



BioTOP-Report 2012

Biotechnology in Berlin-Brandenburg

THE GERMAN CAPITAL REGION
excellence in life sciences & healthcare

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Editorial

Excellence in Life Sciences and Healthcare

Over the past 20 years, the biotechnology industry in Berlin-Brandenburg has developed into an innovation driver which also influences many other sectors. Both in research and industry, we have seen continuous growth in the number of institutions and companies engaged in biotechnology. This growth is driven primarily by excellent research. The region's unique density of prestigious science and research facilities forms an ideal breeding ground for the foundation and location of research-oriented health sector companies. Internationally, Berlin-Brandenburg now counts as one of the world's leading healthcare and life science locations.



Dr. Kai Bindseil
Director BioTOP Berlin-Brandenburg
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More than 200 biotechnology and 30 pharmaceutical companies are located in the German Capital Region. They include global corporations like Bayer HealthCare, Bausch & Lomb, B. Braun Melsungen, Berlin-Chemie, Pfizer, Sanofi and Nycomed Takeda. Along with the sector's many small and mid-sized companies, they benefit from close cooperation, both with science and with more than 130 hospitals – among them, above all, one of Europe's largest university hospitals: Charité – Universitätsmedizin Berlin.

The new capabilities of IT-based technologies open up entirely new potentials for biotechnology and healthcare in the direction of increasingly personalised diagnostics and therapy. In this regard, too, the German Capital Region is a founder Mecca of the IT industry and boasts major companies and institutions like SAP, Siemens and the Hasso Plattner Institute (HPI) in Potsdam.

Based on its excellence in interdisciplinary and translational cooperation, the Cluster HealthCapital Berlin Brandenburg is generating innovations which are to benefit patients as soon as possible. Close networking of all players in the region is essential to accelerate the translation of the newest research findings into innovative products. As part of the joint innovation strategy of the states of Berlin and Brandenburg (innoBB), this task was assigned to the cluster management organisation HealthCapital. BioTOP forms part of this cluster management, and we are pleased to present the most important developments in the life sciences, pharmaceuticals and biotechnology to you in this BioTOP-Report 2012 in the new layout of the Cluster HealthCapital.

We hope you enjoy reading our report and look forward to continuing good cooperation with you.

A handwritten signature in black ink, appearing to read 'Kai Bindseil', written in a cursive style.

Dr. Kai Bindseil

Industry

Biotech Industry Continues to Grow

The Berlin-Brandenburg biotech industry has continued to develop positively in 2011. As in previous years, the number of employees grew by 4%. Compared to the average growth rate of 3.5% of the last years, that is a good result and a sign of the dynamism in the Berlin-Brandenburg region. Currently 215 companies employ 4,068 people here.

Business development in 2011

Once again in 2011, BioTOP carried out a survey of regional companies to learn about current developments and gain a comprehensive overview of the business landscape. In 2011, the number of companies increased by 17 newly registered businesses. They include five new start-ups, six companies that began their business operations in 2011 and six that were newly listed. Two companies ceased operations.

The new companies are smaller units with a strong focus on services and product developments that are close to the market. One example – financed by the High-Tech Gründerfonds – is the **OakLabs** GmbH, providing services and products in the field of

customer-specific SNP analysis and focusing on the development of diagnostic DNA markers for complex attributes. Another is **TissUse** GmbH, which was founded by TU Berlin and is a product of the GO-Bio competition sponsored by the German Federal Ministry of Education and Research (BMBF). The company has developed the following innovation: Using a multi-organ bioreactor in chip format, substances can be tested on humans even before exposition, thereby enabling the prediction of consumer-relevant reactions.

Overall, there has been little change in the size of companies in recent years. 62% of all companies recorded are small businesses with fewer than ten employees. However, those companies employ less than 16% of the sector's workforce, while 32%

JANUARY 2011

RNL Bio (Korea) acquires the Berlin stem cell company Pharmicell Europe ++++ QIAGEN to acquire stake in Alacris, gaining access to biomarker pipeline for use in personalized healthcare assays ++++ GILUPI GmbH: VC funding in the amount of Euro 3.6 million

FEBRUARY 2011

MOLOGEN AG: Euro 10 Mio capital increase ++++ The European Commission awards the newly created "Region of Excellence" label to Brandenburg

MARCH 2011

Algenol announces acquisition of Cyano Biofuels GmbH ++++ Revotar Biopharmaceuticals meets primary endpoint in Phase II COPD study with inhaled Bimosiamose

APRIL 2011

Co.don AG: exclusive agreement with Novomedics GmbH to distribute its cell-based therapy chondrosphere® for Switzerland ++++ Glycotope Biotechnology expands GMP production facility to 11 kg antibody per year and starts phase I clinical trial of FSH-GEX for the treatment of anovulatory infertility

MAY 2011

Lonza and ORGANOBALANCE enter global license agreement to develop and market unique probiotic (*Lactobacillus anti-H. pylori*) ++++ The patient

inclusion criteria for the MOLOGEN AG clinical study of the colorectal cancer medicine MGN1703 are broadened. This creates the opportunity to obtain the expected market approval for the drug independently of a specified first-line therapy ++++ Caprotec bioanalytics increases series B financing in second closing to 5 million Euros

JUNE 2011

Silence Therapeutics` Atu027 demonstrates promising anti-tumour activity in Phase I study presented at ASCO ++++ BIOTECON Diagnostics completes development of a rapid test for EHEC (*enterohemorrhagic E. coli*) to combat the epidemic which also provides specific proof of the circulating EHEC strain O104:H4 ++++ The start-up company Spreelabs of Freie Universität Berlin receives award in the business plan competition Science4Life Venture Cup 2011 for its temperature reference plate also named "DNA Thermometer", which has been registered for patent.

JULY 2011

Metanomics Health officially launches its Energy Metabolite Platform, a unique target platform based on metabolite profiling of the energy status of a biological system

AUGUST 2011

ProBioGen licences its innovative GlymaxX® technology to Boehringer Ingelheim ++++ co.don AG cultivates cartilage cell transplants for the Asklepios

work in companies with 11-50 employees. More than 52% of all employees in the region's biotech industry work for the 19 companies that have more than 50 employees. The thematic focus also remained unchanged in recent years. The main remains biomedicine, and here diagnostics.



Group, Germany's largest private hospital group ++++ The first evaluation data from the clinical study of MGN1601 by MOLOGEN AG in kidney cancer therapy are far more encouraging than expected

SEPTEMBER 2011

The colorectal cancer test Epi proColon® 2.0 developed by Epigenomics detects 95% of cancer cases in a clinical trial ++++ GlycoTope enrolls first patients in phase I trial with TrasGEX (TM), a glycooptimized HER2 biobetter antibody ++++ ATLAS Biolabs joins the bioinformatics project NGSgoesHPC of the German Federal Ministry of Education and Research (BMBF)

OCTOBER 2011

Humedics successfully closes its first VC funding contract with Charité Biomedical Fund, VC-Fonds Technologie, KfW, the German high-tech start-up fund HTGF und Ventegis Capital AG ++++ Epigenomics announces market launch of Epi proColon® 2.0 CE in Europe ++++ ProBioGen and Inhibrx sign licence deal on GlymaxX® ADCC technology for therapeutic antibody development

NOVEMBER 2011

MOLOGEN AG achieves the targets of its kidney cancer study with MGN1601 ahead of schedule ++++ co.don AG receives the entrepreneur award of the Eastern German Savings Bank Federation (OSV), one of the most prestigious distinctions awarded in Germany's eastern federal states

Deals and product developments

The year 2011 saw a range of new cooperation agreements and important milestones in product development. Here are a few selected examples from the wide spectrum of activities:

ProBioGen AG, a specialist in developing production cell lines, process engineering and the GMP production of biopharmaceutical active agents, has been very active. The company closed several license agreements to use their cell lines, including a non-exclusive license agreement with **Boehringer Ingelheim** to use ProBioGen's innovative glyco-engineering technology "GlymaxX". Boehringer Ingelheim will use the technology in biopharmaceutical contract development and production.

ORGANOBALANCE GmbH signed a worldwide exclusive license agreement with **Lonza** under which the licensee develops, produces and markets a probiotic *Lactobacillus* strain. The probiotic strain developed by ORGANOBALANCE acts against *Helicobacter pylori* (*H. pylori*). The license provides Lonza with the basis for access to the probiotic market.

DECEMBER 2011

SCIENION founds the US subsidiary SCIENION US, Inc. ++++ The new method developed by the company Caprotec called Capture Compound Mass Spectrometry is used to research new anti-cancer agents in cooperation with the Leibniz-Institute for Molecular Pharmacology (FMP) ++++ NOXXON completes Phase I trial for the SDF-1 inhibitor NOX-A12

JANUARY 2012

ORGANOBALANCE signs licence agreement with Sanofi Pasteur for access to a modified yeast strain for vaccine applications ++++ EPO starts strategic cooperation with vivoPharm to enhance its market position in the US.

FEBRUARY 2012

The Epi proLung® BL assay by Epigenomics demonstrates good performance as a confirmation test for patients with suspected lung cancer ++++ Construction starts on Europe's largest hospital laboratory in Berlin-Wedding: Groundbreaking ceremony for the operations facility of Labor Berlin – Charité Vivantes GmbH

MARCH 2012

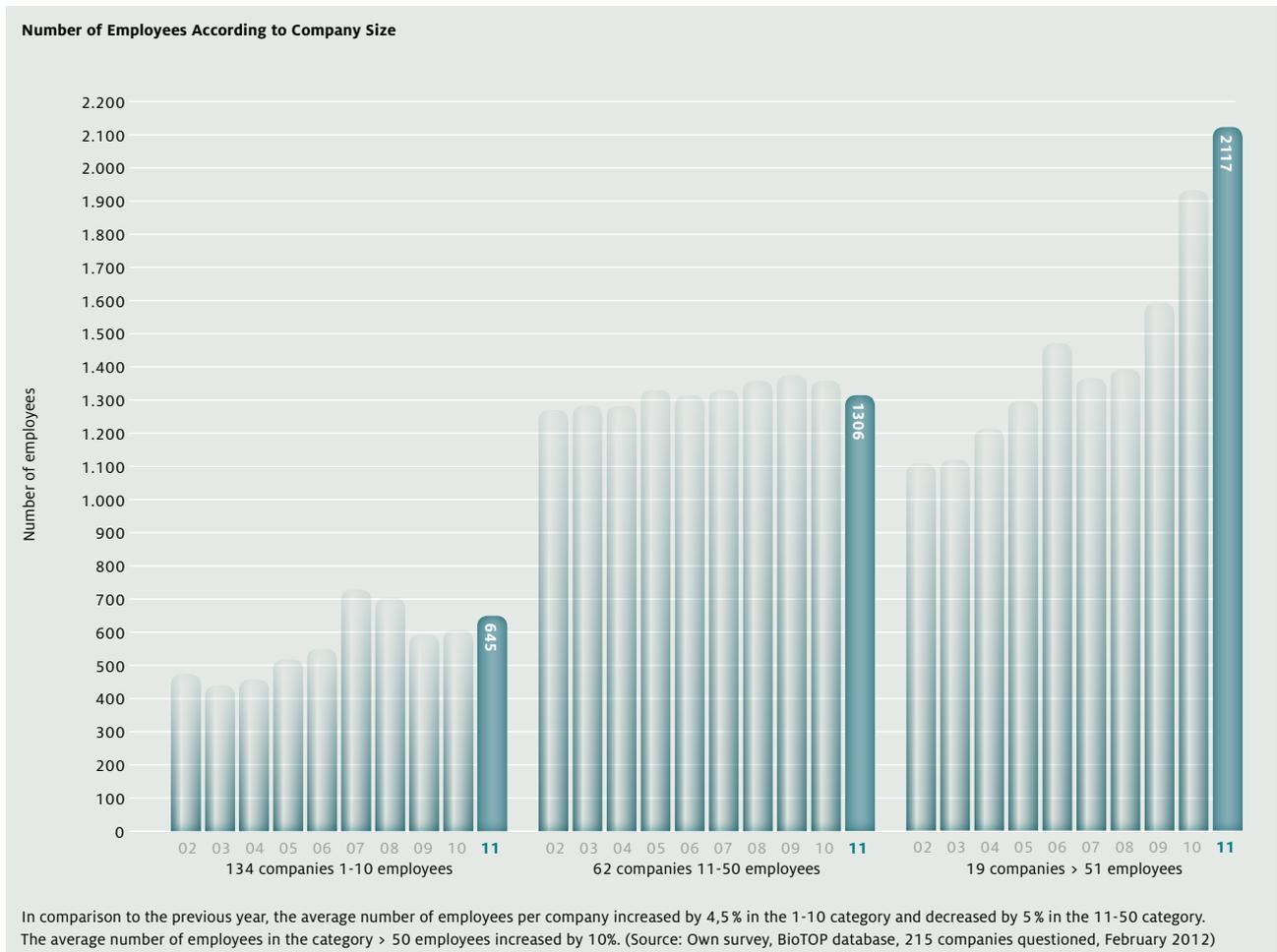
ProBioGen's licenses its AGE1.CR® cell line for viral vaccine production to Ceva ++++ SCIENION introduces sciREADER CL for colorimetric detection of multiplex assays

EPO Berlin-Buch GmbH has closed a cooperation agreement with **vivoPharm**, an Australian/American company. vivoPharm also focuses on preclinical pharmacological research and will make the primary tumour models developed by EPO more intensively available to cancer research facilities in the USA. For the first time, EPO technologies are therefore giving biotechnology and pharmaceuticals companies in the USA the opportunity to test the cancer medicines they are developing in models that are close to clinical practice and to seek and validate predictive (bio-) markers for their efficacy.

In the field of regenerative medicine, **co.don** AG has signed a framework agreement with Germany's largest association of clinics, the **Asklepios Group**. It enables Asklepios Clinics throughout

Germany to treat patients with the cell-based biological medicine **ARTROCELL 3D®/co.don chondrosphere®**. The product is used for regenerative treatment of cartilage damage, e.g. of the knee, and is an ideal extension of the therapies offered by the Asklepios Hospitals.

