



Dresden.
Dresden



INTERREG IVC

INNOVATION & ENVIRONMENT
REGIONS OF EUROPE SHARING SOLUTIONS

Living Science

Biotechnology in Dresden





Axolotl

An amphibian from the *Ambystoma* genus (mole salamanders) with the ability to regenerate organs and extremities after injury.

Contents

- 2 Message from Prof. Kai Simons
- 3 Dresden, City of Excellence
- 4 From Cells to Tissues
- 6 From Molecules to Cells
and Biomaterials
- 8 Dresden Cures
- 10 Pharmaceuticals
- 11 Medical Technology
- 12 Transfer of Technology and Knowledge
- 14 Successful Growth
- 15 Networks | Experts of Tomorrow
- 16 Contact Details | Our Work

A Multifaceted Location

There are many reasons to choose Dresden, the City of Excellence. A growing metropolis in the center of Europe attracts newcomers with a top-class industrial location policy, high quality of life, economic opportunities and scientific perspectives. Biotechnology, too, benefits from the magnetism of this stronghold of art and culture, boasting perfect conditions for work, leisure and family life. It was, however, a long journey from the founding and development of the first pharmaceutical companies more than 100 years ago to this position as one of Germany's leading biotechnology locations.

East Germany's only University of Excellence, TU Dresden, paved the way, enticing increasing numbers of top national and, of course, international scientists and researchers to the city on the Elbe. This was an important factor, allowing as it did not just Dresden's world-famous microelectronics sector but also biological and medical research to make giant leaps towards the future. This trend was supported by training opportunities that held worldwide appeal, such as the International Max Planck Research School for Molecular Cell Biology and Bioengineering, founded in 2001, and the resulting Dresden International PhD Program.

Along with the development of some outstanding fundamental research and effective technology transfer, in the last few decades not just the well-known research facilities of the Max Planck, Leibniz and Fraunhofer Institutes have settled in Dresden but also biotechnology companies. Infrastructure specially adapted to the needs of the life sciences, such as the BioInnovationsZentrum at

the heart of the BioPolis biotechnology quarter, bring together possibilities for science and business near the city center. The general aim is to constantly extend and encourage these opportunities.

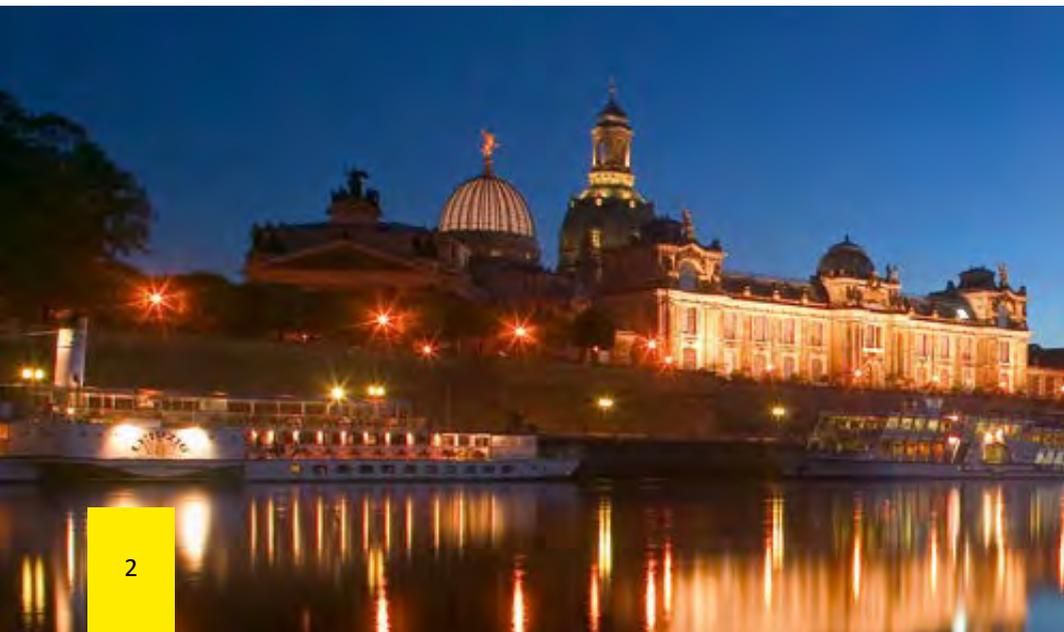
International interest has now been sparked by this targeted interlinking of different disciplines and by the results achieved in bioengineering, regenerative medicine, tissue engineering and adult stem cells. Thanks to efficient technology transfer mechanisms, the innovations emerging from research in Dresden are making their way into industry faster and with increasing success. In the years to come, this unique combination of engineering and biosciences, nanotechnology and microelectronics is set to continue, setting new trends in business and science.

