

LIFE SCIENCES

in the Berlin-Brandenburg Capital Region

THE GERMAN CAPITAL REGION

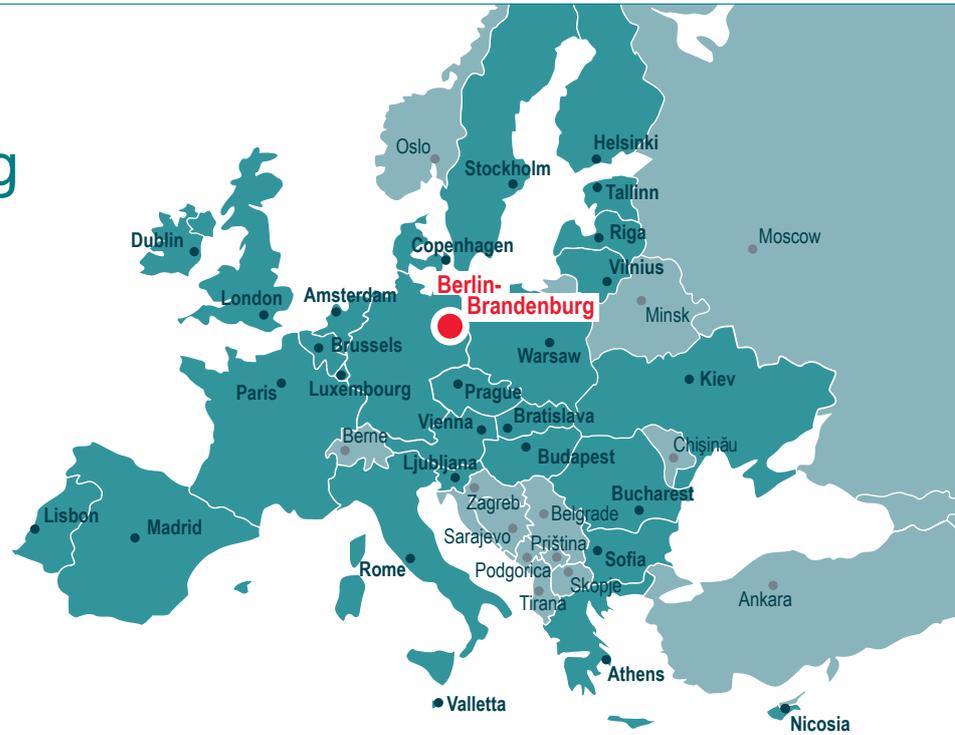
excellence in life sciences & healthcare



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Life sciences in Berlin-Brandenburg



The Berlin-Brandenburg region is one of the leading locations for life sciences in Germany and Europe. Situated in the center of Europe, it offers a decisive advantage: The unique concentration and networking of science, clinics and business has spurred stellar research and applications for innovative products. More than 500 companies in biotechnology, pharmaceuticals and medical technology demonstrate this expertise, as well as 35 major research facilities and institutions of higher education with a life sciences focus. The innovative environment offers optimal conditions for young companies and start-ups. No other region in Germany can claim nine technology parks, which closely link business and science, in such proximity.

The region's advantages include the exceptional pool of multi-lingual, multi-cultural, and highly educated specialists living here, outstanding infrastructure and the affordability of space. This is enhanced by optimal general conditions for all areas of science and industry. At the

same time, Germany's capital region is attractive for renowned scientists and experienced managers from across the globe. Major industry associations are based in Berlin, including the Association of Research-based Pharmaceutical Companies, vfa; Bundesverband der Pharmazeutischen Industrie, BPI; Branchenverband der Biotechnologie-Industrie BIO Deutschland; Bundesverband Managed Care e. V., BMC; and the German Medical Technology Association, BVMed.

No other region offers the same combination of diversity and quality of life at such an affordable cost of living. Thanks to the new Berlin Brandenburg Airport (BER), the region will be even more accessible. Flights from Europe's most modern airport will depart for over 170 destinations in 50 countries.

Ten reasons to choose the Berlin-Brandenburg life sciences region

- A dense concentration of excellent research facilities and institutions of higher education
 - an outstanding platform for research-based companies and partnerships
- The German start-up capital and one of the top investment sites in Europe
- Over 130 clinics, including Charité – Universitätsmedizin Berlin, one of the world's largest university hospitals
- Synergies through well-developed networks and political support
- Highly qualified workforce and flexible working hours
- Affordable commercial and office space available in attractive locations
- Optimal conditions for manufacturing
- The best conditions for funding and incentives in Europe
- Decision-making center: home of Germany's parliament, the federal government and national industry associations
- High quality of life and low cost of living



The Brandenburg Gate in the heart of Berlin

Healthcare in Berlin-Brandenburg by the numbers

This expertise, pooled in the healthcare industries cluster Berlin-Brandenburg – HealthCapital, places the region at the forefront of Germany's clusters.

Roughly **5,800**
companies in the
healthcare industries

Roughly
€ 6 billion
turnover in the
healthcare industries

Roughly **274,000**
employees in the healthcare
industries, 10,000 of whom work
in the pharmaceutical industry

215
biotechnology companies

280
medical technology companies

30
pharmaceutical companies

Over **210,000**
students (winter semester 2012/13)

Over **50**
institutions of higher education
(including two top-tier "universities of
excellence": Freie Universität Berlin and
Humboldt-Universität zu Berlin)

6
Biotechnology parks
and three additional technology parks
with a life science focus

Impressive science and research, efficient networks

Berlin-Brandenburg is one of the most important regions for research in Europe. The concentration of university-based and independent research institutions is unique within Germany. The intensive cooperation within the life sciences plus the integration of key technologies such as IT, nanotechnology, photonics and microsystems technologies create significant gains in efficiency, as does the collaboration with partners in the clinical and business spheres. The German capital region is home to four Max Planck Institutes, two Fraunhofer Institutes, two Leibniz Institutes and two Helmholtz Centers. Roughly 170 health-related degree programs are offered at 19 institutions of higher education in Berlin and six in Brandenburg. Proportionally more money flows into public research in Berlin than in any other German state. The share of R&D expenditures in the public sector was 2.1% in 2009. One major institution of biomedical research is the Max Delbrück Center for Molecular Medicine. It is located on

the Biomedical Campus in Berlin-Buch, which offers an excellent environment for interdisciplinary research driven by patients' needs. At the Teltow site of the Helmholtz Center Geesthacht, the focus is on the development of biomaterials for regenerative medicine.

The cluster management promotes networking and the transfer of technology between science and industry for the Berlin-Brandenburg healthcare industries cluster, known as HealthCapital. The local medical and scientific know-how is also sought after by German and international networks. For example, the region plays a prominent role in the national genome research network NGFN-Plus. In 2011 the German Centre for Cardiovascular Research, DZHK, was founded in Berlin. This research association maintains seven locations and 26 university-based and independent research partners.

In the laboratory at Bayer HealthCare Pharmaceuticals



New milestones in systems biology

“Berlin offers tremendous assets. Abroad, everyone knows that this is where exciting things happen and that Berlin is full of interesting people and structures. There is a new perception taking root in people’s minds: New York in the 1970’s and London in the 1990’s – that’s Berlin today,” Professor Dr. Nikolaus Rajewsky told ZEITmagazin in 2011. He coordinates the Berlin Institute for Medical Systems Biology (BIMSB) at the Max Delbrück Center for Molecular Medicine in Berlin-Buch, which studies the molecular networks of genes and proteins, their regulation and their role in the development of diseases. In 2012 he received the Leibniz Prize, Germany’s most important funded award for research. After earning his doctorate in theoretical physics at the University of Cologne, completing post-doctoral studies at Rockefeller University and holding a professorship at New York University, Nikolaus Rajewsky returned to Germany in 2006.

