

Industrial Cooperation
Spin-offs
Trade Fairs and Events

outcome

Technology Transfer at the UFZ

Patents
Intellectual Property Rights
Technologies

impact

Knowledge Transfer

About the UFZ

Helmholtz Centre for Environmental Research GmbH

Our Vision

The UFZ is one of the world's leading research centres in the field of environmental research and enjoys high social recognition. It offers ways for a sustainable use of natural resources for the benefit of humans and nature.

Our Mission

Biodiversity, functioning ecosystems, clean water and intact soils are our natural bases of life. In light of global change, all staff at UFZ share the objective to demonstrate and promote ways in which excellent research can reconcile social development with a healthy environment. The UFZ is a reliable partner for politics, businesses and civil society in the process of understanding the impacts of human activities on the environment and to develop options for social decision-making processes. Therefore, the UFZ addresses societal challenges and creates knowledge and technologies which help to identify potential conflicts between environmental and societal demands at an early stage and to develop precautionary measures.

Our Structure

The UFZ was founded in 1991 and employs 1,100 people at its locations in Leipzig, Halle (Saale) and Magdeburg. The UFZ is a member of the Helmholtz Association of German Research Centres.



Dear reader,

The UFZ carries out excellent research within a wide range of topics related to the environment. It generates sound knowledge and technological solutions to manage our natural resources in a sustainable way, to the benefit of society and environment. The transfer of knowledge and technologies into society and business is an integral part of the UFZ mission and activities.

For our research endeavours, our institute has a unique infrastructure. Together with over 600 partners from all over the world, we have established a network of know-how that catalyses innovation. The selected examples in this brochure will serve as a first insight into our broad range of technology transfer activities, which include the following topics:

- UFZ Technology Transfer Award 2017
- UFZ Research Award 2017
- Examples of our Top Stories
- Innovative Minds at the UFZ
- Excerpt from „News from the UFZ“
- Exemplary Technology Platforms
- Offers and Contacts

We are looking for partners from the business sector. Would you like to join forces with us and develop our innovative approaches to products and production processes further – based on your processes and market know-how?

Then my colleagues and I will be delighted to hear from you.

Yours sincerely,

Dr. Joachim Nöller
Head of the Department Knowledge and Technology Transfer

P.S.: We are not only responsible for the transfer of technology but also the transfer of knowledge. We offer a wide range of activities to provide decision-makers from politics, businesses, society, and the general public with tailor-made knowledge. Together, we develop options and management tools further in order to solve your specific problem. Just read our brochure „Impact“.

You can find further information on our website:
www.ufz.de/technologytransfer

IMPRINT

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Technology Transfer Award 2017

Dr. Matthias Gehre



... was honoured for excellent technology transfer in developing, patenting and commercialisation of a new method for hydrogen isotope analysis.

As head of the Laboratory of Stable Isotopes (Department of Isotope Biogeochemistry), Dr. Gehre developed and patented chromium-based reactors systems. His laboratory has 25 years of expertise in the analysis of stable isotopes of light elements (H, C, N, O, S and Cl), offers a highly modern research infrastructure with five Isotope Ratio Mass Spectrometers instruments with various interfaces and conducts training courses for modern methods in isotope-ratio mass spectrometry. Furthermore, it owns several licensed method patents and acts as a reference laboratory for the International Atomic Energy Agency (IAEA). The team around Dr. Gehre develop innovative methods for gaseous, liquid and solid samples, and also have expertise in quality assurance.

Dr. Gehre's new method allows the conversion of organic hydrogen to molecular hydrogen. It is a powerful tool for the measurement of hydrogen isotopic compositions of organic matter that may contain hetero-elements (e.g. nitrogen or halogens) in addition to carbon and hydrogen. The method significantly improves measuring accuracy and, for the first time, allows online measurements of hydrogen isotopes in presence of hetero-elements. Furthermore, the technique is far less susceptible to matrix effects which

frequently occur during high-temperature conversion (pyrolysis), currently the routine method for hydrogen isotope analysis.

