. Cristobal Uauy  
**BIOLOGY**



For outstanding research contributions in the area of crop genetics. Among a number of high-class achievements, Cristobal Uauy cloned the first QTL (Quantitative Trait Locus) in wheat, he identified a resistance gene against wheat yellow rust pathogen, and he is very active in the translation of basic research results into applied crop breeding. His scientific work provides the basis for a powerful new toolkit for improved crop productivity, and thus opens the horizon for new strategies in wheat breeding.

**2011** Prof. Dr. Arne Thomas  
**MATERIALS**



For outstanding research contributions in the area of functional materials. The work of Arne Thomas discloses new pathways for the synthesis of highly porous materials. These materials provide new solutions for long unsolved technical challenges, because their properties can be adapted to a wide range of applications, e.g. for gas storage, catalysis support, purification and separation purposes, for column chromatography and ion exchange, and as insulation material.

**2011** Dr. Andreas Bender  
**CHEMISTRY**



For outstanding research work in the field of cheminformatics and the development of new prediction models for drug properties. The work of Andreas Bender discloses new opportunities for a better prediction of modes of action of drugs with in-silico methods, and thus promotes the efficient development of pharmaceutical products on the road from the idea to an optimized drug candidate.

**2012** Dr. Christiane Opitz  
**BIOLOGY**



For outstanding contributions to the understanding of the relevance of the tryptophan metabolism in cancer biology. Together with her team she discovered the first endogenous ligand for the aryl hydrocarbon receptor (AHR) which is involved in promoting tumor growth and suppressing anti-tumor immune responses. This discovery could enable the development of drugs which are expected to inhibit the malignant phenotype of cancer cells and restore anti-tumor immunity.

**2012** Dr. Nuno Maulide  
**CHEMISTRY**



For developing new routes to synthesize highly functional small ring molecules. These molecules are excellent starting points for various active ingredients or natural products. By developing new synthetic methods beyond well-established chemical reactions the Maulide group has discovered unprecedented new phenomena and introduced novel concepts in the field of asymmetric catalysis to be used in all Life Sciences.

**2012** Dr. Volker Presser  
**MATERIALS**



For outstanding research on novel nanomaterials that can be used in energy storage and transformation technologies. The work of his team focuses on the development of super- and pseudocapacitors using state-of-the-art methods like electrospinning and atomic layer deposition. Volker Presser's research contributes substantially to advancing the technologies urgently needed for efficient large-scale use of renewable energies and for energy storage.

**2013** Prof. Dr. Abigail Doyle  
**CHEMISTRY**



For the development of novel nickel-catalyzed cross-coupling reactions and the identification of new reagents and strategies for catalytic nucleophilic (radio) fluorination. The work of Abigail Doyle is of high relevance for the application in drug discovery, agro science and material research.

**2013** Dr. Javier Fernández  
**MATERIALS**



For outstanding contributions in materials engineering. Javier Fernández has developed in particular a new biologically inspired material, called "Shrilk", that replicates the exceptional capabilities of one of nature's most exceptional materials – insect cuticle. This is a milestone in material design and of high relevance in many applications, including biocompatible packaging and tissue engineering

**2013** Dr. Steven Spoel  
**BIOLOGY**



For outstanding contributions in gene function research. The work of Steven Spoel has led to a better understanding of how living cells translate environmental signals into changes in gene expression. This knowledge is of high relevance for the understanding of gene expression mechanisms in human, animal and plant cells, and thus likewise important for cancer research, animal health and crop breeding.

**2015** Prof. Cigall Kadoch MD  
**BIOLOGY**



For outstanding contributions in understanding and targeting human cancers driven by aberrant chromatin regulators, including the discovery of the mechanism of human synovial sarcoma. One of her most significant findings is that high mutation frequency is present in genes involved in chromatin biology-based processes.

**2015** Prof. Dr. Tanja Gaich  
**CHEMISTRY**



For the development of a novel method for efficient synthesis of polycyclic natural products from plants and microorganisms – which play an important role in novel drug development strategies.