His research activities at the BIMSB focus mainly on microRNAs. These are nucleic acids, which, it was recently discovered, play a role in transferring genetic information. Nikolaus Rajewsky published seminal work on the biogenesis of microRNAs and the ways they regulate expression of other human genes. Among other things, he showed that each human microRNA regulates an average of hundreds of target genes in a functionally significant way. The BIMSB was founded at the MDC with seed capital from the Federal Ministry of Education and Research and the Berlin Senate. It works closely with the “Humboldt-Universität” (HU), the Charité – Universitätsmedizin and New York University. By 2016 it will move into a new building on the North Campus of the HU.

Beuth University of Applied Sciences

“Berlin is not only one of the most attractive metropolises in the world; it is also a life sciences stronghold. Students can apply their knowledge directly thanks to close cooperation with the numerous biotech, medical technology and pharmaceutical technology companies in the capital region. In this way, industry – from established companies to dynamic entrepreneurs – benefits from the innovative know-how at the colleges and universities. Most of the graduates from Berlin also stay in the capital region after finishing their studies.”

Berlin’s institutions of higher education will continue to train highly qualified specialists and scientists for the “city of the future,” so that Berlin will be able to compete internationally with other first-rate life sciences locations. Biotechnology is one of the key technologies for the 21st century, and Beuth has been offering this course of studies for more than 25 years. It is distinguished by its highly interdisciplinary approach and practical orientation at the nexus between education, research and industry.”



Prof. Dr. Monika Gross

President of Beuth University of Applied Sciences
www.beuth-hochschule.de

THE BERLIN-BRANDENBURG REGION: A GLOBAL LEADER IN RESEARCH

Over 100 independent research institutes, including:

Max Planck Society institutes and archives	8
Hermann von Helmholtz Association research centers	8
Leibniz Gemeinschaft institutes and headquarters	24
Fraunhofer Gesellschaft institutes	8
Fraunhofer Gesellschaft research associations	3

BIOTECHNOLOGY PARKS AND TECHNOLOGY PARKS WITH A LIFE SCIENCE FOCUS

- Berlin Adlershof
- berlinbiotechpark
- Biotech Campus Potsdam
- Biotechnology Park Luckenwalde
- Campus Berlin-Buch
- co:bios Technologiezentrum
- GO:IN Golm Innovation Center
- Wuhlheide Innovation Park Berlin
- Techno Terrain Teltow

World-renowned for excellent hospitals

Berlin-Brandenburg offers a broad spectrum of outstanding scientific research at excellent locations like the Charité – Universitätsmedizin Berlin, one of the largest university clinics in Europe. The region provides more than 130 hospitals and specialty clinics with more than 35,000 beds. These assets offer a substantial competitive edge: first-class medical care, top expertise on specific diseases and optimal conditions for conducting clinical studies. 2013 will mark the launch of the Berlin Institute of Health – BIH, an institutional merger of the research activities of the Charité – Universitätsmedizin Berlin and the Max Delbrück Center for Molecular Medicine (MDC). By more closely integrating the basic science research done at the MDC with the patient-oriented research of the Charité, the merger will create a first class research environment and will open a new dimension for life sciences in the region.

Outstanding results in the fields of oncology and cardiology have been achieved in the region. The German Heart Institute Berlin,

DHZB, is emblematic of this excellence; it is among the most renowned and highest-performing transplant centers in the world. The Vivantes Netzwerk für Gesundheit, Germany's largest network of municipal hospitals, is based in Berlin. Since 2011, Charité – Universitätsmedizin and Vivantes have linked their expertise in Labor Berlin, Europe's largest hospital lab. The private Helios group of clinics, which is part of the Fresenius healthcare company, is also based in Berlin. Further hospital operators with multiple sites in Berlin are the German Red Cross and the Paul Gerhardt Diakonie, a social work company. The Carl Thiem Clinic in Cottbus is one of the largest, most productive hospitals in the state of Brandenburg. It formed an alliance with the Städtisches Klinikum Brandenburg to create the first comprehensive telemedicine network in Germany for the care of high-risk heart patients. At the Klinikum Ernst von Bergmann in Potsdam, patients receive modern, integrated medical care – from prevention to in- and outpatient treatment, rehabilitation, nursing care and aftercare.

Photograph from the microbiology lab at the Helios Clinic



Working together to understand strokes

Sanofi and the Charité – Universitätsmedizin Berlin are working hand in hand in order to translate their collective know-how in research and development into innovative treatments for acute stroke victims. In February 2012 they opened a new joint research laboratory, which is used by scientists from the Charité as well as Sanofi, to perform pharmacological trials. The lab is located on the Charité campus in Mitte, near the Berlin Center for Stroke Research, which the university clinic has operated since 2008.

The Charité is one of the leading clinics in the acute and long-term treatment of stroke patients and has deep clinical experience as well as

access to patients. It is one of 19 certified stroke units in Berlin-Brandenburg. Sanofi's operations in Germany span the entire value-added chain of the pharmaceutical industry; research labs and production facilities are located here. Sanofi also coordinates clinical studies for Central and Eastern Europe and Central Asia from its base in Berlin. The new research laboratory is part of a partnership launched in 2010. Another project is the Diabetes Alliance, which has been running since 2012.

Charité – Universitätsmedizin Berlin

“The Charité is the engine that powers healthcare and health sciences in the Berlin-Brandenburg region, and a major player in its economy. Roughly 13,000 people work here in diverse medical and scientific fields. Through external research funding alone – termed ‘third-party funding’ – we create over 2,000 jobs and generate tax revenue of about 30 million euros for Berlin. With an annual profit of 8.2 million euros, the Charité exceeded its projections and bucked the trend, becoming one of the few university hospitals in Germany to turn a profit. It bears noting that every single year since 2008, the Charité has met or surpassed its negotiated and

self-declared targets. Providing the best possible healthcare demands a close working relationship with top-level research. The Charité has the advantage of combining both under one roof. In fields where other institutions have outstanding expertise, and where there is potential for synergy-effects through cooperation, we maintain very close partnerships in order to maximize our mutual benefit and create an added value for the healthcare industry. Of course, this enhances Berlin's reputation as a location for life sciences immensely: Good business follows good science.”