In consequence, measurement results from different laboratories can be compared much better, and the quality of research results is improved. At present, international databases are being set up for various issues, similar to the global database for precipitation water (GNIP) at the IAEA.

Based on isotopic signatures, isotope forensics can contribute to the protection of environment, biodiversity and climate, since natural processes can be detected more easily and more accurately.

Two patents have been transferred to the UFZ's cooperation partner Thermo Fisher Scientific, a US-American biotechnology company. Thermo Fisher Scientific took over the registered international industrial property rights and, together with the UFZ, will transfer them to the market. Furthermore, both parties have agreed on a research project looking to implement the technology in biotech equipment.

Personal website of [Dr. Matthias Gehre](#)

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Research Award 2017

The UFZ research group mHM



... was honoured for the development of the mesoscale Hydrologic Model mHM and its applications, for example the "German Drought Monitor".

The Research Prize 2017 went to an interdisciplinary, 13-member research group from the UFZ Department of Computational HydroSystems.

The UFZ team was honoured for the development of a hydrological model system which helps to predict the consequences of climate and land use change on the environment and to provide decision-makers in politics and civil society with a timely, yet reliable, basis for decision-making.

The model system mHM (mesoscale hydrologic model) is based on the fact that large-scale phenomena such as the water drainage in the catchment area of a river do not depend on all small-scale characteristics of this catchment area.

The system was developed at the UFZ over a period of ten years and is already being used internationally and nationally. mHM multiscale parameterisations are e.g. built into earth system models developed by the US National Center for Atmospheric Research (NCAR). UFZ researchers are also working with colleagues from the Canadian University of Waterloo on water quality models based on mH model systems. At the UFZ, the model system is used for the „Dürremonitor Deutschland“ (Drought Monitor for Germany)

to simulate flood and drought events.

The mH model is one of a new generation of so-called "smart" environmental system models that UFZ scientists are working on to mathematically describe ecosystem processes on a landscape scale and to project them into the future. The goal is to develop smart models for other topics as well, such as the transport of nitrogen or pesticides into landscapes.

The strength of the team awarded with the UFZ research prize lies in its diversity: it includes scientists from a number of different disciplines from physicists Prof. Dr. Sabine Attinger, Dr. Matthias Cuntz, Dr. Falk Heße, and Dr. Martin Schrön, hydrologists Dr. Luis Samaniego, Dr. Rohini Kumar and Dr. Matthias Zink, mathematicians Dr. Juliane Mai and Dr. Stephan Thober to climatologist Dr. Andreas Marx, environmental engineer Dr. Oldrich Rakovec, biogeochemist Corinna Rebmann, and geographer David Schäfer.

[Model mHM](#)
[German Drought Monitor](#)

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Top story

A new Autosampler for water research

Testing water samples on the road is difficult and cost intensive. However, missions such as the identification of groundwater reserves in arid and remote areas absolutely require on-the-road testing of water samples.

A robust and economic autosampler for water sampling ...

Therefore, the UFZ, in cooperation with the Technical University of Darmstadt developed a new device, called "Autosampler".

The device makes groundwater tests – based on isotope analysis – much more economic: For one thing, the construction components are not custom-made, but are available on the market. Furthermore, the Autosampler was designed with few electronics and low-tech-construction. And finally, it is more robust and needs less maintenance than existing devices.

... in remote areas as well as closer to home

The Autosampler thus makes it possible to sample and supervise spacious and outlying areas. The first successful field test for, in total, seven Autosamplers took place in Oman between June and December 2017. Dr. Jan Friesen and his team from the Department of Catchment Hydrology installed six devices in the semi-arid cloud forests of the Dhofar mountains and one in the extremely dry Rub al-Khali in order to investigate how much groundwater leaks into the Arabian Sea, which precipitation events are relevant for groundwater renewal and which areas water leaks into. Following this successful pilot application and further adaptation of the Autosampler, the device has generated interest not just with respect to research in remote areas, but also to monitor the water balance of green roofs and, in the frame of the major project MOSES (Modular Observation Solutions for Earth Systems) of the Helmholtz Association, in the area of river ecology. The team also plans to make the structural design of the Autosampler available to the scientific community.