KNAUER GmbH announced a license and cooperation agreement with **ChromaCon** AG, under which ChromaCon grants KNAUER a semi-exclusive license for world-wide marketing, distribution and after-sales services of the Contichrom™ lab-scale preparative chromatography unit for use in discovery, process development and small scale production. In an internationalisation measure, **Scienion** AG founded an American subsidiary in Princeton to develop a base in this important key market and meet the growing



demand for sciFLEXARRAYER dispenser machines and microarrays manufactured by Scienion.

Silence Therapeutics plc, a leading RNA interference (RNAi) therapeutics company, announced that it has entered into an agreement with **Mirna Therapeutics** Inc., a biopharmaceutical company pioneering microRNA-based therapeutics for cancer, to assess the delivery capabilities of Silence's proprietary AtuPLEX™ and DBTC delivery systems for Mirna's novel microRNAs. Under the terms of the agreement, Mirna will provide Silence with specific miRNA sequences, which Silence will formulate with its AtuPLEX™ and DBTC delivery systems in order to develop multiple candidate drugs.

Companies working on the development of innovative medicines achieved important milestones in 2011:

MOLOGEN AG, which specialises in the research and development of innovative medicines based on DNA structures, fully achieved the primary study targets ahead of schedule in the Phase I/II clinical study on their kidney cancer medicine MGN1601, which has shown a significant survival benefit for patients. At the same time, the approval-relevant Phase II/III study on the intestinal cancer medicine MGN1703 is also progressing. It is the most developed product in the MOLOGEN AG pipeline. The DNA immune modulator MGN1703 will now be clinically tested for treating advanced lung cancer.



You need commitment, focus and passion to find new ways to fight the diseases of this world: innovation is at the heart of it.

Innovation for better health. Our commitment is to bring to patients around the world quality medicines for use in diagnosing, combating and preventing disease. Every day we work against time, researching new pathways, new molecules, new technologies – complementing our own capabilities with expertise of innovative partners from science and industry.

The success of this work is evidenced in new medicines for areas with significant unmet medical need such as oncology, cardiovascular and blood diseases, as well as gynecology and ophthalmology. Our aim is a better quality of life for all.

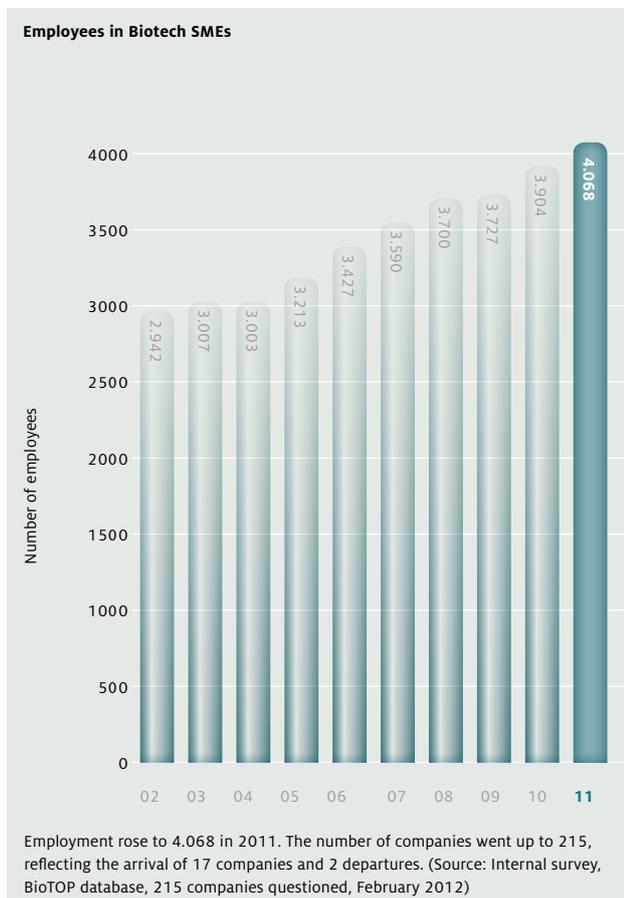


The product portfolio of **Glycotope**, a global leader in optimizing the glycosylation of biopharmaceuticals, now encompasses a variety of antibodies and non-antibody biologics, 4 of which are currently in the clinical stage. This pipeline includes antibodies against novel targets for cancer therapy (e.g. GT-MAB 2.5-GEX™) and significantly improved versions of antibodies as well as other already marketed therapeutic proteins, so called Biobetters.

NOXXON Pharma, a biopharmaceutical company pioneering the development of a new class of proprietary therapeutics called Spiegelmers has a diversified portfolio of clinical stage Spiegelmer therapeutics. For instance, Spiegelmer® NOX-E36 targets the pro-inflammatory chemokine MCP-1 (CCL2) which is implicated in diabetic complications including nephropathy. NOX-E36 is currently completing a Phase Ib study in healthy subjects and diabetics, and a Phase IIa diabetic nephropathy study is currently

in preparation. Spiegelmer® NOX-A12 targets SDF-1 (CXCL12), a chemokine mediator of tumour invasion, metastasis and resistance to chemotherapy, and has completed Phase I and Phase IIa studies in two haematological oncology indications have recently been started.

In recent years there were a number of acquisitions, such as the take-over of the diagnostics company **B.R.A.H.M.S** by **Thermo Fisher Scientific**, but 2011 was exceptionally quiet in this respect and no significant take-overs were recorded. Looking back, one can conclude that the more than 15 take-overs in the past few years have on the whole strengthened the affected companies, which have strategically benefited from them. Overall, the regional industry is in very good shape and developing with great dynamism. In view of the changing situation in the pharmaceuticals industry, which is characterised by increased outsourcing and personalised therapeutic concepts, the biotech companies in Berlin-Brandenburg are well placed for the challenges of the future.



Pharmaceutical Industry in the Capital Region

Major global corporations are located in the German Capital Region: **Bayer Pharma AG**, **Berlin-Chemie AG**, **Pfizer Deutschland GmbH** and **Sanofi-Aventis Deutschland GmbH**. They are joined by more than 20 mid-sized pharmaceutical companies, including several international market leaders. For example: **Bausch + Lomb – Dr. Mann**, the world's leading manufacturer of ophthalmic medicines. In 2011 sales revenues of more than 5 billion Euros were generated by the pharmaceutical products of 24 Berlin-based companies. The German capital's pharmaceutical industry is growing strongly and creating modern jobs. It already employs some 10,000 people in the region, thereby providing about one in ten of all jobs in the city's manufacturing sector. The Japanese pharmaceutical corporation **Takeda** is the most recent arrival, having relocated its German distribution units from Aachen and Konstanz to Berlin.

In the Capital Region, innovation meets tradition – this is the formula that underpins the sustained success of the region's pharmaceutical industry. The tradition has a long history. Since the middle of the 19th century, manufacturing companies have produced medicinal products here, and some of those erstwhile

pioneers now belong to the world's leading pharmaceutical manufacturers. They started modern research and production during the past century and went on to shape the development of medicine.

Two examples:

- In 1930, the world's first injectable kidney contrast agent was developed in Berlin. The product revolutionized the examination of kidney diseases.
- In the 1960ies, Europe's first contraceptive pill was developed in Berlin.

This successful tradition ensures that the industry identifies strongly with Berlin as a pharmaceuticals location. The industry's current research focus areas in the German capital include cardiology and oncology (e.g. Bayer Healthcare), inflammatory diseases and pain therapy (Berlin Chemie).

The region's large number of research facilities, SMEs and pharmaceutical companies provides a unique platform for a wide range of cooperation alliances too. The pharmaceuticals corporation Sanofi, for example, is embarking on a major alliance project with Charité – Universitätsmedizin Berlin. Shared ideas and themes, joint research and working together day by day form the foundation for this cooperation. The partners have just opened



Dr. Dieter Hübl
Chairman of the North-Eastern
Regional Association of the
German Chemical Industry Association (VCI)

Berlin is the center of the German pharmaceuticals industry, right in the heart of a high-performing region. Pharmaceutical companies have access to many cooperation partners here because the German capital is home to internationally renowned hospitals, research institutes and outstanding universities. The region is a global leader in biotechnology, and its pharmaceuticals industry is developing pioneering innovations. As core sectors, they are also stimulating broader growth in the regional economy.



Prof. Dr. Jochen Maas
Managing Director
Research & Development
Sanofi-Aventis Deutschland GmbH

Cooperation with external partners is increasingly important for Sanofi, as indicated by our joint project with the Charité in Berlin. We are cooperating in the fields of stroke, inflammatory immunity disorders and diabetes.

their first joint laboratory near the Charité in Berlin-Mitte, where their scientists are conducting stroke research. This is one of the five themes the partners agreed on after 25 conferences. Other fields in which Charité and Sanofi want to cooperate in future are rheumatism, diabetes, rheumatoid arthritis and regenerative medicine.

The project **OncoTrack** is another example for the region's cooperation potentials. It has brought together an international consortium of more than 60 representatives from science and industry and has launched one of Europe's biggest cooperative research projects to develop new methods for the identification of novel colorectal cancer markers. Bayer HealthCare Pharmaceuticals and the **Max Planck Institute for Molecular Genetics (MPIMG)** are coordinating the consortium's activities. The unique OncoTrack project on „Methods for systematic next generation oncology biomarker development“ is currently scheduled for a term of five years and is bringing outstanding scientists from a range of disciplines and academic institutions across Europe together with representatives from the pharmaceutical sector.

The major pharmaceutical industry associations are also present in Berlin as important actors who represent the interests of the pharmaceuticals and biotechnology sector at the political level. The German Association of Research-Based Pharmaceutical Companies (**vfa**) and **vfa bio**, the German Federal Pharmaceutical Industry Association (**BPI**), the German Chemical Industry Association (**VCI**) with its regional eastern German association and BioDeutschland are all headquartered in the German capital. This provides potent synergies for promoting shared objectives. For example, alongside many other cooperative projects, BioTOP

organised the acclaimed symposium “Personalised Medicine: Benefits for Patients and Society” in cooperation with vfa bio, the biotechnology group of the vfa.

BioTOP and its partners in the cluster management organisation **ZukunftsAgentur Brandenburg (ZAB)** and at **Berlin Partner** support international pharmaceuticals companies looking for potential cooperation partners in science and in biotech SMEs. In recent months, for example, we welcomed international delegations from Genzyme, Pfizer and Novartis and organised structured partnering with regional scientists and companies.

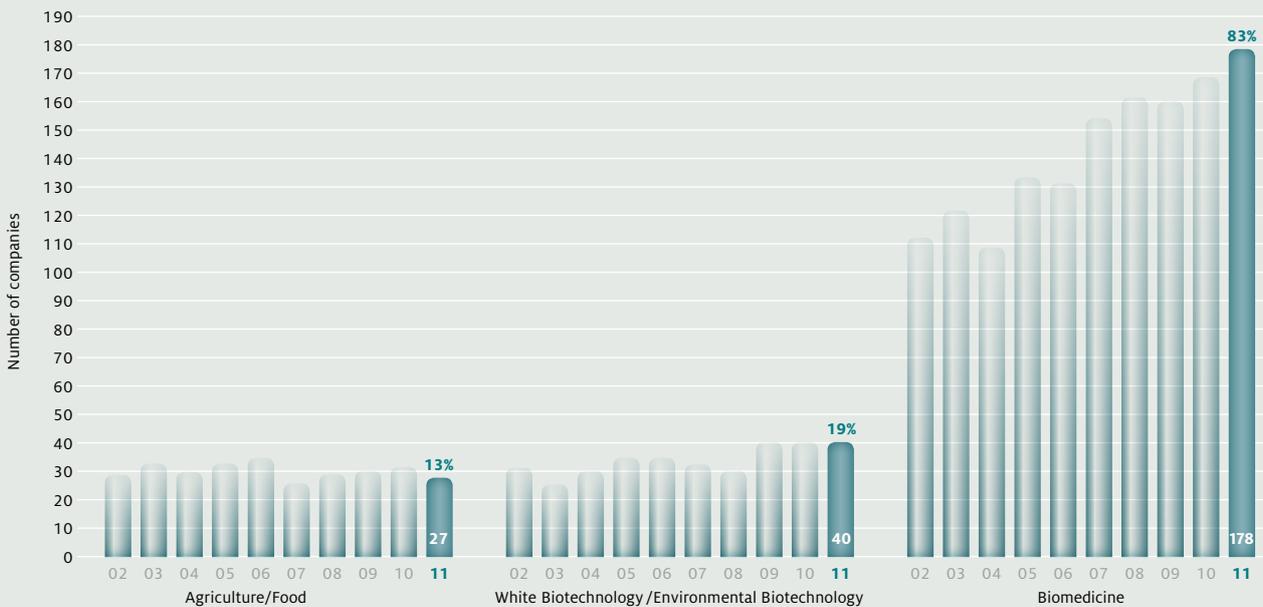


Financing situation

Some capital-intensive companies are still using money from funding rounds in previous years. Most companies provide funds for themselves as part of organic growth, naturally also due to the difficulty of accessing external financial resources. Public support therefore remains an extremely important factor for developing new products, since it is still the case that only few companies have access to VC funding.

According to a study by **Fleischhauer, Hoyer & Partner**, a panel of 36 leading VC investors, investment in Germany fell from Euro 505 million in 2010 to Euro 445 million in 2011 (panelists only). That represents a 14% drop, but is nevertheless a 24% increase compared to 2009. Most of the capital was invested in biotechnology (Euro 70 million) and medical technology (Euro 66 million). The regional distribution of all investment shows Berlin-Brandenburg in third place behind Bavaria and North Rhine-Westphalia.

Market Segments of Companies



Most companies focus on biomedicine. A total of 83% of companies, focus primarily on development in the areas of new diagnostics, drug development and associated services or technologies. 13% of the companies are active in the agriculture/food sector, white biotechnology/environmental biotechnology amounts to 19% of all entries. (Source: Internal survey, BioTOP database, responses from 215 companies, multiple entries, February 2012)

Following this general trend over Euro 40 million were invested in regional companies in 2011. That is half the amount of the previous year. However, capital requirements were not so high since companies had acquired sufficient funding in 2010. So a higher result is expected again in the future. IBB Beteiligungsgesellschaft (IBB Bet) stands out as the region's highest investor, with funding for companies such as Caprotec, OctreoPharm Sciences, Humedics and NDI. The newly founded Charité Biomedical Fund, which is managed by Peppermint Venture Partners, made its first investment in 2011 by funding Humedics.