Prof. Dr. Karl Max Einhäupl

Chairman of the Executive Board of the Charité – Universitätsmedizin Berlin
www.charite.de

CHARITÉ – UNIVERSITÄTSMEDIZIN BERLIN*

Locations	4
Beds	3,213
Inpatient cases	139,142
Outpatient cases	593,614
Employees	12,888
Annual turnover in millions of euros ..	1,096
Third-party funding in millions of euros ..	158
Students	7,001
Collaborative research centers	16

* 2011 operating figures

VIVANTES NETZWERK FÜR GESUNDHEIT**

Vivantes Clinics	9
Beds	5,379
Inpatient cases	211,500
Outpatient cases	284,812
Employees (headcount)	13,938
Turnover in millions of euros	865
Annual earnings in millions of euros	5.1

** per annual report 2011

CARL-THIEM KLINIKUM ***

Clinics and institutes	24
Beds	1,246
Inpatient cases	44,543
Outpatient cases	57,724
Employees (headcount)	2,273
Turnover in millions of euros	160
Third-party funding in millions of euros ..	0.6

*** 2011 operating figures

KLINIKUM ERNST VON BERGMANN ****

Clinics and divisions	29
Beds	1,088
Inpatient cases	38,800
Outpatient cases	147,500
Employees (headcount)	2,491
Turnover in millions of euros	176
Annual participation in clinical studies	approx. 30

**** per management report 2011

Rich in tradition – home to innovative pharmaceuticals

The enduring success of pharmaceutical companies from Berlin and Brandenburg is rooted in innovative products and traditions that date back to the 19th century. The sector benefits from the excellent scientific environment, the clinical research landscape, and the proximity to healthcare decision makers. That applies to global players like Bayer, Pfizer, Sanofi and Menarini as well as over 20 small to medium-sized enterprises. Bayer HealthCare Pharmaceuticals looks back on a rich tradition in Berlin. Today, with over 5,000 employees in Berlin alone, it is among the ten largest specialty pharmaceuticals companies in the world. Sanofi's German marketing and sales headquarters are based in Berlin with nearly 1,250 employees. In 2011 Takeda Pharma acquired the venerable Nycomed manufacturing site in Oranienburg, moving its sales headquarters to Berlin in 2012. Shire consolidated its German operations in the nation's capital as early as in 2010. Pfizer also expanded its activities in Berlin and moved its headquarters and other business divisions to the capital.

Highly trained specialists, investor-friendly economic development and the best investment incentives in Europe make Berlin-Brandenburg an attractive production location for the chemical-pharmaceutical industry as well as medical technology and biotechnology. That is why B. Braun, for example, is expanding its pharmaceuticals division by building new manufacturing facilities in Berlin. Takeda and BASF produce medications, plastics, agricultural and horticultural agents in modern plants in Brandenburg. Bayer and Berlin-Chemie also have a long history of manufacturing in Berlin, as does the global medical technology company, Biotronik.

A Bayer HealthCare scientist prepares to start a sequencer



Innovative medical research in Berlin

Piramal Imaging GmbH was founded in 2012, after the Piramal Group from India acquired the Molecular Imaging Division from Bayer HealthCare. "In Berlin, we had a unique opportunity to transfer smart people from a large organization to a small dedicated team," said Dr. Ludger Dinkelborg, Managing Director of Piramal Imaging GmbH. "This accelerates our work and creates a good environment for innovation. At the same time, we are an integral part of a global company able to provide the capital we need for our research and development activities."

Piramal Imaging GmbH is a wholly owned subsidiary of the Swiss firm Piramal S.A., which

transferred all of its R&D activities to Berlin. The company's diagnostics know-how is centered in the city. In Piramal's Berlin laboratories, 20 employees are now researching novel radiopharmaceuticals for molecular imaging in PET. Recently, applications were filed with drug regulators in Europe and the US for the approval of Florbetaben, a highly specialized molecule used to detect beta-amyloid plaque in the brain and potentially a breakthrough in the early diagnosis of Alzheimer's disease. In Berlin, Piramal collaborates closely with research institutions and clinics and benefits from their expertise, for example with regard to clinical studies and dementia research.

Bayer Pharma AG

"Berlin is where our corporate headquarters are located, as well as one of our main research sites. Our activities here span the entire value-added chain – from research in oncology, gynecology and diagnostic imaging to development and manufacturing. Most of our marketing is also managed from Berlin. Berlin is home to an excellent research

and clinical landscape, and there are many other reasons why the city is an attractive location. We want to grow – and we intend to outpace the market. We can only achieve that with committed and qualified employees, the right partners, a good environment and the appropriate infrastructure. Berlin offers it all."



Andreas Fibig

Member of the Bayer HealthCare Executive Committee and Head of the Pharmaceuticals Division

www.bayerpharma.com

PHARMACEUTICAL COMPANIES IN BERLIN-BRANDENBURG

- Bausch + Lomb
- Bayer HealthCare Pharmaceuticals
- Berlin-Chemie (Menarini Group)
- Haupt Pharma
- Heyl Chemisch-pharmazeutische Fabrik
- Klosterfrau Berlin
- Merz Pharmaceuticals
- Pfizer
- Sanofi
- Shire Deutschland
- Takeda Pharma
- Teva Berlin / CT Arzneimittel
- Winthrop

Medical technology – new devices for global markets

Berlin-Brandenburg is one of the leading medical technology sites in Europe. Comprised largely of small to medium-sized enterprises, this sector employs 11,600 people and is continually growing. It is regarded as the motor behind the region's healthcare industries. Companies benefit from the excellent research conducted in clinics, renowned research institutes like the Institute for Micro- and Medical Technology at the Technische Universität Berlin and cooperation with clinical institutions. Numerous innovative and high-performing companies are working in fields related to telemedicine and e-health, imaging, oncology and cardiovascular medicine.

From pacemakers to cardiac support systems, defibrillators and stents, the cardiological products from Berlin-Brandenburg are the most widely used on the international market. One of the most successful companies in this field is Biotronik, which makes cardiac implants. The German Heart Institute Berlin, DHZB, and its spin-off, Berlin Heart GmbH, are at the forefront of the development of

artificial cardiac support systems. Companies like aap, Biomet, Carl Zeiss Meditec, OHST Medizintechnik, Merete, and S&V Technologies manufacture sophisticated biofunctional implants. Olympus Surgical is developing new methods for high-frequency medical technology. Implants, innovative biomaterials, regenerative therapies, as well as approaches combining these fields, are gaining in importance. In 2011 a new Helmholtz Virtual Institute was launched to conduct research on multifunctional biomaterials for medicine.

Charité – Universitätsmedizin Berlin and the Helmholtz Center for Materials and Energy in Berlin are working together to treat eye tumors with proton therapy under the brand name "BerlinProtonen." This collaboration among medical physicists, radiation oncologists and ophthalmologists has resulted in therapies that are extremely precise and successful. The eye applicators used in the procedure are also manufactured in Berlin by the Eckert & Ziegler company.

Quality assurance in Biotronik's electrode manufacturing facility



STEMO – Speed makes the difference

One outstanding example of the interregional cooperation between scientists, engineers, first responders and doctors is Berlin's mobile stroke unit, "Stroke-Einsatz-Mobil" – STEMO. This fully operational ambulance is equipped with everything that the immediate diagnosis and acute treatment of a stroke require: a mobile computer tomography device, the latest laboratory technology for biomarkers, equipment for electronic treatment

documentation and telemedical communications links with the hospital. STEMO offers new prospects for rapid, life-saving interventions for stroke patients. The project's partners include the Charité, the Berlin Fire Department and companies from Brandenburg such as Thermo Fisher Scientific and MEYTEC, which outfitted the ambulance with state-of-the-art equipment.

B. Braun Melsungen AG

"B. Braun is committed to Berlin. The company's Vascular Systems division in Britz manufactures medical technology products for diagnostics and therapy, and the Langenbeck-Virchow-Haus in Berlin-Mitte houses B. Braun's training academy. The pharmaceutical plant, with over 450 employees, is the largest of our three locations in the city. Seven days a week, we produce nothing but sterile products, injection vials made of plastic and

glass, and we have also established a development team. Last year, we launched the expansion of our pharma plant, which will entail an investment of about 40 million euros. We had already invested the same amount in developing the site, and the new facility will bring 25 new permanent life sciences jobs. Production in our new factory in Rudow is slated to begin in mid-2014."