[Autosampler](#)



An autosampler for the sampling of rainwater

Top story

Accumulation & recovery of phosphorus from sewage

Phosphorus is a non-renewable resource and vital to every living organism. However, there is a limited amount of mineable phosphorus (P), and sources are not distributed evenly across the globe.

Most countries will therefore rely on imports in the future, or do so already. To become less constrained by imports, many countries strive to develop means of phosphorus recovery.

Recycling strategies and processes urgently needed

Prof. Dr. Susann Müller and Dr. Susanne Günther from the Department of Environmental Microbiology have developed a new method for a bio-based phosphorus recovery. Phosphorus that is accumulated in sewage treatment plants is fixed biologically in microorganisms and is removed through the sludge. Under certain conditions, the phosphorus can be released from the microorganisms and thus become available for recovery. The sludge is separated into a liquid and a solid phase after incubation in a P-release tank. During incubation (48 hours), the microorganisms will release the stored phosphorus, which has been enriched during the aerobic phase of the sewage treatment. The aqueous phase is then transferred into the P-recovery tank. Here, yeasts are added, which will store the phosphorus under aeration.

Achieving a closed phosphorus cycle

The P-enriched yeast can be harvested and applied as fertilizer. The technology is a local solution, because the phosphorus can be harvested as described above, wherever there are breweries or sewage waste plants around. The process is a closed circuit, because the phosphorus will be recovered through organisms, which are incurred as residues during the brewing process. Yeasts are non-pathogenic organisms, and are already being used as soil conditioners in so-called effective microorganisms. Hence, the final product is available to plants and pollution-free. The value of the resulting fertilizer was tested successfully by the Saxon State Office for Environment, Agriculture and Geology. In addition, the technology of the whole

process has low costs. A patent application has been submitted (PCT/EP2017/06107 2). Currently, the concept has been proven on a two-litre scale and demonstrations are available. In the next step, together with industry partners, the UFZ will implement the technology at pilot scale in a wastewater treatment plant, in the frame of a project funded by the German Federal Environmental Foundation.

[Flow Cytometry Group](#)



Wastewater treatment plant

Top story

Improvement of groundwater treatment by Fe-zeolites

Small polar contaminants in groundwater are difficult adsorbable harmful substances. They challenge conventional water treatment with activated carbon adsorbers because they necessitate a very frequent exchange of the adsorber, followed by transportation to specialised treatment facilities for high-temperature regeneration.

A legacy of pollution at an industrial site...

The groundwater treatment plant in Bitterfeld (200 m³/h) operated by the German enterprise eno-tech Umwelt GmbH faces such a problem. Due to the previous industrial use of the site, the groundwater contains high concentrations of problematic compounds such as vinyl chloride (VC) and dichloromethane (DCM).

... solved by tailored particles for trapping and degradation of organic contaminants

Trap-Ox® Fe-zeolites are a particle family of colloidal Fe-zeolites developed by Dr. Anett Goergi and Prof. Dr. Frank-Dieter Kopinke (Department of Environmental Engineering) and tailored for in-situ trapping of organic contaminants like VC and DCM, but also other contaminants like trichloroethene (TCE) or methyl tertiary butyl ether (MTBE) by adsorption. Another application is the use in fixed-bed adsorbers for on-site groundwater treatment. The Fe-loaded zeolite particles are suitable for chemical on-site regeneration and thus save cost and energy as well as being environmentally friendly. The implementation of the technological solution is carried out in the frame of contract research. First, the principle applicability of Fe-zeolites for use as additional adsorber in the Bitterfeld treatment plant was confirmed at lab scale. This adsorbent is intended to trap VC and DCM and thus prolongs the lifetime of the activated carbon adsorbers. The Fe-zeolite adsorber is regenerated by flushing with hydrogen peroxide solution. Options for technical realisation have been developed.