Vilma Siodla
COO and CSO
co.don AG

co.don AG has been based in Teltow since 1993. The decision for this location was a good one because Teltow offers a perfect environment for our company. The many universities in the region ensure that we find many qualified professionals here along with a modern infrastructure. The State of Brandenburg supports us with its funding programmes. For example, Brandenburger Investitionsbank approved funding in the amount of 2.5 million Euros for regenerative joint therapy in September 2010, of which 75% were provided by the European Regional Development Fund (ERDF) and 25% from budget funds of the State of Brandenburg. co.don AG used these funds in part to commission a clinical study for scientific evaluation of the already tried and tested use of cell transplants in joint defect therapy.

In addition to private investment, public funds are provided by the federal states for fixed-asset investment and new product developments worth Euro 42 million. The leverage effect generated a further Euro 45 million in private investment. The federal government and the EU provide additional double-figure million Euro funding. Public-sector institutions consequently remain extremely important partners for many small businesses.

The good overall result nevertheless continues to be marked by limited finances on the capital market. Many companies have



Ute Mercker
Vice President/Head of Life Science
IBB Beteiligungsgesellschaft mbH

IBB Beteiligungsgesellschaft and its funds have been investing in innovative biotech and medicine start-ups in Berlin for 15 years now. The German capital stands out due to its large range of universities, academies and research facilities. This creates tremendous potential for innovative start-ups, and our investment strategy aims to develop them into thriving companies. We invested in Noxxon Pharma AG, Jerini AG and Scienion AG shortly after their spin-off from the university. In the meantime, they have established their products successfully on the market. In 2011 we successfully invested in four other start-up companies. Octreopharm Science GmbH and Humedics GmbH will use the invested capital to implement clinical trials. Due to our regional focus, we can support our companies flexibly and swiftly with our extensive experience during the start-up phase.

detached themselves from the capital market due to the lean period that has lasted for years, and have adapted their business models to make them as independent as possible. So it is all the more encouraging that the subject of venture capital funding has once again become an important policy agenda, with the aim of removing key hindrances and improving framework conditions.

In this context, one positive sign is that High-Tech Gründerfonds (HTGF), the leading investor in innovative start-ups, has created a new fund worth more than Euro 280 million, thereby continuing to be one of the few investors that play a strong, consolidating role in the start-up sector. However, HTGF cannot finance the full potential for new company start-ups and can only provide selective investment due to high demand. That means that not all start-up concepts are implemented or only on a low level. New instruments and the return of established VC corporations are therefore urgently required. The many public investors, such as HTGF, KfW, with its ERP-Startfonds, and IBB Bet on a regional level, provide advance funding, but cannot meet the demand for finance future funding rounds on their own.

Excellent Services for the Business Location Berlin-Brandenburg

Due to its high concentration of science and research establishments, the region offers outstanding potential for technological development and cooperation. The joint Life Sciences Team from the Berlin Partner business development agency and the Brandenburg Economic Development Board ZAB supports the life science industry with a full range of services, including marketing activities at national and international exhibitions.

In addition, the Life Science Screening Package Berlin-Brandenburg tends to the needs of major companies in the biotech sector. This program supports companies who seek business partners, networks, service providers and research institutions.



The German Capital Region at BIO-Europe Spring 2012 in Amsterdam.

Berlin-Brandenburg stands out in the life sciences because each health industry segment is present here: The high concentration of international excellence facilitates interdisciplinary exchange and makes it easier to achieve new landmark developments. At the same time, the sheer number of players can make it difficult to find the right partner. Our staff and colleagues at BioTOP have been in direct contact with the region's companies and scientific institutions for many years and can provide quick access to the right contacts and potential partners.



In 2011, the Berlin Partner Life Sciences Team supported expansion projects and provided location services to 17 companies in the capital city, including B. Braun Melsungen AG which started a second expansion at its site in Berlin. More than 1000 new jobs will be created in the next three years with these projects.

In the field of life sciences, ZAB supported more than 70 investment and innovation projects in Brandenburg and was able to assist health industry companies like Laserneedle GmbH, a medical tech business, in moving to the region in 2011. In addition, GETEMED AG expanded at its site. Pentracor and Immunservice GmbH were further examples of how R&D projects are successfully implemented in Brandenburg.

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BIONNALE – Networking at the industry’s largest convention in the German Capital Region

The annual BIONNALE – the Berlin-Brandenburg biotechnology industry’s most important convention – is also regarded as an ideal platform for gathering information about existing funding potential for biotech companies in the region, as well as learning about the latest scientific and economic developments. On the BIONNALE Venture Market, the BIONNALE Contact Forum and at the evening get-together, progress was achieved for a large number of partnerships, projects and funding agreements. This year, the BIONNALE has celebrated its 10th anniversary with more than 500 guests.



growing WITH IBB



Getting your innovation going.

Our tailored financing are your key to success.
Our consultants look forward to meeting you.

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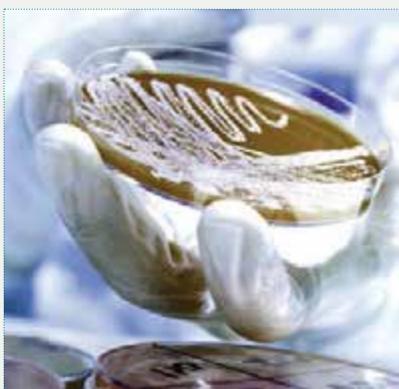
**Investitionsbank
Berlin**

Performing for Berlin.

ORGANOBALANCE GmbH

In Harmony with Nature

ORGANOBALANCE exploits the potential of probiotic bacteria and yeasts for new product developments in food, feed, personal care, for the pharmaceutical industry and for the production of fine chemicals. From a large number of microorganisms, specific strains are selected to inactivate pathogenic microorganisms, add new activities, neutralize malodorous/toxic substances or produce high titers of valuable compounds.



ORGANOBALANCE relies on a variety of natural resources, which are gathered in a company-owned collection of 8000+ microbial strains, mostly originating from foodstuffs. ORGANOBALANCE uses its OASSYS® bioassays for highly efficient screenings. This platform allows the quick identification of most suitable strains from the microbial collection for new applications.

ORGANOBALANCE has a broad expertise in the field of yeast metabolic engineering. This includes the design and development of new production strains for industrial biotechnology applications. Specific production strains of *Saccharomyces cerevisiae*, which carry engineered biosynthesis pathways for the environmentally friendly production of carboxylic acids, terpenoids, steroids and other lipid compounds are developed.

ORGANOBALANCE works in exclusive collaboration with its partners and grants licenses for own product developments.

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PAREXEL International

PAREXEL International is a leading global biopharmaceutical services organization, providing a broad range of knowledge-based contract research, medical communications and consulting services to the worldwide pharmaceutical, biotechnology and medical device industries. For 30 years, PAREXEL has been committed to providing solutions that expedite time-to-market and peak-market penetration, bringing significant expertise across the development and commercialization continuum, from drug development and regulatory consulting to clinical pharma-



cology, clinical trials management, medical education and reimbursement. Perceptive Informatics, Inc., a subsidiary of PAREXEL, provides advanced technology solutions, including medical imaging, to facilitate the clinical development process. Headquartered near Boston, Massachusetts, PAREXEL operates in 71 locations throughout 52 countries around the world, and has approximately 11,300 employees.

PAREXEL has a long-standing presence in Berlin, where over 1,500 employees are located. Clients can benefit from state-of-the-art technologies and equipment provided through PAREXEL's medical imaging lab and Early Phase Units, which provide a safe, high-quality environment for early phase development activities in a hospital setting. The PAREXEL Academy located in Berlin qualifies clinical research associates and clinical data managers, and offers a course for a Bachelor of Science degree in Clinical Research, validated by a British university.

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ifp Institut für Produktqualität GmbH

Founded in 2004, ifp Institut für Produktqualität GmbH is an independent competence center for the analysis of food, feed, water and pharmaceuticals, offering a complete range of services. In addition, ifp develops and produces innovative products which are commercialized globally through a network of selected distribution partners. In 2012, ifp established a second laboratory center specialised in nutritional value and pesticide testing. The company currently employs 100 staff.

Food Analytics

The combination of expert staff, state-of-the-art laboratory equipment and products specifically developed by ifp guarantees high-quality analyses and competent service.

The portfolio includes:

- Allergens: qualitative and quantitative allergen analytics; allergen management consulting
- Vitamins: determination of all water- and fat-soluble vitamins
- Microbiology: microbiological and molecular biological detection of microorganisms in food and drinking water. Additionally, ifp offers hygiene management consulting.
- GMO: screening, identification and quantification of genetically modified organisms
- Contaminants: analysis of mycotoxins, heavy metals, solvents etc.
- Nutritional value: analysis of the basic food components, e. g. water, fat, protein, carbohydrates etc.
- Residues: state-of-the-art analyses covering a broad spectrum of pesticides

Ifp also offers extensive auditing, quality assurance, and control services covering the entire production process. The ifp Quality Seal is awarded to products that undergo and pass this examination.



Pharma Analytics

Ifp meets the highest demands not only in food analytics but also in the field of pharmaceuticals. The company has been GMP certified as per Section 14 (4) No. 3 of the German Drug Law, making it an official testing laboratory for subcontracted drug analyses in compliance with the Good Manufacturing Practice (GMP) guidelines. This authorizes ifp to carry out microbiological tests relevant for the release of pharmaceutical products. The services include testing for microbial purity of non-sterile medical products, testing for sufficient antimicrobial preservation and bacteria endotoxins, identification of microorganisms and analyses of water and monitoring samples.

Innovative Products

Several innovative product lines developed and produced by ifp are successfully distributed worldwide through renowned cooperation partners. The microtiter plate-based VitaFast® vitamin kits are distributed by R-Biopharm. In 2010, QIAGEN acquired the sales rights for ifp's real-time PCR kits for the detection of pathogens, GMO, and other

parameters which are now available under the trademark *mericon*™. The AgraStrip® product line includes immunological lateral flow tests for the rapid screening of allergens and is exclusively distributed globally by Romer Labs.

In March 2011, ifp officially launched its fourth product line within five years, EnzymeFast®, for which ifp has been awarded the InterLabTec Award for Innovative Solutions for Analysis in Labs and Processing. More products are currently in the pipeline. Additionally, ifp is involved in several research projects.

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nanoPET Pharma GmbH

nanoPET is a biopharmaceutical company specialized on R&D, manufacturing and marketing of innovative drug substances for *Diagnostic Imaging*. We focus on relevant cardiovascular, oncological and neurological indications as well as on regenerative medicine. Nanotechnology is a key element of our business. We operate in three major areas.



The first nanoparticulate tracers for clinical PET: nanoPET prepares the clinical development of its patented technology platform: inorganic nanoparticulate tracers for cell- and molecular-specific positron emission tomography (PET).

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Consulting and Service tailored to your needs: As a technology and service provider, we offer our expertise to biopharmaceutical companies and imaging equipment manufacturers. Our customers benefit from the

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Evestra GmbH

Evestra GmbH, founded in July 2008, is a fully owned subsidiary of Evestra Inc. located in San Antonio Texas. Evestra GmbH serves as the development and commercialization center for Europe and ROW. Evestra's mission is to develop and commercialize steroid-based female healthcare products. The development strategy of the company



includes product ideas with known compounds as well as New Chemical Entities.

Evestra is conducting research and product development in a number of in-demand, but as yet unmet, medical need areas of women's health such as hormonal-dependent breast cancer and endometriosis. The company is also pursuing different projects in fertility control, e.g. a new estrogen for oral contraception, with superior pharmacological properties compared to the standard drug ethinyl estradiol.

Several patents on new composition of matter, new technical processes and use patents have been filed during the last three years and support the strong intellectual property position. Evestra is concentrating on R&D and will seek more partners for commercialization.

More detailed information can be found on our web side.

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Biotech Parks

The BioCampus Network Berlin-Brandenburg

Berlin-Brandenburg boasts seven biotechnology parks, which offer optimal space for the specific requirements of every company. This geographic concentration of specific biotech parks is unique in Germany and probably in all of Europe. The parks differ in their offers and strategic focus and provide ideal conditions for newcomers. More than half of the 215 companies are currently utilizing the infrastructure of a publicly or privately managed park. In addition, the young companies benefit from the closeness to science and the permanent contact and exchange.

berlinbiotechpark

In the very heart of Berlin

berlinbiotechpark is located on a 86,000 sq.m. site in the very heart of Berlin, currently offering a total of approx. 57,000 sq.m. of office, laboratory and production space, with a building potential for another 45,000 sq.m. of rental area.

The site, which is home to 32 Biotech/Pharma/Service Companies is supplied with a complete range of media for laboratory and production purposes, with production steam with possibility to upgrade to HP steam, power supply, compressed-air, nitrogen and other inert gases, cooling water, DI-water, with possibility to upgrade to aqua purificata and water for injection, all being provided at favorable rates.



The infrastructure includes a canteen and conference facilities as well as works security and waste disposal services. It is rounded off by production-related services such as plant engineers and laboratory technicians, industrial safety engineers, a medical service as well as best-buy services and communication services. Offering flexible growth potential, production-orientated media equipment and comprehensive industrial-specific services and

infrastructure, berlinbiotechpark is particularly attractive for growing internationally orientated technology companies. Furthermore, it offers a permanent base in Berlin for developing companies that have outgrown the size allowed by their limited start-up funding. The inner-city location and the excellent public transport guarantee short ways to all scientific institutions and hospitals of the city.

berlinbiotechpark

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Biotech Campus Potsdam

Research on the Waterfront

Just a few minutes away from Potsdam's central railway station in the direction of Caputh, Biotech Campus Potsdam is located on the Hermannswerder peninsula in the river Havel. It is owned and operated by Biotech Campus Potsdam GmbH, a fully owned subsidiary of the Investment Bank of the State of Brandenburg.

The biotechnology center is housed in four buildings dating from around 1900 and one modern complex and offers a total of 11,400 sq.m. of laboratory, office, greenhouse and storage space. With such a large facility at its disposal, it offers biotechnology companies an ideal environment for successful operations. All labs are approved as S1 laboratories and meet the building requirements for approval as S2 labs. The Hermannswerder site also includes an S3 laboratory as a special resource. The beautiful, park-like setting of the peninsula offers an excellent environment for research activities. The island hotel and a conference center are located directly next to the campus.