**2015** Dr. med. Marie-Luise Berres  
**MEDICAL SCIENCES**



For outstanding contributions to a better understanding of the pathogenetic role of Langerhans Cell in Histiocytosis, a barely understood hematological disorder with incidence similar to acute myelogenous leukemia and a mortality rate of 20–40% in high risk patients (mostly children).

**2016** Dr. Christopher Aylett  
**BIOLOGY**



For outstanding research on structural studies to understand the machinery of cellular signalling – his work contributes largely to explain the function of a protein complex implicated in cancer, obesity and neurodegeneration.

**2016** Dr. Bill Morandi  
**CHEMISTRY**



For outstanding contributions in green catalysis – particularly his work on novel methods for a sustainable transformation of hydrocarbons and polyols into high-value building blocks is of high relevance in many areas of medicine and materials science.

**2016** Dr. Theresa Bunse  
**MEDICAL SCIENCE**



For outstanding work in the field of tumor immunotherapy – particularly for her contributions towards the development of mutation-specific vaccines for patients with gliomas.

# BAYER THROMBOSIS RESEARCH AWARD

## The Bayer Thrombosis Research Award – Talents in Medical Sciences

The **Bayer Thrombosis Research Award** honors talents in science and medicine for outstanding achievements in **basic and clinical thrombosis research**. The current focus is particularly on the promotion of diagnosis, prevention and therapy of thromboembolic diseases (including epidemiology and health policy approaches).

Suitable candidates are either working in German-speaking countries, or have completed major parts of their scientific training in the German-speaking world, and they should have finished their PhD not longer than five years ago. The award is presented every second year with a prize money of €30,000.

### *The Benefactors of the Award*

*The Bayer Thrombosis Research Award was launched in 2011 by support from the Bayer scientists Dr. Frank Misselwitz, Dr. Dagmar Kubitzka and Dr. Elizabeth Perzborn. The three scientists won the Deutscher Zukunftspreis for the invention of the anticoagulant Xarelto®, and they have donated their prize money of €250,000 for the benefit of a new talent development award: the Bayer Thrombosis Research Award. Bayer matched the donation by an equal installment.*

# WINNERS OF THE BAYER THROMBOSIS RESEARCH AWARD

**2013**

Dr. Krystin Krauel

**IMMUNE RESPONSES IN CARDIOVASCULAR DISEASES**



In recognition of her contributions to a better understanding of the interactions between thrombotic processes and immune defense mechanisms. Her work on the role of platelet factor 4 (PF4) in the antibacterial immune response system provided a new level of awareness about the pathophysiology of heparin-induced thrombocytopenia (HIT). Dr. Krauel was able to demonstrate that the binding capabilities of cytokine signaling molecule to bacteria is a significant cause for the immune-mediated adverse drug reaction HIT. This better understanding of HIT opens new horizons for patient treatment and prevention.

**2015**

Prof. Dr. Markus Bender

**PLATELET RECEPTOR RESEARCH**



In recognition of his work in the field of rare congenital blood platelet disorders in patients with Wiskott-Aldrich syndrome. Dr. Bender showed that the severe blood clotting and immune system disorders in patients suffering from this condition are attributable to a deficiency of the cytoskeleton-stabilizing protein profilin-1 in the precursor cells of blood platelets. This could open up new opportunities for the early detection and treatment of this severe illness in future.

**2017**

Dr. med. David Seiffge

**ANTICOAGULATION RISK MANAGEMENT**



For outstanding clinical research in the area of anticoagulation risk management. David Seiffge's innovative studies provide pioneer evidence for the clinical relevance of novel oral anticoagulants (NOACs) in stroke patients. Particularly his research on the bleeding risk of acute stroke patients taking NOACs and rapid availability of NOAC plasma levels to assess anticoagulant effect have potential to open new treatment opportunities with improved benefit-risk ratio for stroke patients.