Since November 2017, an “on-site” pilot tests under way. After optimising the process, it is envisaged to operate the on-site groundwater treatment facility in Bitterfeld for a long-term period (more than 10 years).

Moreover, a trademark has been registered in the EU, Canada and the US (Trap-Ox®).

For further information please contact [Dr. Anett Georgi](#)



Treatment plant in Bitterfeld-Wolfen

Top story

SandTrap®: harvesting & cleaning small microbial cells

In preparing microbial cells, it is necessary to harvest cells from liquid cultures or aqueous samples and to wash off media components. Numerous methods have been used to achieve this, including centrifugation and different types of filtration.

Conventional filters completely miss cells < 0.2 µm

However, it has been recognised that major branches of the microbial world consist of very small cells < 0.2 µm. These are washed through filters and their density is too low for standard centrifugation. Consequently, they have been completely missed so far.

SandTrap® works for small cells and under anaerobic conditions

SandTraps® are silica-filled cartridges used to harvest and clean microbial cells. They allow lab staff to work under strictly anaerobic conditions and with unusually small cells. SandTraps® are especially suited for environmental applications, which are characterised by small culture volumes or low cell densities.

The method collects and concentrates 50 – 98% of all cells, preserving enzymatic activity and cell viability. SandTraps® are scalable to different culture volumes and can be multiplexed in standardised systems. Differential harvesting of cells according to cell size is also possible.

The technology was developed by Prof. Dr. Lorenz Adrian from the Department Isotope Biogeochemistry. It has been successfully tested at lab scale and is being developed and standardised further. In particular, recent experiments have shown that it might be possible to use plastic, instead of glass, cartridges. However, positive results with plastic cartridges depended on them being sealed, e.g. glued. This would mean cells have to be extracted once again – a clear disadvantage. Further research will therefore look into other options for creating anaerobic conditions in plastic cartridges.

In order to improve cell retention, the effects of different techniques of packing the SandTraps® were studied. First results indicate that retention can be si-

gnificantly improved by simple but effective measures, and further work will concentrate on testing different filter materials with regard to an optimal retention and harvest of the most important model organisms.

The efficiency with which cells can be harvested could also be shown to depend on their physical shape. Cell shape will therefore play a role in future tests, too. Finally, commercial viability of SandTrap® will be determined by their total efficiency. Different cartridge sizes were therefore compared, and it became evident that results are very much dependent on the volume of both cartridge and culture liquid. As a next step, it will be determined which load a single SandTrap® should take in order to yield the best result.

A trademark for SandTrap® has been registered with the EU Intellectual Property Office (015668395).

For further information please contact [Dr. Lorenz Adrian](#).



Analysis of live cell cultures

Innovative minds

Dr. Matthias Gehre

Department of Isotope Biogeochemistry

Dr. Matthias Gehre is head of the Laboratory of Stable Isotopes and winner of the UFZ Technology Transfer Award. His work has been focussed on analysing stable isotopes of light elements since 1984. As the end of the eighties brought substantial changes in this area (computer-based mass spectrometry and data analysis, on-device sample preparation and on-line transformation to sample gas), these new methods became his key interests. In international projects coordinated by IAEA and IUPAC, Dr. Gehre developed reference materials which made it possible to calibrate – and thus better compare – measurement results. Some of these ideas lead to Dr. Gehre's long-standing contacts to equipment producers like ThermoFisher Scientific or HEKAtech GmbH, who transferred his ideas into marketable products. Other results of his work were patented by the UFZ. Methods of the UFZ's Laboratory of Stable Isotopes are known and being used globally.

Personal website of [Dr. Matthias Gehre](#)

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Prof. Dr. Katja Bühler

Department of Solar Materials

Professor Dr. Katja Bühler is head of the working group Catalytic Biofilms and is Professor for Technology of productive Biofilms at the Technical University Dresden in a joint professorship with the UFZ. Prof. Dr. Katja Bühler joined the UFZ in 2015. Her research interests include the development of alternative biotechnological reactor concepts based on in vitro and in vivo approaches.