Biotech Campus
Potsdam

ILB



The site also includes a self-service restaurant and small island shop. The philosophy of Biotech Campus Potsdam was, and still is, to create the freedom for research and innovation in the high-tech sector of biotechnology. Reputable firms from the industry can indeed be found here.



The work carried out by resident companies is multi-faceted, ranging from green biotechnology, the development of vaccines, the development of pharmacologically active substances based on plant materials, the development and production of PCR tests for food testing and preclinical contract research right through to medical technology. A total of 200 employees work on the site.

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Biotechnology Park Luckenwalde

Space for Expansion

Located just 25 miles from the new Berlin-Brandenburg International Airport (BBI) in the rural district of Teltow-Flaeming, the Biotechnology Park Luckenwalde is one of the most modern facilities of its kind in Germany. It is home to 35 companies with 550 employees from Germany, USA, UK, Korea, India, Italy, Israel and Russia.

Companies in the park focus on the development and production of pharmaceuticals, recombinant proteins and diagnostic kits,

biological/chemical substances for biotech and pharmaceutical applications, as well as fine chemicals. There are also suppliers of medical technology, analytical services, and a Biotech Education Center. Technical Equipment comprises completely furnished S2 laboratories (safety workbench, autoclave, dishwasher, deionized water, water purification system, central media supply (compressed air, N₂, CO₂, O₂, H₂), storage and cool rooms, pharmaceutical clean rooms category (B/C), 400 MHz NMR spectrometer, meeting rooms, conference hall (300 seats), library, restaurant with catering service.



The entire central technique meets GMP/ISO 9001 specifications. The park management offers comprehensive, individual services and advice during the settlement and development of firms, including support for the implementation of quality management systems and GMP certification. Currently the park offers 15.000 sq.m. labs and office space, and additional 100.000 sq.m. industrial property ready for expansion.

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Co:bios Technologiezentrum

Service for all stages of growth and expansion

Located in the northwest of Berlin, the co:bios Technology Center in Hennigsdorf is the congested urban area in Berlin-Brandenburg of biotechnology and life science. In the last 15 years more



than 30 companies with approximately 700 international employees have settled on this site.

On more than 10.000 sq.m. we offer service space for extension to clean rooms (class D/E/F), S1 labs, DI-water supply, compressed air supply, special gas supply, state of the art data communication, meeting rooms, conference hall and more. The building and central technique requirements also meet the fulfillments for S2 labs for GMP/ISO 9001 based production specifications. As a center of excellence for biotechnology and life science we have a selected portfolio of service and advice to young start-ups as well as medium sized companies, in aim to support them across all stages of company growth. For those companies who have outgrown their limited start-up funding, we additionally hold 80.000 sq.m. developed industrial property ready for expansion.



With our holistic approach combining settlement, development, construction and licensing issues to the point of traditional management consulting, and on the background of the high density of innovative, research-intensive and service-oriented companies on the co:bios biotechnology park Hennigsdorf we can initiate interesting synergy effects for your business model. Within this locational advantages the co:bios biotechnology park became a magnet for the international healthcare industry and the percentage of international settlements on this site is growing, fore example from USA, South America, VAI and Asia.

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Campus Berlin-Buch

Interaction of Research, Clinics and Companies

Berlin-Buch is the location of one of the largest biotechnology parks in Germany, with 26.000 sq.m. of scalable lab and office space for start-ups and maturing companies. Situated to the northeast of the city, the Berlin-Buch Campus is currently home to 54 companies, 35 of which are biotech companies; the rest provides support services.



Beside the BiotechPark the Max Delbrück Center for Molecular Medicine, the Leibniz Institute for Molecular Pharmacology as well as clinical groups from the Charité University Hospital within the Experimental and Clinical Research Center are part of the Campus community. The Campus gives access to high-end technology platforms, state of the art infrastructure, interdisciplinary communication, projects and expertise in a wide range of items, especially in translational research. The BiotechPark including the Innovation and Incubation Center is managed by BBB Management GmbH Campus Berlin-Buch. Acting as a full-service company BBB's main tasks are the settlement, accompanying and support of Biotech businesses.

The BiotechPark at the Campus Berlin-Buch offers:

- Immediately available lab and office space
- Excellent research and clinical expertise on-site
- Training programs for personnel on spot
- An international community of like-minded people
- Interdisciplinary networks and platforms

Campus Berlin-Buch
Robert-Rössle-Straße 10 · 13125 Berlin



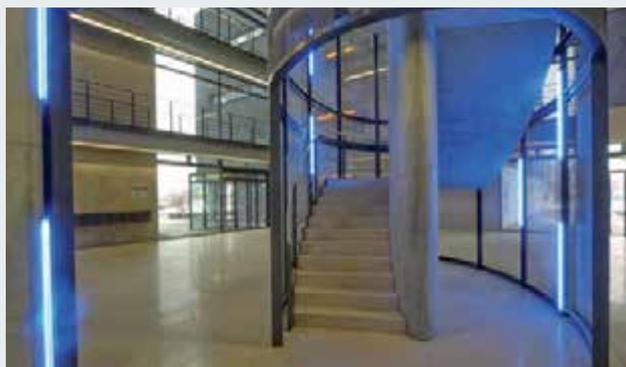
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Berlin Adlershof

The “City of Science, Technology and Media”

Berlin Adlershof is one of the most successful high-tech locations in Germany with focus on photonics and optical technologies, material and microsystems technology, information and media technology, as well as biological, environmental and energy technology. There are currently 25 biotech companies in Adlershof occupying 18,200 sq.m. of lab and office space. The environmental, biological and energy technology companies focus on:

- Analysis: Tracing substances in foodstuffs and groundwater, cosmetics, waste; Quality assurance, Identification of pollutants
- Biotechnology: Research development and marketing or manufacture of base materials for biotechnology and chemical processes, of biochips and biochip-based biomedical procedures, of technical enzyme preparations
- Environmental technology: Remediation work based on innovative microbiological processes for degradation of pollutants or production of specific microbial anaerobes; Research in the field of supercritical media and high-pressure technology; High-sensitivity detection systems for biotechnology and genetic engineering; Laser technology
- Pharmacy, Medicine and Medical Technology: Equipment engineering and measurement technology; Research for medical chemistry



Technical Equipment comprises laboratories with a basic equipment: security-lockers, laboratory basins, work benches, vacuum supply, preliminary setup for supply of pure gases and compressed air, reconfiguration for further media and gases, central cooling, preliminary setup for cold water supply in rental areas, refitting of heat exchanger by the tenant possible.

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Head of Center for Biotechnology and Environment

Science Park Potsdam-Golm

Connecting Excellence



Science Park Potsdam-Golm combines cutting-edge international research and the training of young scientists in a high-powered location in the immediate vicinity of the German capital Berlin. Alongside the Faculty of Science and the Human Sciences Faculty of the University of Potsdam, three Institutes of the Max Planck and two of the Fraunhofer Society as well as an innovation center with currently 18 companies operate in Brandenburg's largest science park.

More than 2500 people work at Potsdam-Golm and more than 8000 students are pursuing their academic qualifications here. The pleasant and very family-friendly working environment on the edge of a nature conservation area, the high quality of life

in and around Potsdam and continuous growth make Potsdam-Golm a highly attractive location. Professional site management is extending the park infrastructure and fosters the integration of the capabilities and interests of all institutions, associations and companies that operate at Science Park Potsdam-Golm. The GO:IN Innovation Center offers young technology-based companies and entrepreneurs a range of office and laboratory spaces along with extensive services and optimal support for a successful market launch. Close proximity to the other players at Potsdam-Golm and the intensive networking of the different institutions and companies here offer perfect conditions for the development and exploitation of synergies.

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Our experience is your success!

The German Pharmaceutical Industry Association (**BPI – Bundesverband der Pharmazeutischen Industrie e.V.**) consists of approximately 260 pharmaceutical companies. These include not only the classic pharmaceutical firms and service-providers, but also biotechnology companies and manufacturers of medical devices.

All of our members use our association as a platform for information and communication to develop collaborative responses to the diverse challenges they face.

Our team consists of highly qualified experts in all fields which are necessary to generate a sustainable benefit for pharmaceutical companies, e.g. market access, regulatory affairs, law, biotechnology and political affairs.

Interested in being a member? Feel free to contact us!

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Expertise in Life Sciences

Special

Industrial Biotechnology 2012 (Vol. 3)

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Supplement

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Further info: www.goingpublic.de

Life Sciences

Excellent Research in Berlin-Brandenburg

Berlin-Brandenburg is regarded both nationally and internationally as one of the most important centers of modern biotechnology. The region provides optimal conditions: It is one of the TOP life sciences locations worldwide – with five universities, numerous colleges and a unique density of extramural research centers. Renowned facilities in the field of biotechnology and the life sciences include four Max Planck Institutes, two Fraunhofer Institutes, two Leibniz Institutes and two Helmholtz Association centers. The region also has an abundant landscape of clinics, led by the Charité – Universitätsmedizin Berlin.

Biotechnology is a major contributor to the development of the modern life sciences. It is highly interdisciplinary, encompassing pharmaceuticals research, diagnostics, theranostics, molecular genetics and the development of innovative biomaterials for medical applications. In addition to scientific expertise, the Berlin-Brandenburg region offers excellent conditions for close networking between different science disciplines, research centers, industry and (clinical) users.

No less than seven technology parks focusing on the life sciences are situated in the region (see p. 18-22). One of Germany's largest biotechnology parks is Campus Berlin-Buch, with important facilities such as the Max Delbrück Center for Molecular Medicine (MDC), which is part of the Helmholtz Association, and the Leib-



Prof. Dr. Volker Haucke
Scientific Director of the Leibniz Institute
for Molecular Pharmacology (FMP)

We are experiencing exciting times in Berlin and at the Campus Buch, where biology, pharmacology, and chemistry meet – with the FMP serving as a melting pot. The Campus and the FMP have gained a lot of international recognition over the last years and serve as a magnet for top scientists from all around the globe.

JANUARY 2011

Prof. Dr. Andreas Radbruch of the German Rheumatism Research Center Berlin (DRFZ) receives Advanced Grant of the European Research Council (ERC) in the amount of 2.5 million Euro ++++ Prof. Dr. Klaus Rajewsky receives Advanced Grant of the European Research Council (ERC) in the amount of 2.5 million Euro and establishes working group at the MDC

FEBRUARY 2011

ESGI project (the European Sequencing and Genotyping Infrastructure), coordinated by the Max-Planck-Institute for Molecular Genetics, starts

MARCH 2011

Charité-scientist Andrea Ode of the Julius Wolff Institute wins BIONNALE Speed Lecture Award ++++ Prof. Dr. Oliver Daumke from the Max Delbrück Center for Molecular Medicine (MDC) Berlin-Buch receives "Bayer Early Excellence in Science Award 2010" for biology

APRIL 2011

Berlin research consortium becomes part of the German Center for Cardiovascular Research (DZHK) ++++ Dr. Daniel Toben of Charité receives Raisz-Dreznner-Award of the American Society of Bone and Mineral Research (ASBMR) ++++ BioTOP and BCRT publish technology report on Regenerative

Medicine in Berlin-Brandenburg ++++ Prof. Dr. Jan Schwab of the Department of Neurology at the Charité and the Berlin-Brandenburg Center for Regenerative Therapies (BCRT) received the Novartis Award for therapy relevant pharmacological research

MAY 2011

Researchers at the Max Delbrück Center for Molecular Medicine (MDC) Berlin-Buch of the Helmholtz Association have discovered what it is that enables embryonic stem cells to develop into the most diverse cell types and hence be pluripotent ++++ An international team around researchers at the Max Planck Institute of Colloids and Interfaces in Potsdam has developed a vaccine based on a carbohydrate against the bacterium *Clostridium difficile*, which causes severe intestinal infections especially in hospitals

JUNE 2011

The MDC, Charité and German Heart Institute Berlin (DHZB) are appointed as the Berlin sites for the German Centers for Cardiovascular Research (DZHK) ++++ Andreas Radbruch, Science Director of the German Rheumatism Research Center (DRFZ), receives the world's most prestigious rheumatology award, the Carol-Nachman Prize, for his research into the immunological memory for inflammatory-rheumatic diseases

niz Institute for Molecular Pharmacology (FMP). Both institutes are celebrating their 20th anniversaries this year and enjoy an outstanding reputation worldwide. Chemists, biologist, bioinformaticians, pharmacologists, pharmacists, physicists and doctors work together from around the world. It is clear that the German Capital Region is becoming ever more attractive to scientists due to its excellent research and living conditions.

Pooling fundamental and patient-oriented research

The significance to biomedical research in the German Capital Region is further enhanced by the close cooperation between the Charité and the MDC. There are also plans to further extend the pooled complementary fundamental and patient-oriented clinical research on an institutional level by creating a joint research as-

sociation, thereby consolidating the leading international position of Berlin-Brandenburg as a life science location in the long term.



Prof. Dr. Walter Rosenthal
Science Director of the Max Delbrück Center for Molecular Medicine (MDC) Berlin-Buch

The new structure will be most beneficial for both the MDC and the Charité since excellent basic research and excellent clinical research will further strengthen and complement each other for the benefit of patients. And it goes without saying that excellence is the key to success.



Prof. Dr. Jürgen Mlynek
President of the Helmholtz Association

The planned strategic partnership between the MDC and the Charité will give biomedical research in Berlin an even higher international profile.

