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Dear Anniversary Guests,

Bavaria has taken the lead as top location for science and innovation in Germany and enjoys a great reputation and respect worldwide. This success has been made possible by the excellence of the Bavarian research environment with first-rate universities, industrial research centers, and extramural research.

The four large German extramural research organizations, globally known as Max Planck Society, Helmholtz Association, Fraunhofer Society and Leibniz Association cover a broad science spectrum that is unsurpassed in the world. It ranges from the most advanced basic research, applied research, and modern science combining the life sciences, technology, medicine and biology in multi-disciplinary centers, to the research activities of German museums. All scientific institutes of the mentioned organizations have clearly defined and well-developed management structures, they perform to the highest scientific standards, and they establish the required networks to meet today's challenges.

Therefore, the Free State of Bavaria greatly expanded the publicly funded research institutes. Thanks to the follow-up financing as part of the program to advance technological and scientific developments, the German Federal Government now provides at least half and

sometimes even up to 90 percent of the funding. This facilitates the solid long-term funding of the scientific institutes by the German Government.

Welcome to the members, alumni and friends of the new Leibniz-Institute for Food Systems Biology at the Technical University of Munich (Leibniz-LSB@TUM)! The scientific performance ability of the institute with its progressive research agenda in the areas of food, nutrition and health greatly enhances the economic and innovation potential of Bavaria. The work of the institute will stimulate the advancement of Bavaria as economic powerhouse through its ability to collaborate with leading regional, national, and international companies. Yet more advantages flow out of the close interactions with researchers at the TUM.

The State Government of Bavaria supports the successful advancement of the Leibniz-Institute vigorously. As a bold example, the Bavarian Ministry of Economic Affairs, Energy and Technology funds the institute with the project 'Task Force – Integrative Food Research 2018 – 2020'. Supported with a total of EUR 16.7M, the Leibniz-Institute will kick-start its new strategic orientation towards 'Food Systems Biology' while enhancing their equipment

infrastructure to an internationally competitive level. The plan also includes constructing a new research building to provide office and lab space adequately matching the needs of cutting-edge research.

The measures are integrated in the overall plan of the Free State of Bavaria to advance the topic 'Food for Healthy and Tasty Nutrition'. Hence, we are very pleased that Professor Hofmann has been appointed new Director of the Leibniz-Institute. With his outstanding scholarship, he is going to give the institute a clear scientific profile and international distinction. In his role as Director of the Leibniz-Institute, Chair of the TUM Department of Food Chemistry and Molecular Sensory Science, and Senior Vice President for Research and Innovation at the Technical University of Munich, Professor Hofmann has a truly collaborative spirit and is an expert in bridging academic and extramural research. Therefore, I am grateful to the President Professor Dr. Dr. hc. mult. W. Herrmann and President Professor Dr. Matthias Kleiner for strengthening the relationship between the Technical University of Munich and the Leibniz Association.



State Minister
Franz Josef Pschierer

Dear Students, Colleagues, Alumni, Friends and Esteemed Guests

Thank you for joining us as we celebrate the 100th anniversary of the 'Leibniz-Institute for Food Systems Biology at the Technical University of Munich'.

Less than a year ago, on 15th September 2017, the institute arose from its progenitor, the 'Deutsche Forschungsanstalt für Lebensmittelchemie' (German Research Center for Food Chemistry), which was established in April 1918. Under the leadership of its founding director Professor Dr. Dr. Theodor Paul, the initial mission of the institute was to create new knowledge helping to alleviate the effects of war-induced food shortages and to improve nutrition for the population.

Ever since the institute's birth 100 years ago, the challenges in the agro-food-nutrition sector have been changing, today ranging from resource sustainability of food production via affordable, healthy and tasty food all the way up to public health. More than ever, this invites the Leibniz-Institute to operate as an international thought leader in food and nutrition science and technology.

As complex challenges can only be tackled by fostering diversity in thinking, the new Leibniz-Institute has developed far beyond the scientific core competence of food chemistry. Chemists, biologists,

bioengineers, nutritionists, informaticians and mathematicians collaborate in cross-functional teams to decode the complex food ingredient systems on a molecular level. Together, we are striving to systemically understand the functional interplay of single components in complex foodborne mixtures contributing to the acceptance, health and nutritional needs, as well as sensory preferences of people. By means of new technology and machine learning tools, we are aiming to modulate and predict the action of such functional systems of effector molecules on human biology. Our research on chemoreception along the axis 'mouth/nose – gastrointestinal tract – blood cells' targets new sustainable solutions to improve aroma and taste perception of foods by natural modulating systems. It ranges all the way down to the action of odorants and tastants as immune stimulants and the epigenetic programming of blood cells. And by means of our research on food hypersensitivities, we want to contribute to less dietary restrictions for people suffering from food intolerances and, therefore, to an increased quality of life.

What started small in 1918 plays 100 years later in the international top league: the Leibniz-Institute stands for pioneering new ways of thinking. Our research agenda is driven by curiosity, the experimental work designed by creativity and executed with expert

skills and craftsmanship. Our international reputation is built on the diversity of talented people performing impactful research ranging from fundamentally new insights in food, nutrition and health all the way up to their translation into industrial applications. It is also documented by the many successful alumni careers marking the reputation that our talented PhD graduates and Postdocs are receiving from academia and industry.

Therefore, I am proud and delighted to celebrate this very special birthday together with you - our alumni, research partners, friends and supporters! My warm-hearted welcome goes also to all scientific, technical, and administrative personnel: thanks for your trust in these times of change and for your passion and engagement in taking ownership when designing the future of the Leibniz-Institute.

Thomas Hofmann
Director



Thomas Hofmann studied food chemistry at the University of Erlangen-Nürnberg, received his PhD (1995) and habilitation (1998) at the Chemistry Department of the Technical University of Munich (TUM), and was appointed as the Chair of Food Chemistry of the University of Münster in 2002. Since 2007, he has been full professor for Food Chemistry and Molecular Sensory Science at TUM and since 2009 Senior Vice President Research & Innovation of TUM. As chairman, he successfully initiated the Knowledge & Innovation Community EIT FOOD of the European Institute of Technology in 2016 and, since 2017, is member of the EIT FOOD Board of Directors. In 2017, he was appointed as Director of the new Leibniz-Institute for Food Systems Biology at TUM. He received numerous scientific awards, is editor-in-chief of the Journal of Agricultural and Food Chemistry (ACS), served on the Scientific Advisory Board of the Medical & Health Services of the German Federal Ministry of Defence and chairs the Education & Science Committee of the Economic Advisory Council of Bavaria.

Guests of Honor with Anniversary Addresses

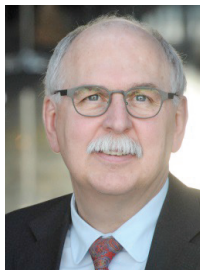
State Minister Franz Josef Pschierer



Franz Josef Pschierer was born on July 01, 1956 in Haunstetten (Bavaria, Germany). He studied political and social sciences at the University of Augsburg (1978 - 1983). From 1984 to 1986, Franz Josef Pschierer worked as public relations specialist for the Chamber of Crafts for the region of Schwaben in Augsburg before taking a position at the Deutsche Handwerks Zeitung (Newspaper of the German Chamber of Industrial Crafts) in 1986. At this newspaper, he held the position of vice editor-in-chief from 1989 to 1994. In 1994, he started his political career as Member of the Bavarian Parliament. Since 1996, Franz Josef Pschierer is also county councilor of Unterallgäu County (Germany). From 2003 to 2008, he was Chairman of the Committee of Economic Affairs, Infrastructure, Transport and Technology.

After his appointments as State Secretary in the Bavarian Ministry of Finance (2008 - 2013) and as IT Officer of the Bavarian State Government (2009), he was a member of the Bavarian Cabinet under Horst Seehofer. Between 2013 and 2018, he held the position of the State Secretary in the Bavarian Ministry of Economic Affairs and Media, Energy and Technology. In March 2018, Prime Minister Markus Söder called on Franz Josef Pschierer to join his cabinet. Currently, Franz Josef Pschierer is the Bavarian State Minister of Economic Affairs, Energy and Technology. He also serves as executive committee member of his political party.

Prof. Dr.-Ing.
Matthias Kleiner



Matthias Kleiner studied mechanical engineering at the University of Dortmund and obtained his doctorate and habilitation in the field of forming technology. In 1994, he joined the faculty of the newly founded Brandenburg Technical University of Cottbus as Professor of Forming Technology. In 1997, he was awarded the Gottfried Wilhelm Leibniz Prize and followed an offer of the TU Dortmund in 1998 as the head of the Chair of Forming Technology. From 2004 to 2006, he served as managing director of the newly established Institute of Forming Technology and Lightweight Construction. Matthias Kleiner has played an instrumental role in a number of international and interdisciplinary research projects and research networks and serves in various professional committees and academies. He is co-founder of Science Europe and the Global Research Council. Matthias Kleiner was elected President of the German Research Foundation (DFG) from 2007 to 2012. As of July 2014, Matthias Kleiner is President of the Leibniz Association.

