BIO NRW
The Home of Biotech

Company Directory

Spot on Biotechnology Business 2020/2021

ExcellenceNRW
Cluster North Rhine-Westphalia

From Mind to Market:
Biotechnology Company Directory 2020/2021
North Rhine-Westphalia

Design and Layout: it's FR!TZ, Heiko Fritz, Zossen

Picture Source:
p. 6 © dmt Bildarchiv
p. 7 © Matthias Römer
p. 17 © science photo – Fotolia.com
p. 19 © Avatar_023 - istockphoto.com
p. 22 © NanoStockk- istockphoto.com
p. 26 © BillionPhotos.com - stock.adobe.com
p. 27 BIO.NRW; Institute of Biochemistry, University of Cologne
p. 31 © vadimguzhva - istockphoto.com
p. 32 © science photo – Fotolia.com
p. 42 BIO.NRW; Institute of Biochemistry, University of Cologne
p. 56 ©Traimak_Ivan - istockphoto.com
p. 64 © Vlad Teodor - istockphoto.com
p. 66 © Peter Depkat
p. 68 © Chepko_Danil - istockphoto.com
p. 73 © Jaroslav_74 - istockphoto.com
p. 74 © Matthias Römer

Content

Greeting

What have we learned?

The Corona Crisis has hit humanity hard around the world. Our health systems have been put to the test. National and regional lockdowns have brought personal and economic activities to a standstill. Researchers and policy makers are working hard to avert the effects of this crisis.

The Corona crisis is the big issue that has occupied our society in 2020. After the weeks-long lockdown in spring and subsequent relaxations over the summer, case numbers are now on higher levels than ever and it is hard to estimate when we will be able to return to an unrestricted daily routine. But what has the crisis taught us? What will we take away from a time when our society was put to the test?

The crisis has held up a mirror to all of us. We were shown where our strengths lie and what the economy, research, and society are capable of achieving. In the beginning, we did not know anything about the virus and many things are still uncertain today. There was a lot of discussion, e.g., what long-term effects COVID-19 causes, when a vaccine will be available for everyone and which restrictive measures are necessary or sufficient. The crisis has also been polarizing. But during the lockdown it became clear above all that NRW is standing together. Many companies and scientific institutions spontaneously started working on a vaccine or a cure. Companies adjusted their production lines when disinfectants became scarce. Staff and premises were made available to create testing capacities. Medical students have helped with telephone hotlines, private individuals have sewn masks and politicians have put together aid packages. In the time of crisis, we have seen that businesses, science, society and politics have all contributed in their own way. NRW stands together against COVID-19 and as a network BIO.NRW stands together with NRW.

But something else became clear during the crisis: biotechnology is a key technology in the fight against the virus. It contributes significantly to the development of treatments, vaccines and diagnostic tools. Even after the crisis, the importance of biotechnology for society should not slip out of focus. As a cross-sectional technology, it offers many solutions to the pressing problems of our society, even beyond the health sector. We must ensure that this sector is strengthened and that innovations in biotechnology are developed locally. Therefore, NRW must be attractive for companies. This is favored by improved access to venture capital, the promotion of innovative projects and the provision of infrastructures for scaling up processes, for example. As a future-orientated technology, biotechnology must be given sustained attention.

In this sense: spotlights on for the biotechnology sector in NRW!

Your BIO.NRW Team

About BIO.NRW

BIO.NRW - Business for Biotech

Biotechnology offers decisive approaches to solving the global challenges of our time. In order to drive the sustainable development of biotechnology in North Rhine-Westphalia (NRW), the players involved should be as well connected as possible. The BIO.NRW network acts on behalf of the state government and connect entrepreneurs, scientists, investors and the public. In addition, the network promotes cooperation at the state level as well as nationally and also internationally. BIO.NRW engages in location marketing, offers networking events and supports young companies and start-ups in a variety of ways.

A particular strength of NRW is the many companies that are active in pharmaceutical biotechnology. With its focus area BIO.NRW.red, BIO.NRW provides a thematic offer specifically tailored to the pharmaceutical biotechnology sector. The structural change and climate targets are inducing a shift in industry towards sustainable management and production. BIO.NRW addresses the topic of bioeconomy in its new focus area BIO.NRW.eco. In this way, BIO.NRW further develops the strengths of North Rhine-Westphalia as a location for research and innovation and promotes the growth of the biotechnology business landscape.

Keeping an eye on the NRW biotechnology scene

The biotech sector in North Rhine-Westphalia has developed rapidly over the past ten years, which is, inter alia, due to numerous advantageous location factors. BIO.NRW provides information on the prospects, strengths and potential of NRW as a biotechnology location and how the associated sectors are developing here. This includes the annually updated key figures in this brochure. In addition, BIO.NRW provides an overview of current R&D activities in industry and academia. All this information is also available to everyone free of charge on the BIO.NRW homepage. Information about industry-relevant news and events are presented here. The BIO.NRW online databases list companies and scientific institutions that are active in the life science sector.

