



**Biotechnology**

**in Saxony-Anhalt**

Location - Success - Future.



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## Preface

A lot has happened in the biotechnology sector in Saxony-Anhalt - particularly in the past five years. The number of jobs in the red biotechnology sector has risen by more than 15% since 2003 and in the pharmaceutical industry by even as much as 38% over the same period. At the same time Saxony-Anhalt has evolved to become the plant biotechnology centre in Germany - even if this is not yet reflected to the same extent in the number of jobs.

This brochure chronicles the major successes achieved over the past 5 years since the biotechnology offensive was initiated, and illustrates what has been happening in the State: for example with regard to companies founded, jobs created, product and process development etc.

The field of biotechnology will in future continue to play a major role in Saxony-Anhalt. To achieve this it is necessary to analyse the results already obtained within the sector - as practised in other fields.

With this publication we also wish to highlight the fact that Saxony-Anhalt is in a position to respond to new challenges and developments. Over the past few years new possibilities for a future development in the sector have presented themselves, for example biomass-based material production, more tightly knit cooperation between biotechnology and chemical industries and the strengthening of the collaboration between the pharmaceutical industry and biotechnology.

The government decision on the biotechnology offensive on 19<sup>th</sup> November 2002 sent a signal built on previous experiences, traditions and results in the State. With the ensuing implementation strategy from July 2003 a conscious decision was taken to implement comprehensive strategies that targeted all departments. Political support was and is important, particularly when it comes to shaping legislative framework in Berlin or Brussels. Meanwhile the State has attracted a lot of attention as the result of its commitment. Many players in this sector have come to appreciate that innovation in Saxony-Anhalt is not merely a talking point but is actually put into practice.

Dr. Jens A. Katzek  
Managing Director  
BIO Mitteldeutschland GmbH

## Vorwort

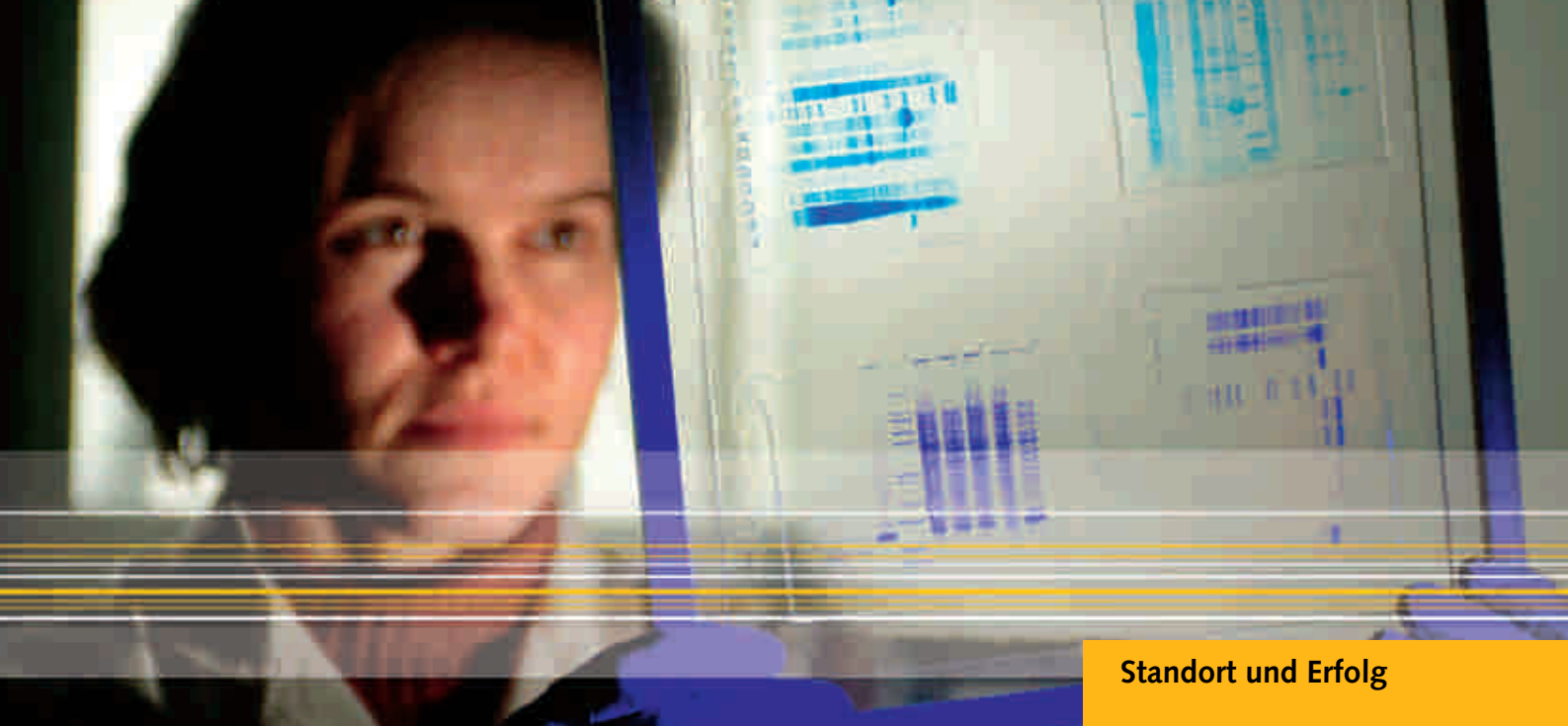
*Es hat sich viel getan in der Biotechnologiebranche von Sachsen-Anhalt - gerade auch in den letzten fünf Jahren. Die Arbeitsplätze im Bereich der roten Biotechnologie sind seit 2003 um 15 Prozent gestiegen und im Bereich der pharmazeutischen Industrie im selben Zeitraum sogar um 38 Prozent.*



*Gleichzeitig hat sich Sachsen-Anhalt zum Zentrum der Pflanzenbiotechnologie in Deutschland entwickelt - auch wenn sich dies noch nicht in dem Maße bei den Arbeitsplatzzahlen widerspiegelt.*

*Mit dieser Broschüre wollen wir Ihnen verdeutlichen, welche wesentlichen Erfolge in den vergangenen 5 Jahren seit dem Start der Biotechnologie-Offensive zu verzeichnen waren und was sich im Lande verändert hat: Im Bereich der Unternehmensgründungen, der Arbeitsplatz-, Produkt- und Verfahrensentwicklung usw.*

*Das Land hat durch sein Engagement mittlerweile international für Aufsehen gesorgt. Viele der in dem Bereich Tätigen haben wahrgenommen, dass in Sachsen-Anhalt nicht nur über Innovationen geredet, sondern auch entsprechend innovativ gehandelt wird.*



## Location & Success

### Your Wishes: Our Expertise

Saxony-Anhalt can rely on numerous internationally renowned research facilities, outstanding scientific training facilities and innovative research companies in the biotechnology sector and pharmaceutical industry that possess formidable expertise in the fields of pharmatechnology, neurotechnology, recombinant proteins, plant biotechnology and crop research.