Prof. Bühler's working group aims to employ naturally immobilised microbes as biocatalysts in continuous flow-through reactor systems, by turning their "problematic" characteristics into beneficial traits for catalysis. To reach this goal, the group combines engineering and natural science approaches in a diverse team of biologists, biochemists and engineers. Prof. Bühler's work on various questions related to the use of bacterial biofilms for biocatalysis has earned her a number of joint projects and research contracts with companies such as Südzucker, Evonik or BRAIN AG.

Personal website of [Prof. Katja Bühler](#)

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Innovative minds

Dr. Susann Günther

Department of Environmental Microbiology

Dr. Susanne Günther works at the Department of Environmental Microbiology. She has a Diploma in Biology and a PhD in Biology from the TU Dresden.

Her research focusses on microbial dynamics in complex communities from wastewater treatment to biogas production. In cooperation with Prof. Dr. Müller, she developed a process to recover phosphorus from wastewater treatment plants using biological phosphate removal and by-products of the brewery industry. A patent for this process has been filed. In a project funded by the German Federal Environmental Foundation (DBU grant number: 33960/01), a pilot plant is currently being installed at a local wastewater treatment facility. This will serve to upscale the phosphorus recovery process, a topic which has become tremendously important for agriculture and industry alike in recent years. Consequently, Dr. Günther's research has been met with great interest, and an automated process for the production of the fertiliser will be developed in cooperation with industry.



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Fabian Bonk

Department of Environmental Microbiology

Fabian Bonk has been a PhD student in the UFZ's research group "Systems Biology of Microbial Communities" since 2015. He has an MSc UAE in Water and Environmental Engineering from Masdar Institute, Abu Dhabi. He is a winner of the Joachim Herz Fellowship Add-on Fellowships for Interdisciplinary Science.

His research interests include the explanation and ODE-based modelling of microbial community dynamics in anaerobic digesters and their application in relevant industrial problems.

With regard to the latter aspect, Mr. Bonk has shown outstanding inventive spirit. He has successfully applied for first-phase funding under the BMBF's "New products for the bio-economy" scheme, with the 2nd phase currently under evaluation, and he is one of the few PhD students who live and breathe the concept of technology transfer.



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News from the UFZ

Visit from the Netherlands

During their trip to Germany through Saxony, Saxony-Anhalt and Thuringia, the Dutch royal couple Willem-Alexander and Máxima visited the Leipzig Science Park on February 9th 2017.

Invited by the Helmholtz Centre for Environmental Research (UFZ) and the German Biomass Research Centre (DBFZ), the royal couple attended the official signing of two Memorandums of Understanding between Dutch and German research institutes and visited the UFZ high-tech laboratory ProVIS.

The royal visit to the Leipzig Science Park was preceded by an internal network meeting of German and Dutch companies in the areas of green chemistry, biotechnology, circular economy and bioenergy. The royal couple were accompanied by the Dutch Minister for Foreign Trade & Development Cooperation, Lilianne Ploumen, and the Saxony State Minister for the Environment and Agriculture, Thomas Schmidt, as well as the managing directors of UFZ and DBFZ, Prof. Dr. Georg Teutsch and Daniel Mayer.

For further information please contact karen.goerner@ufz.de.



Signing two Dutch-German Memorandums of Understanding

The DE-US.net project

On May 2nd 2017, scientists from the DE-US.net project took part in the scientific networking event "Smart Cities & Urban Development" in New York. Dr. Stephan Bartke from the Department of Economics presented the project to around 200 interested parties from science, politics and companies.

Project partners also participated in the following conferences: "Smart Cities Asia" (Kuala Lumpur), "Smart Cities Week" (Washington) and "National Brownfields Training Conference – Brownfields 2017" (Pittsburgh).

Based on the example of LinkedIn, DE-US.net is an expertise network for experts and those interested in the "city of the future", coordinated by the UFZ as part of a BMBF-funded project. It supports the transfer of ideas and access to expertise and markets in Germany and the USA.

The project will support people with innovative solutions for research activities, provide a platform to exchange new approaches to making German and US cities fit for the future and a market place to establish new partnerships to further optimise, adapt and implement innovations.