JULY 2011

Berlin achieves yet another success for health research: the Charité is selected as the new site of the German Research Institute for Neurodegenerative Diseases (DZNE) ++++ Research at the MDC in the field of pharmaceuticals research will from now on be networked closely with five other centers of the Helmholtz Association of German Research Centers and three other partners, including the Leibniz Institute for Molecular Pharmacology (FMP) in Berlin-Buch

AUGUST 2011

The Berlin Institute for Medical Systems Biology (BIMSB) of the MDC is now the first academic research facility on the European continent to receive an innovative sequencing system using SMRT technology which can read individual DNA molecules in real-time ++++ Charité has established the new molecular diagnostic test "EndoPredict Assay" for breast cancer patients which helps doctors in deciding which personalised therapy to choose for individual patients

SEPTEMBER 2011

Prof. Dr. Thomas Willnow at the MDC is awarded the Franz-Volhard Prize on September 10, 2011 at the opening ceremony of the annual conference of

the German Society of Nephrology in Berlin ++++ Researchers at the MDC in Berlin-Buch establish the first mathematical model for determination of the contribution of genetic risk factors to the development of Alzheimer's ++++ The Charité opens the new building for its Translation Research Institutes: the facility's central unit is the Berlin-Brandenburg Center for Regenerative Therapies (BCRT)

OCTOBER 2011

The scientist Dr. Jan Laufer receives 1.6 million Euros from the European Research Council (ERC) to establish a researcher group for the investigation of stem cells in tissue regeneration by means of photoacoustic imaging

NOVEMBER 2011

In the context of the internally funded project „Fraunhofer ivD-Plattform“ a credit-card sized system was developed jointly by seven Fraunhofer Institutes during the past five years which now permits the analysis of up to 500 parameters in a single drop of blood ++++ Four researchers at the MDC will receive a total of eight million Euros in research funding from the European Research Council (ERC) in Strasbourg. The two neurobiologists Prof. Dr. Gary Lewin (MDC) and Prof. Dr. Thomas Jentsch (MDC/FMP) will each receive an ERC Advanced Grant worth 2.5 million Euros

Outstanding research to meet the medical and bioeconomic challenges of the future

There are also many excellent research facilities in the state of Brandenburg – including the University of Potsdam, the Helmholtz-Zentrum Geesthacht in Teltow, the Fraunhofer Institute for Applied Polymer Research, the Fraunhofer Institute for Biomedical Engineering, the Max Planck Institute for Colloids and Interfaces, the German Institute for Human Nutrition and the Max Planck Institute for Molecular Plant Physiology. In addition to red biotechnology, scientists also work on central aspects of green and white biotechnology, which are decisive for meeting

the bioeconomical challenges of the future. Modern biotechnology and life sciences create ever greater data volumes that cannot be managed without modern software solutions. So it is an advantage that two important software institutes, namely the Hasso-Plattner-Institut and the future SAP Innovation Center in Potsdam, are based locally and directly focus on the requirements of scientists and users in the region, developing innovative software technologies in close collaboration with them.

The following pages present selected life sciences themes and projects in Berlin-Brandenburg and innovative developments achieved in the recent past.



DECEMBER 2011

Prof. Dr. Nikolaus Rajewsky at the MDC receives the Gottfried Wilhelm Leibniz Prize, Germany's most highly endowed science award ++++ The scientist Dr. Alexander Kühn at the Max Planck Institute for Molecular Genetics is this year's winner of the essay competition "Gesundheit 2050"

JANUARY 2012

Researchers at the MDC map the mechanism by which immunocyte cells destroy cancer cells ++++ Opening of the new Helmholtz Virtual Institute "Multifunctional Biomaterials for Medicine" ++++ Artemisinin, the most effective anti-malaria agent, can now be manufactured cheaply and in high volumes. Researchers at the Max Planck Institute for Colloids and Interfaces in Potsdam and from Freie Universität Berlin have developed a very simple artemisinin synthesis

FEBRUARY 2012

Scientists at the Charité are the first to have mapped which specific disorders of nerve cells are involved in the development of focal therapy-resistant epilepsies ++++ Prof. Dr. Erich Wanker at the MDC in Berlin-Buch will receive 1.35 million Euros over the next two years to search for active agents for the treatment of diseases caused by protein misfolding such as Alzheimer's and Parkinson's ++++ The Charité launches the new EU research project RESPONSIFY for

improved adjustment of breast cancer therapy to each individual patient so as to avoid unsuccessful treatment

MARCH 2012

TU Berlin, the Science and Technology Park Berlin Adlershof and Campus Berlin-Buch launch a cooperation project with the Russian Skolkowo Foundation ++++ Scientists at the Charité and the US National Institutes of Health (NIH) developed a realistic model for cellular signal processes to permit systems biology analysis of the function of cardiac muscle cells and for modelling specific data from tumour tissues of lung cancer patients



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Theranostics

A New Approach in Individualized Healthcare for the Future

The term theranostics refers to the increasing integration of diagnostics and therapy with the aim of providing the right therapy for the right patient at the right point in time. The implementation of such a concept requires, above all, determination of the genetic predisposition of the patient, characterization of the stage of the disease and monitoring of the progress of healing. *In vitro*-diagnostic procedures and molecular imaging will increasingly interlock in this approach in the future.

Companion diagnostics and personalized medicine

This “personalization” of medicine has become one of the prime strategic goals in health research. It is based on the insight that different patients with the same diagnosis respond differently to the same treatment. To choose the “right therapy”, it is therefore necessary first to evaluate a therapy potentially to be applied by reference to the individual patient and assess its effectiveness, tolerability, safety and dosage. This is done using predictive diagnostic tests which determine the individual features of the patient at the genetic, molecular or cellular level.

The use of such companion diagnostics as part of the therapeutic process permits stratifying patients with the same diagnosis and selecting them accordingly to ensure that each patient receives the most effective customised therapy possible. Personalized medicine consequently comprises defined tandems of medicines and tests to demonstrate effectiveness of the respective therapy.

The key drivers behind this trend are, above all, the need to improve medical treatment (healthcare pressure/benefit-risk ratio), economic pressure (benefit-cost ratio) and the development of new technologies which continuously expand the range of diagnostic capabilities available.

The impact of new technologies on the development of personalized medicine

Diagnostics for personalized medicine require suitable biomarkers as the foundation for patient-specific therapy selection. The sequencing of the human genome and the continuously progressing molecular differentiation it has opened up, above all as regards oncological and immunological diseases, permits predictive statements about the possible progress of therapy based on an analysis of the patient’s genetic makeup. Next generation

sequencing, bioinformatics and data mining are expanding the range of available markers continuously. The Max Planck Institute for Molecular Genetics, the spin-off company Alacris Theranostics GmbH and Bayer Healthcare are eminent players in this field in Berlin-Brandenburg in the context of the European research project OncoTrack which focuses on cancer of the colon. The miniaturization and parallelization of analytical technologies (micro-arrays, beads) and new multiplex processes such as those developed by Scienion AG (Berlin) and the Fraunhofer Institute for Biomedical Engineering (IBMT) in Potsdam are bringing the new assays into routine clinical laboratory practice.

Oncology – key driver for diagnostic-based therapy

The approval of Trastuzumab in the United States in 1998, based on the genetic proof of the overexpression of the HER2 gene in breast cancer, marked the first step in the personalization of oncotherapy. Since then, further genetic tests have been introduced into clinical practice, including K-RAS (colorectal cancer) and EGFR mutation analyses (lung cancer). The approval of new and expensive medicinal substances such as biologicals will be conditional in future on the availability of mandatory diagnostic pre-tests.

In Germany, 20 medicines are currently approved for personalised medicine, 16 of them for oncotherapy and the rest for the treatment of HIV (2), epilepsy (1) and transplantation prognosis (1). The co-development of diagnostic and therapeutic products presents the pharmaceutical industry with a new strategic challenge and is opening up new business fields for innovative SMEs as developers of *in vitro*-diagnostics.

In vitro-diagnostics in Berlin-Brandenburg

In Berlin-Brandenburg, some 80 SMEs and about 20 research facilities provide the entire value chain for *in vitro*-diagnostics – from biomarker identification and validation to the development of new technologies for the production of marketable innovative products, above all for immunology, oncology and the diagnosis of infectious diseases.

As one of Europe's largest university hospitals, Charité – Universitätsmedizin Berlin provides outstanding conditions for the implementation of clinical trials to validate new biomarkers. Some 30 regional companies specialise in the development of molecular diagnostics for use in screening, prognosis and monitoring, and some of them are also engaged in the development of companion diagnostics for oncotherapy.

Current developments include assays for the therapy of cervical cancer under anti-angiogenesis treatment (Celltrend GmbH, Luckenwalde), for the use of Cetuximab in colorectal cancer therapy (Signature DIAGNOSTICS GmbH, Potsdam), the develop-

ment of mathematical models for the implementation of “virtual” clinical studies and the discovery of new markers in colon and pancreas cancer therapy (Alacris Theranostics GmbH/Berlin).



PD Dr. Bodo Lange
CEO
Alacris Theranostics GmbH
Berlin

Personalised healthcare is currently undergoing a revolutionary development as technology advancement permits now to analyse a patient's genome with increasing speed at continuously falling costs. Alacris Theranostics is applying a combination of next generation sequencing and systems biology modelling to develop new methods for optimised personalized treatment of cancer patients. The Berlin-Brandenburg academic research and biotech network provides an excellent environment for such developments.



Health-IT

New Opportunities for Biotechnology on the Interface between Life Sciences and IT

Berlin-Brandenburg is not only one of Europe's most attractive life sciences and healthcare locations, but also a leading centre of the IT industry. That combination offers optimal conditions for the development of innovative health IT solutions for the regional and global market. To bring together the know-how of the different sectors involved and promote even stronger networking between the players in the region, TSB Innovationsagentur Berlin organised a workshop on "Health IT Solutions for the Healthcare Industries of the Future" in cooperation with SAP and the Hasso Plattner Institute in late November 2011¹.

The participants, representing science and industry, jointly developed interdisciplinary scenarios of what regional model projects for innovative IT-supported healthcare may be seen by 2020. Several ideas from the workshop were adopted and are to be developed in working groups in the years ahead.

Health IT comprises a broad range of applications, including telemedicine and solutions for process optimisation in hospitals as well as technologies for handling large data volumes along the entire value chain from research to patient therapy and care. Below we present some examples of projects in the Berlin region to illustrate what is happening on the interface between life sciences and IT.

IT Future of Medicine (ITFoM) – Berlin heads a European flagship project

Modern biotechnology and today's increasingly personalised medicine require a huge amount of fundamental data. That will present the IT sector with unprecedented challenges regarding hardware, software, memory and communication systems. To meet these new tasks in the clinical, technological and ICT-based environment, 60 mainly European institutions and companies have joined forces in the initiative "IT Future of Medicine" which is being coordinated by the Max Planck Institute for Molecular Genetics in Berlin. ITFoM will develop computer models by which personalised "virtual patients" will be derived from the molecular, physiological, anatomic and environmental data of every individual patient. The aim is to develop individually optimised prevention and therapy concepts and minimise the potential side-effects of therapies (more information: www.itfom.eu).



Prof. Dr. Hans Lehrach
Director of the Max Planck Institute for
Molecular Genetics

Medicine will in future be based on the ever larger volumes of available patient data. A small arithmetical example: At the MPIMG we need 12 hours of computing performance to simulate a tumour based on our cancer model which demonstrates the interaction of about 4000 cell components. In the case of a fully virtual patient, we would be talking about more than 1000 different cell types, each with 1000 different conditions! This can be done only with smaller chips, optimised data flows and smarter algorithms which increase the available computing capacity!

Using bioinformatics to develop a better understanding of life

Bioinformatics is indispensable to catalogue, analyse and interpret the huge data volumes in medical research, genomics and systems biology. Many questions can simply not be answered without innovative computer programmes and mathematical methods. "Treffpunkt Bioinformatik" is a leading expert forum in this field. It is organised jointly every year by the Max Planck Institute for Molecular Genetics and BioTOP Berlin-Brandenburg in the German Capital Region. Its eighth meeting in September 2011 was attended by experts from Germany and the United States and devoted to "Bioinformatics and Evolution Biology".

¹ Documentation of the workshop for downloading at www.tsb-berlin.de/health-it



Cafer Tosun
Managing Director
SAP Innovation Center

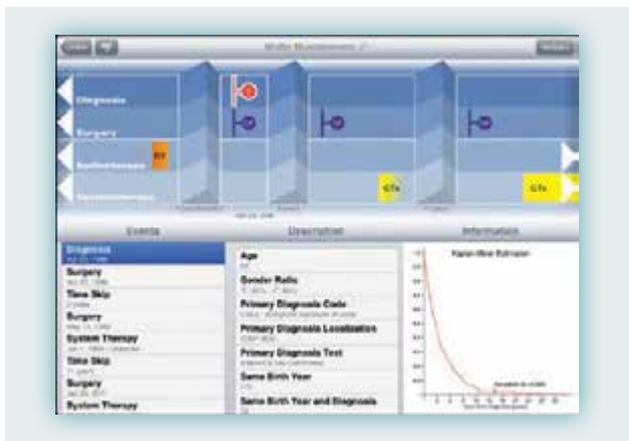
With the HANA Oncolyzer, SAP is also to some extent embarking into new territories beyond the field of “classical” SAP applications. This mobile application is helping oncology move towards personalised cancer therapy by providing a solution that can cope with the enormous flood of data and information. Until now, doctors wanting to use a promising personalised therapy need to research files and other documents for up to two days to find the patient whose features are suited for precisely that treatment. Using in-memory technology per iPad, this can now be done in just seconds. At the same time, the joint project HANA Oncolyzer with the Charité and HPI is a perfect example of how we at the SAP Innovation Center operate. We work directly with users because they are most familiar with the challenges in their field and with research facilities with a high international reputation like the HPI. In Berlin-Brandenburg we have exactly the kind of network that brings together leading experts like these. The HANA Oncolyzer demonstrates very impressively how fast such an initiative can deliver excellent results.

One of the themes addressed was how bioinformatics supports evolution biologists in reconstructing the emergence of present-day organisms and decoding the evolution processes involved. By sequencing the genomes of many species and analysing them applying IT-supported methods, scientists are working on the reconstruction of phylogenesis and thereby developing a better understanding of life.

A mobile application for personalised cancer therapy from Berlin-Brandenburg

In the context of a joint research initiative, Charité – Universitätsmedizin Berlin, together with the SAP Innovation Center and the Hasso Plattner Institute in Potsdam developed a new data management technology for the research and therapy of

cancer within only seven months. The HANA Oncolyzer is based on the in-memory technology co-developed at the Hasso Plattner Institute which permits accessing all relevant patient and clinical data in realtime and supplementing them at any time. Using the mobile end user device, this can be done directly from the patient bed. Cancer therapies can therefore now be adjusted more specifically and more quickly to each patient and cancer type, so that the chances of healing improve considerably. In addition, this technology also makes the work of researchers far less onerous. For example in gene sequencing where terabyte volumes of raw data per patient are generated, the HANA Oncolyzer helps analyse them as to their relevance and select them accordingly. The HANA Oncolyzer was presented to a broad expert audience at CeBIT in spring 2012. Productive operation is scheduled to begin this year.