#### Plant Breeding and Plant Biotechnology

Plant biotechnology is one of the core competences of Saxony-Anhalt. Especially the Nordharz/Börde region is regarded as the birthplace of modern plant breeding in Germany. The city of Gatersleben, nearby the capital of Magdeburg, is the centre of plant breeding in Saxony-Anhalt and in Germany. Around 1.500 employees are located in this region with an exclusive interest on plant biotechnology and plant breeding. The Leibniz Institute of Plant Genetics and Crop Plant Research (IPK), the Leibniz Institute of Plant Biochemistry (IPB) in Halle (Saale) and the universities as well as innovative companies such as SunGene GmbH, Icon Genetics GmbH and Novoplant GmbH form the basis for excellent research.

The plant biotechnology of Saxony-Anhalt is specialised in plant genetics, crop plant research (metabolic engineering, phytofarming, gene expression), production of veterinary antibodies, expression of recombinant proteins in plants, production of renewable resources, production of phytopharmaceuticals and dietary supplements through herbs and spices, development of biopolymers on the basis of vegetable oil and resin.

#### Pharmatechnology and Neurotechnology

Pharmatechnology and the neurosciences belong to the key research sectors defining Saxony-Anhalt's profile. Particularly in and around the State capital of Magdeburg a long-established location has developed. Innovative biotechnology enterprises such as KeyNeurotek Pharmaceuticals AG, IMTM GmbH, NanoDel Technologies GmbH, MelTec GmbH & Co. KG or SkinSysTec GmbH and research facilities such the Otto von Guericke University, the Leibniz Institute for Neurobiology (IfN), the Max Planck Institute for Dynamics of Complex Technical Systems or the Fraunhofer Institute for Factory Operation and Automation form the basis of the cluster. The location specialises in developing new drugs for treating brain and autoimmune diseases, chronic inflammatory diseases, therapies for brain tumors and other illnesses of the central nervous system, research into the mechanisms of learning and memory and also the automation of production and measuring systems in the fields of medical engineering and biotechnology.

### Standort und Erfolg

#### Ihre Wünsche: Unsere Kompetenzen

*Pflanzenbiotechnologie und Pflanzenzüchtung sind eine der Kernkompetenzen von Sachsen-Anhalt. Besonders die Region Nordharz/Börde kann als der Geburtsort der modernen Pflanzenzüchtung in Deutschland angesehen werden. Der Ort Gatersleben, unweit der Landeshauptstadt Magdeburg, ist das Zentrum der Pflanzenzüchtung in Sachsen-Anhalt und in Deutschland. Etwa 1.500 Menschen beschäftigen sich in Sachsen-Anhalt mit der Pflanzenbiotechnologie und Pflanzenzüchtung.*

*Die Pharmatechnologie und die Neurowissenschaften gehören ebenfalls zu den profilbestimmenden Forschungsschwerpunkten in Sachsen-Anhalt. Insbesondere in und um die Landeshauptstadt Magdeburg hat sich hierfür ein traditionsreicher Standort entwickelt. Innovative Biotechnologie-Unternehmen wie KeyNeurotek Pharmaceuticals AG, IMTM GmbH, NanoDel Technologies GmbH, Meltec GmbH & Co. KG oder SkinSysTec GmbH und Forschungseinrichtungen wie die Otto-von-Guericke-Universität, das Leibniz-Institut für Neurobiologie, das Max-Planck-Institut für Dynamik komplexer technischer Systeme oder das Fraunhofer-Institut für Fabrikbetrieb und Automatisierung bilden die Basis des Clusters.*



The pharmaceutical industry is also an important pillar within the health industry sector. It is a significant employer in Saxony-Anhalt with steady rates of growth in turnover and employment.

Benefiting from scientific expertise in the field of neuroscience, innovative enterprises and service providers have established themselves in Saxony-Anhalt in the field of medical engineering. These enterprises primarily focus on the development and production of technical appliances and technology-related projects.

#### ■ Protein Biotechnology

The companies and institutes, located at the city of Halle (Saale), are involved in R&D of proteins for innovative therapeutic and diagnostic applications. For example Scil Proteins GmbH is developing and manufacturing novel and recombinant proteins for therapeutics, diagnostics and applications in chromatography. Further innovative companies are probiodrug AG and novosom AG and the "network of excellence in structures and mechanisms of biological information processing", initiated among others by the Martin Luther University Halle-Wittenberg.

Central to this core competence is the development of new technologies for the efficient production of recombinant proteins that have hitherto been carried out largely on a laboratory scale, for example the production of disulphide bridged proteins. The recombinant proteins designed and developed are intended to support process development, improve storage formulation, aid the identification of small molecule drugs or serve as drug delivery agents.

*Die pharmazeutische Industrie ist ebenfalls eine wichtige Säule innerhalb der Branche der Gesundheitswirtschaft. Sie ist für das Land Sachsen-Anhalt ein bedeutender Arbeitgeber mit stetigen Wachstumsraten in Umsatz und Beschäftigung.*

*Unter Nutzung der wissenschaftlichen Kompetenzen auf dem Gebiet der Neurowissenschaften haben sich in Sachsen-Anhalt innovative Unternehmen und Dienstleistungsanbieter auf dem Gebiet der Medizintechnik etabliert.*

*Unternehmen und Forschungseinrichtungen in Halle (Saale) arbeiten auf dem Gebiet der Entwicklung und Herstellung rekombinanter Proteine und Biotherapeutika. Scil Proteins GmbH entwickelt beispielsweise Prozesse zur Herstellung von Proteinen und produziert rekombinante Proteine mit mikrobiellen Expressionssystemen. Weitere innovative Unternehmen sind die probiodrug AG und die novosom AG sowie das Exzellenznetzwerk „Strukturen und Mechanismen der biologischen Informationsverarbeitung“.*

International Research Locations	
Universities	2
Universities of Applied Sciences and Technical Colleges	8
Institutes of the Max Planck Society	4
Institutes of the Leibniz Society	5
Institutes/Branches of the Fraunhofer Society	2
Institutes of the Hermann von Helmholtz Association	1
German Academy of Sciences Leopoldina	1
<b>Source: 2007. Internet presence of the respective non-university research facilities, Saxony-Anhalt Ministry of Education/Studying in Saxony-Anhalt 2007/2008.</b>	



Wir haben Platz für  
Ihre Ideen

## We have room for your ideas

### Infrastructure & Collaboration Opportunities

Infrastruktur &  
Kooperationsmöglichkeiten

Increased demand since 2003 has seen the need for the biotechnology offensive by the State of Saxony-Anhalt to focus on expanding infrastructure facilities and improve the road network between the individual locations, in addition to efficiently using existing infrastructures.