# SCIENTIFIC COMMITTEES (I/II)

## Board of Trustees

Prof. Dr. Ernst-Ludwig Winnacker (Chair), FORMER MEMBER OF BAYER AG SUPERVISORY BOARD, CHAIRMAN OF BAYER FOUNDATION BOARD OF TRUSTEES

Prof. Dr. Wolfgang Plischke, MEMBER OF BAYER AG SUPERVISORY BOARD, MEMBER OF BAYER FOUNDATION BOARD OF TRUSTEES

Kemal Malik MD, MEMBER OF BAYER AG BOARD OF MANAGEMENT RESPONSIBLE FOR INNOVATION

Prof. Dr. Andreas Busch, MEMBER OF EXECUTIVE COMMITTEE AND HEAD OF RESEARCH BAYER AG, DRUG DISCOVERY PHARMACEUTICALS

Dr. Adrian Percy, GLOBAL HEAD OF RESEARCH & DEVELOPMENT AT BAYER CROPSCIENCE

## Board of Directors

Kemal Malik MD, MEMBER OF BAYER AG BOARD OF MANAGEMENT RESPONSIBLE FOR INNOVATION

Thimo V. Schmitt-Lord MBE, EXECUTIVE DIRECTOR OF THE BAYER FOUNDATIONS HEAD FOUNDATION & DONATIONS MANAGEMENT BAYER AG

## Jury OTTO BAYER AWARD

Prof. Dr. Ernst-Ludwig Winnacker (Chair), FORMER MEMBER OF BAYER AG SUPERVISORY BOARD, CHAIRMAN OF BAYER FOUNDATION BOARD OF TRUSTEES

Prof. Dr. Patrick Cramer, MAX PLANCK INSTITUTE FOR BIOPHYSICAL CHEMISTRY, GÖTTINGEN

Kemal Malik MD, MEMBER OF BAYER AG BOARD OF MANAGEMENT RESPONSIBLE FOR INNOVATION

Prof. Dr. Wolfgang Plischke, MEMBER OF BAYER AG SUPERVISORY BOARD, MEMBER OF BAYER FOUNDATION BOARD OF TRUSTEES

Dr. Adrian Percy, GLOBAL HEAD OF RESEARCH & DEVELOPMENT AT BAYER CROPSCIENCE

Prof. Dr. Ferdi Schüth, DIRECTOR AT THE MAX-PLANCK-INSTITUT FÜR KOHLENFORSCHUNG IN MÜLHEIM AN DER RUHR

Prof. Dr. Herbert Waldmann, DIRECTOR AT THE MAX PLANCK INSTITUTE FOR MOLECULAR PHYSIOLOGY IN DORTMUND, PROFESSOR OF BIOCHEMISTRY AT THE UNIVERSITY OF DORTMUND

Prof. Dr. Lothar Willmitzer, EXECUTIVE DIRECTOR AT THE MAX PLANCK INSTITUTE FOR MOLECULAR PLANT PHYSIOLOGY IN POTSDAM

## Jury HANSEN FAMILY AWARD

Prof. Dr. Ernst-Ludwig Winnacker (Chair), FORMER MEMBER OF BAYER AG SUPERVISORY BOARD, CHAIRMAN OF BAYER FOUNDATION BOARD OF TRUSTEES

Prof. Dr. Andreas Busch, MEMBER OF EXECUTIVE COMMITTEE AND HEAD OF RESEARCH BAYER AG, DRUG DISCOVERY PHARMACEUTICALS

Prof. Dr. Thomas Carell, PROFESSOR OF ORGANIC CHEMISTRY, INSTITUTE FOR CHEMISTRY AND PHARMACY OF LUDWIG MAXIMILIAN UNIVERSITY MUNICH

Dr. Gert Hansen, REPRESENTATIVE OF THE FAMILY OF THE BENEFACTOR

Prof. Dr. Herbert Jäckle, DIRECTOR AT THE MAX PLANCK INSTITUTE FOR BIOPHYSICAL CHEMISTRY IN GÖTTINGEN, VICE PRESIDENT OF THE MAX PLANCK SOCIETY