Prof. Dr. Dr. h.c. mult.
Wolfgang A. Herrmann



Wolfgang A. Herrmann studied chemistry at the Technical University of Munich (TUM) and obtained the diploma degree in the group of Professor E. O. Fischer. Following his doctorate and his postdoctorate at the Pennsylvania State University, he acquired the habilitation at the University of Regensburg where he was appointed Associate Professor in 1979. He received a full professorship in Frankfurt/Main in 1982 and took over the Chair of Inorganic Chemistry at TUM from Professor E. O. Fischer in 1985. Since 1995, Wolfgang A. Herrmann has been serving as President of TUM. Under his forward-thinking leadership, TUM was among a small number of universities singled out under the German Excellence Initiative in 2006 and again in 2012. He is one of the most frequently cited German chemists, winner of the Gottfried Wilhelm Leibniz Prize in 1987 and received numerous awards and honors like the Bavarian Maximilian Order for Science and Art in 2012 as well as 13 honorary doctorates.

Prof. Dr.
Monika Pischetsrieder



Monika Pischetsrieder studied food chemistry at the Ludwig-Maximilians-Universität München, from where she also received her PhD (1994) and habilitation (1999). From 1994 to 1995, she was postdoctoral fellow at the Case Western Reserve University in Cleveland, Ohio, USA and from 1997 to 2000 Visiting Assistant Professor at the Columbia University, New York, USA. In 1999, she was appointed as Associate Professor for Food Chemistry and 2004 as Full Professor for Food Chemistry at the Friedrich-Alexander-University Erlangen-Nürnberg. She received several scientific awards and serves the scientific community in various functions. For example, she was elected to the review board of the DFG and is currently member of the scientific advisory board of the Federal Ministry of Food and Agriculture. Since 2011, she has been serving as board member and since 2014 as chairwoman of the Society of Food Chemistry (LChG) of the Gesellschaft Deutscher Chemiker (GDCh).

Key Note Speakers

Prof. Dr. Markus Herderich



Markus Herderich studied food chemistry at the University of Würzburg, from where he received also his PhD. After his habilitation at the University of Würzburg, he has been the Group Manager Research at The Australian Wine Research Institute (AWRI) since 2004. Markus Herderich is also Affiliate Professor at the University of Adelaide, member of the Executive Management Group of Metabolomics Australia (MA), Director of the Australian Wine Industry Technical Conference Inc. (AWITC), Graduate of the Australian Institute of Company Directors (GAICD) and an Expert at the Organisation Internationale de la Vigne et du Vin (OIV). His primary research interests comprise aroma chemistry, natural product chemistry, analytical chemistry and metabolomics. Markus Herderich has authored or co-authored more than 130 peer-reviewed publications and book chapters.



Prof. Dr. Harry J. Klee

Harry Klee received his PhD in biochemistry from the University of Massachusetts. After his postdoctoral research at the University of Washington, he worked as a research scientist at Monsanto Company in St. Louis Missouri (1984 - 1995). Since 1995, he followed an offer of the University of Florida on an endowed chair in the Horticultural Sciences Department. His major research interest focuses on the molecular understanding of the chemical and genetic make-up of "flavor" in fruits and vegetables. His research targets the identification of the key genes that control synthesis of flavor volatiles and the application of this knowledge in plant breeding. Harry Klee is a Fellow of the American Association for the Advancement of Science, a member of the U.S. National Academy of Sciences, and the current president of the American Society of Plant Biologists.



Prof. Dr. Jan A. Delcour

Jan Delcour studied food science and technology at KU Leuven where he received his PhD in 1985. He was a Nato Research Fellow at Kansas State University in 1988. In 1991 he founded the Laboratory of Food Chemistry at KU Leuven and became Full Professor at the same university in 1997 where he now heads the same laboratory which in the mean time is named Laboratory of Food Chemistry and Biochemistry. His research focuses on cereals, their constituents and applications in biotechnological processes. He was co-founder of the spinout company Fugeia. He is chairman of the Leuven Food Science and Nutrition Research Centre (LForCe) and serves as a board member of the University's technology transfer office. Since 2017, he is a member of the Supervisory Board of the Knowledge and Innovation Community EIT FOOD of the European Institute of Technology (EIT). He is an ISI 'Highly Cited Author' and the recipient of many awards including the Bertebos Prize of the Swedish Royal Academy of Agriculture and Forestry and the Osborne Medal of AACC International.



Sean Westcott

Sean Westcott gained a Bachelor of Applied Science in Food Technology and an MBA in Australia. After joining Uncle Tobys in Australia in 1994, he joined Nestlé via acquisition in 2006 taking him to Switzerland, the USA and he currently lives and works in Germany, at the Nestlé Product Technology Centre for Food. Sean Westcott is the VP for R&D for Food (Culinary) in Nestlé, and his career has taken him around the world. He has experienced the diversity of the food industry, particularly culinary, in many contexts. His career has focused on inspiring innovation through science and technology. His approach is guided by what he has learned during his career:

- Food must be respected as it transcends nourishment. Cuisine is culture, it brings people together, enriches relationships and transmits values, while providing nutrition, health and wellness
- Innovation is fundamental to address the challenges in our lives and our communities and create sustainable growth in the food industry
- Science must support nature, and technology should be applied carefully to enhance and improve the intrinsic qualities of food.



Prof. Dr. Fred Brouns

Fred Brouns studied sports sciences in Amsterdam and Brussels, followed by bio-medical sciences at Maastricht University. After receiving his PhD in Human Exercise Nutrition Physiology (Maastricht Univ., 1987), he had several R&D leadership positions (1987 - 2008): Wander dietetics-NL, Sandoz Nutrition-CH, Novartis Nutrition-CH, Eridania Beghin Say-BE, Cerestar-BE, and Cargill Inc-USA. At present, he is emeritus professor "Health Food Innovation" at Maastricht University and leads the international project "Well on Wheat" addressing gluten and wheat sensitivity. His research is focused on health and disease challenges with regards to whole grains, dietary fibers, carbohydrates, and sweeteners. He received the Dutch Sports Medicine Award for Tour de France studies, the Award of Federation Internationale du Médecin et Sport, Cargill Innovation Awards, and the Golden Award – Health Ingredients Europe. He chairs various expert panels like IDACE Paris, ILSI Europe, and Dutch Academy Nutritional Sciences. He is member of the Nutrition Society UK and the Dutch Academy of Nutritional Sciences, fellow of the American College of Sports Medicine, European College of Sports Sciences, Cereal Sciences Academy, and was fellow-of-the-year of the Intern. Soc. of Cereal Sciences in 2015.

Prof. Dr. Timothy S. McClintock



Timothy McClintock received his MS (1984) from Florida State University, his PhD (1989) from the University of Florida, and did postdoctoral training at Yale University and the Howard Hughes Medical Institute. He joined the University of Kentucky in 1994, was named University Research Professor in 2002, and a full professor in 2004. As today, he is the Louis Boyarsky Professor of Physiology at the University of Kentucky College of Medicine. He is renowned for his work on odorant receptors, on the cell and molecular biology of the olfactory epithelium, and for service to his profession. He is an Executive Editor for the journal Chemical Senses. He has been both President (2011) and Program Chair of the Association for Chemoreception Sciences (2004), and received this organization's Young Investigator Award (2000). He served as chairman of the Membership and Chapters committee for the Society for Neuroscience (2005 - 2008) and is a founding member of the International Society of Neurogastronomy (2015).

PD Dr. Evelyn Lamy



Evelyn Lamy studied environmental sciences and toxicology at the University of Trier. From 2005 to 2007, she received a PhD research scholarship from the Hessen State Ministry of Higher Education Research and the Arts and completed her PhD in Human Biology at the Faculty of Medicine, University of Giessen, in 2008. From 2009 to 2015 she gained further training in toxicology (DGPT), was supported by a Margarete-von-Wrangell fellowship (2010 - 2015), and received the habilitation in 2015 in the field of Experimental Medicine at the Faculty of Medicine, University of Freiburg. Since 2008, she is heading the research group "Molecular Preventive Medicine" at the University Medical Center Freiburg. She has been a Guest Editor for the International Journal of Environmental and Molecular Mutagenesis (2007 - 2009), and founded in 2011 "SciNet", an interdisciplinary network of early-career researchers at the University of Freiburg, which she chaired from 2012 to 2014 as the spokesperson.

Actors of the Science Slam

Dr. Anastasia August



At age 17, Anastasia August immigrated to Germany from Kazakhstan. After qualifying for university entrance in 1998, she studied mathematics and physics for a teaching degree and mathematics for a diploma at the University of Bayreuth. Anastasia August earned her doctoral degree at the KIT Mathematical Institute. Currently, she works at the Institute for Applied Materials - Computational Materials Science (IAM-CMS) in the field of computer-aided materials research. The research team around Anastasia August uses computer-aided simulations to develop and investigate new materials.