Thanks to its high quality of life, facilities such as the Dresden International School and the city's constantly increasing internationalism, Dresden is now more for me than just an excellent location for culture, business and science. It's my second home town.



Professor Dr. Kai Simons

Lipotype GmbH,
former head of the Max Planck Institute
for Molecular Cell Biology and Genetics,
Honorary chairman
of the association biosaxony e. V.





Prof. Gerd Kempermann carries out research at the CRTD and DZNE into new neurons for old brains.

Dresden, City of Excellence

536,000 inhabitants. 43,500 students. 6,000 jobs in the field of the life sciences. And the number is rising. Dresden is more than a cultural metropolis. The city blends business, science and research. An excellent location, outstanding in the fields of microelectronics, nanotechnology, new-generation materials and biotechnology. Flagship institutions such as the Max Planck, Leibniz and Fraunhofer Institutes entice scientists from all over the world. Collaborative projects such as DRESDEN-concept, a cooperative venture between the TU Dresden and non-university institutions of research and culture, bring together different skills in research, education, infrastructure and administration. Joint projects have arisen such as the Dresden Genome Center, the Technology Platform, BioPolis Dresden Imaging Platform and welcome@DRESDEN-concept.

Ideal conditions for biotechnology and its forward-looking interdisciplinary connections. The pharmaceutical industry's traditionally strong presence in the city led to the creation of Bio-Polis, a high-performing science and research center. Here, at the heart of Dresden, almost everything revolves around biotechnology, from fundamental biological and medical research to training and degrees, then technology transfer. In the facilities on the site, such as the BioInnovationsZentrum, researchers and companies work side by side.

Their close proximity, the shared high-tech research platform, jointly used infrastructure, space for further extension, a targeted industrial location policy and the high number of start-ups are setting the course for further growth. The lovely Elbe valley is home not only to history, culture and quality of life but also to a globally recognized biotechnology location which is constantly gaining strength.





Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG)

From Cells to Tissues

Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG)

It all kicked off in 1998. The establishment of the Max Planck Institute for Molecular Cell Biology and Genetics sowed the seeds for the development of Dresden's current biotechnology scene. Here, more than 400 researchers, roughly 60 per cent of whom come from abroad, tackle the overriding question of how cells form tissues.

The aim is to gain a comprehensive understanding of organized cell structure, from the formation of tissues to the internal exchange of information. The research program covers as wide a range of complexity levels as possible, from that of molecular networks to organelles, cells, tissues, organs, all the way up to entire organisms. A specially founded graduate school, the International Max Planck Research School for Cell, Developmental and Systems Biology, continues to make an impact on an international scale. In cooperation with TU Dresden, this produced the top-class Dresden International PhD Program.

Max Planck Society – Consolidated Expertise for Dresden

All life processes are based on tiny systems and complex actions which are invisible to the naked eye. New technologies and approaches are required to carry out fundamental research into these molecular processes, bringing together huge quantities of data. The aim is to create an overall impression of biological structures which is as comprehensive and precise as possible. The initial search for a location was thus very specific. As Germany's centre for microelectronics and information technology, Dresden was the first choice: the city was a strong candidate as it offered necessary opportunities for interdisciplinary networking.

The newly founded Center for Systems Biology Dresden (CSBD) extends and gives institutional form to the existing intensive cooperation between the Max Planck Institute for Molecular Cell Biology and Genetics, the Max Planck Institute for the Physics of Complex Systems and TU Dresden. Led by the American bioinformatician Prof. Eugene Myers, who played a key role in decoding the human genome, the center will use new microscopy technology in a bid to deliver the necessary answers. Combined with calculation, theory and computer-assisted approaches, the key mechanisms of biological systems are being revealed.

Eating Yoghurt to Combat Parkinson's

The MPI-CBG researchers offered up the evidence in a Petri dish. Neurodegeneration can be stopped. Glycolates and D-lactate (lactic acid) counteract decreases in mitochondrial activity. Yoghurt and unripe fruits, which contain these substances, may be able to help. After all, many other diseases apart from Parkinson's are also caused by a reduction in mitochondrial activity.

DFG Centre for Regenerative Therapies Dresden (CRTD)

At the CRTD, the DFG Research Center and Cluster of Excellence for Regenerative Therapies, founded at TU Dresden in 2006, researchers and the institute director Prof. Elly Tanaka are hot on the scent of self-healing organisms. The aim is to carry out research into regenerative processes and develop novel treatments and replace diseased or damaged human tissues. The focus is on treatments for diabetes, for hematological, immunological and neurodegenerative diseases and for damage to the eyes,

Every day, an amphibian from the *Ambystoma* genus helps take major steps in this direction. It is the special attributes of the axolotl which fascinate Prof. Tanaka and her colleagues. With its ability to regenerate multiple organs, extremities and even its retina after injury, the axolotl is absolutely the model

organism. As well as the axolotl, other organisms are also studied, such as zebrafish and mice.