Providing competitive business premises and state-of-the-art laboratories with the highest security rating for research, start-ups and incoming companies was a major interest for Saxony-Anhalt. The government therefore supported for example investments in ...

#### ZENIT I/II Magdeburg

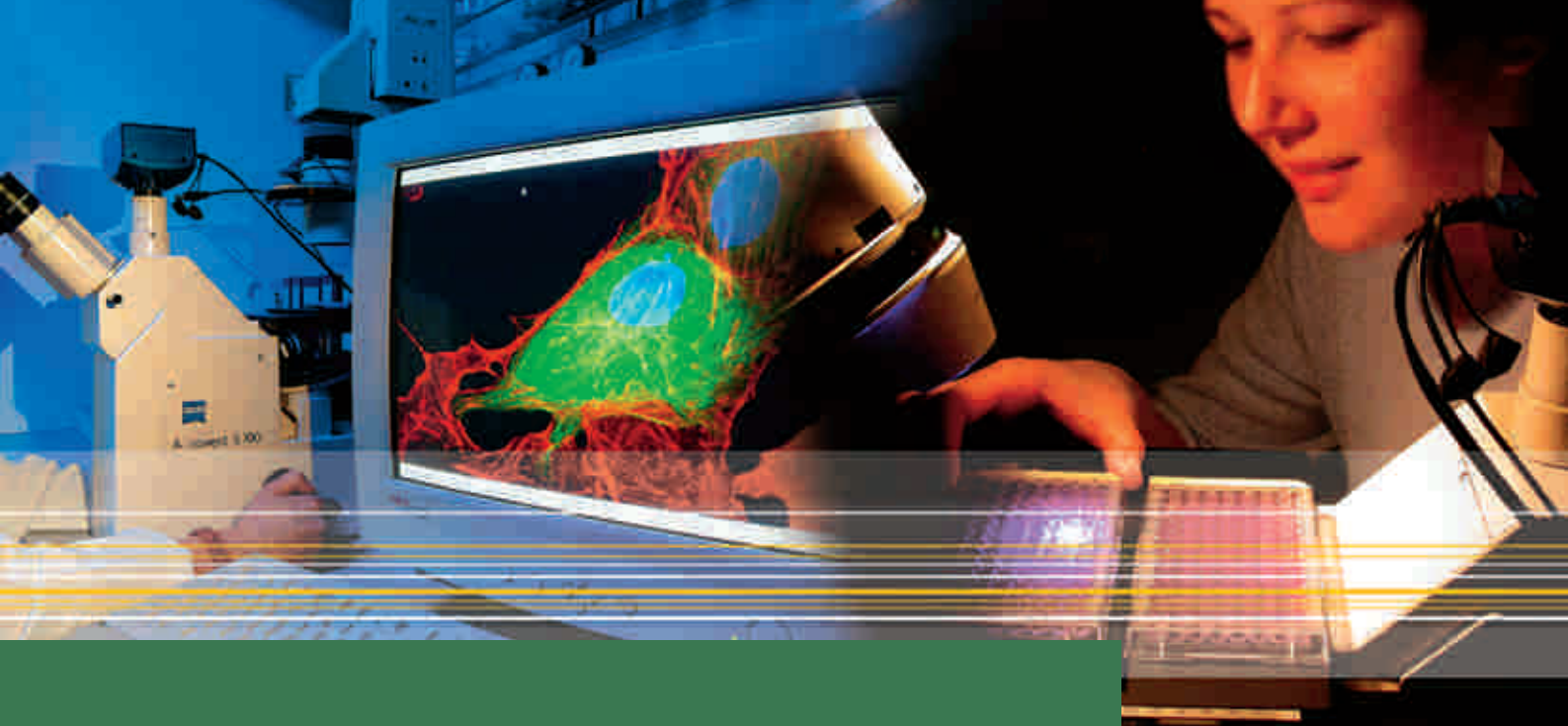
The Centre for Neuroscientific Innovation and Technology facilitates top-level neuroscientific research in Saxony-Anhalt via infrastructure and research areas. Here's the brain of neuroscientific research of Saxony-Anhalt.

#### Biotech Start-up Centre Gatersleben

In the Biotech Start-up Centre, young businesses and the founders of new companies within the areas of biotechnology and plant biotechnology will find an ideal infrastructure for the economic realisation of their service and product concepts. The Centre was built in 2000 and consists of a two-storey building complex offering an area of 2,500 sqm for laboratories, offices and greenhouse complexes.



*Neben der effektiven Nutzung bestehender Infrastrukturen standen auf Grund der Nachfrage seit 2003 auch die Erweiterung von Infrastruktureinrichtungen und die Verbesserung des Straßenbaus zwischen den einzelnen Standorten im Mittelpunkt der Biotechnologie-Offensive des Landes.*



#### ■ Biopark Gatersleben

The Biopark Gatersleben is one of the most important locations in plant biotechnology. The Plant Biotechnology Park Gatersleben covers an area of 100,000 sqm. High-quality lab buildings, greenhouses and conference centre are available.

#### ■ Technology Park weinberg campus

The incubators encompass more than 20.000 sqm main useful area incl. clean room technology in accordance with the GMP guideline and ensure high-quality research standards.

Strong networks are also important for innovation. Established and future players can draw upon their past experience in supporting the emergence of an innovative growth industry. They deliver contacts to value chain partners, financiers and other specialised services, organise network conferences and support the exchange of information.



*Starke Netzwerke sind ebenfalls wichtig für Innovationen. Ältere und junge Unternehmen können sich auf die bisherigen Erfahrungen bei der Unterstützung und Entwicklung einer innovativen Wachstumsbranche stützen.*

*Die Netzwerke liefern Kontakte zu Partnern, Finanziers und anderen spezialisierten Dienstleistungen, organisieren Konferenzen und sorgen für einen vertrauensvollen Austausch von Informationen.*



**Hoch qualifiziertes Personal**

## Highly qualified personnel

### Concentration & Expansion

The State of Saxony-Anhalt offers great potential for the training and qualification of employees in the biotechnology sector thereby contributing to the competitiveness of the enterprises located here.

The State invests in the future and strengthen the potential of skilled employees (e.g. school, academic and non-academic education).

**Practice makes perfect:** The recently inaugurated green laboratory in Gatersleben affords pupils a modern experimental education together with the ideal prerequisites to prepare them for performance comparisons (e.g. „Jugend forscht“ or the “Biology Olympics”). Regular further training courses are foreseen for teachers and the Green Laboratory’s many events are directed towards informing and educating the broad public on the future-oriented biosciences.