Presentation title:

Wärme speichern wie ein Bär
(Storing heat like a bear)



Dr. Florian Buhr

After an undergraduate degree in Biochemistry, Florian Buhr went on to investigate novel aspects of cellular protein production and folding for his PhD from Goethe-University Frankfurt. Since 2016, he is a postdoctoral researcher at the Centre for Misfolding Diseases at the University of Cambridge, where he focuses on the role of protein synthesis defects in neurodegenerative diseases, such as Huntington's and Alzheimer's disease. Since 2013, he has engaged in different formats of science communication, where he tends to speak about topics from food and protein science.

Presentation title:

Alzheimer und Flugzeugabstürze: Was machen wir falsch?
(Brain Crash Investigation: Are we looking at Alzheimer's wrong?)



Dr. Stefan Spreng

After finishing his studies in food chemistry, Dr. Stefan Spreng, born in 1988, concentrated for his doctorate on antioxidants in beer – which almost sounds like a cliché for a native Bavarian. Under supervision of Prof. Dr. Thomas Hofmann, he evolved at the TU Munich with a top-graded work into a specialist for instrumental analysis of taste and bioactive compounds. Nowadays, he applies his knowledge in the Aroma & Taste Modulation Group of the Nestlé Product Technology Center in Orbe (VD, Switzerland) to understand and master the flavor of beverages like coffee.

Presentation title:

Antifaltencreme für Bier gesucht
(Anti-wrinkle cream for beer wanted)



Dr. Sascha Vogel

Sascha Vogel got his PhD in physics in 2009 from the University of Frankfurt. After a post-doc stay in France he came back to Germany to coordinate the Graduate School of GSI. Since 2016 he is the Managing Director of the Frankfurt International Graduate School for Science at FIAS. In his spare time he started projects like „Physics in Hollywood“, „Wissenschaft zum Anfassen“ and is the founder of science birds (sciencebirds.de). His mission is to stimulate a conversation between scientists and society, thus his projects take place not only in universities and schools, but also at festivals, companies and stages throughout Germany.

Presentation title:

Physik in Hollywood
(Physics in Hollywood)

Musical Accompaniment of the Anniversary Symposium

Wind Ensemble of the Symphonic Ensemble of Munich

Musicians:

Lena Renken	flute 1
Claudia Geigner	flute 2
Florian Weber	oboe 1
Gerlinde Utsch	oboe 2
Philipp Wolfrum	clarinet 1
Tilman Röckel	clarinet 2
Elfriede Nietzsche	bassoon 1
Clara Neuhäuser	bassoon 2
Andreas Bernögger	horn 1
Daniel Scherer	horn 2
Vanessa Reußner	horn 3
Andreas Raupach	horn 4
Katharina Ruf	tuba

Conductor:

Prof. Felix Mayer

Music:

Richard Strauss (1864 – 1949)
Serenade for 13 Wind Instruments
in E flat, Op. 7



Live Music in the Evening

Showband Dolce Vita

Musicians (left to right):

Rudi Cornelissen	vocals, guitar
Hans Riedmaier	vocals, keyboard, trumpet
Gerd Schmitt	vocals, drums, moderation
Michael Riedmaier	vocals, bass, accordion, panpipe, and many other instruments
Dieter Aigner	vocals, keyboard, accordion



Program

Venue

Lecture hall HS14, Building 4214
Maximus-von-Imhof-Forum 6, 85354 Freising/Germany

8:30 am | Entry

9:00 am | Welcome Address

Prof. Dr. Thomas Hofmann
Director of the Leibniz-Institute for Food Systems
Biology at the Technical University of Munich

Musical Intermission

9:30 am | Anniversary Greetings

State Minister Franz Josef Pschierer
Bavarian State Ministry of Economic Affairs, Energy and
Technology

Prof. Dr.-Ing. Matthias Kleiner
President of the Leibniz Association

Prof. Dr. Dr. h. c. mult. Wolfgang A. Herrmann
President of the Technical University of Munich

Prof. Dr. Monika Pischetsrieder
Chair of the Executive Board of the Society of Food
Chemistry, Gesellschaft Deutscher Chemiker

Musical Intermission

10:20 am | Coffee Break

11:00 am | Scientific Key Notes

*50 Years of aroma chemistry: Lessons learned, myths
busted, challenges and opportunities ahead*

Prof. Dr. Markus Herderich
The Australian Wine Research Institute,
Glen Osmond, AU

*Fixing flavor in food plants: The chemical world linking
plant genomes to consumer preferences*

Prof. Dr. Harry J. Klee
Department of Horticultural Sciences,
University of Florida, USA

*Our daily bread: An exciting and socially relevant
research object*

Prof. Dr. Jan Delcour
Food Chemistry and Biochemistry,
University of Leuven, BE

*What new knowledge is needed to tackle the grand
challenges and unlock new opportunities in the food
industry?*

Sean Westcott
Head NPTC Food, Nestlé Research, Singen, DE

01:00 pm | Lunch Reception

02:00 pm | Scientific Key Notes

WHEAT – Good for most, bad for some: Composition, sensitivities & intolerances

Prof. Dr. Fred Brouns

Department of Human Biology,
Maastricht University, NL

Modifying perception via the odorant receptors

Prof. Dr. Tim McClintock

College of Medicine, University of Kentucky, USA

The taste of disease prevention: Bitter molecules in nutrition and medicine

PD Dr. Evelyn Lamy

Institute for Infection Prevention and Hospital
Epidemiology, Molecular Preventive Medicine,
Medical Center – University of Freiburg, DE

03:30 pm | Celebration Party at the Leibniz-Institute

04:00 pm Coffee & Cake

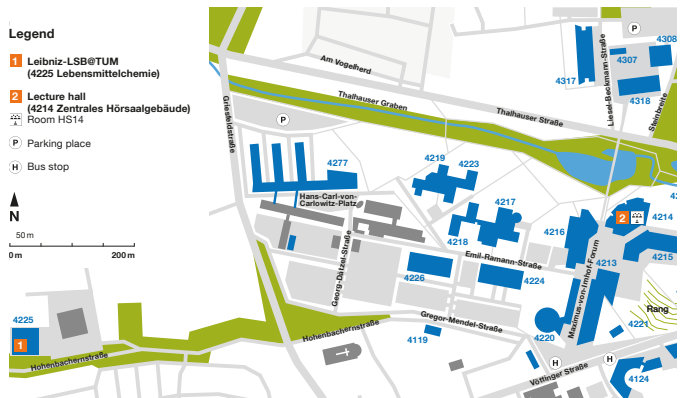
05:00 pm Science Slam

07:30 pm Dinner Reception

10:00 pm End of the Event

Live Music in the Evening | Dolce Vita

Venues



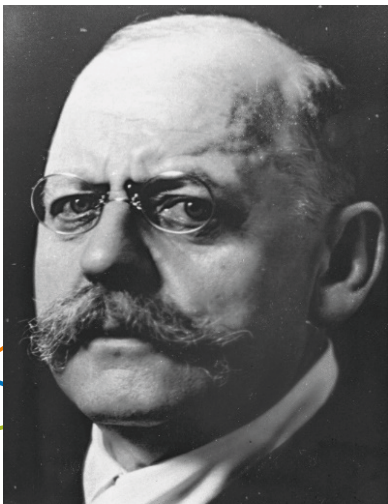
1918-2018

100
YEARS

Advancing science
for food & health



1918



Theodor Paul

*1862 – 1928

Spiritus Rector and Founding Director of the German Research Center for Food Chemistry

Initiated by food chemist and medical doctor Professor Dr. Dr. Theodor Paul, the Royal Bavarian House established on April 03, 1918, the German Research Center for Food Chemistry. In the same year, Theodor Paul was appointed as Founding Director of the institute.



The institute at No. 29 Karlstrasse, Munich-Maxvorstadt

The First Research Laboratories

Scientific work at the German Research Center for Food Chemistry took off in the premises of No. 29 Karlstrasse in Munich (Germany).

1918



First meeting of the Board of Trustees on July 31, 1918

Definition of the Research Agenda

In the first meeting of the Board of Trustees, Professor Dr. Dr. Theodor Paul (left) presented his vision on the future research of the institute. His research plans were focused on improving nutritional quality of food and understanding the principles of taste perception of organic acids and sweeteners.

The 1920s

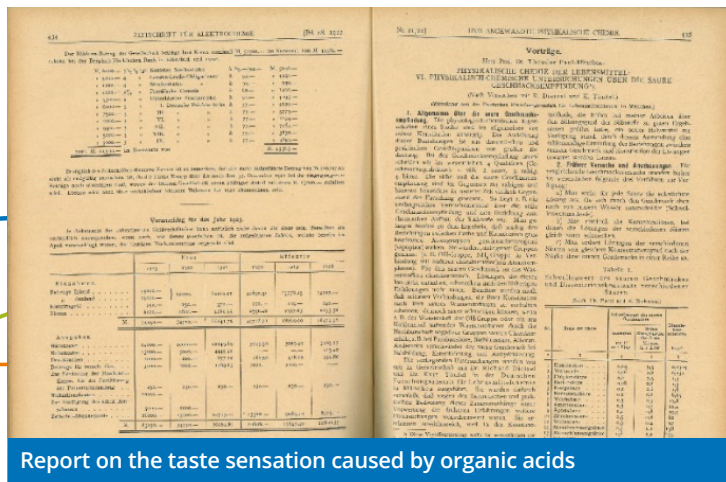


Sensory analysis of sweeteners in the institute's seminar room

The Origin of Taste Research

In the remaining twenty years of his career, Professor Dr. Dr. Theodor Paul explored structure-activity relationships of sour tasting organic acids in food and developed technologies for the de-acidification of wine. For the first time, he reported on the synergistic sweet taste sensation of the sweeteners dulcin and saccharin.