The crux of their success is the close cooperation between these fundamental researchers and the medics at the neighboring university hospital. For this reason, the CRTD takes an interdisciplinary approach. The short distance between the researchers and their hospital colleagues is a crucial advantage on the long path to developing new treatments. The CRTD also works in an extensive scientific network to keep everything near at hand and maximize synergies.



“Dresden is an excellent location where interdisciplinary basic research is linked with medicine to develop treatments of the future.”

Professor Elly Tanaka

Director of the Cluster of Excellence DFG Research Centre for Regenerative Therapies at the TU Dresden (CRTD)

Aquariums with zebrafish at the CRTD



From Molecules to Cells and Biomaterials

Biotechnology Center at TU Dresden (BIOTEC)

The BIOTEC Biotechnology Center, founded in the year 2000, now makes a mark with top-class achievements in research and internationally excellent teaching and training. It has proven to be the driving force behind the Free State of Saxony's biotechnology offensive, which is making rapid progress in the field of molecular bioengineering.

BIOTEC is involved in three key areas of biotechnology research:

- BIOTEC cell biologists are investigating subjects such as the fundamental mechanisms through which brain cells are formed from progenitor or stem cells (area of application: dementia).
- BIOTEC biophysicists are carrying out research into the physical properties of cells and how they behave in relation to the physical properties of their environment, e.g. how light is conducted from the retina to photoreceptor cells (area of application: poor eyesight and visual impairments).
- BIOTEC bioinformaticians are collecting and structuring medical data on preparations, genes, proteins and illnesses with the aim of using them for entirely new purposes (area of application: pancreatic cancer).

Numerous inventions and spin-offs have arisen from this interdisciplinary networking. The companies cooperating with BIOTEC include global concerns such as Roche Pharma AG, BASF and Carl Zeiss AG.

B CUBE – Center for Molecular Bioengineering at TU Dresden

The focus of scientific work at B CUBE, which was founded in 2008, is on transferring natural phenomena to synthetic materials: molecular bioengineering. Closely interlinked with the life sciences and engineering, B CUBE researches into and develops biological materials, moving in three main directions:

- Bioprospecting (studying natural systems and their functions)
- Bionanotools (developing and using novel methods for characterizing biological structures on a molecular level)
- Biomimetic materials (translating the properties of living materials to synthetic materials)

Researcher at B CUBE – Center for Molecular Bioengineering at TU Dresden



B CUBE is a spin-off from the BMBF initiative “Entrepreneurial Regions – Centres for Innovation Competence.” Here, innovations are expected in the fields of active ingredient development, medical diagnosis and synthesizing functional materials. For example, B CUBE is looking into biomolecular kinesin motors for use as artificial transport systems. When research is carried out into DNA metabolism, magnetic and optical tweezers are used to influence the way enzymes bind to DNA. In future, the plan is to regulate the activity of helicases, “tools” for separating the strands of the double helix, in order to influence the division of cancer cells. Hydrogels made of heparin and other materials could imitate the properties of the extracellular matrix and one day replace it. And research is being carried out into diatoms’ impressive ability to produce an unusually strong underwater adhesive, for example with regard to the development of biocompatible adhesives.

Max Bergmann Centre for Biomaterials, Dresden

A joint initiative by the Leibniz Institute of Polymer Research, Dresden, and the Institute of Materials Science at TU Dresden, the Max Bergmann Centre for Biomaterials is a good example of close cooperation between different institutes, organizations and even companies in the field of biotechnology. The scientists at the Max Bergmann Centre carry out interdisciplinary, closely interlinked research in the fields of nanotechnology, biotechnology and chemistry.

Their joint aim: to develop new biomaterials, nanoparticles and bioactive materials for medicine and technology. From dentistry to orthopedic technology or regenerative treatments, research is being carried out on numerous applications, some of which are already being put into practice. Whether it is bone replacement, implants, tissue regeneration or special implant coatings, these are all developments for the medicine of tomorrow. Even wires made of DNA molecules, only nanometers thick, are developed here for the microelectronics of the future.

InnoTERE GmbH

Ever since it took up business at the end of 2005, InnoTERE GmbH has concentrated on the research, development and production of innovative implants for bone regeneration. The company’s key products are its patented paste-like calcium phosphate cement (a bone replacement material sold as VELOXTM) and the delicate scaffolds this is used to make on a 3D printer, used as implants to fill in bone defects and for tissue engineering. Since November 2014, VELOXTM has provided surgeons with a new, minimally invasive ready-to-use product which comes as a pre-filled syringe. The same technology platform is the basis for bioimplants made at mild temperatures with 3D printing. The company is cooperating with local researchers and hospitals to systematically develop this further.