Wilhelm Schlemmermeyer

Director of the Pharma Plant, Berlin,
B. Braun Melsungen AG
www.bbraun.de

MEDICAL TECHNOLOGY IN BERLIN-BRANDENBURG

- aap Implantate
- B. Braun Melsungen
- Berlin Heart
- Biomet
- BIOTRONIK
- Carl Zeiss Meditec
- Christoph Miethke
- Eckert & Ziegler
- JPK Instruments
- MELAG
- Merete Medical
- OHST Medizintechnik
- Olympus Surgical Technologies Europe
- OTB Orthopädie-Technik
- Vamed
- VANGUARD
- W.O.M. WORLD OF MEDICINE
- XION

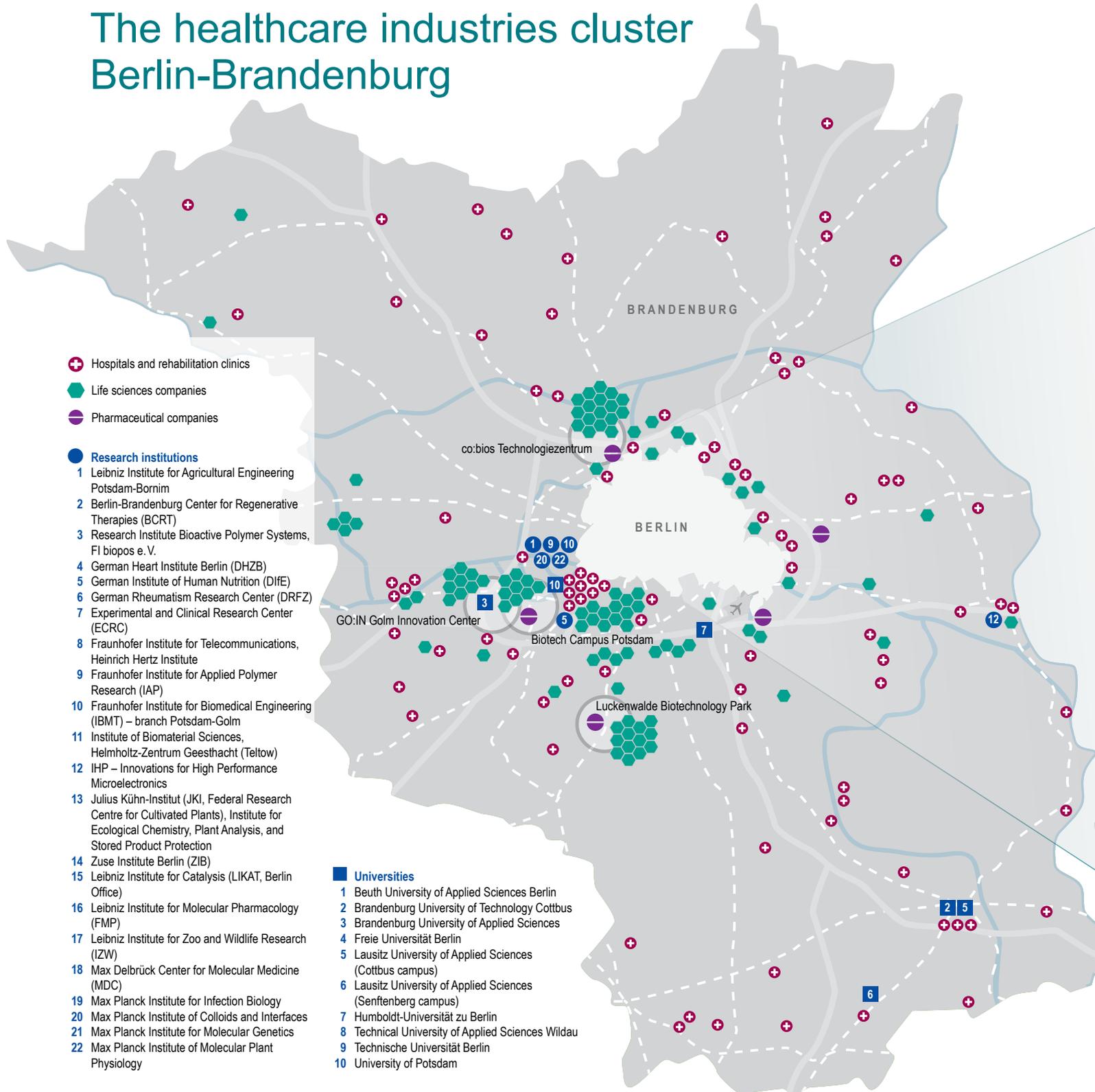
MEDICAL TECHNOLOGY NETWORKS IN BERLIN-BRANDENBURG

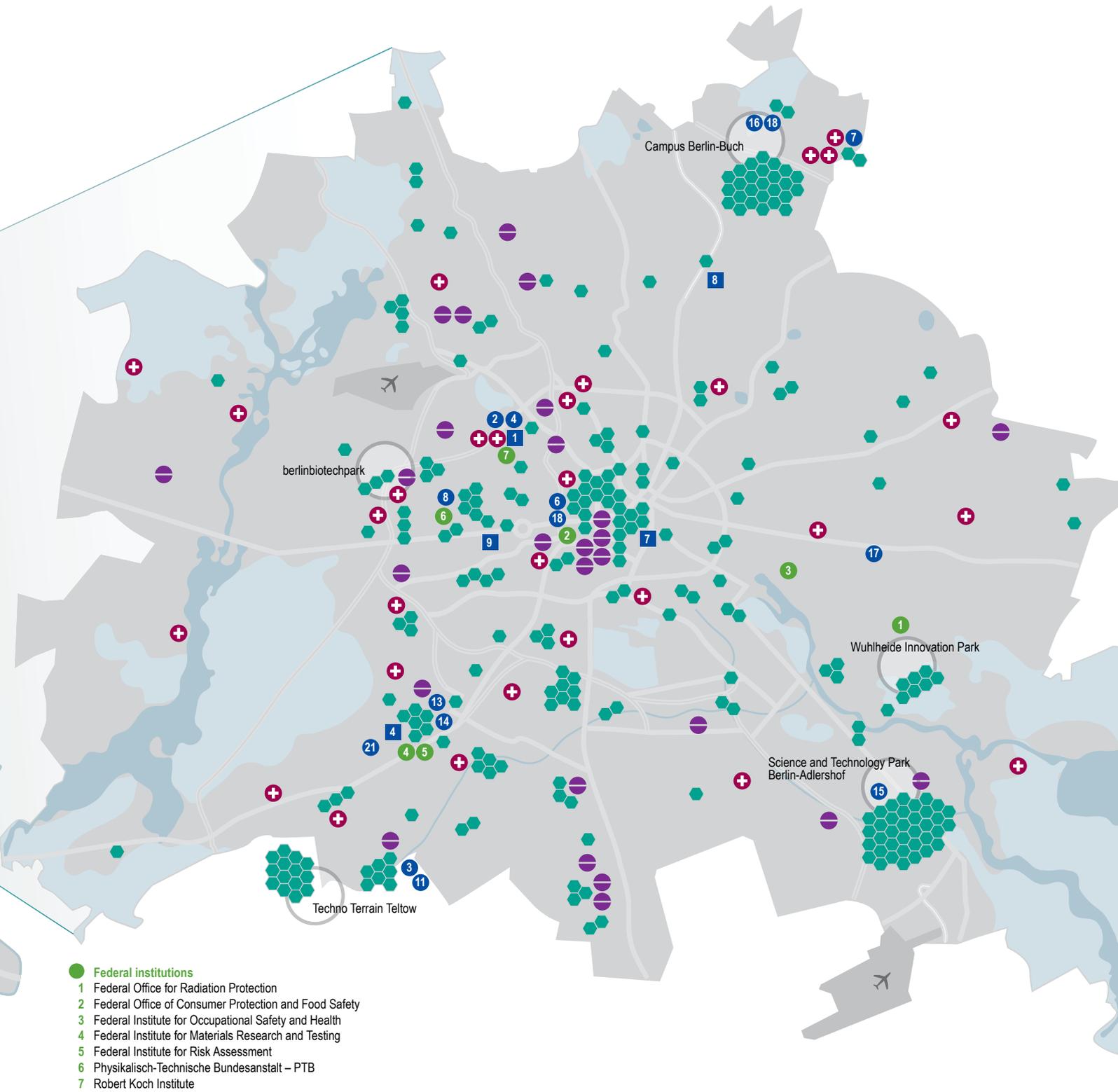
- Berlin NeuroImaging Center (BNIC)
- Imaging Network Berlin INB
- Kompetenznetz Optische Technologien – OpTecBB
- Kompetenzzentrum für Miniaturisierte Monitoring- und Interventionssysteme
- National Association for eHealth Systems and Telemedicine
- Medtecnet Berlin-Brandenburg
- Small Animal Imaging Center Charité