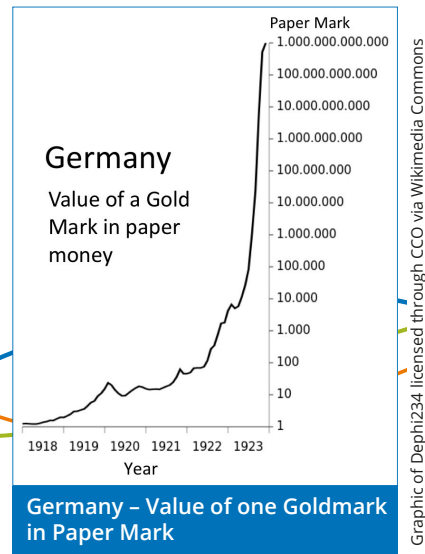
1922



Seminal Results on the Sour Taste Sensation

By means of physico-chemical experiments, Professor Dr. Dr. Theodor Paul, Dr. Richard Dietzel and Dr. Kurt Täufel initiated a paradigm change in taste research. They demonstrated that the sour taste of organic acids depends not exclusively on the acid's dissociation constant as believed hitherto.

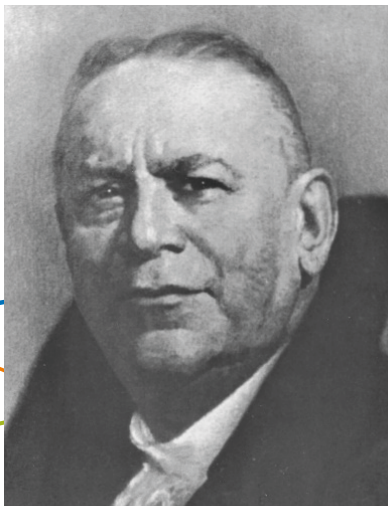
1923



Loss of the Foundation Assets

In 1923, the trust foundation assets got lost in course of the inflation. In the following, the German Research Center for Food Chemistry became associated with the University Laboratory of Applied Chemistry of the Ludwig-Maximilian-University of Munich.

1929



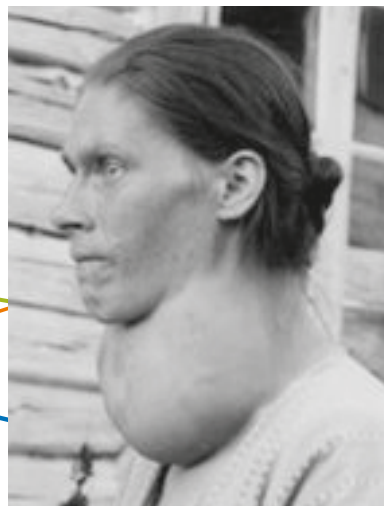
Benno Bleyer

*1885 – 1945

The New Director

After Professor Dr. Dr. Theodor Paul passed away on September 30, 1928, Professor Dr. Benno Bleyer, Chair of Pharmaceutical and Food Chemistry at the Ludwig-Maximilian-University of Munich, was appointed on April 01, 1929 as the new Director of the institute.

1939

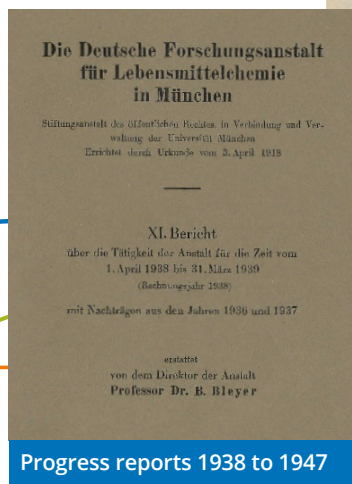


Iodine deficiency and goiter

New Research Focus

Under the leadership of Professor Dr. Benno Bleyer, the research activities of the institute were focused on alcoholic fermentation as well as on biochemical and physiological questions on plant- and animal-derived phosphatides, carbohydrates and lipids. For a better understanding of goiter development, he developed new micro-methods for quantitative iodine determination.

1944

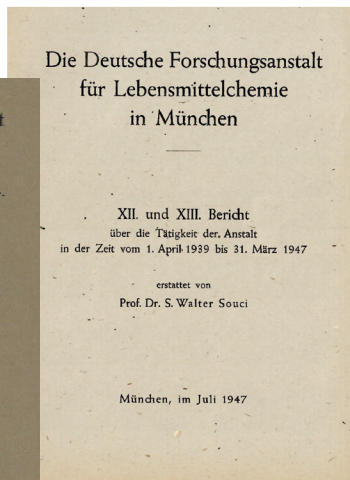


Progress reports 1938 to 1947

Hard Times after the War, but Research Went on!

In the Second World War, heavy airstrikes destroyed the laboratories and almost the entire property of the German Research Center. Professor Dr. Benno Bleyer passed away on November 24, 1945. In 1946, Professor Dr. Siegfried Walter Souci became the Provisional Director of the institute and resumed research activities in makeshift laboratories in Dachau, Nymphenburg and Schwabing.

1947

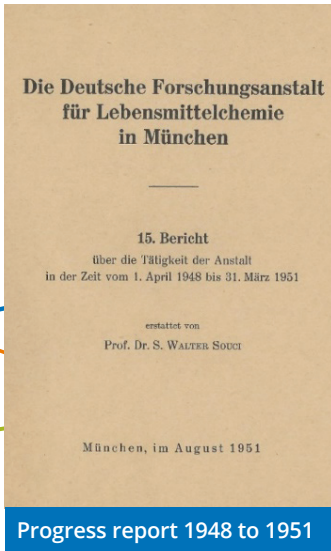


Siegfried Walter Souci *1904 – 1992

New Director Appointed

On July 16, 1947, Professor Dr. Siegfried Walter Souci was appointed as the new Director of the German Research Center for Food Chemistry. Until his retirement in 1968, he worked on food additives and the chemistry of water and balneology (hydrotherapy).

1948



Progress report 1948 to 1951

1951

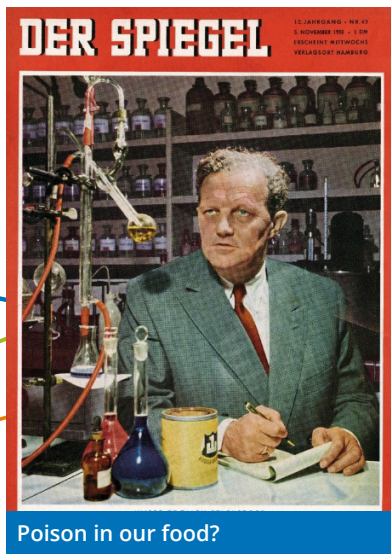


The institute moved into the new building at No.175 Leopoldstrasse, Munich-Schwabing

Continued Financing on Solid Ground

After the financial shortfalls caused by the Second World War, the funding of the institute regained its financial footing. At first, the Bavarian State Ministry for Education and Culture continued to finance the Research Center. Later, the Administration for Nutrition, Agriculture and Forestry of the United Economic Area and the German Federal Ministry of Nutrition, Agriculture and Forestry ensured the long-term survival of the institute.

1958



Draft to 'Amend the German Food Law' in the Lower House of the German Parliament

While the Lower House of the German Parliament discussed the draft to amend the food law, the German magazine DER SPIEGEL interviewed Professor Dr. Siegfried Walter Souci as expert for food additives and the analytical assurance of the food quality.

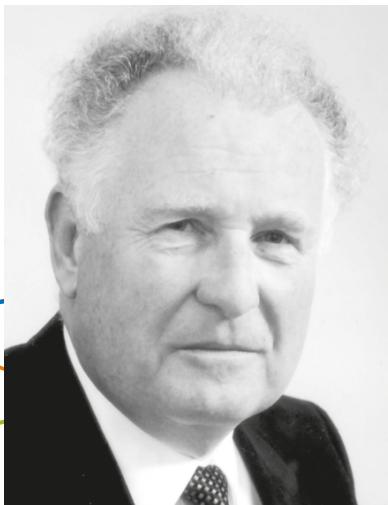
1962



Birth of the Souci-Fachmann-Kraut Food Composition Table

In collaboration with Professor Dr. Heinrich Kraut and Dr. Walter Fachmann, Professor Dr. Siegfried Walter Souci published the 'Food Composition Table' for the first time in May 1962. Until today, the table is continuously updated and extended with new entries. Meanwhile, the food composition table evolved into an international reference. The print and online versions of the Souci-Fachmann-Kraut Composition Tables are available to scientists in academia and industry as well as to the broad public.