Reconstructing extensive cranial defects, Max Bergmann Centre for Biomaterials, Dresden





Proton accelerator (cyclotron) at OncoRay

Dresden Cures

Paul Langerhans Institute, Dresden (PLID), an outpost of Helmholtz Zentrum München at TU Dresden's Carl Gustav Carus university hospital – Diabetes

Founded in 2009, the Paul Langerhans Institute in Dresden concentrates on recognizing and combating Type 1 and Type 2 Diabetes mellitus. The member of the German Center for Diabetes Research (DZD) concentrates on mechanisms which influence the insulin-producing beta cells. It also investigates and questions immunological approaches and progress in the field of transplants.

There has been measurably successful cooperation in fundamental research, translational research and clinical application with patients. Dresden is the only location in Germany to boast a successful transplant program for the islets of Langerhans (also known as islet cells) within the pancreas. A step in the fight against diabetes and a success story made in Dresden.

National Center for Radiation Research in Oncology – OncoRay – cancer

Founded in 2005, OncoRay works towards healing cancer. In future, the aim is for biologically individualized and technologically optimized radiotherapy to improve patients' chances of recovery. A team of researchers led by the director

of OncoRay, Professor Michael Baumann, works with the Helmholtz-Zentrum Dresden-Rossendorf to develop corresponding methods and procedures.

Since 2014, a modern proton therapy unit (cyclotron) has been in operation at Dresden's university proton therapy department. This gentle procedure is only used in two other German cities (Heidelberg, Essen) and 30 hospitals around the world.

The OncoRay research topics can be divided into three main focuses: medical radiological physics (including high-precision radiotherapy); radiobiology (including research into biomarkers for individualized radiotherapy) and translational radiation oncology (including improving radiotherapy in combination with novel bioactive substances).

A specially developed Masters course in medical radiation science and a doctoral program accompanying a thesis at the OncoRay Postgraduate School introduce the next generation of scientists to the future of radiotherapy.

German Center for Neurodegenerative Diseases (DZNE) – Alzheimer's and dementia

The scientists at the DZNE Dresden examine how physical and mental activity helps to prevent and sometimes even treat neurodegenerative diseases. The central focus of the research is on the basic neurobiological principles of

“plasticity”: how the shape of the brain changes depending on activity. Some of the central questions asked by the DZNE Dresden include:

- How does exercise help combat neurodegeneration?
- What is the function of newly formed nerve cells in the adult brain (“adult neurogenesis”)?
- What role do brain stem cells play in neurodegeneration and brain plasticity?

These questions are being answered in close cooperation with Dresden University Hospital and the CRTD, the Center for Regenerative Therapies at TU Dresden.

Biotype Diagnostic GmbH

Biotype Diagnostic GmbH is an innovative, dynamic biotechnology company with more than a decade of experience in developing, producing and selling molecular biology testing systems for professional medicinal diagnostics. Biotype develops products for the early, fast recognition of specific sets of symptoms, mainly in the fields of:

- Hematology/oncology (characterizing acute myeloid leukemia, chimeric analysis)
- Dermatology / mycology (pathogen diagnostics)

Every day, Biotype faces the challenges of continuously extending its areas of application and developing novel procedures for personalized medicine.



“It is not enough just to have more ideas than others; you also have to be able to put them into practice”

Dr. Wilhelm Zörgiebel

CEO of Biotype Diagnostic GmbH

Transplantation of islets at the Carl Gustav Carus university hospital, Dresden

People with Type 1 diabetes, who suffer from extreme fluctuations in their glucose balance despite medicinal treatment, can undergo not only an organ transplant (of the pancreas) but also islet transplantation therapy. Here, insulin-producing cells are extracted from a donor pancreas, carefully prepared then injected into the recipient’s liver. After a short time, the cells start producing insulin again. The islet transplant program has been running at the Carl Gustav Carus University Hospital since 2008, making Dresden currently the only site in Germany with a successful islet cell transplantation program.

Riboxx GmbH

Riboxx GmbH concentrates its activities on two independent fields of work: Riboxx LIFE SCIENCES and Riboxx PHARMACEUTICALS. Their joint aim is to fight cancer, viral infections and autoimmune diseases. The main focus of Riboxx GmbH is on preventing relapses in patients who have already undergone cancer treatment. The great challenge is to get rid of all the cancer cells remaining in the body after treatment. To do so, RIBOXXIM has been developed: this can switch on the body’s immune cells to achieve a full cure.

BioCrea GmbH

Some impressive results of BioCrea GmbH’s work are medicines against autism, amyotrophic lateral sclerosis, epilepsy and depression. Scientists at the company are particularly hot on the trail of diseases of the central nervous system. The BioCrea researchers and developers work with partners from the fields of biotechnology and pharmaceuticals to improve upon medicines. BioCrea is involved in this process all the way up to the pre-clinical stage. Subsequent licensing creates resources for further developments and projects.