The healthcare industries cluster Berlin-Brandenburg

- + Hospitals and rehabilitation clinics
- ⬢ Life sciences companies
- Pharmaceutical companies
- **Research institutions**
 - 1 Leibniz Institute for Agricultural Engineering Potsdam-Bornim
 - 2 Berlin-Brandenburg Center for Regenerative Therapies (BCRT)
 - 3 Research Institute Bioactive Polymer Systems, FI biopos e.V.
 - 4 German Heart Institute Berlin (DHZB)
 - 5 German Institute of Human Nutrition (DIfE)
 - 6 German Rheumatism Research Center (DRFZ)
 - 7 Experimental and Clinical Research Center (ECRC)
 - 8 Fraunhofer Institute for Telecommunications, Heinrich Hertz Institute
 - 9 Fraunhofer Institute for Applied Polymer Research (IAP)
 - 10 Fraunhofer Institute for Biomedical Engineering (IBMT) – branch Potsdam-Golm
 - 11 Institute of Biomaterial Sciences, Helmholtz-Zentrum Geesthacht (Teltow)
 - 12 IHP – Innovations for High Performance Microelectronics
 - 13 Julius Kühn-Institut (JKI, Federal Research Centre for Cultivated Plants), Institute for Ecological Chemistry, Plant Analysis, and Stored Product Protection
 - 14 Zuse Institute Berlin (ZIB)
 - 15 Leibniz Institute for Catalysis (LIKAT, Berlin Office)
 - 16 Leibniz Institute for Molecular Pharmacology (FMP)
 - 17 Leibniz Institute for Zoo and Wildlife Research (IZW)
 - 18 Max Delbrück Center for Molecular Medicine (MDC)
 - 19 Max Planck Institute for Infection Biology
 - 20 Max Planck Institute of Colloids and Interfaces
 - 21 Max Planck Institute for Molecular Genetics
 - 22 Max Planck Institute of Molecular Plant Physiology

- **Universities**
 - 1 Beuth University of Applied Sciences Berlin
 - 2 Brandenburg University of Technology Cottbus
 - 3 Brandenburg University of Applied Sciences
 - 4 Freie Universität Berlin
 - 5 Lausitz University of Applied Sciences (Cottbus campus)
 - 6 Lausitz University of Applied Sciences (Senftenberg campus)
 - 7 Humboldt-Universität zu Berlin
 - 8 Technical University of Applied Sciences Wildau
 - 9 Technische Universität Berlin
 - 10 University of Potsdam



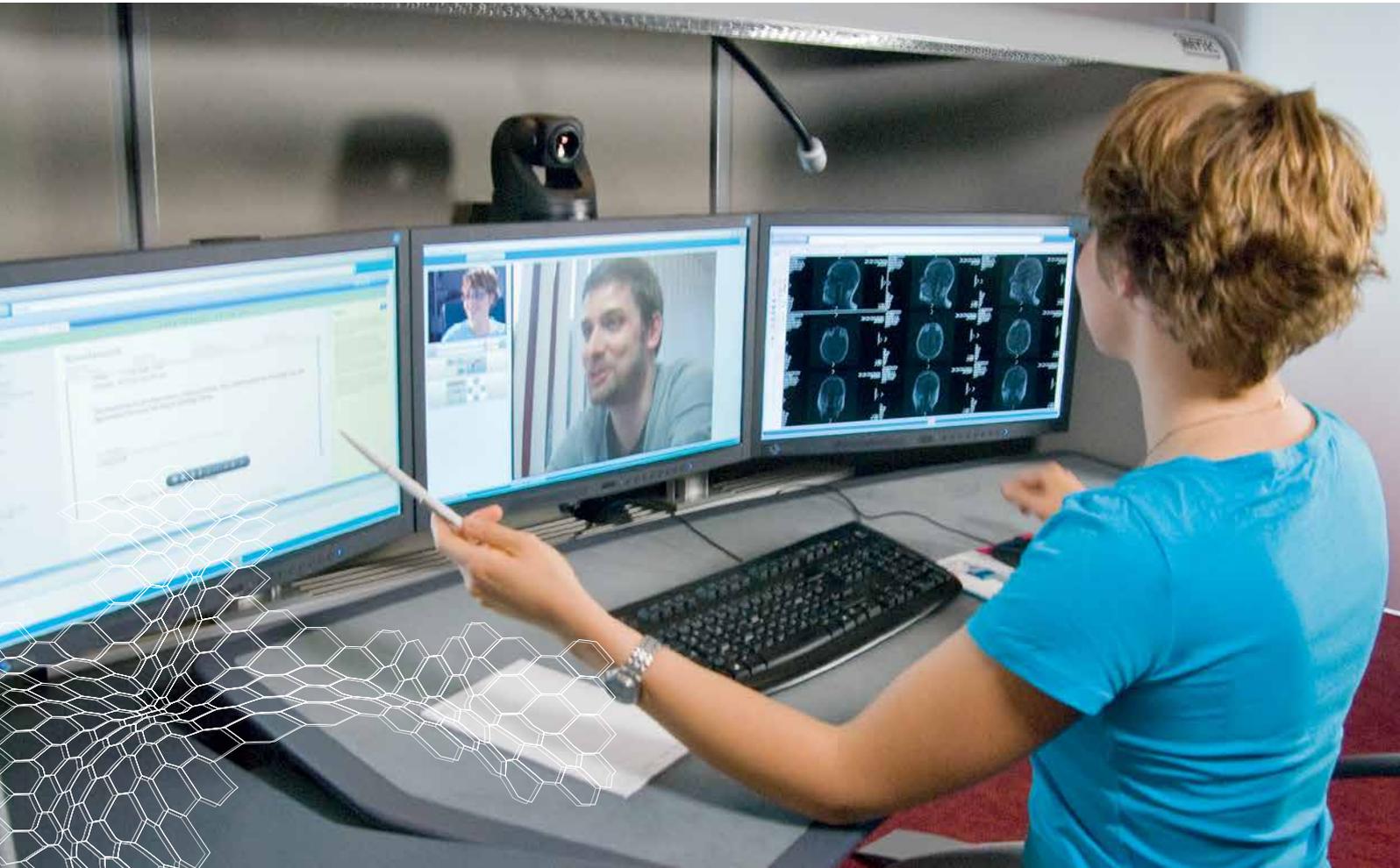


IT and telemedicine: catalysts for progress

It is necessary to access, evaluate and transfer ever-increasing volumes of data in the field of medicine. The growing integration of medical technology and biotechnology with bioinformatics and IT generates promising opportunities for the Berlin-Brandenburg region, where superb IT know-how, a comprehensive and modern communications infrastructure and excellent IT-oriented research come together. The Max Planck Institute for Molecular Genetics is coordinating what will become the European Sequencing and Genotyping Infrastructure, ESGI. It will enable scientists to use the emerging technologies for deciphering the complex function of genes at a low cost. Also, the Hasso Plattner Institute in Potsdam conducts research on innovative data management technologies that have a transformative effect on many fields, including telemedicine.