Overall the biotechnology sector has developed positively between 2003 and 2007. Depending on the branch the number of employees has mostly risen (in enterprises and research facilities) by between 15% and 38%. The headcount increased during this period by approx. 1.000, from approx. 4.700 to approx. 5.700 employees.

**Table 1: Biotechnology Sector Saxony-Anhalt: Employee Count, 2003-2007.**

	2003	2005	2007
Red Biotechnology	854	947	1.010
Plant Biotechnology	1.480	1.494	1.484
Environmental Technology	165	71	170
Pharmaceutical Industry	2.204	2.807	3.060
<b>Total</b>	<b>4.703</b>	<b>5.419</b>	<b>5.724</b>

**Source: BMD, 2007.** Including non-university and university research facilities. According to the biotechnology offensive and implementation strategy the development of the pharmaceutical industry is a component of the appraisal and implementation. Not including medical engineering and white biotechnology/bio fuels.

### Konzentration & Ausweitung

*Mit der Exzellenzinitiative des Landes werden seit 2005 Forschungsk Kooperationen und die wissenschaftliche Nachwuchsförderung verbessert. Darüber hinaus ist zum Beispiel mit dem im September 2005 gegründeten Center of Life Sciences an der Hochschule Anhalt (FH) ein Forschungs- und Ausbildungszentrum entstanden, das für die Studienrichtungen Biotechnologie und Pharmatechnik erstklassige Ausbildungsbedingungen bietet.*

*Die Biotechnologiebranche hat sich in ihrer Gesamtheit zwischen 2003 und 2007 positiv in Sachsen-Anhalt entwickelt. Je nach Teilbereich sind die Mitarbeiterzahlen (in Unternehmen und Forschungseinrichtungen) - konstant geblieben bzw. zwischen 15 und 38 Prozent - angestiegen. Die Mitarbeiterzahl stieg in diesem Zeitraum in ihrer Gesamtheit um etwa 1.000 Beschäftigte von ca. 4.700 auf ca. 5.700.*



# Cluster Structure

## Clusteraufbau

### Development through Start-ups

The life science sector that also incorporates medical engineering and white biotechnology/bio fuels in the broader sense, comprises a total of more than 80 enterprises in 2007.

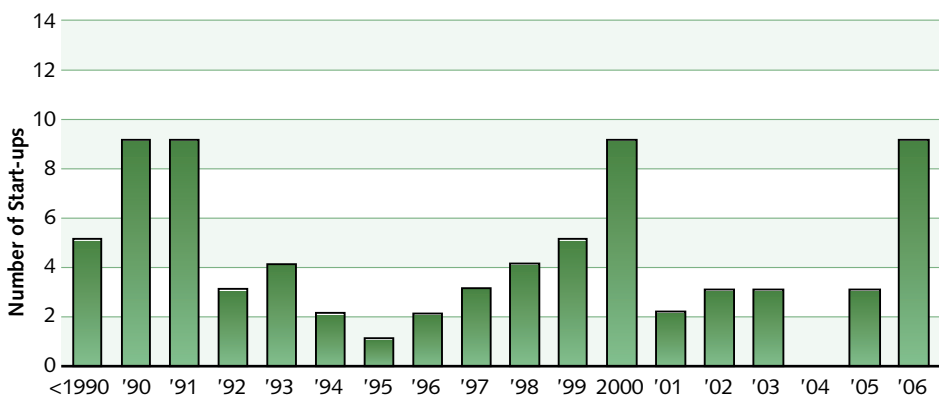
Between 1990 - 1993 the majority of start-ups were from the environmental technology (clean-up) and pharmaceutical industries. The BioRegio BMBF competition 1996 - 2000 sparked off a boom. After 2001 start-ups were primarily founded in the field of red and green biotechnology.

### Entwicklung durch Gründung

*In der Biotechnologie entstehen und entwickeln sich Cluster hauptsächlich durch Spin-off- und Start-up-Unternehmen. Die Darstellung zeigt, dass sich im Land Sachsen-Anhalt ein kontinuierlicher Prozess entwickelt hat.*

*Zwischen 1990-1993 haben sich vorwiegend Unternehmen aus der Umwelttechnologie (Sanierung) und der pharmazeutischen Industrie gegründet. Ein Boom erfolgte nach dem Wettbewerb des BMBF 1996 - 2000. Nach 2001 wurden vorzugsweise Unternehmen in den Bereichen der roten und grünen Biotechnologie gegründet.*

**Figure 1: Development after the founding years, <1990 - 2006**



Source: BMD 2007. Including Medical Engineering.



Wettbewerbs-  
fähigkeit

## Competitive Position

### National & International Vibrancy

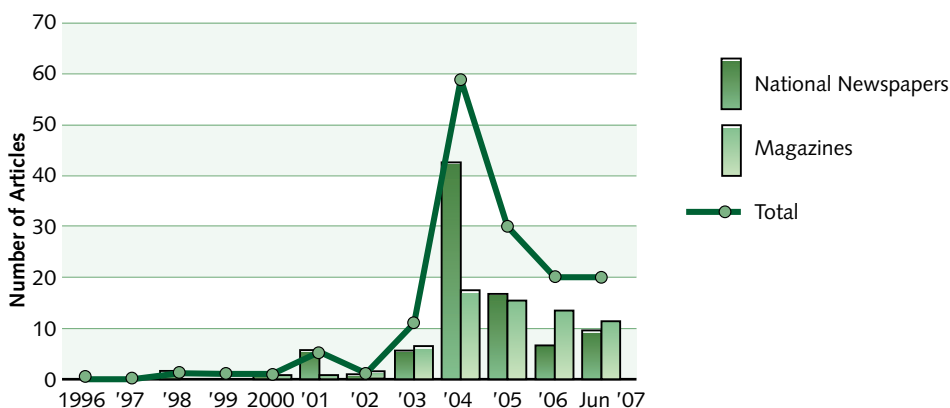
Nationale & Inter-  
nationale Ausstrahlung

Recognition as a cluster automatically strengthens the economic performance of the region.

In addition to improvements gained from developing and expanding cluster structures the national and international perception of the location is enhanced. Site location marketing is implemented by a number of different players through representation at national and international trade shows, active participation in committees and continuous commitment to image cultivation and publicity work. These activities are gratefully strongly supported by the Investitions- und Marketinggesellschaft mbH (IMG).

The figure below demonstrates that the visibility of the location in national newspapers and specialist publications has significantly increased especially from 2003 onwards. This can be ascribed amongst other things to the work performed by the cluster management through BIO Mitteldeutschland GmbH as of January 2003 and the biotechnology implementation strategy adopted through the State of Saxony-Anhalt in June 2003.