1969



Hans-Dieter Belitz *1931 – 1993

The Technical University of Munich Appoints the New Director of the German Research Center

On February 01, 1969, food chemist Professor Dr. Hans-Dieter Belitz, Professor for Food Chemistry at the Technical University of Munich was appointed as the new Director of the institute. With his appointment, the personal union of the institute's Director and a university professor moved from the Ludwig-Maximilian-University of Munich (LMU) to the Technical University of Munich (TUM).



Tensile testing of dough for rheological analysis

Professor Belitz Gives a New Face to the Institute's Research Agenda

Under the leadership of Professor Dr. Hans-Dieter Belitz, the research focus of the institute changed with special emphasis on structure-activity relationships of taste molecules and cereal proteins like gluten, which gives wheat flour its specific baking characteristics.

1977



Article 91b GG

Joint Federal Government and State Funding as 'Blue List' Institute

Since January 01, 1977, the Research Center receives funding based on the joint support for research according to Article 91b GG (German Constitutional Law). From this point on, the Research Center has been part of the 'Blue List' institutions, from which the Leibniz Association emerged later.

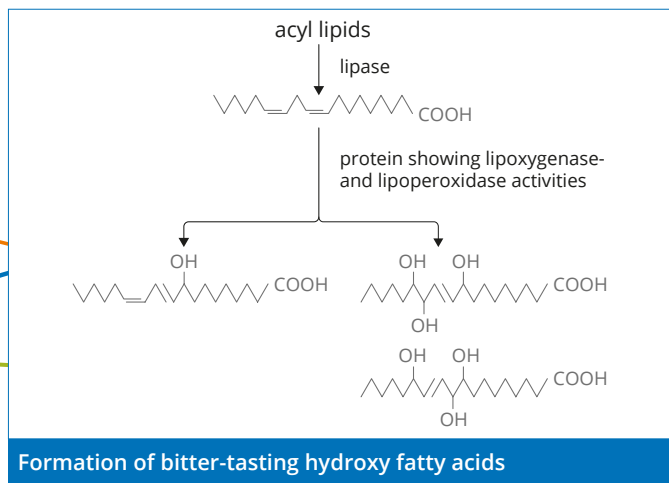


Department of Chemistry, Biology and Geosciences of the Technical University of Munich, at No. 4 Lichtenbergstrasse, Garching

Move to the TUM Campus in Garching

In 1977, the German Research Center for Food Chemistry moved its laboratories from the Munich city center to the new laboratories of the Department of Chemistry, Biology and Geosciences of the Technical University of Munich (TUM). This opened an entirely new scientific horizon and outstanding technical development opportunities for the future research of the institute.

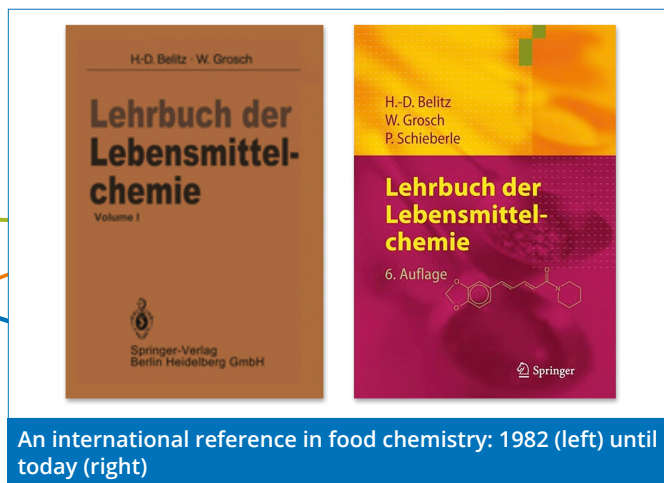
1979



Bitter Off-Taste from Enzymatic Lipid Oxidation

In 1979, Professor Dr. Werner Grosch was the first to show that oxidized fatty acids are responsible for the bitter and burning off-taste of fat-rich seeds such as oats.

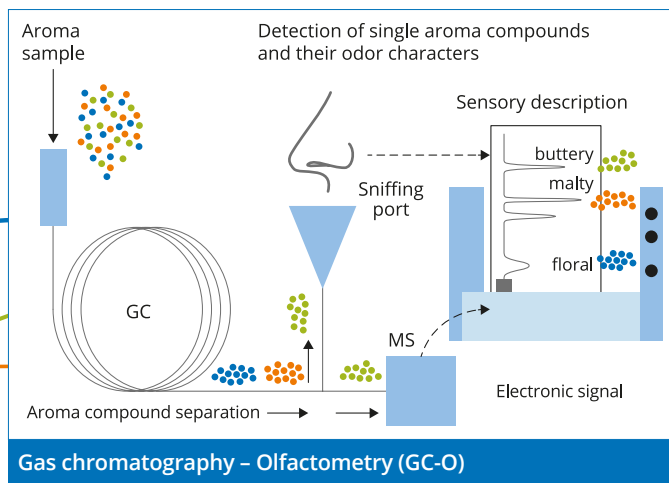
1982



Birth of the Textbook of Food Chemistry

The textbook written by Professors Belitz and Grosch was first published in 1982. With Professor Dr. Peter Schieberle as the third co-author, it became the international teaching book for students of food chemistry. It also serves as helpful reference for scientists and technicians in food technology, nutritional science, human and veterinary medicine in academia, industry and food control administration.

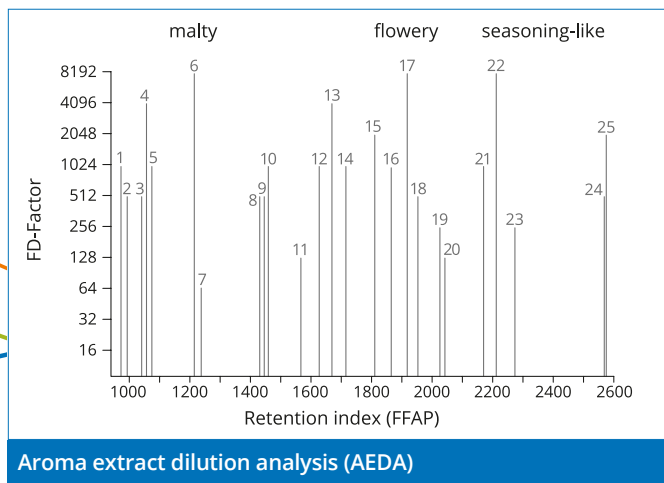
1983



Technological Game Change in Key Odorant Identification

Professor Dr. Werner Grosch and Dr. Peter Schieberle developed a new methodology, known as 'gas chromatographic olfactometry'. This new technology initiated step-change developments in de-complexifying aroma research. By sniffing the carrier gas stream during gaschromatographical separation of complex mixtures of food aromas, they succeeded to selectively locate and identify the odor-active compounds among the vast majority of odorless volatiles.

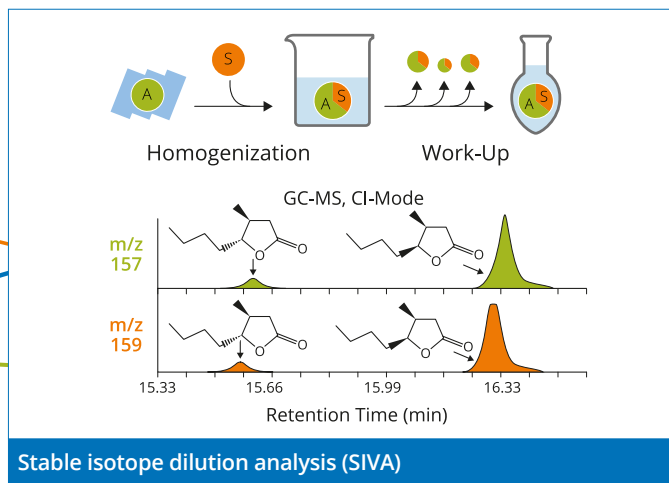
1987



Aroma Research Becomes Focused!

In 1987, Professor Dr. Werner Grosch and Dr. Peter Schieberle introduced the aroma extract dilution analysis (AEDA). They applied gas chromatography/olfactometry repeatedly to serially diluted food aroma distillates in order to rank the odor molecules detected according to their sensory impact. This enabled the scientists to focus the laborious identification experiments on the most potent key odorants.