In the region, roughly 100 companies, clinics, research institutes and telemedicine centers develop products and services in the fields of medical informatics and telemedicine. Among the projects providing comprehensive access to expert care in the region are the teleradiology network at the Trauma Hospital Berlin, telemedicine networks for patients with high cardiac risk, the joint "FONTANE" healthcare project in North Brandenburg and the EU project "Renewing Health" (REgioNs of Europe Working INtogether for HEALTH). The region is also home to "CardioBBEAT," the largest telemedical study in the world. A model project known by the German acronym AGnES gives doctors across Brandenburg access to community-oriented support from specialist nurses.

VIMED® DOC – a diagnostic work station for specialists in telemedical centers



Mobile solutions for personalized cancer therapy

It took only seven months for the Charité – Universitätsmedizin Berlin, the SAP Innovation Center, and the Hasso Plattner Institute (HPI) to develop a new data management technology for cancer research and treatment – the HANA-OncoLyzer. This device is based on the in-memory technology co-developed at HPI, and allows patient-related and clinical data to be accessed and edited in real time, anytime. “Doctors used to have to wade through files for up to two days to find a patient whose characteristics were an exact match with the parameters of a promising new personalized therapy. Thanks to the in-memory technology, they can now do this in seconds on their iPads,” said Cafer Tosun, Director of the SAP Innovation Center. “At the same time, this joint project is indicative of

how we work at the SAP Innovation Center. We engage users from the first step, and of course we partner with internationally renowned research institutions. The Berlin-Brandenburg region offers just the network we need to bring together first-class experts. The HANA OncoLyzer is an impressive example of how quickly partnerships like this can deliver formidable results.”

The Charité already cooperates with SAP on a pilot project for creating electronic patient records. For this purpose, the software firm has developed a platform which merges data from different information systems within the clinic and makes them accessible on mobile devices like the iPad.

GETEMED Medizin-und Informationstechnik AG

“GETEMED AG, founded in 1984 in Berlin, has been located in Teltow since 1998. The outstanding conditions the region offers – good infrastructure, access to highly trained experts, proximity to clinical and scientific institutions and the support from various economic development bodies – motivated us to construct our own building in Teltow in 2006.

This is where our team of over 60 highly trained employees develop and manufacture products in the fields of vital signs monitoring, non-invasive ECG diagnostics and telemedicine, which are then marketed by distribution and sales partners in Germany and abroad.”



Robert Downes
Executive Board Member, GETEMED
Medizin- und Informationstechnik AG
www.getemed.de

HEALTH-IT AND TELEMEDICINE IN BERLIN-BRANDENBURG

- BIOTRONIK SE & Co. KGCisco Systems
- ClinPath
- Coniugo
- Emperra E-Health Technologies
- Fraunhofer FOKUS, Institute for Open Communication Systems
- GETEMED Medizin- und Informationstechnik
- GHC Global Health Care
- ID Information und Dokumentation im Gesundheitswesen
- iDoc Institut für Telemedizin und Gesundheitskommunikation
- IHP – Innovations for High Performance Microelectronics / Leibniz-Institut für innovative Mikroelektronik
- IT-Solutions CONWORX Technology
- ixellence
- Marabu EDV-Beratung und Service
- MEYTEC Informationssysteme
- Safe4Net
- Tembit Software
- T-Systems International

NETWORKS

- Telemed-Initiative Brandenburg e. V.
- Telemedizin-Netzwerk Brandenburg
- bvitg e. V.
- Deutsche Gesellschaft für Integrierte Versorgung im Gesundheitswesen e. V.
- German Society for Telemedicine
- Deutsche Gesellschaft für Gesundheitstelematik e. V.
- National Association for eHealth Systems and Telemedicine
- TMF – Technology, Methods and Infrastructure for Networked Medical Research
- ICT & Digital Business Association Berlin-Brandenburg

Diagnostics – early detection and precision

The Berlin-Brandenburg region boasts far-reaching expertise in bioanalytics and in vitro diagnostics: around 100 companies and research institutes are engaged in developing innovative new technologies and products in this field. Two companies that typify the enormous potential are Bayer HealthCare, the global market leader in radiocontrast agents, and Thermo Fisher Scientific B•R•A•H•M•S, the leader in thyroid and sepsis diagnostics, as well as epigenomics, with a new approach to cancer diagnostics based on DNA methylation.

The Center for Molecular Diagnostics and Bioanalytics Berlin-Brandenburg, ZMDB, is the nexus for the development of innovative diagnostics in the region. As a platform for technology transfer, it brings together basic science research, technology development, clinical research and industrial applications. It has been representing Berlin-Brandenburg in the European Diagnostics Clusters Alliance, EDCA, since 2010 as the only German region in the network. Roughly 35 companies and research institutes have joined forces in DiagnostikNet Berlin-Brandenburg e. V. to develop and mar-

ket the need for new in vitro diagnostic tools. The Potsdam-Golm Science Park is also home to the Fraunhofer Institute for Biomedical Engineering, IBMT, which is involved in several joint R&D projects. It focuses on the development of pioneering in vitro diagnostics and tools for regenerative medicine. The joint project Tera-Sens is part of the development platform T(h)era-Diagnostik, a network of research institutes and companies in Brandenburg, and studies the integration of pre-analytics and sensors for in vitro diagnostic tools as well as bioanalytic tools for new applications. The project specializes in the analysis of infectious agents and cardiac markers for acute care.

The region also offers excellent access to state-of-the-art diagnostic imaging devices. For example, one of the world's first open high-field magnetic resonance imaging devices is at the Charité. The Experimental and Clinical Research Center, ECRC, has a 7-Tesla MRI at the Max Delbrück Center for Molecular Medicine. Further imaging resources are available at the Imaging Science Institute, ISI, a joint venture between Siemens and the Charité – Universitätsmedizin Berlin that brings together research and clinical applications.