Production of medicines at APOGEPHA Arzneimittel GmbH

Pharmaceutics

GlaxoSmithKline Biologicals

Innovative entrepreneurship still has a major influence on Dresden as a traditional location for pharmaceuticals. Since 1992, the Saxon Serum Works, founded in Dresden, has been part of the British pharmaceutical company SmithKline Beecham; a 2000 merger made this the global concern GlaxoSmithKline (GSK). GSK is one of the world's leading providers in the field of developing, producing and supplying flu vaccines. Produced on an annual basis in line with the World Health Organization's flu strain recommendations, GSK's seasonal flu vaccines are delivered all over the world. As a manufacturer, GSK offers an innovative flu vaccine which protects against four rather than just three strains.

APOGEPHA Arzneimittel GmbH

APOGEPHA Arzneimittel GmbH, specialized in developing and manufacturing medicines in the field of urology, boasts a company history going back more than 120 years in Dresden. Here, the central focus is on developing medicines against urinary incontinence, infections of the urinary tract or prostate problems. In 2011, APOGEPHA Arzneimittel GmbH was named Dresden's most family-friendly company.

Menarini-Von Heyden GmbH

In 1874, Friedrich von Heyden developed a way to synthetically produce salicylic acid, thus founding the modern pharmaceutical industry at what is now Menarini-Von Heyden GmbH on Leipziger Strasse in Dresden. Its predecessors, the pharmaceutical companies von Heyden, Gehe and Madaus merged after the Second World War to form Arzneimittelwerk Dresden (Dresden Pharmacological Works). In 2006 the MENARINI group took over the production section of this traditional pharmaceutical company. Today, under the name Menarini-Von Heyden, medicines are produced to treat problems such as diabetes, pain and cardiovascular disease.

ROTOP Pharmaka GmbH

Rossendorf Pharmaka GmbH has its roots in the previous National Institute for Nuclear Research in Rossendorf. As long ago as 1958, shortly after the research reactor came into operation, radioactive substances first began to be produced here. Even then, the name ROSSENDORFER IsoTOPE was used as an identifier. When ROTOP Pharmaka GmbH was founded in the year 2000, this created one of the world's leading radiopharmaceutical centers. In close cooperation with the Helmholtz-Zentrum Dresden-Rossendorf, which is responsible for fundamental research, the focus is on developing, producing and selling products for use in nuclear medicine.

Medical Technology

Dental implants, hearing aids, devices for diagnosis and monitoring: Dresden's strong microelectronics industry is of benefit to local medical technology, offering potential for synergies.

Institute of Biomedical Engineering at TU Dresden

At TU Dresden, the spotlight is on engineering. The link between the Medical Faculty and the Carl Gustav Carus University Hospital creates the perfect conditions for biomedical technological research and teaching. In the fields of cardiology, intensive care, obstetrics and rehabilitation, the institute develops low-cost medical imaging, diagnosis and monitoring technology for the early recognition, diagnosis and treatment of cardiovascular diseases.

Contract Medical International GmbH

Founded in Saxony in the year 2000, Contract Medical International now has two sites and 160 staff in all. At home in Dresden and the Czech town of Hradec Králové, this international company's focus in Dresden is on developing and producing disposable medicinal items/catheters and on having them approved on various markets. From cardiovascular applications to endoscopy, neurosurgery and gastrointestinal uses, the company's own product portfolio covers a wide range.



Mobile assistance system at the Fraunhofer Institute for Photonic Microsystems (IPMS)

Fraunhofer Institute for Photonic Microsystems (IPMS)

The Fraunhofer IPMS, one of five Fraunhofer Institutes in Dresden boasting expertise in medical technology, cooperates in research and service provision in the fields of optical sensors and actuators, ASICs, microsystems (MEMS/MOEMS) and nanoelectronics. One of ten Dresden Fraunhofer Society institutions, the Fraunhofer IPMS employs some 300 scientists. To make the provision of social services and institutions more flexible, and adapt them better to the needs of the people being cared for, the Fraunhofer IPMS developed a mobile assistance system. Modelled on a watch, it allows people to contact the emergency services, service providers and trusted parties, giving older people the chance to remain mobile and participate actively in public life.

MEGADENTA Dentalprodukte GmbH

MEGADENTA Dentalprodukte GmbH has stood for dentistry products made in Saxony for more than 90 years. From research to development and production, the Radeberg company offers dentistry solutions and products, such as innovative materials for treatments, prosthetics and prophylaxis. These include dental impression materials, temporary and permanent filling materials, composites, adhesives and glass ionomer cements.