[DE-US.net project](#)

For further information please contact [Dr. Stephan Bartke](#).



News from the UFZ

Energy Days 2017

The Energy Days were initiated to provide a platform to discuss challenges and recent progress in research on renewable energies and on the transition towards decarbonisation and the bio-economy.

Scientists, stakeholders and representatives of public authorities discussed technological and socio-environmental implications of using renewable resources for energy and material supply.

The 2017 programme focussed on workshop-style sessions on various topics, such as subsurface energy systems, the technological use of microbes for energy and material supply, the sustainable deployment of wind energy, and the perception and acceptance of new energy infrastructures.

The latter topic featured a presentation of legal frameworks which set the background for the ensuing demonstration of two decision-support tools concerning wind energy and developed at the UFZ. These tools and their benefits as well as the conditions for their practical application were discussed by a panel and among the participants.

[Energy Days 2017 - workshop documentation](#)



Electricity production from wind power in a settlement

Innoteam-Project S2DES

On March 6th, the first „Smart Sensor-based Digital Ecosystem Services“ (S2DES) community meeting with 50 participants took place in the UFZ's KUBUS building in Leipzig. S2DES deals with the cross-domain economic use of sensor data.

The project is led by the Institute for Information Systems at the University of Leipzig and includes the UFZ and the Institute for Applied Informatics (InfAI) e.V., as well as a good and growing number of industry partners.

The Innoteam project assumes that the increasing mass and diversity of data from numerous sensors can be used not only in one, but in several application areas or domains. For example, agricultural companies could share not only soil quality data, pest infestation and other growth-influencing factors with each other, but could even link environmental with other data and with results of research projects to improve their yields.

Such applications require smart, highly flexible and modular information systems which support the provision and use of sensor data by different user groups, which can process large amounts of data, integrate expert knowledge in the form of methods and offer cooperative marketplace functionalities for economic use.

[S2DES project](#)



S2DES - Community Meeting 2017

News from the UFZ

Odour Radar

The project "Odour radar: Validation of a measuring system to localise and quantify diffuse sources of odours" was awarded third place in the BMBF's 2017 Validation Award.

The award ceremony took place during the VIP/VIP+ innovation conference of the BMBF in Berlin on the 1st of February.

Public awareness of odour emissions from industrial, municipal, and agricultural sources has increased over the last decade. By legal definition, an odour nuisance occurs if the odour can be detected over 10% of total hours per year (876 hours). This requires a considerable number of measurements which must be performed at the sampling site. Conventional methods require considerable man power and time, and are therefore costly.

The UFZ developed new measurement instrumentation for the real-time, fast and simple detection of environmental odours, based on ion mobility spectrometry. This technology detects typical spectral pattern for odours from different emission sources. Measurements are performed directly at the emission site.

The suitability of the developed procedure was demonstrated at different sites with possible stakeholders.

For further information please contact [Dr. Helgo Borsdorf](#).



Measurements near a biogas plant

V-EcoTech-Filter

The V-Eco Filter is a plant for the near-natural purification of contaminated groundwater. It is another milestone in the sustainable remediation of the multiple contaminations at the Leuna site.

The filter has been in operation since November 2017 and stands for the successful application of a remediation process developed and perfected by the UFZ over the past ten years.

The V-EcoTech filter (vertical filter system) is very often a more effective and economic solution than classical physical-chemical treatment technologies, as proven by the first large-scale plant in Leuna. Based on this success, the second plant was put into operation, which will purify over 1,000 cubic meters of groundwater per day. The system is also being implemented in several pilots such as in the municipality of Rositz.

For further information please contact [Dr. Manfred van Afferden](#).



Front: Groundwater remediation plant at ÖPG Leuna

News from the UFZ

1st INCOVER stakeholder workshop

Chances for value-added products from wastewater discussed at 1st INCOVER stakeholder workshop
The European Commission-funded project INCOVER aims to turn biogenic waste and wastewater into valuable products. The 18-partner consortium has already been working on case studies in Spain and Germany for one year and looked into different use concepts.