Figures: Analytical view of HANA Oncolyzer (Source: SAP AG)

Biomaterials

Biotechnologically Improved Biomaterials from Berlin and Brandenburg

For decades, biomaterials have been an integral part of medical practice. The biologisation of biomaterials, however, is a relatively new trend. Multifunctional polymer-based biomaterials are of high relevance, especially in biomaterial induced auto-regeneration. Berlin-Brandenburg is positioned excellently in the material sciences field and is rapidly becoming a pacemaker for the newest generation of innovative biomaterials.

A great deal is happening in this field in the German Capital Region. Scientists at acclaimed institutions like the Max Planck Institute of Colloids and Interfaces, the Fraunhofer Institute for Applied Polymer Research, the Centre for Biomaterial Development of the HZG in Teltow, and Charité – Universitätsmedizin Berlin are setting international standards in this field. The outstanding networking between science and industry in the region permits swift translation of the latest research findings into marketable products. Alongside the big players in industry, small and mid-sized companies which often emerged as university spin-offs play a major role in these trailblazing activities.

A prime example of networked cooperation in the region is the Helmholtz Virtual Institute (HVI) "Multifunctional Biomaterials for Medicine" which was opened in December 2011. The HVI "Multifunctional Materials for Medicine" is coordinated by the



Prof. Dr. Andreas Lendlein
Centre for Biomaterial Development and
Berlin-Brandenburg Centre for Regenerative
Therapies · Helmholtz-Zentrum Geesthacht
Spokesperson of the HVI

Helmholtz Virtual Institutes, funded by the Helmholtz-Association of German Research Centres were initiated to combine the key competencies of a university with those of one or two Helmholtz-Centres. Freie Universität Berlin, Helmholtz-Zentrum Berlin and HZG-Teltow are working together in the HVI "Multifunctional Materials for Medicine" with the aim to gain a comprehensive understanding of the complex protein-biomaterial surface interactions in order to control the application-relevant protein adsorption behavior in the future. Our activities are integrated into the regional cluster "Healthcare Industries Berlin-Brandenburg – HealthCapital".

Helmholtz Virtual Institute (HVI) Multifunctional Materials for Medicine

Core Institutions

- Helmholtz-Zentrum Geesthacht (HZG-Teltow),
Coordinating Centre
HVI spokesperson: Prof. Dr. Andreas Lendlein
- Helmholtz-Zentrum Berlin (HZB)
HVI deputy spokesperson: Prof. Dr. Matthias Ballauff
- Freie Universität Berlin (FUB/FUB-Charité)
HVI deputy spokesperson: Prof. Dr. Rainer Haag
- Albert-Ludwigs-Universität Freiburg
Prof. Dr. Prasad Shastri

International Partners

- Harvard University, Materials Research Science and
Engineering Centre, Cambridge (MA, USA)
- The University of Tokyo, Centre for NanoBio Integration,
Tokyo (Japan)
- Sichuan University, National Centre for Biomaterials,
Chengdu (China)

Industrial Partners

- mivenion GmbH, Berlin
- Fresenius Medical Care Deutschland GmbH, Bad Homburg

Contact

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“Centre for Biomaterial Development” at the Helmholtz-Zentrum Geesthacht/Campus Teltow (HZG-Teltow) and is one of twelve new HVI initiatives, which were successfully evaluated in a highly competitive process in July 2011.

Biomaterials in Regenerative Medicine

With the Centre for Biomaterial Development at the HZG-Teltow and the Berlin-Brandenburg Center for Regenerative Therapies (BCRT), the German Capital Region has excellent expertise in the field of Regenerative Medicine. Here, fundamental research for polymer based biomaterials meets application-motivated science aiming at the translation of the knowledge gained into products and clinical applications. Cooperation of scientists from different disciplines is essential to perform research and develop biomaterials directed to clinical applications and products.

This is the aim of the BCRT as one of the centres for translational research of the German Federal Ministry of Education and Research. This joint initiative of Europe’s largest university hospital, the Charité, and Germany’s largest research organization, the Helmholtz Association, is based on a highly interactive research program and a consortium of internationally acknowledged experts in both basic and clinical science with more than 15 excellent institutional partners.

The German Capital Region as pacemaker for innovative biomaterials

There are other successful examples for biomaterials research in Berlin-Brandenburg, such as the cooperation of the research



Berlin/Bremen/Cologne/Frankfurt/Hamburg/Munich/Stuttgart

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- Due diligence (financial and tax) and business valuations
- Consulting services on IPOs
- Business Advisory
- Mergers & Acquisitions (M&A)
- German and international taxation

Contact

Dr. Ulla Peters or Reinhold Lauer

UHY Deutschland AG Wirtschaftsprüfungsgesellschaft/Zimmerstraße 23/D-10969 Berlin
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group headed by Prof. Dr. Rainer Haag at Freie Universität Berlin with mivenion GmbH on the research campus Dahlem, which has successfully characterized a new macromolecular diagnostic agent for inflammation imaging of rheumatoid arthritis.

The Nanopatterned Biomaterials group of Prof. Dr. Marga Lensen at the Technical University Berlin has developed a toolbox of tailor-made biomaterials that are patternable in 2D and 3D and at different length scales, and have tuneable physicochemical properties, specific degradability profiles and all the characteristics of a desired biomaterial.

In addition, the Fraunhofer IAP specializes in the targeted development of sustainable processes and materials based on natural and synthetic polymers. The working group of Dr. Joachim Storsberg is developing an artificial cornea based on new biomaterials in order to obtain the different functionalities required to perform the needed biological interactions.

The bone healing process can be supported by biochemical or mechanical intervention and by the introduction of synthetic scaffolds. In the Department of Biomaterials at the Max Planck Institute of Colloids and Interfaces in Potsdam, scientists are investigating the material characteristics of bones at the micro- and nanometer level. The research group of Britt Wildemann at the Julius Wolff Institute of the Charité in Berlin has studied the possibilities for improving bone healing by local application of factors. Antibiotics are used for infection prevention, while factors stimulating the bone metabolism are applied to promote healing.

Another example of the use of biomaterials in medicine is the development of artificial heart valves. Such valves made by AutoTissue GmbH were produced by removing cellular components from xenogenic heart valves and have the major advantage that they do not calcify in vivo and possess remodelling and growth potential.

Biomaterials are also essential in the field of drug delivery. For example, the Paccocath technology for the use of balloon catheters as an effective drug delivery technology was invented in the Department of Radiology at the Charité, then successfully developed to market maturity in cooperation with InnoRa GmbH and Saarland University, and is now being marketed by two companies.

FINANCING AND ADDED VALUE

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Berlin



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Selected portfolio companies:



VC Fonds Technologie Berlin was set up as a joint initiative of Investitionsbank Berlin (IBB) and the State of Berlin. It is co-financed by the European Regional Development Fund (ERDF).



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GAT **CORPORATE PUBLISHING** TTT GGA GAA CTA ACA TCT AGA
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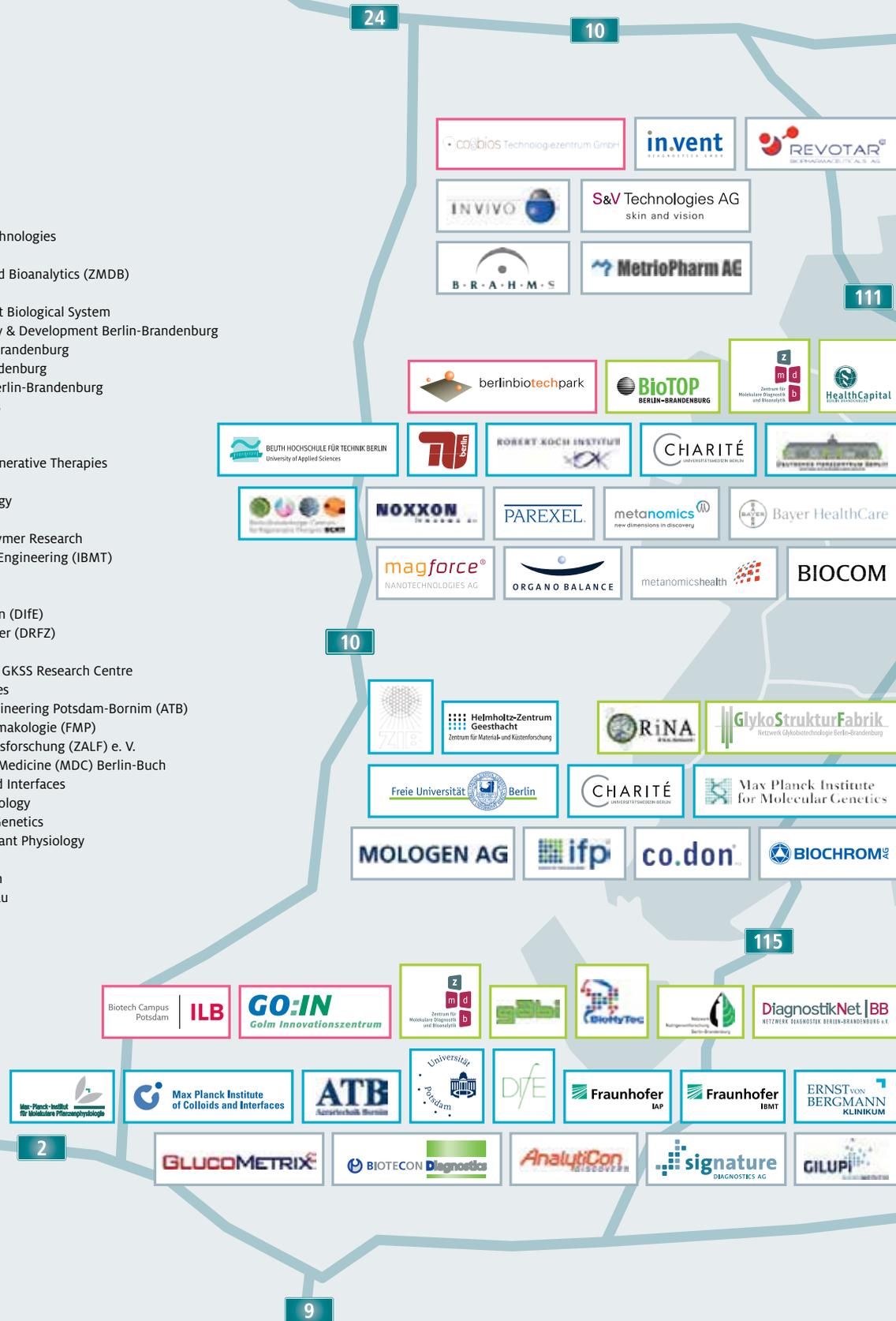
- Bioparks
- Networks
- Scientific Institutions
- Companies

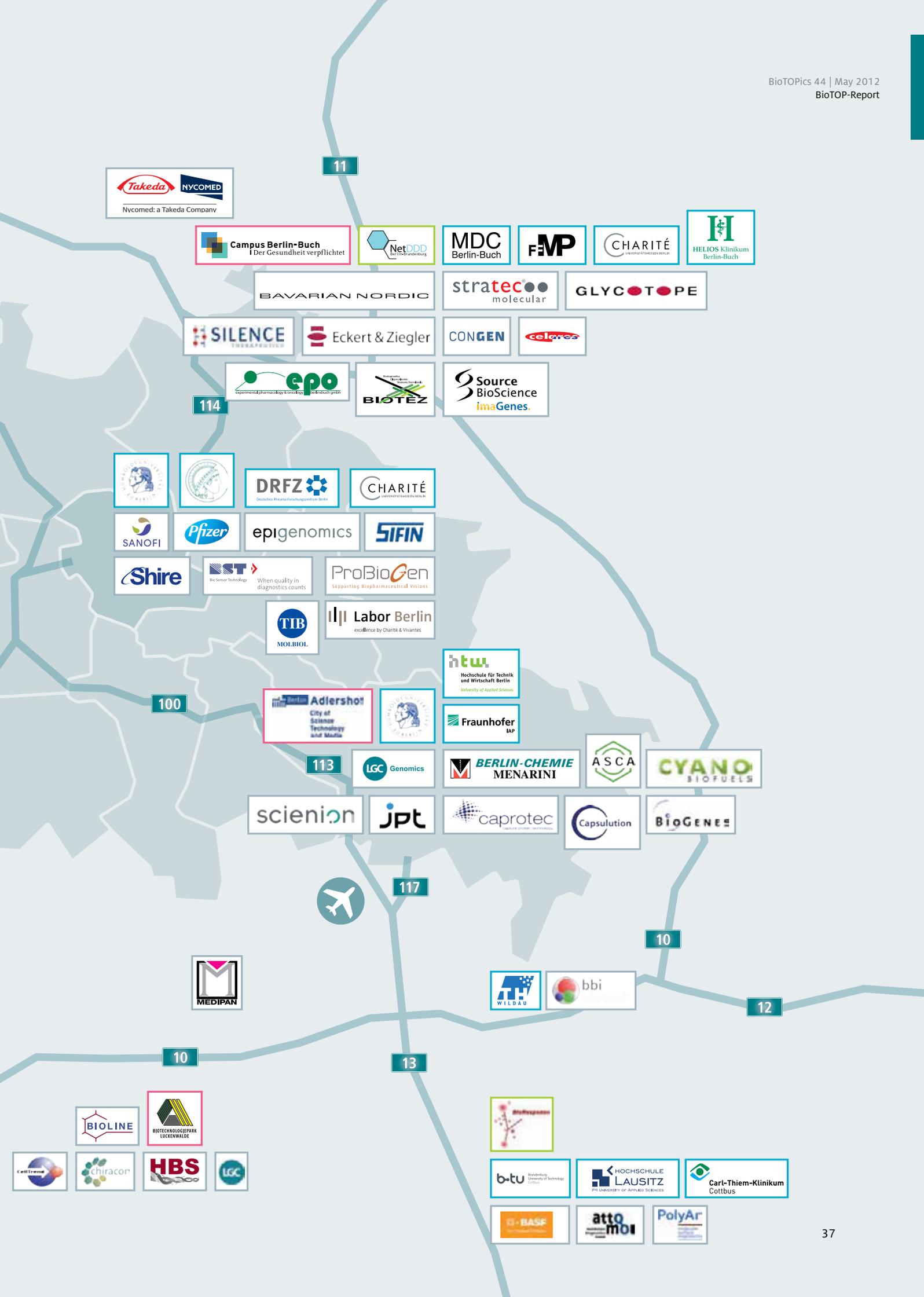
Biotech Networks

- BioTOP Berlin-Brandenburg
- BioHyTec Network for Biohybrid Technologies
- BioResponse
- Center for Molecular Diagnostics and Bioanalytics (ZMDB)
- DiagnostikNet-BB
- GABI – Genome Analysis in the Plant Biological System
- NetDDD Network for Drug Discovery & Development Berlin-Brandenburg
- Network Glycobiotechnology Berlin-Brandenburg
- Nutrigenomics Network Berlin-Brandenburg
- Regenerative Medicines Initiative Berlin-Brandenburg
- RiNA Network for RNA Technologies

Scientific Institutions

- Berlin-Brandenburg Center for Regenerative Therapies
- Berlin Institute of Technology
- Brandenburg University of Technology
- Charité – Universitätsmedizin Berlin
- Fraunhofer Institute for Applied Polymer Research
- Fraunhofer Institute for Biomedical Engineering (IBMT)
- Freie Universität Berlin
- German Heart Institute Berlin
- German Institute of Human Nutrition (DIfE)
- German Rheumatism Research Center (DRFZ)
- Humboldt-Universität zu Berlin
- Institute of Polymer Research of the GKSS Research Centre
- Lausitz University of Applied Sciences
- Leibniz-Institute for Agricultural Engineering Potsdam-Bornim (ATB)
- Leibniz-Institut für Molekulare Pharmakologie (FMP)
- Leibniz-Zentrum für Agrarlandschaftsforschung (ZALF) e. V.
- Max Delbrück Center for Molecular Medicine (MDC) Berlin-Buch
- Max-Planck-Institute for Colloids and Interfaces
- Max Planck Institute for Infection Biology
- Max Planck Institute for Molecular Genetics
- Max Planck Institute of Molecular Plant Physiology
- Robert Koch Institute
- University of Applied Sciences Berlin
- University of Applied Sciences Wildau
- University of Potsdam





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Biochrom AG is a company dedicated to be a primary supplier of cell culture media and quality animal sera.