Cicor RHe Microsystems GmbH

Located in Radeberg, Cicor RHe Microsystems GmbH works with its customers to produce complex electronic switches for medical applications such as eye pressure sensors, retina implants, cardiac catheters and hearing aids. Cicor structures ceramic interconnect devices using thick-film technology and delicate micro-assembly of the carrier material. This sets demanding requirements in terms of manufacturing technology. Quality, reliability and functioning must be assured without exception.

ETTBio – Technology Transfer in Biotechnology

How does a research idea become a marketable product? How does a researcher become a successful entrepreneur? These were the questions posed by the ETTBio project. The aim: more effective transfer of technology and knowledge.



ETTBio – effective technology transfer in biotechnology

For scientific potential to lead to scientific growth, conducive structures are required. Processes are needed to ensure that research results are transferred to industry. The EU project “Effective Technology Transfer in Biotechnology” (ETTBio) took on this task.

The ETTBio project involved a total of ten partners from seven European countries. The biotechnology sites were critically evaluated based on everything from identifying good practice to breaking through the barriers preventing the improvement of technology transfer at research institutes and universities. The task of the Dresden participants was to recognize possible problems and implement the best strategies applied by other sites in Dresden.

For Dresden, three key topics were pinpointed:

- setting up validation funding for biotechnology
- improving natural scientists’ training in business and technology transfer
- creating a central technology transfer unit in Dresden

Results in the field of validation funding:

Small and medium enterprises are especially likely to fail at transferring research results into market-ready products. There is a lack of funding programs for the “proof of principle” to the “proof of concept” project stages. The project involved handing plans for this process to ministries and politicians.

Results in the field of improving training:

The International Summer School and the series of seminars on “Science as usual? Job opportunities for life scientists” are newly created training opportunities for scientists in the field of biotechnology and the life sciences.

Results in the field of the technology transfer unit:

The linchpin for the planned development is the creation of a central technology transfer unit in Dresden. The idea is to combine existing resources to create better visibility, with the aim of providing scientists with support at short notice, from helping find a partner to the final exploitation. Work is still being carried out on a specific scheme for a shared-service model, to involve the existing transfer points and university and non-university institutions.

The ETTBio EU project received a total of roughly 2.3 million euros in funding as part of the INTERREG IVC EU program. INTERREG IVC supports the exchange of knowledge and experience between European regions. As well as improving regional structures and processes, the point is to balance out regional inequality within the EU.

Knowledge Transfer in Action at BIOZ Dresden

BioInnovationsZentrum Dresden

The BioInnovationsZentrum is a business incubator covering an area of 7,600 m² and creating the basis for a whole new level of cooperation. Here, business and science work together under one roof at the center of Bio-Polis. As a regional center of excellence which adds to networking between institutions from business, TU Dresden and non-university research institutions, the BIOZ offers a wide range of services and facilities.

As well as an extensive equipment pool and access to the technology platform of the Biotechnology Center (BIOTEC), conference rooms and various services offer all tenants the chance to make their work more efficient. The “innovation alliance” offered here creates the financial and infrastructural conditions for carrying out exciting research missions in the life sciences. At the same time, it brings together the elite and the upcoming generation of scientists and businesspeople.

Technology platforms

Biotechnological research develops on the basis of ultra-modern equipment operated and improved by specialized staff. The joint use of these high-cost advanced technologies and access to the necessary specialist knowledge are provided using technology platforms (also known as core facilities). Their wide range of uses means they raise the efficiency of technology/knowledge transfer and is a sign of how economically the funding (often from public sources) is used.

Technology platforms are also a key element of life sciences research in Dresden. The Dresden research institutes’ core facilities are closely coordinated, sometimes being operated jointly or, under the overall control of “Dresden-concept” even commercialized on an interdisciplinary basis. As the site of close cooperation, they initiate research activity and strengthen shared interdisciplinary ventures.

📄 www.dresden-concept.de

BioInnovationsZentrum Dresden (BIOZ)



Successful Growth

Life Science Inkubator Sachsen (LSI Sachsen)

The long path from research to a market-ready product makes it a great challenge for scientists in the life sciences to turn a scientific success into a business success. The Life Science Inkubator (LSI) Sachsen, a subsidiary of LSI Bonn, supports such attempts following a model which has been established in Bonn since 2008. At the LSI, innovative research projects from the fields of biotechnology, pharmaceuticals and medical technology are incubated for a period of at most three years. The goal is to develop the projects to the point where they are able to attract funding. The federal and regional governments, scientific organizations and private investors back this concept. LSI Sachsen has its offices at BioZ Dresden and is currently supporting a project aimed at developing devices for fluorescence cryo-microscopy and spectroscopy. They will find their application in medical diagnostics, and in particular the early diagnosis of malign and neurodegenerative diseases, as well as adult-onset diabetes. Other projects are currently at the in-depth evaluation stage.