**Figure 2: Number of articles in national newspapers/magazines, 1996 - 2007, that mentioned "Biotechnology" in "Saxony-Anhalt".**



Source: LexisNexis 2007. National newspapers: SZ, FR, Berliner Zeitung, Welt, taz etc./Magazines: Spiegel, Focus, Ernährungsdienst, Laborpraxis, transkript, etc.

Die Abbildung verdeutlicht zum Beispiel, dass die Sichtbarkeit des Standorts in überregionalen Zeitungen und Zeitschriften insbesondere ab 2003 erheblich angestiegen ist. Dies ist u. a. auch auf die Arbeit des Clustermanagements der BIO Mitteldeutschland GmbH ab Januar 2003 und auf die Verabschiedung der Biotechnologie-Umsetzungsstrategie des Landes im Juni 2003 zurückzuführen.

### New Products, Processes and Patents

In collaboration with scientists from the Department for Bioprocess Technology at the Otto von Guericke University Magdeburg, the Max-Planck Institute and IDT Biologika GmbH a new process for manufacturing animal vaccines was developed in 2004.

Probiodrug AG is the pioneer in the field of QC-inhibition, a new approach to treat Alzheimer's disease and other neurodegenerative disorders. Before it focused on QC, it was the pioneer in the field of DP 4 - inhibition for treatment of type 2 diabetes. Probiodrug AG successfully commercialized its DP 4 approach with Merck & Co., USA, Ferring Pharmaceuticals and Ortho-McNeil, Inc., Novartis Pharma and OSI Prosidion Ltd., respectively.

Researchers at the Hanoi University of Technology want to use rice husks also to generate electricity. At the end of 2006 researchers at the Fraunhofer Institute for Factory Operation and Automation IFF in Magdeburg designed a fluidised bed combustion plant for this purpose.

KeyNeurotek Pharmaceuticals AG possesses a number of product candidates at the pre-clinical and clinical development stage. The furthest developed is the cannabinoid receptor agonist KN 38-7271 that is currently being tested in an international clinic Phase IIa study on patients suffering traumatic brain injury. These patients, primarily accident victims, have not been able to be treated effectively to date.

In November 2006 the East Germany-based Bayer subsidiary (Bayer Bitterfeld GmbH) produces a new painkiller for Asia and is able to generate new business in the US.

The biotechnology enterprises involved in research activities in Saxony-Anhalt are primarily engaged in linking and generating knowledge and its economic realisation. The biotechnology enterprises (and university and non-university research facilities) also ensure that a proportion of the highly qualified workforce that have been trained at the local research facilities stay in Saxony-Anhalt and generate knowledge that can lead to patents and potential economic realisation.

Since 1995 a total of 181 German patent publications have been registered for the biotechnology sector by enterprises based in Saxony-Anhalt. In addition there are those patents, which were published exclusively on European Union level by the enterprises.

### Neue Produkte, Verfahren und Patente

*Die im Land Sachsen-Anhalt forschenden Biotechnologie-Unternehmen sind maßgeblich an der Verknüpfung und Generierung von Wissen und seiner wirtschaftlichen Verwertung beteiligt. Die Biotechnologie-Unternehmen (und universitäre und außer-universitäre Forschungseinrichtungen) sorgen außerdem dafür, dass ein Teil der hoch qualifizierten Arbeitskräfte, die in den Forschungseinrichtungen des Landes ausgebildet wurden, in Sachsen-Anhalt bleiben und Wissen generieren, die zu Patenten und einer potenziellen wirtschaftlichen Verwertung fortgeführt werden können.*

*Insgesamt wurden seit 1995 181 recherchierbare Patentveröffentlichungen aus dem Bereich Biotechnologie durch die Unternehmen in Sachsen-Anhalt angemeldet. Hinzu kommen zusätzlich jene Patente, die ausschließlich auf EU-Ebene durch Unternehmen veröffentlicht wurden.*

**Table 2: Researchable German Patent Publications by Biotechnology Enterprises in Saxony-Anhalt, published by the German Patent and Trademark Office Munich, 1995 to 07/2007.**

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	Jul 07	Total
Red Biotechnology	0	0	1	0	5	6	9	10	13	16	17	6	5	88
Plant Biotechnology	0	0	0	0	0	0	0	12	10	13	12	5	4	56
Environmental Technology	1	0	1	1	1	0	1	0	1	2	1	4	0	13
Pharmaceutical Industry	0	2	0	2	2	5	2	3	1	4	1	0	2	24
<b>Total</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>8</b>	<b>11</b>	<b>12</b>	<b>25</b>	<b>25</b>	<b>35</b>	<b>31</b>	<b>15</b>	<b>11</b>	<b>181</b>

Source: German Patent and Trademark Office Munich 2007; compiled by BMD <download am 07. 08. 2007 <http://publikationen.dpma.de/>>. The study does not refer to medical engineering enterprises or enterprises from white biotechnology/bio fuels. Duplication may occur in the case of research associations in which several companies possess equal shares in the same patent. The cut-off date is the date of publication and not the application date of the patent.



Beitrag zum  
Wachstum

## Contributing to Growth

### M&A, Licences and Investments

The development of new active substances requires sufficient capital as the risks are quite numerous. It includes venture capital and other forms of funding by professional banks and other investors.

The State of Saxony-Anhalt and the IBG Beteiligungsgesellschaft mbH have invested since the beginning of the biotechnology-offensive a total volume of about EUR 135 million in terms of grants and venture capital funding in the field of biotechnology.

Probiodrug AG, Halle acquired the Munich-based biotechnology enterprise Ingenium Pharmaceuticals. The combined entity successfully closed a series A financing round of EUR 20.6 million.

Serumwerk Bernburg AG invests EUR 10 million in a new synthesis facility at its location. Since 1992 Bayer has invested more than EUR 630 million in its subsidiary at Bitterfeld (Bayer Bitterfeld GmbH).

KeyNeurotek Pharmaceuticals AG signed an exclusive licence agreement with the global player Bayer Healthcare AG in 2005.

ProNAi Therapeutics, Inc. and novosom AG have announced their co-operation agreement in March 2007. ProNAi will use the SMARTICLES® liposome technology of the Halle-based biotechnology enterprise.

In August 2007 the pharmaceutical company Oncotec Pharma Produktion GmbH commissioned a new production line. Under State sponsorship a total of EUR 13 million was invested. The key activity is the production of sterile cytostatic drugs, drugs for human medicine used primarily in chemotherapy.