Open high-field magnetic resonance imaging facilitates simultaneous diagnostics and treatment



Biomedical research at the ECRC

At the Experimental and Clinical Research Center, ECRC, on the biomedical research campus in Berlin-Buch, clinicians and basic scientists are working together to translate the results of molecular research into new medical procedures. ECRC is sponsored by the Max Delbrück Center for Molecular Medicine and the Charité – Universitätsmedizin Berlin. Research at the ECRC is designed to be both translational as well as interdisciplinary, which is evident, for example, from its partnerships with the Leibniz Institute for Molecular Pharmacology, the national metrology institute Physikalisch-Technische Bundesanstalt, and partners from industry such as Siemens Healthcare. In joint projects, new

approaches to diagnosis, prevention, and therapy for cardiovascular, oncological, and neurological diseases are developed and rapidly moved into patient trials. The possibilities for research were considerably expanded by the creation of the new Berlin Ultrahigh Field Facility, B.U.F.F. The technical facilities are outstanding: In addition to an experimental 7-Tesla full-body MRI device, a 3-Tesla MRI device and a 9.4 Tesla MRI device for small animals have been installed. Within a very short time, researchers at the ECRC were able to develop a highly efficient imaging procedure for capturing a beating human heart using the 7-Tesla Magnet machine.

Thermo Fisher Scientific B•R•A•H•M•S

“In late 2009 Thermo Fisher Scientific acquired B•R•A•H•M•S AG in Hennigsdorf in order to further develop its business in the field of diagnostics. We take advantage of alliances in Berlin with other companies and institutes like the Max Planck Institute for Infection Biology, the University of Potsdam and the Charité for clinical validation of

our biomarkers in various therapeutic fields. We are very proud of our PCT test for the diagnosis of sepsis. This unique test provides an early indication of whether an infection is bacterial or viral. Using it doctors can better monitor the therapy, avoiding the unnecessary administration of antibiotics.”



Christophe Fraudeau

Managing Director of B•R•A•H•M•S GmbH,
Part of Thermo Fisher Scientific
www.thermoscientific.com/brahms

DIAGNOSTIC EXPERTISE IN THE REGION

- Berlin NeuroImaging Center (BNIC)
- DiagnostikNet-BB e. V. – Netzwerk Diagnostik Berlin-Brandenburg
- Imaging Netzwerk Berlin (INB)
- Small Animal Imaging Center Charité
- Center for Molecular Diagnostics and Bioanalytics (ZMDB)

FOCUS ON IN VITRO DIAGNOSTICS

- Biomarkers, biobanks and clinical studies
- Detection systems and biosensors
- Manufacturing technology for microarrays und biosensors

FOCUS ON DIAGNOSTIC IMAGING

- Molecular imaging
- Development of imaging devices (MRT, CT, PET/SPECT)
- Development of radiocontrast agents and clinical studies

A leading biotechnology location in Europe

Biotechnology is one of the region's engines for innovation. This sector, which has benefited from the coordination and networking done by BioTOP Berlin-Brandenburg for over 15 years, has shown steady growth, and many new companies have been established. The backdrop for this success is the region's excellent research landscape and the technology parks specializing in biotech. The region offers optimal conditions for start-ups and large, research-intensive companies alike. Of the region's 215 biotechnology-companies with a total of 4,000 employees, 83% are active in biomedicine. In developing innovative therapeutic and diagnostic processes to treat cancer, cardiovascular disease or diabetes, they profit from the region's strong scientific know-how and excellent infrastructure for clinical studies. Berlin-Brandenburg is home to expertise in genome and proteome research, RNA technologies, glyco-biotechnology and regenerative medicine. Companies such as Auto Tissue Berlin, co.don, Epigenomics, Glycotope, NOXXON, ProBioGen, Scienion and Silence Therapeutics lead the way.

Excellence in translational medicine

The Berlin-Brandenburg Center for Regenerative Therapies, BCRT, is an outstanding translation center operated jointly by the Charité – Universitätsmedizin Berlin and the Helmholtz Center Geesthacht. Here, scientists research and develop clinical applications for technologies and products based on cells, biomaterials and bioactive factors that facilitate personalized therapies for immune, cardiovascular and musculoskeletal disorders. BCRT collaborates closely with the graduate program "Berlin-Brandenburg School for Regenerative Therapies," which receives support from the national Excellence Initiative for higher education in Germany. Thanks to the integration of interdisciplinary basic science research and clinical application, research results are rapidly translated into new therapies.

Clean room at co.don AG: double isolation for maximum hygiene



Glycotope: Turning glycomics into health

A global leader in glycobiology and immune therapy, Glycotope was founded in 2001 in Berlin and has more than 150 employees today. Glyco-optimization has a high potential for commercial applications because the formation of complex sugar chains, known as glycosylation, considerably influences the efficacy of biotechnologically produced medications (for example in the treatment of cancer). With GlycoExpress™, Dr. Steffen Goletz, founder and CEO of Glycotype, has developed a technology platform that can modify glycosylation in a controlled manner. This significantly improves efficacy while increasing half-life times, which ensures better effects for more patients ("BioBettters"). Production using human cell lines reduces adverse immune

reactions. The technology of GlycoExpress™ facilitates the optimization of existing products, and it is applicable to most proteins with therapeutic uses. In 2011 Glycotope won the CPhI Innovation Gold Award for this new technology. Four products are currently in clinical development, and each has been showing outstanding results. "Berlin offers a good environment, especially with regard to universities. That makes recruiting easier," said Dr. Franzpeter Bracht, CFO and CBO of Glycotope. The majority of Glycotope's employees are from the region. The company's site at the Max Delbrück Center in Berlin-Buch also offers excellent working conditions because it places the company in close proximity to the other firms with which it partners.

co.don AG

"co.don AG became the first company in Germany to receive a license for cartilage-cell transplants using patients' own tissue. Since our products are made of living cells, it is indispensable to have reliable logistics that allow products to be traced at any time. The good infrastructure and excellent transportation connections we find here make this possible for the domestic market in Germany as well as our European distribution areas. The state

of Brandenburg supports us with various funding programs. For example, the Investitionsbank Brandenburg granted us a subsidy of 2.5 million euros for regenerative joint therapies in September 2010. We used those funds to commission a clinical study to scientifically evaluate the use of cell transplants in therapies for joint damage, a technique that has been tested in many scenarios in the interim."



Vilma Methner
COO, CSO co.don AG
www.codon.de

BIOTECHNOLOGY IN BERLIN-BRANDENBURG

- 215 biotech companies with over 4,000 employees
- Over 100,000 square meters of laboratory space at locations in Buch, Charlottenburg, Adlershof, Hennigsdorf, Luckenwalde and Potsdam

FOCAL AREAS OF LEADING BIOTECHNOLOGY RESEARCH AND DEVELOPMENT INSTITUTIONS IN BERLIN-BRANDENBURG:

- Glycobiology
- Molecular diagnostics and bioanalytics
- Nutrigenomic research
- Personalized medicine
- Plant genome research
- Regenerative medicine
- RNA technologies
- Systems biology
- Industrial biotechnology
- Drug development

Innovations in agriculture, food and industry

With its sophisticated research landscape and specialized companies, the region is also home to strong industrial and agricultural biotechnology sectors. Chemicals companies such as BASF in Schwarzheide use biotechnological processes for industrial production. The Fraunhofer Institute for Applied Polymer Research, IAP, develops sustainable materials and processes using synthetic and bio-based polymers and coordinates the activities of the LIGNOS research association, which investigates the use of biomass for various materials. The Leibniz Institute for Agricultural Engineering is a leader in innovations in agriculture, research pursuing interdisciplinary studies on renewable raw materials and energy sources in agriculture. Its activities include, for instance, the production of highly pure lactic acid from rye and the production of biogas from renewable raw and waste materials.