Lipotype GmbH

A spin-off from the Max Planck Institute for Molecular Cell Biology and Genetics (MPI-CBG), founded in 2012, Lipotype developed a new high-throughput technology for lipid analysis. Known as “shotgun lipidomics,” this combination of mass spectrometry, high-throughput

probe processing and evaluation using the LipotypeXplorer software determines the lipid composition of large numbers of samples, in terms of both quality and quantity, within a short time. The software identifies biomarkers of diseases such as cancer, asthma, Alzheimer’s, diabetes and the cardiovascular system. Used in personalized medicine, new lipid parameters are revolutionizing clinical diagnosis and nutrition science, helping to identify and heal diseases better and more quickly.

Qualitype GmbH

Qualitype GmbH was founded in Dresden in 2001. With 30 members of staff, it works for companies in more than 30 countries. With a focus on bioinformatics, the Dresden software company develops solutions for the fields of forensics, medicine and foodstuffs. In the areas of food production and medicine, Qualitype provides software and database solutions for quality management and monitoring. In forensics, the bioinformatics company implements software solutions for forensic institutes and companies. From laboratory and case management to the evaluation of evidence at crime scenes, biostatistical calculations, and DNA profiling, Qualitype helps solve complicated cases fast.



Automated sample extraction for high-throughput lipid analysis at Lipotype GmbH

Qualitype tracks down the identity of Nefertiti

Using the Geno-Proof 3 evaluation software, in 2012 Qualitype GmbH corrected our knowledge of the Egyptian queen Nefertiti’s parentage. The genetic material, more than 3,300 years old, caused a sensation. Thanks to the analysis results, we now know for certain exactly how Nefertiti and Tutankhamen were related: he is the queen’s son.



Dresden benefits from young, talented scientists from all over the world.

Networks



“As a location of science and industry, Dresden stands for strong interdisciplinary connections between research institutes and companies. Close cooperation is the order of the day here.”

André Hofmann

Managing Director of biosaxony e.V.

biosaxony e. V.

biosaxony e.V. is the Saxon federation for the biotechnology/life sciences sector, whose over 100 members represent the different life sciences enterprises, scientific institutions and sectoral stakeholders in Saxony. The cluster aims to initiate projects between companies and scientists, to mediate services and expertise, and to use synergies to further develop the sector and commercialize regional skills.

The federation’s work is designed to develop new ideas and strategies, and to extend the life sciences sector in Saxony.

Healthy Saxony

Founded in 2014, Healthy Saxony supports cooperation between science, medical institutions, politics and industry. The association sees itself as a central communication platform for Saxony’s health industry. Healthy Saxony records current information on companies in the health industry in its “Saxon Digital Health Atlas.”

Promoting Skills and Ideas



The Economic Development Office supports the development of companies and research institutes in Dresden. It guides companies through the approval process for business expansion investment, advises on commercial locations for companies wishing to expand or establish operations, provides information about current projects and helps create active networking with various institutions and facilities. The business service also provides advice on funding, financing and start-ups. Dresden's Economic Development Office cooperates with the Saxon Economic Development Corporation and networks in the sector to prepare trade show stands, exhibitions and events.

The contact person for biotechnology/ the life sciences, key sector manager Lucia Coskun, answers specialist questions and helps companies carry through their projects.

Economic Development Office, Dresden

Lucia Coskun
Key sector manager

World Trade Center
Ammonstr. 74
01067 Dresden
Germany

Phone: +49 351 488-8788
Fax: +49 351 488-8702
LCoskun@dresden.de

↘ www.dresden.de/wirtschaft

- 1 Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG)
↘ www.mpi-cbg.de
- 2 DFG Centre for Regenerative Therapies Dresden (CRTD)
↘ www.crt-dresden.de
- 3 Biotechnology Center at TU Dresden (BIOTEC)
↘ www.biotec.tu-dresden.de
- 4 B CUBE – Center for Molecular Bioengineering at TU Dresden
↘ www.bcube-dresden.de
- 5 Max Bergmann Centre for Biomaterials, Dresden
↘ www.mbc-dresden.de
- 6 InnoTERE GmbH
↘ www.innotere.de
- 7 Paul Langerhans Institute, Dresden (PLID), an outpost of Helmholtz Zentrum München at TU Dresden
↘ www.plid.de
- 8 National Center for Radiation Research in Oncology – OncoRay
↘ www.oncoray.de
- 9 German Center for Neurodegenerative Diseases (DZNE)
↘ www.dzne.de
- 10 Biotype Diagnostic GmbH
↘ www.biotype.de

Experts of Tomorrow

TU Dresden

The University of Technology is one of eleven Universities of Excellence in Germany. A Volluniversität, i. e. covering the four traditional faculties, it is one of the country's most research-intensive universities. Some 40,000 students and 6,000 staff study and work at the TU. Future biotechnologists can choose from Master and Bachelor courses in the departments of biology, chemistry, process engineering and natural materials technology. Specialized training is possible in the form of a Bachelor course in molecular biotechnology and a Master course in Applied Ecology.