This first stakeholder workshop was designed to provide researchers with feedback on their approaches and interim results, and also bring external ideas, especially from industrial sectors that may be of interest, into the further development of the work.

The focus of this workshop was on a case study implemented at the UFZ, which uses carbon-rich waste and wastewater from the food industry for the biotechnological production of organic acids, such as citric acid. The remaining process residues are partly used energetically (biogas) and partly converted to fertilizer by way of hydrothermal carbonisation.

Discussions during the workshop were lively and gave the researchers valuable cues for future tests and possible cooperation partners.

INCOVER project

For further information please contact [Dr. Andreas Aurich \(in German\)](#).



Participants of the 1st INCOVER Stakeholder workshop

CITEPro

The CITEPro platform is designed to allow high throughput screening of biological and chemical samples. With a central bio-informatics and omics platform, it will be possible to manage and make available enormous amounts of quantitative and qualitative data on cells, genes, proteins and metabolic products.

Specific bioanalytical methods bring to light endogenous changes and chemical stresses, information required e.g. in the context of epidemiological studies, patient cohorts and field studies for diagnostic procedures.

CITEPro platform

For further information please contact [Dr. Rita Schlichting](#).



High-throughput screening of samples

News from the UFZ

GMK Consulting: a new start-up

In 2017 three UFZ scientists founded the GMK GbR with the goal to conduct practice-oriented scientific analyses and to provide consulting services in the field of environmental studies, risk and sustainability.

Comprehensive expertise and long-term experience of the scientists in research areas such as climate change adaptation, risk and vulnerability analyses and urban research are the basis of the services offered by the GMK GbR. The team's interdisciplinary background and versatile competences with regards to methods and focus of research enable them to work on the interface of social and natural sciences as well as practice. As an SME, the GMK GbR plans to participate in scientific third-party funded projects, to counsel public authorities, and to provide expert opinions.

For further information please contact [Oliver Gebhardt \(in German\)](#).



Flood in Barby in 2013

First Winter School successfully run

The first "Winter School - Business Administration Compact" successfully ran at the UFZ from 11th to 15th of December 2017 under the motto "Learning by doing". The main aim was to offer UFZ scientists an opportunity to understand the functional aspects of a business – hands on – in order to instil in them a feeling of confidence for future career perspectives, including spinning off.

The various courses during the five-day event gave the participants an insight into the different aspects of business administration, thus enabling them to understand how an organisation functions. Basic economic concepts, principles of strategic management, marketing and sales as well as basic finance and tax law were covered. The course had a theoretical and a practical part in form of a business simulation, so that participants had an opportunity to put learnt theory directly into practice under the guidance of experts. Didactic elements included interactive workshops, discussions, individual and group work as well as role-plays.

For further information please contact milina.alber@ufz.de.

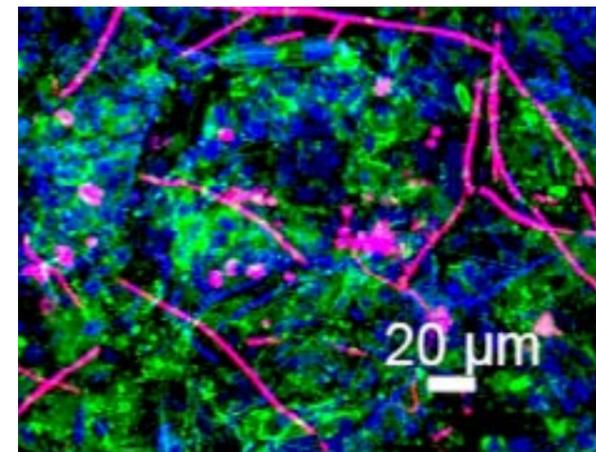


An impression of the Winterschool 2017

Technology platforms

ACROSS – Validation of satellite data

[ACROSS](#) (Advanced Remote Sensing - Ground Truth Demo and Test Facilities) provides field data across different spatial and temporal scales and environmental compartments in order to enhance the interpretation of satellite data for environmental science. The UFZ partly coordinates the ACROSS infrastructure and contributes to the terrestrial platform by investigating hydrogeophysical and ecological parameters like soil moisture, temperature, carbon and water fluxes.