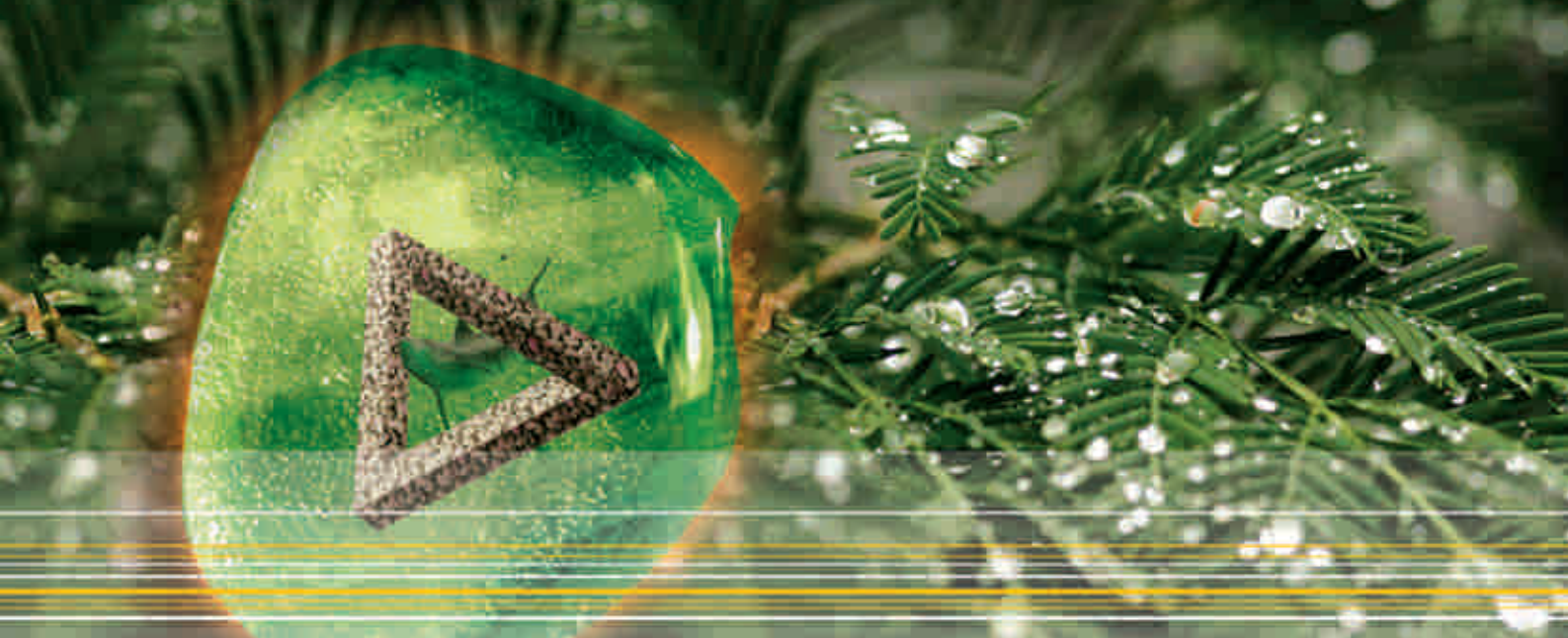
### M&A, Lizenzen & Investitionen

*Das Land und die IBG Beteiligungsgesellschaft mbH haben im Rahmen der Biotechnologie-Offensive insgesamt ca. EUR 135 Millionen in Form von Zuschüssen und Beteiligungen investiert. Davon wurden ca. EUR 61,1 Millionen als Beteiligungen seitens der IBG im Bereich der Biotechnologie getätigt.*

*Die Entwicklung neuer Wirkstoffe erfordert ausreichendes Kapital, da sie mit erheblichen Risikofaktoren behaftet ist. Es beinhaltet Venture Capital und andere Formen der finanziellen Unterstützung durch professionelle Banken und andere Kapitalgeber.*

*Um ein nachhaltiges und profitables Wachstum zu gewährleisten, kommen in einer späteren Phase eines Biotechnologie-Unternehmens spezielle Dienstleistungen zum Tragen, wie zum Beispiel die Fusion oder die Übernahme von anderen Unternehmen bzw. Unternehmensteilen.*

*Die Probiodrug AG, Halle hat das Münchner Biotechnologie-Unternehmen Ingenium Pharmaceuticals übernommen und wirbt mit der Zusammenlegung EUR 20,6 Millionen als Erstfinanzierung ein.*



## Improving the Political Framework

### Verbesserung der politischen Rahmenbedingungen

Improving the pragmatic political framework on national and international level is crucial for the biotechnology sector in Saxony-Anhalt. To accomplish this close contact to players from business, science and politics at national and European level is necessary.

BIO Mitteldeutschland GmbH therefore maintains close contacts to a number of Advisory Groups and political decision-makers at EU, federal and regional level to assist in improving the framework for research and business.

Activities to support the regional government within the scope of the biotechnology offensive over the past few years subdivide into a number of areas such as the trial cultivation of genetically modified crops (co-existence initiative), amendment of genetic engineering legislation and filing of the complaint of unconstitutionality at the Federal Constitutional Court.

The successes of the past few years demonstrate that manifold discussions with many different decision-makers, collaboration in national and international associations, giving lectures and participating in numerous events is a rewarding approach to improving the political framework.

*Die Verbesserung praxisgerechter, politischer Rahmenbedingungen auf nationaler und internationaler Ebene ist für die Biotechnologie-Branche insgesamt und natürlich auch für Sachsen-Anhalt unerlässlich. Hierfür ist ein enger Kontakt zu bundesweit und europaweit agierende Akteure aus Wirtschaft, Wissenschaft und Politik notwendig.*

*Die BIO Mitteldeutschland GmbH hält deshalb engen Kontakt zu verschiedenen Interessengruppen und politischen Entscheidungsträgern auf EU-, Bundes- und Landes-Ebene, um mitzuhelfen, die Rahmenbedingungen für Forschung und Wirtschaft weiter zu verbessern.*

*Die Erfolge der letzten Jahre zeigen, dass vielfältige Gespräche mit diversen Entscheidungsträgern, die Mitarbeit in nationalen und internationalen Verbänden, das Halten von Vorträgen und die Teilnahme an Veranstaltungen ein gewinnbringender Ansatz für die Verbesserung der politischen Rahmenbedingungen sind.*