Berlin-Brandenburg is also a respected center for functional plant genome research. Scientists from institutions such as the Max Planck

Institute of Molecular Plant Physiology collaborate within the GABI Network – Genome Analysis of the Plant Biological System. One company in the region that has produced outstanding innovations is ZIM Plant Technology, which developed the first non-invasive system for remotely monitoring a plant's water status. The German Institute of Human Nutrition, DIfE, in Potsdam is unique within Germany for its integration of clinical research and nutritional science. It researches the molecular causes of nutrition-related diseases and develops new strategies for prevention and therapy as well as dietary recommendations. Researchers at the DIfE develop these strategies through interdisciplinary collaboration using a broad spectrum of scientific, medical and epidemiological methods. The institute concentrates on the most critical diseases which could be influenced by nutrition-related factors in the present day: obesity, diabetes, cardiovascular disease and cancer.

Environmental chambers at the Max Planck Institute of Molecular Plant Physiology



New inspiration for the region's chemicals and plastics industry

Berlin-Brandenburg is heightening its position as a major player in the field of biopolymer technology. A joint initiative in Schwarzheide of the chemicals corporation BASF, the Fraunhofer Institute for Applied Polymer Research and the Kunststoff-Verbund Brandenburg Berlin e. V., KuVBB, incubates new ideas for the application of polymers made from regenerative raw materials in the chemicals and plastics industry. As part of the German government's bio-economics strategy, the KuVBB is planning to establish the "Lausitz Innovation Center for Bioplastics" at BASF's long-standing production site for chemicals and plastics. The center will

bring together research institutions, technology developers and manufacturers for the development of innovative products from biopolymers. The initiative BioTOP Berlin-Brandenburg is coordinating the innovation forum "Biopolymers and bio-based plastics," which aims to build functional value-added chains. Support for R&D projects in the fields of biopolymers, synthesis and polymer technology comes from Fraunhofer IAP, one of the leading providers of applied cellulose and starch research. IAP is building an applied science center for the development of biologically based new polymer materials at its branch in Schwarzheide.

aevotis GmbH

"At aevotis, we are building on the strong basis of knowledge and technology in the field of industrial biotechnology developed over many years in Potsdam. Today, with 17 employees, we are developing procedures for the enzymatic transformation of raw materials into carbohydrate polymers and oligomers. Our first product, a soluble, taste- and color-neutral form of dietary fiber, was presented to the public for the first time in 2012 at the International Dietary Fiber Conference. Its

special characteristic is that it can also be added to carbonated drinks. We are working with a partner who is managing the extensive regulatory proceedings for new foods, and we plan to bring the product to market in 2013. aevotis also maintains research partnerships in the region, for example with the Fraunhofer IAP and the University of Potsdam in the Investitionsbank-Brandenburg-funded LIGNOS-Projekt for the use of lignocellulose."



Martina Döring and
Dr. Volker Landschütze
CEOs aevotis GmbH
www.aevotis.com

FOCAL AREAS OF INDUSTRIAL BIOTECHNOLOGY

- Biopolymers
- Utilization of biogenic waste materials
- Algal biotechnology
- Lignocellulose fractionation
- Integrated biomass usage (bio-refining)
- Secondary metabolites from biogenic sources

Competitive advantages of doing business in Berlin-Brandenburg

High rates for subsidies and funding

Berlin-Brandenburg offers the best conditions for subsidies and funding in Europe. Support for investments and innovation comes in the form of grants, loans and allowances. The programs administering this support combine funding from the EU, the Federal Government of Germany and the states of Berlin and Brandenburg.

High quality of life

The region uniquely combines the international culture and cosmopolitan flair of the Berlin metropolis with the fascinating nature and historical attractions of Brandenburg. Berlin-Brandenburg offers a high quality of life for singles as well as families. The region's unparalleled recreational, cultural and educational opportunities offer residents superb opportunities to follow their dreams and ways of life. Rent and the cost of living are considerably lower here than in comparable metropolitan regions.

Central location

Germany's capital region connects Europe: Berlin's central station is the largest junction train station in Europe and offers high-speed connections to all major destinations. The Berlin Brandenburg Airport will be Europe's most modern international airport. A diverse array of commercial space is available directly at the airport, facilitating optimal logistics near the city. The region's transit authority, the Verkehrsverbund Berlin-Brandenburg, is Germany's largest and provides optimal connections and transportation.

"One of the fastest-growing research-based pharmaceutical companies in Germany is based in Berlin Adlershof: Berlin-Chemie AG. Over half of our revenues are generated abroad in Eastern Europe. As a nexus between East and West, Berlin is the ideal location for Berlin-Chemie AG

to pursue continued growth. Over the past ten years, we were able to more than quadruple our revenues and more than double our workforce in Germany and abroad. Currently 5,215 people are part of our company.

Dr. Reinhard Uppenkamp

Chairman of the Berlin-Chemie AG Supervisory Board
www.berlin-chemie.de





Joint cluster management for a strong healthcare region

HealthCapital is the name of the healthcare industries cluster in Berlin-Brandenburg. It combines diverse activities in the fields of biotechnology, medical technology, pharmaceuticals and healthcare in the region and promotes growth along the entire value-added chain in these fields.

The cluster management ensures the cluster's continued development and progress. It is jointly coordinated by the TSB Innovationsagentur Berlin, Berlin Partner and the Brandenburg Economic Development Board (ZAB).



“Renowned Nobel Laureates like Emil von Behring, Robert Koch, Max Planck and Albert Einstein made scientific history in Berlin-Brandenburg. Their discoveries set a high bar for scientific advancement worldwide. In the life sciences in particular, the region is still a global leader. Research-oriented

industries like healthcare need this environment, which combines scientific know-how with a passion for discovery and cultural diversity. This is fertile ground for innovation and ideas for the healthcare market of the future.”

Prof. Dr. Dr. h.c. Günter Stock

Healthcare Industries Cluster Spokesman
Berlin-Brandenburg – HealthCapital



“Healthcare is in the midst of a comprehensive structural transformation! By channeling the capabilities of business, research and medicine in the cluster, we can find better and faster answers

to the challenges of the future. That benefits businesses, doctors, patients and everyone who wants to remain healthy longer.”

Dr. Kai Bindseil

Healthcare Industries Cluster Manager
Berlin-Brandenburg – HealthCapital

Invest in Berlin-Brandenburg

Investment made easy

The economic development corporations Berlin Partner and the Brandenburg Economic Development Board (ZAB) offer comprehensive support and consultation for businesses investing or expanding in the region: competent, fast, free of charge and without red tape.

Our services for you:

- We provide all the stats and facts you need about the healthcare industries in the Berlin-Brandenburg region.
- We offer information about subsidies, financing instruments and investment partners for research, development and translation projects.
- We support you in the search for a suitable location for your business.
- We facilitate contacts with the government agencies, banks, chambers, associations and networks you need to build your business in the German capital region.
- We assist you in recruiting well-trained personnel.

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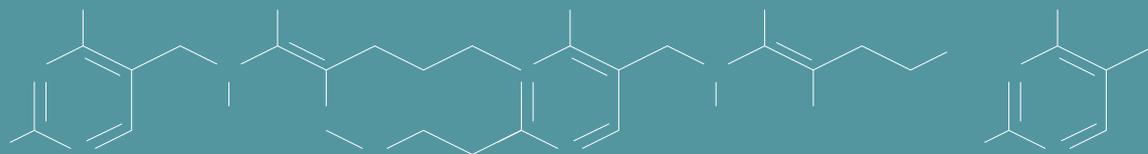
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