Biofilm – Microscopy unit

At boundaries, microorganisms at interfaces form so-called biofilms, which play a key role in a variety of processes. While microorganisms are systematically applied in biotechnological processes, their action in biofouling or the human body may also result in undesirable effects on product quality or health. The technology platform "[Biofilm](#)" comprises several laser scanning microscopes, which allow a thorough investigation of structural and functional properties of biofilms and, therefore, contribute to a better understanding of the processes which occur in biofilms.

Biotechnikum – Bioreactor technology

The [bioreactor pilot plant](#) consists of modern bioreactor technology for the cultivation of different microorganisms like bacteria, yeast and fungi. It offers multi- and laboratory bioreactor systems as well as a set of geometrically similar reactors for a scaling up with working volumes. The facility is completed by devices for analytics along the bioprocess and cell separation and thus, enables an integral approach for the investigation, development and optimization of bioprocesses.



Technology platforms

CITEPro – Chemicals in the Environment Profiler

[CITEPro](#) provides a platform for high-throughput sample preparation, the automated exposure of cell cultures and aquatic organisms, and the automated analysis of the effects and chemical concentrations for large numbers of chemicals and environmental samples. The platform can increase the sample throughput of established bioanalytical, toxicological and analytical methods and is therefore suited for a wide range of applications including the spatial and temporal resolution of contamination with micropollutants in various environmental matrices from water, sediment and soil to biota and humans.



LSI – Isotope analysis

The Laboratory of Stable Isotopes ([LSI](#)) has know-how in the analytics of stable isotopes for more than 25 years. It holds several methodological patents which are licensed and acts as reference laboratory for the IAEA. Core competences are online component specific analyses (GC, TCEA, HPCL), the development of methods for isotope analysis for gaseous, solid and liquid samples, quality control and management as well as the development and calibration of international reference materials.



MOSAIC – Hydrogeological subsurface exploration

[MOSAIC](#) (Model Driven Site Assessment, Information and Control) is a platform for the model-based, high-resolution exploration of complex subsurface structures by applying and combining minimally invasive methods. The platform combines various methods such as direct push technologies, on-site analytical methods, geophysical, tomographic, as well as hydrogeological techniques. A further innovative approach is the adaptive site investigation.

Technology platforms

Prometheus: Metabolomic and proteomic mass spectroscopy platforms

The [Prometheus](#) platform offers most modern mass spectroscopy (GC and LS/MS) to identify and quantify exogenic and endogenic metabolites in epidemiological studies and cellular models for metabolomic analysis, and targeted and non-targeted proteomic analysis in simple (gel bands, affinity-enriched) and complex samples (extracts from cell culture, tissue, body fluids, microbial consortia). For microbial ecology, we use our Protein-SIP (stable isotope probing) approach and bioinformatics tools. All analyses combine our expertise with cutting-edge lab equipment.



ProVIS – Visualisation of biochemical processes

[ProVIS](#) (Platform for visualisation of biochemical processes at the cellular level) provides a unique pool of scientific equipment combining imaging technologies with methods for chemical analysis to study biological samples, structures and surfaces on a nanometer scale. The technology comprises high-resolution atomic force, electron and ion microscopy as well as several mass spectrometry methods which are used to answer questions from fundamental research to applied science.

TESSIN/VisLab – 3D-Visualisation centre

The Visualisation Centre ([VisLab](#)) provides a platform for scientists from various fields to explore and analyse complex and spatially heterogeneous data sets. By way of an interactive large-area stereo projection screen, scientists can immerse themselves in the projected environmental data and, thereby, acquire new insights into scientific questions and problems. Furthermore, the platform offers opportunities for knowledge transfer between researchers on the one hand side and to interested citizens on the other hand side.



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- Risk assessment of chemicals
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