**Brücken bauen**

**Building Bridges**

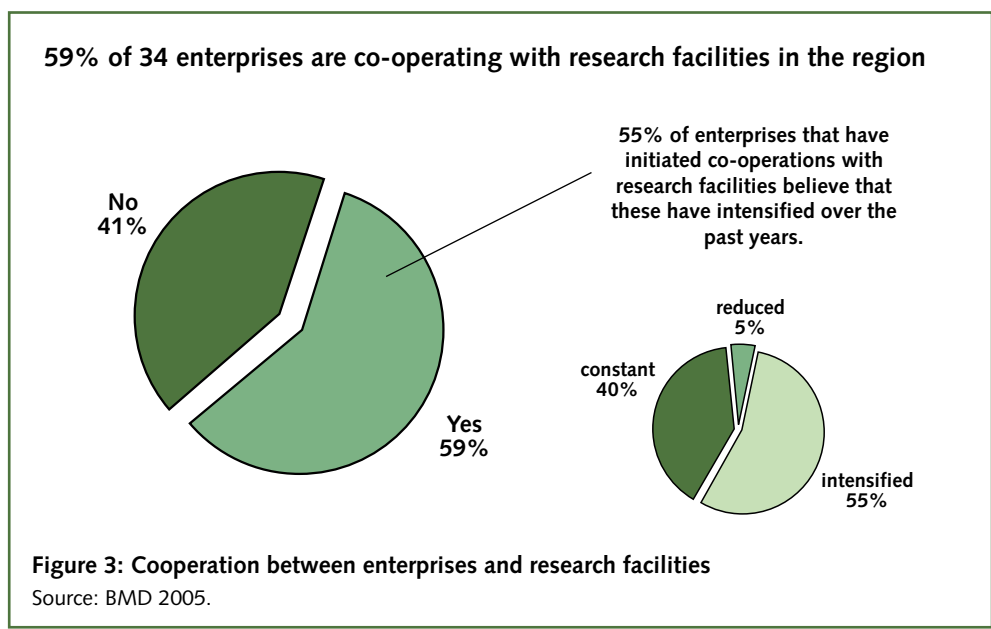
**The Pharmaceutical Industry meets Biotechnology from Saxony-Anhalt**

Pharmazeutische Industrie trifft Biotechnologie aus Sachsen-Anhalt

One goal of the State's implementation strategy is to establish and promote collaboration between biotechnology enterprises, university and non-university research facilities and other upstream and downstream enterprises in the sector for the respective key areas in the State.

*Im Mittelpunkt des Kooperationsmanagements steht die Zusammenarbeit zwischen Unternehmen und Forschungseinrichtungen und vice versa. Ca. 60 Prozent der Unternehmen und 92 Prozent der Forschungseinrichtungen, die in einer Umfrage von 2005 geantwortet haben, erklärten, dass sie Kooperationen mit dem jeweiligen Gegenpart haben. Dabei gaben 55 Prozent der Unternehmen, die Kooperationen mit Forschungseinrichtungen im Land haben, an, dass sich diese Art der Kooperation in den letzten drei Jahren verstärkt hat (siehe nebenstehende Abbildung). 40 Prozent sehen keine Veränderung und nur 5 Prozent sind der Meinung, dass sich die Kooperationen seit 2003 reduziert haben.*

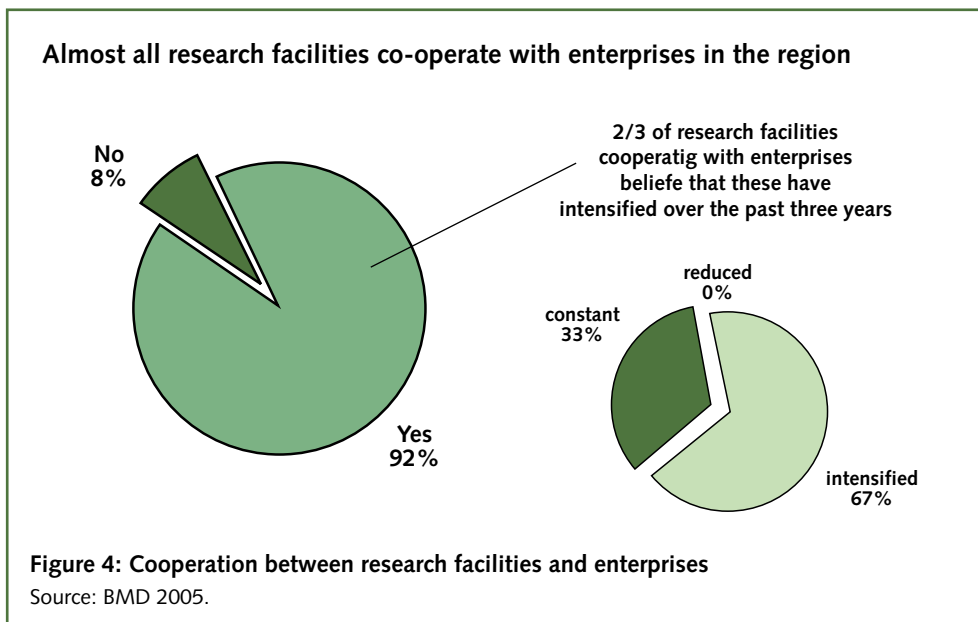
This co-operation management focuses therefore on the collaboration between enterprises and research facilities and vice versa. Approx. 60% of enterprises and 92% of research facilities that completed a survey in 2005 stated that they had entered into co-operations with their counterpart. Of those enterprises that stated that they were cooperating with regional research facilities 55% declared that this type of co-operation had intensified over the past three years (see Figure 3). 40% experienced no change and only 5% believed that the cooperation had declined since 2003.





The research facilities in the region have an even more positive outlook. Of the 92% that had entered into co-operation with enterprises in the region, 2/3 declared that the cooperation had intensified. 1/3 of those surveyed stated that the intensity of the co-operation over the past 3 years had remained at the same level as previously (see Figure 4).

The figures are even more significant when one studies the intensity of the respective cooperation. 55% of enterprises co-operate with at least one research institute. 45% even specify two to three research facilities in Saxony-Anhalt with which they co-operate.



*Noch positiver sehen es die Forschungseinrichtungen im Land. Hier äußern sich von den 92 Prozent, die Kooperationen mit Unternehmen im Land eingegangen sind, 2/3 dahingehend, dass sich die Kooperation mit Unternehmen im Land verstärkt hat. 1/3 der Befragten sagt, dass die Intensität der Kooperation in den letzten drei Jahren auf dem gleichen Niveau wie zuvor geblieben ist (siehe nebenstehende Abbildung).*

In 2005 Icon Genetics GmbH signed several co-operation agreements with Bayer Crop Science. The objective of the collaboration is to evaluate the production and quality of pre-clinical protein active substances that are to be synthesized in special plant varieties.

In 2006 Cambridge Antibody Technology (CAT) and Scil Proteins GmbH announced that they have signed a cross-licence agreement, under which both parties obtain substantial freedom to conduct research under certain of each others' intellectual property, as well as the right to develop a number of therapeutic, diagnostic and technical products.