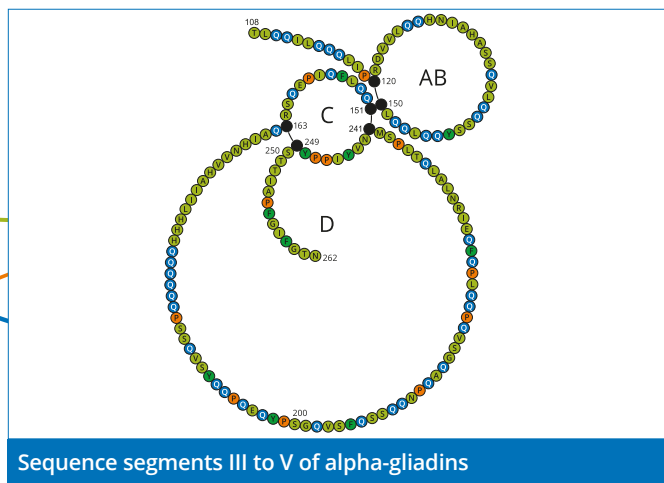
1987



'Heavy' Twin Molecules Initiate the High-Precision Analysis of Key Food Odorants

In 1987, Dr. Peter Schieberle and Professor Dr. Werner Grosh developed the stable isotope dilution analysis (SIDA) for the exact quantitative determination of key odor molecules. By using synthetic ^{13}C or ^2H stable isotope-labeled twin molecules of the food odor compounds as "ideal" internal standards in gas chromatography-mass spectrometry, they initiated a technological breakthrough in modern aroma research.

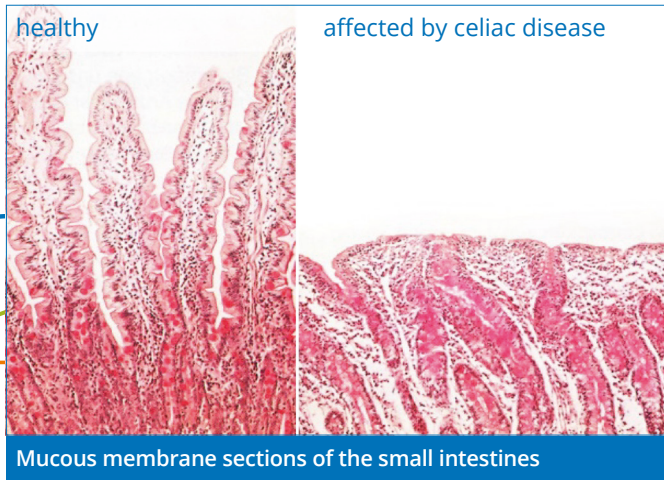
1992



Gluten Proteins Influence Baking Characteristics

A clever approach enabled Professor Dr. Hans-Dieter Belitz and Dr. Peter Köhler for the first time to map the complex patterns of free cysteine residues and their disulfide bridges in wheat protein molecules. They also succeeded in identifying the sequence segments of gliadins, which through thiol/disulfide exchange are key in developing the gluten network during preparation of wheat doughs.

1993



Gliadins are the Key Inducers of Celiac Disease

Professor Dr. Hans-Dieter Belitz and Dr. Peter Köhler made significant contributions to the structure determination of the 'toxic gliadin sequences', which may cause celiac disease in genetically susceptible people. Celiac disease is an autoimmune disease, which causes chronic inflammation of the mucous membrane of the small intestines.



Acting Director of the Institute

After Professor Dr. Hans-Dieter Belitz passed away in 1993, the Deputy Director Professor Dr. Werner Grosch took leadership as Acting Director of the institute until 1995.

1995



Peter Schieberle

*1951

Appointed as the New Institute Director

In 1995, Professor Dr. Peter Schieberle, Professor for Food Chemistry at the Technical University of Munich, was appointed as the new Director of the German Research Center for Food Chemistry. He became a driving force in decoding the complex aroma systems in food and navigated the institute's research to receive the highest international recognition.

1999

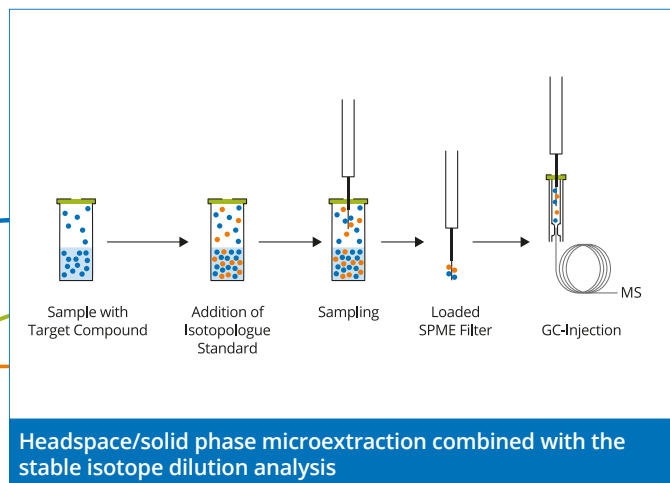


SAFE technique for gentle aroma isolation

Technical Breakthrough in the Artifact-free Preparation of Aroma Isolates

To isolate volatile aroma fractions from food, scientists around Professor Dr. Peter Schieberle developed the *solvent-assisted flavor evaporation technique* (SAFE), which is based on a robust all-in-one sublimation system. Thanks to the optimized system dimensions of the SAFE device, they were able to isolate sensible aroma fractions from complex foods while preventing any artifact formation. Today, the SAFE technique has become an established standard procedure in academic and industrial research laboratories all around the globe.

2003



Speeding up Aroma Analysis

Using a clever combination of headspace/solid phase microextraction (HS-SPME) for rapid aroma isolation and the stable isotope dilution analysis (SIDA) for precise quantitation, Professor Dr. Peter Schieberle and Dr. Martin Steinhaus moved a crucial step closer to the automated quantitative analysis of food aromas.

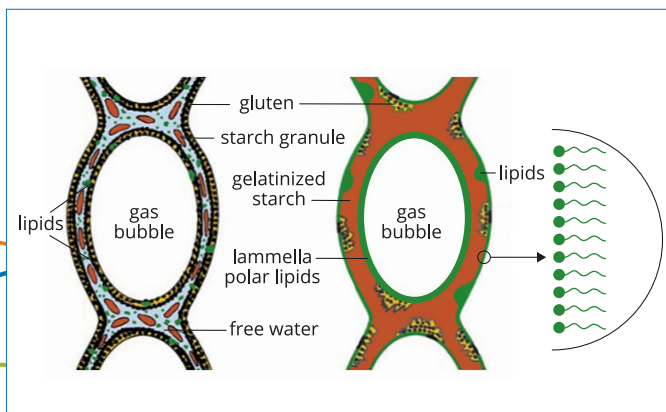
2008



Polar Lipids Control the Volume of Bread

Professor Dr. Peter Köhler performed micro-baking tests using a worldwide unique automated mini-production line for baked goods to identify polar lipids as the key natural emulsifying agents with a positive influence on the bread texture. These lipids were shown to increase the bread volume by up to 60 %. Among the active emulsifiers are for example phosphatidylcholine, lysophosphatidylcholine, digalactosyl-diglycerides and monogalactosyl-monoglycerides.

2009



Changes of the membrane structure around gas bubbles in dough before (left) and after (right) baking

The Effect of Polar Lipids on Bread

Professor Dr. Peter Köhler used structure-activity studies to show and explain the effect of polar lipids on bread baking. One of these polar lipids is phosphatidylcholine. In the risen bread, polar lipids form a layer around the gas bubbles. This stabilizes the air inside the dough and keeps it trapped inside. This produces bread with a large volume and a soft crust.

2010

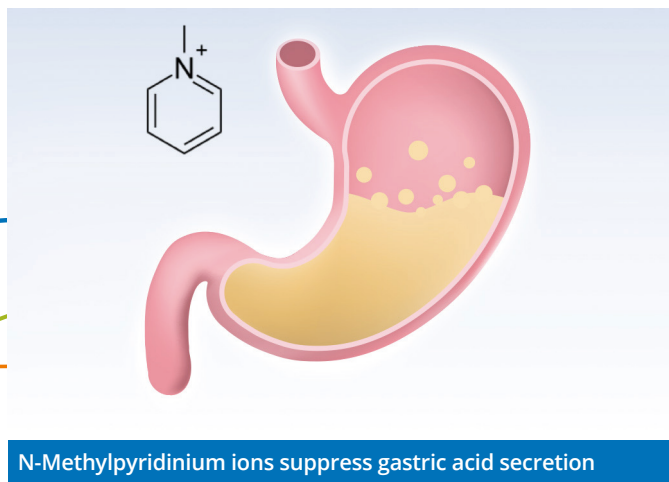


New home of the institute on the Weihenstephan Campus of the Technical University of Munich

Move to the Life Sciences Campus Weihenstephan

To better meet the ever-changing scientific challenges in times of key transformations in the food and nutrition sector, the German Research Center for Food Chemistry moved in April 2010 into the former Degussa Building on the Life Science Campus Weihenstephan of the Technical University of Munich. On this campus, food chemistry got the opportunity to expand its scope of action and to complement and enrich the scientific approaches of food engineering, nutritional, biological, plant and animal sciences with additional molecular and analytical technologies.