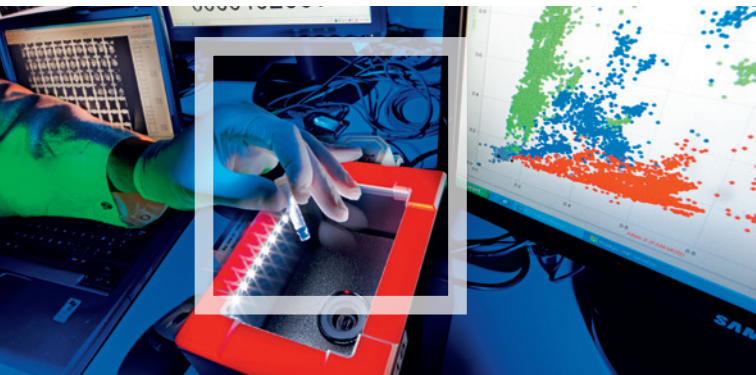
Prof. Dr. Martin Lohse, CHAIR OF THE BOARD AND SCIENTIFIC DIRECTOR OF MAX-DELBRÜCK CENTER, BERLIN

Kemal Malik MD, MEMBER OF BAYER AG BOARD OF MANAGEMENT RESPONSIBLE FOR INNOVATION

Prof. Dr. Hartmut Michel, DIRECTOR AT THE MAX PLANCK INSTITUTE FOR BIOPHYSICS IN FRANKFURT AM MAIN, PROFESSOR AT THE UNIVERSITY OF FRANKFURT, NOBEL PRIZE FOR CHEMISTRY (1988)

Prof. Dr. Wolfgang Plischke, MEMBER OF BAYER AG SUPERVISORY BOARD, MEMBER OF BAYER FOUNDATION BOARD OF TRUSTEES

Prof. Dr. med. Otmar D. Wiestler, PRESIDENT OF THE HELMHOLTZ ASSOCIATION IN BERLIN



# FOUNDATION COMMITTEES (II/II)

Space for notes

---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---



---

## Jury BAYER THROMBOSIS RESEARCH AWARD

(in alphabetic order)

Prof. Dr. Christoph Bode, MEDICAL DIRECTOR, DEPARTMENT OF INTERNAL MEDICINE III, CARDIOLOGY / ANGIOLOGY AT THE UNIVERSITY HOSPITAL FREIBURG

Prof. Dr. Michael Böhm, DIRECTOR OF THE DEPARTMENT OF INTERNAL MEDICINE III, CARDIOLOGY / ANGIOLOGY / INTERNAL INTENSIVE MEDICINE AT THE UNIVERSITY OF SAARLAND

Prof. Dr. Andreas Greinacher, DIRECTOR OF TRANSFUSION MEDICINE AT THE INSTITUTE OF IMMUNOLOGY AND TRANSFUSION MEDICINE, UNIVERSITY HOSPITAL OF THE ERNST-MORITZ-ARNDT UNIVERSITY, GREIFSWALD

Dr. Dagmar Kubitzka, PRICE FOUNDER / HEAD CLINICAL PHARMACODYNAMICS, CLINICAL PHARMACOLOGY, CARDIOVASCULAR, PRIMARY CARE AT BAYER PHARMACEUTICALS

Prof. Dr. Edelgard Lindhoff-Last, HEAD OF ANGIOLOGY AND HEMOSTASIS AT VASCULAR CENTER OF THE MEDICAL CLINIC III, JOHANN WOLFGANG GOETHE-UNIVERSITÄT IN FRANKFURT

Kemal Malik MD, MEMBER OF BAYER AG BOARD OF MANAGEMENT RESPONSIBLE FOR INNOVATION

Dr. Frank Misselwitz, PRIZE FOUNDER / VICE PRESIDENT & HEAD TA CARDIOLOGY, COAGULATION OF BAYER PHARMACEUTICALS

Prof. Dr. Bernhardt Nieswandt, DFG RESEARCH CENTER FOR EXPERIMENTAL BIOMEDICINE AT THE RUDOLPH VIRCHOW CENTER, UNIVERSITY OF WÜRZBURG

Dr. Elisabeth Perzborn, PRICE FOUNDER