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screened prior to acceptance; only those lots that meet strict quality control requirements are accepted for further processing and subsequent sale to customers. Serum products are tested for sterility, adventitious viral agents, physico-chemical parameters, and biological performance. The manufacturing processes are designed for the specific needs of customers engaged in biotechnological research, development, and biopharmaceutical production. Biochrom AG specializes in meeting customers' specifications and regulatory concerns, to facilitate the manufacture of custom media consistent with Good Manufacturing Practice (GMP). The media are produced in a strictly controlled environment; chemicals used conform, where applicable, to grade standards of European Pharmacopoeia and US Pharmacopoeia. Biochrom AG produces lot sizes of sterile industrial buffers up to 4,000 litres, sterile media up to 2,000 litres, powder media up to 20,000 litres and customized sizes in smallest quantities.

Biochrom AG and TPP Techno Plastic Products AG (Switzerland) are exclusive partners for the sale of TPP products for cell culture and general laboratory equipment in Germany.

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caprotec bioanalytics GmbH

caprotec bioanalytics GmbH has developed a ground-breaking, proprietary technology to reduce the complexity of protein mixtures in a targeted and directed manner.

Founded in 2006 by scientist and entrepreneur Prof. Dr. Hubert Köster, founder of Sequenom Inc. and Biosyntech, caprotec raised since 2007 approx. 11 million Euro. Caprotec is operational in Berlin Adlershof since September of 2008 and currently has 26 employees.

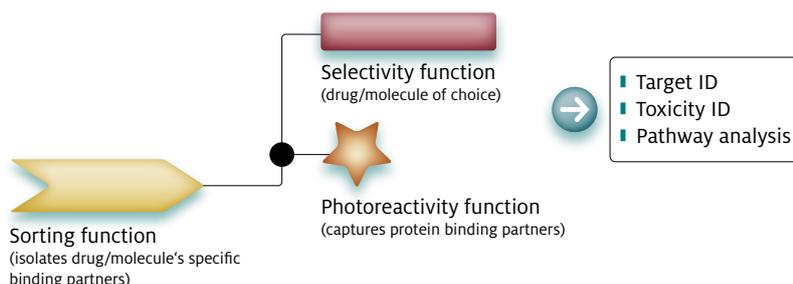
caprotec's Capture Compound Mass Spectrometry (CCMS) Technology is based on multifunctional small molecules that are used to target, capture, and isolate proteins based on their function. The company is commercializing the CCMS technology as kits for research applications and in the form of interactive research collaborations with the pharmaceutical, biotech and agrobiological industry. In collaborations for drug development caprotec is using small molecule drugs or drug candidates to establish a

profile of proteins that interact specifically with the small molecule drug in a mixture of human proteins. The profile can be used to elucidate the mode of action of drugs and drug candidates and also to discover off-target proteins that potentially could cause adverse side effects in humans, e.g. liver toxicity.

Address

caprotec bioanalytics GmbH
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CCMS profiles small molecule interactions with the proteome



Contact

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BioTeZ Berlin-Buch GmbH

BioTeZ is focused on biotechnological products and services for life science research, pharmaceutical industry and diagnostics.

In many business fields BioTeZ has own technologies with outstanding properties, e.g., in the sphere of immunoaffinity columns, HRP-labeling, sundry streptavidin coatings and the development of enzyme immunoassays. On the basis of many years' experience the powerful diagnostic tool *recoveryELISA*[®] was created for monitoring therapies with biologics.



Business fields at a glance:

Immunoaffinity chromatography

- Production of customized IAC
- Coupling of different ligands, e.g. antibodies against mycotoxins

Premium oligonucleotid synthesis

- DNA / RNA incl. modifications

Streptavidin coating

- Microplates and other surfaces and materials
- Polystrept R for high binding capacity, excellent for lateral flow assays

ELISA development and services

- inclusive conjugate development, labeling, purification etc.

Companion Diagnostics

- *recoveryELISA*[®] – a new diagnostic method to predict and to measure interaction between therapeutic antibodies or biologics and their target molecules.

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Epigenomics AG

Epigenomics is a molecular diagnostics company developing and commercializing a pipeline of proprietary products for cancer.

The Company's products enable doctors to diagnose cancer earlier and more accurately, leading to improved outcomes for patients. Epigenomics' lead product, Epi proColon[®] 2.0, is a second generation blood-based test for the early detection of colorectal cancer, which is currently marketed in Europe and is in development for the U.S.A.



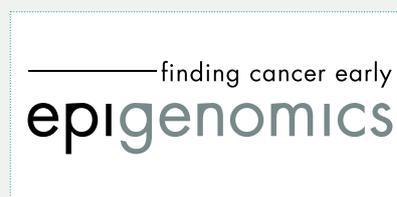
With clinical studies indicating a majority of colorectal cancers are detected with the test added to the convenience of a simple blood draw, Epi proColon[®] is expected to improve compliance for colorectal cancer screening and save lives through early detection of disease. Laboratory test services based on this technology are available in the U.S.A. and Canada by our partnering laboratories Quest, ARUP and Warnex.

Epigenomics' product portfolio further includes Epi proLung[®], a confirmatory test aiding in the diagnosis of lung cancer that is marketed in Europe, and additional products in development for colorectal, lung and prostate cancer. The Company's technology and products have been validated through multiple partnerships with leading global diagnostic companies including Abbott, QIAGEN, Sysmex, and Quest Diagnostics. Epigenomics is an international company with operations in Berlin, Germany, and Seattle, WA, U.S.A.

For further information please visit www.epigenomics.com

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Metanomics Health GmbH



Metanomics Health – a BASF Group company – applies comprehensive Metabolite Profiling (metabolomics) with biomedical data interpretation. Metabolite Profiling is defined as the parallel analysis of multiple endogenous and xenobiotic metabolites in biological systems. The core expertise of Metanomics Health resides in discovery and validation of biomarkers.

Technologies

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- Wide metabolite coverage via combination of unbiased and targeted platforms
- Unique tox mode of action prediction through MetaMap®Tox database
- Excellence in systems correlation analysis of complex gene function relationships
- Wide metabolite coverage via combination of unbiased and targeted platforms
- Companion diagnostic development
- Cell culture & bioprocess optimization

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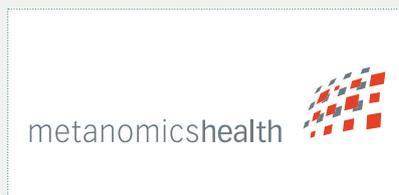
Major R&D-Topics

In cooperation with academic institutes and clinical experts Metanomics Health is running a large-scale diagnostic biomarker program. Areas include metabolic syndrome, heart failure, prostate cancer and multiple sclerosis to mention a few.

Market Segments

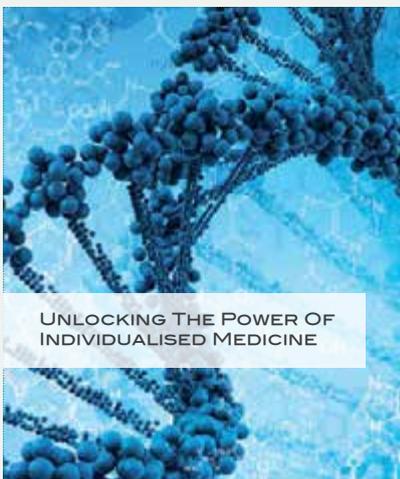
Metanomics Health provides its services to pharmaceutical, diagnostics and nutrition companies. Technology applications include:

- Mechanism of action studies
- Mechanism of toxicity studies
- Translational and clinical biomarker development (e.g. PK/PD, patient stratifi-



Alacris Theranostics GmbH

Alacris Theranostics GmbH, operative since September 2011, is specialised in developing new approaches in personalised medicine for cancer patient diagnosis, treatment and drug stratification. Alacris has built up a next-generation sequencing center for the analysis of clinical samples and applies a systems biology approach for patient and drug



stratification using the **ModCell™** software which is exclusively licensed to Alacris. This approach has been originally developed in the department of Prof. Lehrach at the Max Planck Institute for Molecular Genetics. Based on genome and transcriptome information and including kinetic pathway information, mutation and drug databases it is providing a **"Virtual Patient"** model. This "Virtual Patient" can predict the effects of chemotherapeutic treatment and optimised combinatory treatment for personalised medicine approaches. ModCell™ also facilitates biomarker discovery and "Virtual Clinical Trials" for patient and drug stratification.

Alacris' work provides the opportunity for:

- finding targeted personalised treatment for the patient
- saving negative side effects
- reducing health costs for non-necessary treatment
- optimising stratification of drug treatment

- providing more rapid approval of drugs in targeted non-randomised trials
- recovering "fallen angel" drugs for the pharmaceutical industry
- reducing animal testing via virtual trials

Address

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LGC Genomics

LGC Genomics (www.lgcgenomics.com) is the genomics division of the international science-based LGC Group. LGC Genomics has recently merged with KBioscience, a UK-based technology company providing its own range of SNP genotyping chemistry and novel instrumentation to the life science research and quality control communities. The combined company now provides a full range of high quality genomics products, services and solutions including sample preparation (primarily, nucleic acid extraction), nucleic acid sequencing, genotyping and biobanking. LGC Genomics has laboratories in the UK, Germany and North America along with sales and support staff in over 15 locations in Europe, America and the Far East.

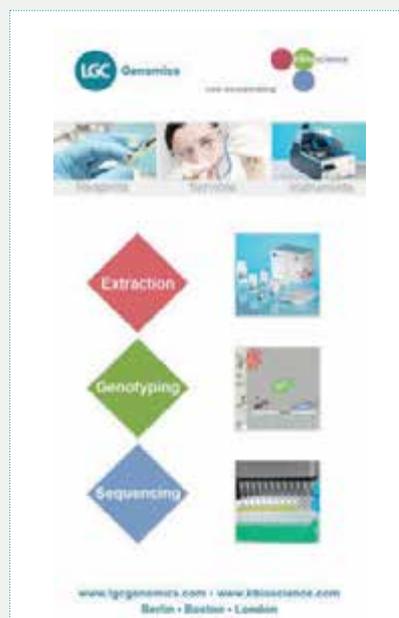
The portfolio includes:

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- DNA and RNA extraction products and services
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- Reagents and consumables for molecular biology
- Pharmacogenetics and diagnostic services
- Laboratory instrumentation including plate sealers, liquid handling robots, high-throughput PCR thermal cyclers, plate readers and a suite of laboratory automation instruments

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co.don AG

co.don® AG is a public biopharmaceutical company, founded in November 1993, since 2001 listed on Frankfurt stock exchange. co.don® AG manufactures cell-based tissue engineering therapeutics of the highest purity and to the highest quality standards. Its products represent a revolutionary process in the biological replacement of damaged articular cartilage, intervertebral disc and bone by building up strictly autologous tissue without the involvement of any external carrier materials or additives. The application of the products may be minimally invasive or arthroscopic and so surgery and rehabilitation times significantly reduced for doctor and patient. Because no external materials are used, the risks of rejection, inflammation and infection are very slight.

co.don® AG is certified in accordance with DIN EN ISO 9001:2008. Furthermore, production, quality control and quality assurance have been certified in accordance with European Guidelines for Good Manufacturing Practice (EU-GMP) since 1997. In 1997 co.don® AG was the first biopharmaceutical company in Europe to be granted a permit for the manufacture of autologous chondrocyte and osteoblast transplants under section 13 of the German Drugs Law (AMG).

co.don® AG's technological, production and regulatory expertise makes the company a first mover in the market for biological cartilage and bone replacement and a provider of highly effective, safe treatment options between pain therapy and endoprothetics.



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Bioeconomy

Towards the Age of the Bioeconomy

Bioeconomy stands for a sustainable and resource-saving “green” economy which uses biological resources more extensively than in the past and becomes increasingly independent of fossil raw materials. This is vital because population growth, limited resources and global warming require urgent action to master the global challenges of the future. Biotechnology is essential to the development of the bioeconomy.

One approach is the industrial use of non-food materials which do not compete with food production. These are either renewable raw materials which are not used in the food sector (e.g. lignocellulose, the structural matrix of ligneous plants) or biogenous waste and residual materials. Valuable substances for the pharmaceuticals, food and cosmetics industries can be obtained from these raw materials. In the German Capital Region, the potential of microalgae, for example, is being investigated at the research institute IGV GmbH, while other research in the region focuses on the extraction of vitamins and further secondary substances from sawallow thorn leaves for natural cosmetics.