Biotechnology Center at TU Dresden

Interdisciplinarity and internationality characterize teaching at the BIOTEC on the three English-language Master courses in molecular bioengineering, nanobiophysics and regenerative biology and medicine. Here, everything revolves around the subject of the life sciences, with excellent support in an international environment. One particular highlight for students at BIOTEC is taking part in international competitions. Here, they are given the opportunity not only to display

the specialized knowledge they have acquired but also, above all, to demonstrate their ability to carry out scientific teamwork. A crowning achievement to round off a challenging course.

Dresden International PhD Program (DIPP)

This highly competitive, structured doctoral program has proven its worth on the path to a doctorate in the life sciences. Doctoral students on the program can choose between four interlinked research routes: Cell and Developmental Biology, Computational Biology, Biophysics and Bioengineering or Regenerative Medicine. The institutions involved:

- Max Planck Society
- Leibniz Association
- Helmholtz Association
- and TU Dresden

with their Dresden facilities guarantee a top-class education and support.



Construction of the Biology department at TU Dresden



- | | |
|--|---|
| 11 Riboxx GmbH
www.riboxx.com | 17 Contract Medical International GmbH
www.contract-medical.com |
| 12 BioCrea GmbH
www.biocrea.com | 18 MEGADENTA Dentalprodukte GmbH
www.megadenta.de |
| 13 GlaxoSmithKline Biologicals NL of SmithKline Beecham Pharma GmbH & Co. KG
www.glaxosmithkline.de | 19 Cicor RHe Microsystems GmbH
www.cicor.com |
| 14 APOGEPHA Arzneimittel GmbH
www.apogepha.de | 20 Life Science Inkubator Sachsen (LSI Sachsen)
www.life-science-inkubator.de |
| 15 Menarini-Von Heyden GmbH
www.menarini.com | 21 Lipotype GmbH
www.lipotype.com |
| 16 ROTOP Pharmaka GmbH
www.rotop-pharmaka.de | 22 Qualitytype GmbH
www.qualitytype.de |



23 BioInnovationsZentrum Dresden

↳ www.tzdresden.de/standort-bioz

24 biosaxony e.V.

↳ www.biosaxony.com

25 Healthy Saxony

↳ www.healthy-saxony.com

26 TU Dresden

↳ www.biotech.tu-dresden.de

27 Biotechnology Center
at TU Dresden

↳ www.biotech.tu-dresden.de

28 Transinsight GmbH

↳ www.transinsight.com

29 RESprotect GmbH

↳ www.resprotect.de

30 Arevipharma

↳ www.arevipharma.com

31 Eupheria

↳ www.eupheria.com

32 ABX advanced biochemical
compounds GmbH

↳ www.abx.de

33 MED Nuklear-Medizintechnik
Dresden GmbH

↳ www.nuklear-medizintechnik.de



Publishing Details

Published by:
City of Dresden
The Mayor

Economic Development Office
Phone: +49 351 488-8700
Fax: +49 351 488-8703
wirtschaftsfoerderung@dresden.de

Mayor's Office
Public Relations Department
Phone: +49 351 488-2390
Fax: +49 351 488-2238
presse@dresden.de

Postfach 12 00 20
01001 Dresden
Germany
www.dresden.de

Photos: front, 2: DFG Center for Regenerative Therapies Dresden (CRTD)/Boes; 1: DFG Center for Regenerative Therapies Dresden (CRTD)/Boes; 2: Lipotype GmbH/ONE. Photostudio; 2/3: Sylvio Dittrich; 3: DZNE/Sven Döring; 4: Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG)/Jussi Tiainen; 5: LHD/Lösel, DFG Center for Regenerative Therapies Dresden (CRTD); 6: ZIK B CUBE/Katrin Boes; 7: IPF/A. Breier; 8: OncoRay/ André Wirsig; 9: Biotype Diagnostic GmbH/David Brandt. de; 10: APOGEPHA Arzneimittel GmbH; 11: Fraunhofer Institut für Photonische Mikrosysteme (IPMS); 12: LHD/Lösel; 13: Lipotype GmbH/ONE. Photostudio; 14: Dresden international Phd Program/Frank Janowski; 15: LHD/Thomas Ott

Design: Sandstein Kommunikation GmbH, Dresden
www.sandstein.de

Translation: Schweitzer Sprachendienst, Radebeul
www.ssd-online.de

February 2015

Digitally signed or encoded files not accepted. Procedural motions or written pleas cannot be submitted with legal effect by electronic means (including, but not limited to, those sent by e-mail). This information material is published by the City of Dresden's Public Relations Department. It may not be used for electoral campaigning. However, parties may use it to inform their members.