In 2007 KeyNeurotek Pharmaceuticals AG and Grünenthal GmbH signed a license agreement for clinical active substance development and marketing.



Länderübergreifende  
Zusammenarbeit

## Cross-State Cooperation

### Promoting Synergies

The goal of politics in Saxony-Anhalt, Saxony and Thuringia is to continue to develop the Central German economic area. Developing and highlighting synergies is a significant factor in enhancing the attractiveness of the whole Central German economic area for investors.

Through BIO Mitteldeutschland GmbH Saxony-Anhalt is actively engaged in improving the cross-state collaboration of business and science. With colleagues from Saxony and Thuringia and in cooperation with the Central Germany economic initiative, network structures are established that are intended to lead to measurable successes for enterprises and research facilities.

In addition to focussing on the Central German economic area other forms of cross-state cooperation will be promoted. Kick-started by InnoPlanta with the conference on "Plants as Economic Power - Future through Innovation Cluster" on 19 October 2005 during the Biotechnica, the impetus was given to establish a cross-state collaboration with colleagues from Lower Saxony, Berlin and Brandenburg.

### Synergien fördern

*Sachsen-Anhalt ist durch die BIO Mitteldeutschland GmbH an der Verbesserung einer länderübergreifenden Zusammenarbeit von Wirtschaft und Wissenschaft aktiv beteiligt. Mit den Kollegen aus Sachsen und Thüringen und in Kooperation mit der Wirtschaftsinitiative Mitteldeutschland werden Netzwerkstrukturen aufgebaut, die zu messbaren Erfolgen für die Unternehmen und Forschungseinrichtungen führen sollen.*





# Shaping the Future

## Further Growth

### Biomass-based material production

The potential of plant raw materials extends far beyond energy recovery and can lead to the development of new, sustainable economic systems based on new material flows from agriculture to the chemical industry and other non-food markets.

To increase the use of biomass in a climatic and economically relevant scale several preconditions must be in place: volume availability at the processing locations, cost competitiveness compared with fossil fuels, ecological compatibility and sustainability of biomass production and processing, and ensuring sufficient availability of biomass for traditional applications (particularly food and feed).

In this instance plant breeding and plant biotechnology play a decisive role in boosting the yield per hectare of conventional crops, in increasing their resistance to stress in extreme weather conditions, in improving plant health whilst simultaneously reducing the use of agro-chemicals and in breeding new industrial plants with new substances.

New industrial crops not only open up new market opportunities but can also contribute significantly to crop rotation and sustainability in agricultural production. Plant biotechnology with genome analysis, marker-supported breeding procedures and molecular genetic metabolic engineering make these ambitious breeding goals tangible.

In May 2007 representatives from the scientific world, enterprises and regional development organisations of the four States of Berlin, Brandenburg, Saxony-Anhalt and Saxony joined forces to establish a cross-state initiative entitled "Biomass-based material production East Germany".

The goal of the initiative is to develop and implement a conclusive concept for integrated recycling of plant biomass and hence to give a major impetus towards industrial development in East Germany.

## Zukunft gestalten

### Weiteres Wachstum

*Das Potenzial pflanzlicher Rohstoffe reicht weit über die energetische Nutzung hinaus und kann zur Entwicklung eines neuen, nachhaltigen Wirtschaftssystems mit neuen Stoffströmen aus der Landwirtschaft in die chemische Industrie und weitere non-food-Märkte führen.*

*Pflanzenzucht und Pflanzenbiotechnologie sind dabei entscheidend für die Steigerung der Hektarerträge konventioneller Kulturpflanzen, ihre Stressresistenz bei extremen Witterungsbedingungen und die Verbesserung der Pflanzengesundheit bei gleichzeitig verringertem Einsatz von Agrarchemikalien.*

*Aufgrund der ungeheuren Wachstumspotenziale in diesem Bereich haben sich im Mai 2007 Vertreter aus Wissenschaft, Unternehmen und Regionalentwicklungsgesellschaften aus den vier Bundesländern Berlin, Brandenburg, Sachsen-Anhalt und Sachsen zu einer länderübergreifenden Zukunftsinitiative „Biomasse-basierte Stoffproduktion Deutschland Ost“ zusammengeschlossen.*

*Ziel dieser Initiative ist es, ein schlüssiges Konzept für die integrierte stoffliche Nutzung von pflanzlicher Biomasse zu erstellen und umzusetzen und damit einen wichtigen Impuls für die industrielle Entwicklung in Ostdeutschland zu geben.*



**Zukunft gestalten**

## Shaping the Future

In future, cooperation between the chemical and pharmaceutical sectors in the region will be further strengthened. This includes promoting corresponding projects to take advantage of the synergy effects achieved between plant biotechnology and the chemical and pharmaceutical industries, and to enhance the overall international attractiveness of the location.

The first steps in this direction, such as the efforts made within the scope of the Federal Ministry of Education and Research (BMBF) funding programme "BioIndustry 2021" in 2006, the cross-state initiative entitled "Biomass-based material production East Germany" and the optional combination of our strengths in plant research, plant breeding, agriculture and the chemical and pharmaceutical industries, provide positive impacts for the future development of the biotechnology location.

**We invite you to shape the future with us!**

*In Zukunft sollte es zu einer weiteren Verbesserung der Zusammenarbeit mit dem Chemie- und Pharmabereich im Land kommen.*

*Dies umfasst auch die Förderung branchenübergreifender Projekte, um Synergieeffekte zwischen den beiden Schwerpunkten Pflanzenbiotechnologie und Chemie- und Pharmaindustrie zu nutzen und die Attraktivität des Standortes insgesamt international weiter zu stärken.*

*Erste Ansätze, wie die Bemühungen im Rahmen des BMBF-Wettbewerbs BioIndustry 2021 im Jahr 2006, die länderübergreifende Zusammenarbeit im Rahmen der „Initiative Biomasse-basierte Stoffproduktion Deutschland-Ost“ und die Kombination unserer Stärken Pflanzenforschung, Pflanzenzüchtung, Landwirtschaft und Chemie- und Pharmaindustrie sorgen für positive Impulse für die zukünftige Entwicklung des Biotechnologie-Standortes.*



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- Biotechnology in Halle (Saale) & Recombinant Proteins (English)
- PharmaMD®. Drugs from Saxony-Anhalt (English)
- Plant Biotechnology. Tradition. Expertise. Innovation. (English)
- Biotechnology: Report 2003-2005 (German)
- Medical Technology, Red Biotechnology and the Pharmaceutical Industry in Saxony-Anhalt (German and English)
- Services in Life Sciences (German & English)
- Life Science Business in Central Germany (English)
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# Biotechnology

# in Saxony-Anhalt

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