Biopolymers and biobased synthetic materials form a key application field for the industrial use of biomass, i.e. the conversion of biomass into building blocks for the chemical industry. In the cooperation project LIGNOS (Aevotis GmbH, Fraunhofer Institute for Applied Polymer Research (IAP) and the University of Potsdam), enzyme systems are being optimised for the extraction of different lignocelluloses, from which biopolymers are obtained which are then processed in moulded products, fibres or fleece materials. The Leibniz Institute for Agricultural Engineering (ATB) in Potsdam-Bornim is a partner of the EU demonstration project BREAD4PLA, in which lactic acid is produced from waste bread. After being polymerised into poly-lactic acid (PLA), the material can be used to produce packaging foils for bread. To foster more intense interaction between the existing capabilities in the field of biopolymers and the plastics processing industry, BioTOP Berlin-Brandenburg will organise an innovation forum in 2012 in cooperation with Kunststoffverbund Berlin Brandenburg e.V., BASF Schwarzheide GmbH and the Fraunhofer IAP.

Berlin and Brandenburg have recognised the strategic and economic importance of the bioeconomy for their regions. A “Potential Analysis of the Regional Bioeconomy in Berlin and Brandenburg” was performed in late 2011 to investigate the existing capabilities and identify the innovation potentials in the field of renewable raw materials. The analysis showed that Berlin-Brandenburg has the potential to play a decisive role in the development of the bioeconomy in Germany and Europe.

A short version of the analysis can be downloaded on www.biotop.de/Biooekonomie

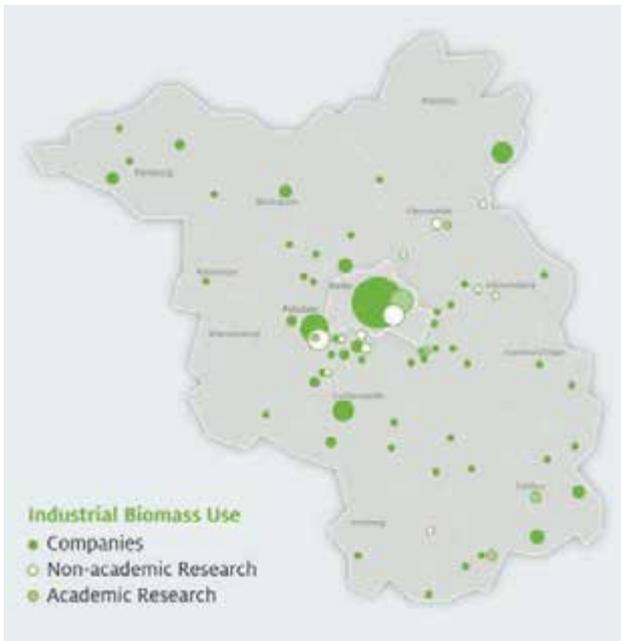


Figure : Regional players in the field of industrial biomass use.

The following sectors are involved: agriculture and forestry, plant breeding/horticulture, wood/cellulose/paper, chemicals (from biological raw materials), cosmetics, pharmaceuticals (from biological raw materials), new materials/bio-polymers, textiles, environmental technology and waste disposal/recycling. The size of the circles corresponds to the number of players in the respective area. (Source: genius gmbh – science & communication.)

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Global Business

The Role of Berlin-Brandenburg in the European Context

Internationalisation was the main watchword for the Bioregion Berlin-Brandenburg in 2011. The reason is not hard to recognise: the region's biotechnology companies earn the majority of their income abroad, and that share is rising! Companies in the industry need to look beyond national boundaries – and that applies even for very small ones. Especially they, however, often find it hard to implement an international strategy without customised external support.

Internationalisation and the challenges it presents were addressed at an early stage by both European and regional policies. At the European level, the new research funding programme Horizon 2020, which is to replace the old FP7, is of prime importance. The European Commission is not only committed to promoting the increased integration of research-intensive SMEs in European funding programmes, but regards that as essential. The details of the programme are currently being defined. Two things are already clear:

1. Horizon 2020 will incorporate and harmonise all EU research funding activities, have a total funding volume of 80 billion Euros and devote a large share of those funds to the support of innovative SMEs.
2. Berlin and Brandenburg are currently positioning themselves to ensure that their interests will be secured by H2020 and be prepared to benefit from the programme when it enters into operation.

At the regional level, the increasing importance of internationalisation was also an important theme at the 4th Innovation Summit of Berlin and Brandenburg in August 2011. Here, Brandenburg's Minister for Economic and European Affairs, Ralf Christoffers, launched a passionate appeal to the summit participants to seize the opportunities Europe provides and make use of the potential they offer.

Berlin meets Brussels

This appeal is reflected in the theme of this year's 'Dialogforum', a joint annual event of the states of Berlin and Brandenburg with the European Commission which was first held in 2007. Under the title "Improving Health for the Ageing Society" entrepreneurs from Berlin-Brandenburg in the fields of molecular diagnostics, medical engineering and regenerative medicine will engage in discussion with high-ranking representatives from European in-



stitutions and other life science regions in Brussels on 30 May 2012. The aim of the event is, on the one hand, to present innovative project proposals in the life sciences and receive direct feedback from the Commission's experts and programme directors. At the same time, the Commission is to receive first-hand reports about the experience of the companies represented with EU institutions and their funding instruments. This also provides companies with an opportunity to present their own input for the design of future funding programmes like Horizon 2020 and secure good positions on the starting line as funding candidates.

The event is truly European in character due to the participation of many European SMEs and regional representatives from Denmark, France, the United Kingdom, Belgium and Sweden with whom Berlin-Brandenburg has networked intensively for many years and already cooperated in a range of projects. The dinner reception at the "Dialogforum" presents an exclusive opportunity for direct exchange with these European partners and with experts and politicians from Berlin-Brandenburg and the European Union.

European networks – Old friends, new formats

Active cooperation in the networks of Europe's BioRegions has played a central role in the internationalisation efforts in our region. BioTOP Berlin-Brandenburg is a founding member of the networks Council of European Bioregions (CEBR) and ScanBalt – a biotech network of the Baltic Sea states that celebrated its 10th anniversary in Heringsdorf on the island of Usedom in 2011. Through the Center for Molecular Diagnostics and Bioanalytics (ZMDB), the region is also a founding member of the still young European Diagnostic Clusters Alliance (EDCA), a network of leading European diagnostics clusters which currently represents more than 400 companies from the member regions. As the only German region in this network to date, Berlin-Brandenburg is regarded as one of the most high-performing regions in the alliance as regards both the number of companies and research facilities engaged in diagnostics development and the structures already established here (the ZMDB as a coordination platform and driver with a very clear focus). A main goal of this new European alliance is to provide targeted support to companies in the field of in-vitro diagnostics by means of customised support offers, activities and formats. The first attempt to combine European

partnering especially for diagnostics companies with a regional conference was successfully made with the Euromediag International Convention (EIC) in summer 2011. With 127 participants from seven European countries, and 237 B-2-B meetings, the event made a promising start. The sequel will take place in June 2012 at the 4th Berlin-Brandenburg Technology Forum on In-vitro Diagnostics and Bioanalysis, which is being co-organised by the region's Enterprise Europe Network, setting a positive signal for Berlin-Brandenburg and Europe.

A success story from Berlin-Brandenburg: The Trilateral Event 2011

As in the years before, scientists from France, Britain and Germany met in the French Embassy in Berlin in September 2011 for one and a half days of expert exchanges on the theme of „Innovative Health-Promoting Food“.



Dr. Stéphane Roy
Scientific Attaché
French Embassy in Germany

The reinforcement of the partnership between France and Germany in the field of biomedical research is a key element of our strategy with BioTOP. The goal is to exchange the know-how of different partners and develop new collaborations in cutting edge fields. This approach has proven highly successful for the last ten years.

Discussion focused on the latest research, developments and applications in the fields of nutrigenomics and functional food. Now running in its 7th year, the event is gaining recognition both as a high-level expert forum and as a partnering platform for scientific cooperation in Europe that is finding increasing interest among many target groups throughout Europe.

Education

Knowledge-Based Leadership

Berlin is one of the world's most interesting and attractive cities – especially for young people. Here and in the adjacent region, they find excellent living conditions and outstanding sites of learning at five universities, seven technical colleges and more than 60 private and public research facilities. Especially in the life sciences, Berlin and Brandenburg are leading centers of academic teaching and research. The new edition of the German-language student guide „Studienatlas des Netzwerks Gesundheitswirtschaft HealthCapital Berlin Brandenburg“ published in spring 2012 offers a comprehensive overview of the region's study programmes in the health and life sciences. It can be downloaded at www.atlas-studium.de

In Berlin and Brandenburg, science and industry cooperate closely and with impressive success. Due to intense networking between academic institutions and the region's many companies in the biotechnology, medical engineering and pharmaceuticals sectors, students can directly apply their knowledge in practice, deepen it and demonstrate it in their exam theses on cutting-edge themes. And the region also offers graduates many exciting career opportunities both in established companies and young start-ups.

To maintain and extend its position as one of the world's leading life science locations, the German Capital Region devotes considerable effort to attracting, educating and keeping the best young brains here. These activities include a wide range of continuing education programmes in both academic and extramural facilities as well as attractive funding programmes, some of which we present to you below.

Independent and international: The Helmholtz Association supports junior scientists

The junior scientist programme of the Helmholtz Association is unique in Germany and offers young researchers from Germany and abroad the opportunity to conduct independent research at an early stage. In this programme, young scientists receive grants of up to 250.000 Euros annually for a period of up to five years. With these funds, they can set up and direct their first own research group. And, in doing so, they benefit from the excellent infrastructures of the Helmholtz Centers and from being part of a distinguished international working environment.

This programme has enhanced the attractiveness of the Helmholtz Centers for junior scientists from around the world. At the

Max Delbrück Center (MDC) in Berlin, which forms part of the Helmholtz Association, 84 % of junior research group heads have arrived from a position abroad, and more than half of these come from the United States. The German Chancellor, Angela Merkel, was impressed by the MDC's efforts in promoting junior scientists and by the successful development of Germany as a research location during a visit at the MDC on 13 September 2011.

www.helmholtz.de

www.mdc-berlin.de



German Chancellor Angela Merkel (center) at a roundtable discussion with junior researchers at the Max Delbrück Center for Molecular Medicine (MDC) with Prof. Dr. Walter Rosenthal, Chairman of the MDC Board of Directors, Prof. Dr. Matthias Selbach, cell biologist and head of a Helmholtz junior research group at the MDC, Nuria Cerdá-Esteban, a Spanish postgraduate at the MDC, and Prof. Dr. Jürgen Mlynek, President of the Helmholtz Association. (Photo: David Ausserhofer/Copyright: MDC)

Interdisciplinary and with a strong focus on practical application: 25 years of biotechnology at Beuth University of Applied Sciences

The Biotechnology Programme at Beuth University of Applied Sciences in Berlin, which is celebrating its 25th anniversary this year, is characterised by a high level of interdisciplinary cooperation and a strong focus on practical application on the interface between academic teaching, research and industry. Bachelor and Master students of biotechnology are trained here in biochemistry, bio-process engineering, microbiology as well as cell and molecular biology. After graduating they work in different industries and a range of fields in research, development, production or sales. Since Beuth University of Applied Sciences is participating actively in the future use of the Tegel Airport site, Campus Wedding and Tegel will gain additional space for modern teaching using the best facilities and equipment, including state-of-the-art laboratories.

www.beuth-hochschule.de

In Berlin and Brandenburg, biotechnology is also taught at Technische Universität Berlin (TU) and at Lausitz University of Applied Sciences in Cottbus.



Prof. Dr. Steffen Prowe
Director of Study Course Biotechnology
at Beuth University of Applied Sciences Berlin

Our students from Germany and abroad are always fascinated by Berlin as a site of higher education. Student life is less expensive here than in other major cities, and the German capital offers a uniquely broad range of culture and leisure activities. Berlin's closely networked biotechnology scene enables students to discover the many career options in the region's biotechnology companies and institutions during their practical training phases. In addition, they benefit from the extensive industry experience and contacts of their professors and visiting lecturers from many institutions in Berlin and Brandenburg.

Lifelong learning: BB LIFE seminars for entrepreneurs and service providers

BB LIFE is designed for SMEs in the sectors pharmaceuticals, biotechnology, medical products/medical engineering and *in vitro* diagnostics.



The seminars provide extensive information about the conditions and recommended procedures for the development, testing, manufacturing, approval and marketing of products and for the provision of services for these product groups. In addition to some "classics", new themes are continuously researched based on the information needs of participants to ensure that all current developments in the regulatory field are addressed optimally. In the seminars, participants heard talks from more than 250 speakers to date, the majority of whom work in regional companies and research establishments.

An early start into the world of science

To kindle enthusiasm for the life sciences among young people and foster their interest in scientific work at an early stage, Berlin-Brandenburg offers many initiatives which address school students in the region. They include the SchülerBIONNALE organised by BioTOP which attracts up to 1000 pupils every year. In lectures and at the booths of companies, educational facilities and universities, they can form a vivid impression of professional work and career prospects in the life sciences. Another very successful initiative is Call-a-Scientist which is organised by the Biotechnologieverbund Berlin-Brandenburg (bbb). More than 80

acclaimed scientists, professors and entrepreneurs are available here on request for lecturing in schools to report on the fascination of research, new research findings and the working practices and environment in universities and companies.



No other German region has as many laboratories for school pupils in such a compact area as Berlin-Brandenburg. In addition, many companies and institutions also provide information on themes in science and technology and hence also on the life sciences. The school student laboratories of the region's research facilities and universities have established the network Schülerlabornetzwerk GenaU which provides information about all the information services on offer on its web page at www.genau-bb.de.



Information for everyone

Other information sources for the general public in research facilities and universities are listed on the web page Berliner WissensWerte (www.berliner-wissenswert.de) established and maintained by TSB Technologiestiftung Berlin. Users can view the wide range of information available according to themes, target groups and dates to receive inspiration for an excursion into the world of science.



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Alles auf einen Klick:
www.berliner-wissenswert.de

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