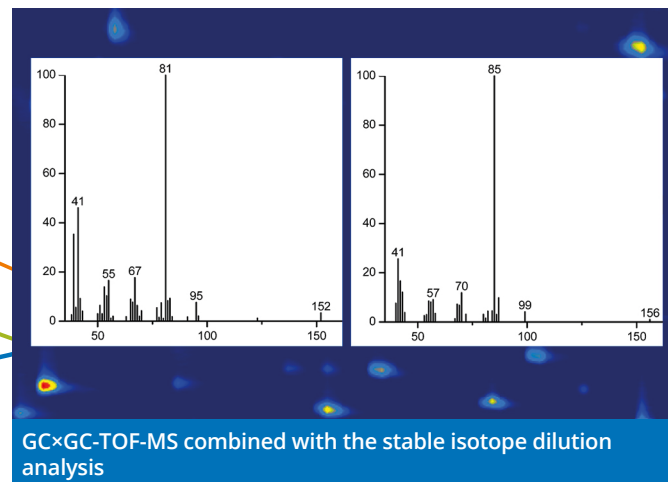
2011



Discovery of a Gastric Acid Blocker in Coffee!

By combining various molecular and cellular tests, a team of scientists around Professor Dr. Veronika Somoza and Professor Dr. Thomas Hofmann was able to show for the first time that N-methylpyridinium in roasted coffee inhibits gastric acid secretion in humans. Their results provided a scientific basis for the development of stomach-friendly coffee.

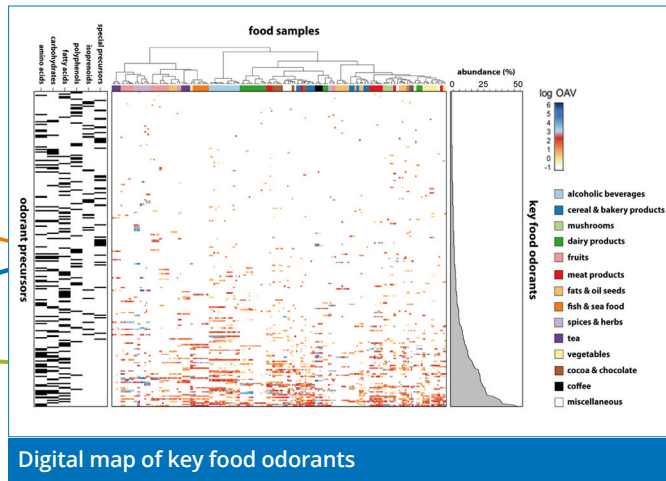
2013



On the Way to Automation Through the Simultaneous Key Odorant Quantitation

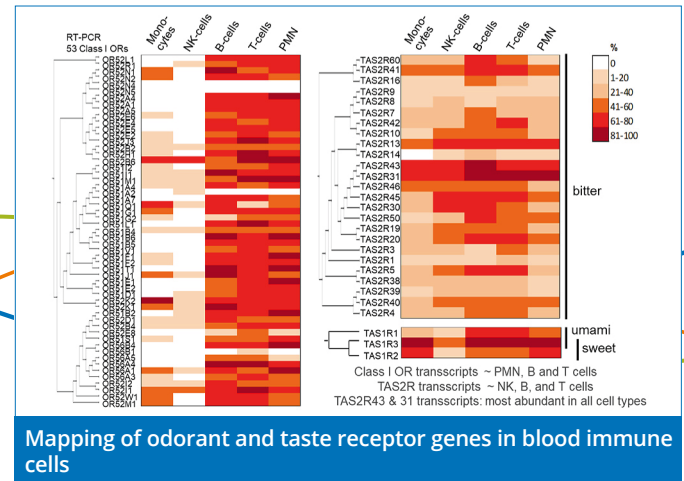
By combining 2-dimensional gas chromatography, time-of-flight mass spectrometry (GCxGC-TOF-MS) and the stable isotope dilution analysis (SIDA) using ^{13}C -labeled (AE) internal standards for each analyte, Professor Dr. Peter Schieberle succeeded for the first time in quantitating a series of key food odorants simultaneously. This method provides the technological foundation for achieving fully automated aroma analyses in the future.

2015



Food Aromas are Coded Combinatorially from ~230 Compounds

Against past prevailing views, Professor Dr. Peter Schieberle demonstrated that combinations of only ~230 key odorants out of the so far identified 12,000 volatiles make up the almost unlimited variations in food aromas. By means of reconstruction experiments, between two (e.g. Durian) and about 40 odorants (e.g. Cognac) have been found to constitute the typical aroma profile of foods.



Odorant and Taste Receptors Discovered in Blood Immune Cells

In cooperation with researchers of the Technical University of Munich, PD Dr. Dietmar Krautwurst and his colleagues provided the first evidence of odorant and taste receptors in blood immune cells. Since these cells respond chemotactically to the sweetener saccharin as well as the chocolate's biogenic amine 2-phenylethylamine, odorant and taste receptors do not only play an important role in the nasal and oral cavity but, most likely, also in the control of the cellular immune system.

2016



Anna Maria Reichlmayr-Lais *1953

The Board of Trustees Appoints Interim Director

From October 10, 2016 to August 14, 2017, ecotrophologist Professor Dr. Anna Maria Reichlmayr-Lais, Professor at the Technical University of Munich, became Interim Director of the institute until the joint TUM-Leibniz procedure for the appointment of a new permanent Director had been accomplished. Her aim was to link modern life science-based food chemistry tightly with nutrition science and medicine.

2017



Thomas Hofmann *1968

Senior Vice President of the Technical University of Munich Becomes New Director

Professor Dr. Thomas Hofmann, Senior Vice President Research & Innovation of the Technical University of Munich and Professor for Food Chemistry and Molecular Sensory Science, was appointed as the new Director of the German Research Center for Food Chemistry on August 15, 2017.

2017

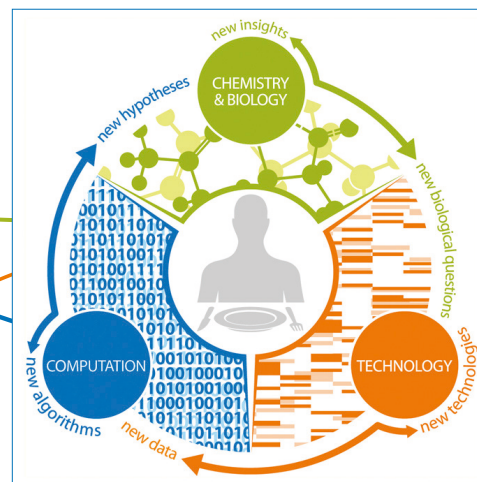


The official introduction of the new institute's name on September 15, 2018

Leibniz-Institute for Food Systems Biology at the Technical University of Munich

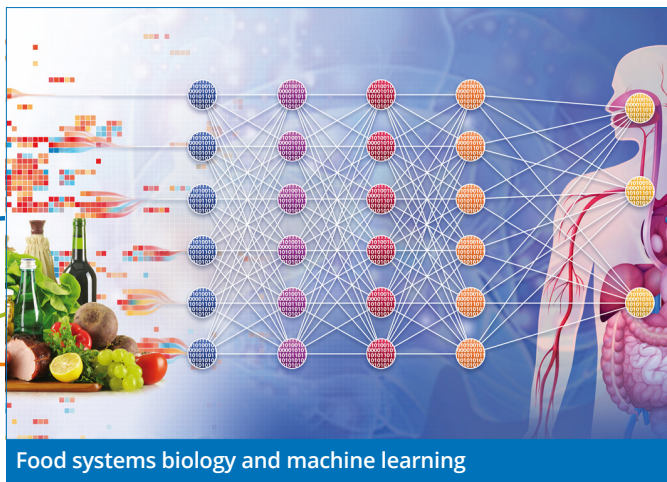
After 99 years of success as the German Research Center for Food Chemistry, the institute continued to do research under the new name 'Leibniz-Institute for Food Systems Biology at the Technical University of Munich' since September 07, 2017. This initiated a scientific, structural, and strategic re-orientation of the institute to meet the complex scientific challenges along the agriculture ► food ► human' axis.

(left to right: Dr. Florian Herrmann MdL, Dr. Bernhard Schwaab MD, Minister Ilse Eigner, TUM President Professor Dr. Wolfgang A. Herrmann and Professor Dr. Thomas Hofmann - Photo: StMWi/A. Heddergott)



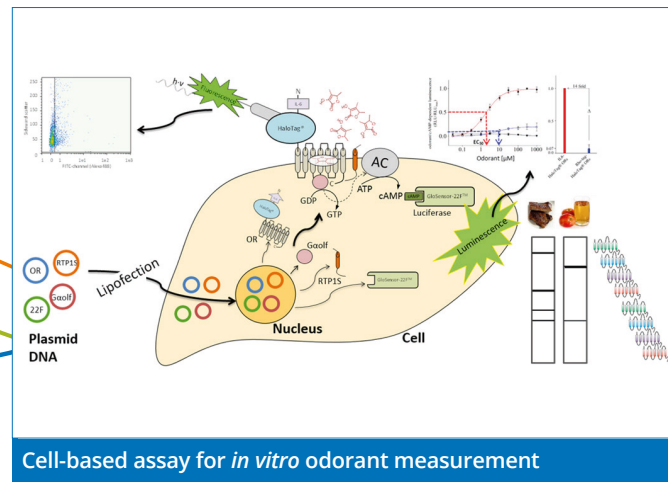
The new Leibniz-Institute Follows a Systems Biology Approach

To study the complex systems of food effector molecules more thoroughly, to understand, predict, and modulate their biological functions in the future, the new Leibniz-Institute comprises a unique research profile at the intersection of food chemistry & biology, technology & chemosensors and bioinformatics & machine learning. With these goals, the institute has grown far beyond its original core discipline of food chemistry and introduces the development of FOOD SYSTEMS BIOLOGY as a new interdisciplinary field of research. The institute comprises a unique research environment in which chemists, biologists, nutritionists, biotechnologists, informaticians, and mathematicians work together in interdisciplinary teams.



A Unique Research Profile

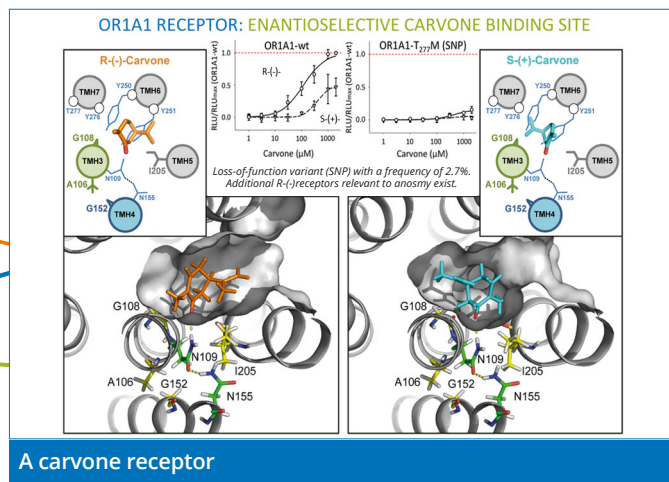
Effective approaches to producing sufficient food on a sustainable basis requires a new molecular understanding of functional food ingredients, which goes far beyond the knowledge of individual molecules. The functional profiles of foods, determined by complex systems of effector molecules, have to appeal to the sensory preferences as well as the health and nutritional needs of people. By using a systems biology approach, the institute investigates structure-concentration-function relationships of complex food ingredients starting with alternative raw materials and use of industrial side streams as secondary raw materials, via new process technologies and personalized food products all the way up to the physiological interactions with the human organism.



The World's Most Sensitive Technology for the Development of a 'Biomolecular Nose'

PD Dr. Dietmar Krautwurst and his colleagues modified cells in such a way that they feature human odorant receptors on their surface. By linking the odorant receptors to a helper protein in a highly targeted way, the sensitivity and signal strength of the odorant receptor assays could be increased by a factor of up to 14 when compared to current state-of-the-art. By having an array of 800 different odorant receptor expressing cells, the institute is in the unique position to capture complex odors as specific receptor barcodes and to digitize entire aroma signatures of food, body and environmental samples. The institute is striving to develop a 'biomolecular nose' with performance capabilities resembling those of humans.

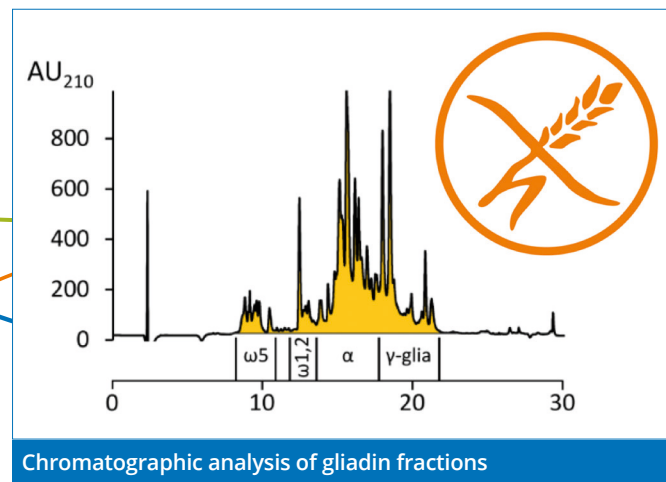
2017



What Causes Anosmia?

Approximately 8 % of people are odor-blind to the mint-like smelling R(-)-carvone. However, these same people are able to sense the stereoisomeric S(+)-carvone, which smells like caraway. How does that happen? Research performed by PD Dr. Dietmar Krautwurst in collaboration with his peers at the Leibniz Institute for Molecular Pharmacology indicates that a mutation in the R(-) stereoisomer-specific binding site at the OR1A2 odorant receptor is responsible for the insensitivity of some individuals for smelling the minty R(-)-carvone.

Springer Customer Service Centre GmbH, Springer Nature, Cell Mol Life Sci 74, 4209-4229, Geithe, C. et al., 2017



Method Improvement for the Reliable Quantitation of Gluten

Consumers recognize the crossed ear of grain on food packages as symbol for gluten-free food products. These foods may not contain more than 20 mg gluten/kg. As part of an international research team, Dr. Katharina Scherf improved analytical methods as well as reference materials for the reliable quantitation of gluten in wheat, rye and barley. This work contributed significantly to analytically ensure the quality of gluten-free products.

The diagram illustrates the 'cocktail effect' of cyclamate and saccharine on the receptor level. It is divided into two horizontal sections: 'sweet' (top) and 'bitter' (bottom), separated by a dashed line.

Sweet Section:

- At the top, the receptor **TAS1R2 / TAS1R3** is shown, represented by a green and orange structure.
- Below it, the chemical structures of **Cyclamate** and **Saccharin** are shown. Both have a sulfonamide group (SO₂NH-).
- Arrows indicate that both Cyclamate and Saccharin bind to and activate the TAS1R2 / TAS1R3 receptor.

Bitter Section:

- Below the dashed line, three bitter receptors are shown: **TAS2R1**, **TAS2R31**, and **TAS2R43**, each represented by a blue structure.
- Arrows from both Cyclamate and Saccharin point towards these bitter receptors, but they are blocked by red T-bars, indicating inhibition.

Conclusion: The combination of cyclamate and saccharine results in a net sweet taste because they activate the sweet receptor while inhibiting the bitter receptors.

Dr. Maik Behrens, who joined the Leibniz-Institute in February 2018, set out to answer this question and showed that both sweeteners do not only stimulate the sweet receptor and their specific bitter receptors but also act as bitter receptor inhibitors of the other sweetener.

Inspired by this knowledge and following a systems approach, the Leibniz scientist started initiatives in new taste modulator discovery in complex systems of effector molecules.

The prevalence of celiac disease is increasing globally. Since gluten is considered the main cause of celiac disease, modern wheat flour has been suggested to potentially contain higher levels of celiac disease-inducing gluten peptides than the older varieties. However, based on the analysis of 57 samples of old and modern wheat varieties from all around the world, Dr. Katharina Scherf was the first to show that there are no significant differences in the content of this 33-mer peptide. Therefore, other not yet known factors have to be taken into account for the increasing prevalence of celiac disease.

2018



Saliva proteomics to understand taste sensitivity

'Fine-tuning' of Salt Taste Sensitivity Recruits Salivary Proteins

Excessive consumption of sodium is a risk factor for developing cardiovascular diseases. Successful salt reduction in food requires new insights into the mechanisms of salt taste perception. For the first time, Professor Dr. Thomas Hofmann and his team found strong evidence that proteolytic processes in saliva play a key role in the fine-tuning of salt taste sensitivity. Saliva samples collected from salt-insensitive persons showed increased endopeptidase inhibitor activity, while salt-sensitive individuals showed an increased endopeptidase activity. After oral endoprotease administration, the scientists observed an intensified salt taste sensation which was paralleled with the formation of the salt taste enhancing tetrapeptide PLWR in saliva.



Re-enforcement of the research equipment

Bavarian Task Force: Integrative Food Research 2018 – 2020

For the next three years, the Bavarian Ministry of Economic Affairs, Energy and Technology supports the Leibniz-Institute with the unique investment project.

Staffed with a total amount of EUR 16.7M, this 'Task Force – Integrative Food Research 2018 – 2020' will catalyze the structural renewal and modernization of the research infrastructure and will give a major boost to the institute's new focus on Food Systems Biology.

Future Plans



Plans for the new building

For the First Time After 100 Years: Plans for an Own Research Building!

To scientifically capitalize on the new research agenda of the Leibniz-Institute, the current limitations in laboratory, office, and seminar space needs to be overcome. With the support of the Bavarian Ministry of Economic Affairs, Energy and Technology, we started to plan a new research building (~3,500 square meters) where interdisciplinary research teams are able to perform top-level food and nutrition research for the benefit of society.

Picture credits:

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