Special Service: The Covid-19 Information and Contact Platform

The BIO.NRW website offers all companies and scientists in NRW a platform with up-to-date information on the COVID-19 pandemic. This includes funding programs and resources from the state, federal government and EU as well as relevant reports from industry and science. In addition, we also offer the possibility of individual cooperation and contact enquiries.

Support of young professionals is our business

One of BIO.NRW's special concerns is the support of young professionals in biotechnology. BIO.NRW organizes various events where young professionals and founders can get in touch with representatives of the industry. In addition, BIO.NRW is represented with joint stands at all major national and international trade fairs in the sector, thus giving SMEs and start-ups the opportunity to draw attention to their activities and make contact with potential business partners. BIO.NRW also arranges individual cooperation partners on request. The Business Angel Network - BIO.NRW helps with the financing and promotion of biotech start-ups. In addition, a forum, that brings together institutional investors, private investors, business angels and developers, provides information on the current biotech scene in NRW. In the context of workshops, BIO.NRW provides information on special funding measures tailored to the life science sectors. Funding opportunities from the EU, the federal government and the state of NRW is presented in these workshops.

Technology transfer is our concern

NRW is one of the most innovative regions in Germany. It is particularly important to bring new technologies to market and application. Supporting technology transfer is one of BIO.NRW's key tasks. BIO.NRW initiates cooperation between the players in the value chain in order to transform ideas and scientific findings more effectively into forward-looking processes and marketable products. In addition, BIO.NRW organizes events, working platforms and meetings to promote dialogue between companies, research, investors and decision-makers to intensify cooperation.

Thematic focus area BIO.NRW.red

BIO.NRW.red is the thematic focus for "red", pharmaceutical biotechnology in the BIO.NRW network. North Rhine-Westphalia has been a strong location for biotechnology and especially for the pharmaceutical industry for more than a century. Internationally renowned companies such as Bayer, Johnson & Johnson, UCB, Grünenthal, Henkel, Evonik are proof of the great importance of NRW in this environment. In addition, the state is also home to a large number of younger and

start-up companies such as Qiagen, Miltenyi Biotec, AiCuris, Cygenia epigenetic diagnostics, or Priavoid. These are just a few examples of the great diversity in NRW. In times of the COVID-19 pandemic, highly innovative North Rhine-Westphalian biotech companies have drawn attention to themselves and the location by producing reliable and new diagnostic procedures, developing potential therapeutic agents, and providing important components for vaccine development. Never before have medical biotechnology companies been so much in the focus of the public and the media as they have been these days. Throughout Germany, medical biotechnology is a key technology for innovations in the pharmaceutical industry. This is particularly true for the development of personalized medicine, stem cell research, and new cell and gene therapies[1].

The sales of biopharmaceuticals (pharmacy and hospital market) increased in 2019 by 13 % compared to the previous year and is thus 12.7 billion euros. Its share of sales in the total pharmaceutical market (EUR 44.1 billion) is 28.7 %, an increase of 13 % compared to 2018 (total market growth 6.9 %).

In 2019, 33 drugs with a new active ingredient, a biosimilar active ingredient, or a new combination of known active ingredients were approved in the EU. 15 of these new approvals were biopharmaceuticals alone. Furthermore, the pipeline for new, innovative biopharmaceutical drug candidates is well filled. 640 clinical development candidates (clinical phases I to III) have been documented by the end of 2019[2].

A 10-year comparison for the years 2009 and 2019 (published in June 2020 in the biotech report "Medizinische Biotechnologie in Deutschland 2020") shows the growing importance of biopharmaceuticals for patients and for Germany as a pharmaceutical location. The number of approved biopharmaceutical products rose from 188 in 2009 to 319 in 2019. The biopharmaceutical pipeline (including vaccines) also grew significantly by 37% (from 468 to 648) and the number of employees increased by 54% (from 27,500 to 42,300). Biopharmaceutical sales have almost tripled in this 10-year period[2].

Due to this enormous development and market potential, the establishment of the thematic focus area BIO.NRW.red was logical and appropriate. Initiated in 2010 as a strategic initiative of BIO.NRW, experts from the pharmaceutical industry, biomedical research, health care, medicine and pharmaceutical biotechnology, in particular, were brought together for interdisciplinary exchange. In the meantime, BIO.NRW.red has become a stable and lasting network in NRW, with significant growth potential, of experts from a wide range of cross-sectional areas, i.e., medical diagnostics, development of medicines, regenerative medicine, and gene therapy.

Thematic focus area BIO.NRW.eco

The bioeconomy refers to the knowledge-based production and use of renewable resources to provide products, processes, and services in all economic sectors within the framework of a sustainable economic system. To achieve this, the bioeconomy often, but not exclusively, uses biotechnological methods and processes. To ensure the use of biotechnological methods and processes in the sense of a bioeconomy, a wide variety of actors from different value-chains and often also from different industries and economic sectors must work together. However, in most cases, cooperation is not enough to create a legal framework supported by the politics and to create acceptance within the society for innovative processes, products, and services. To ensure successful networking, BIO.NRW with its new thematic focus area BIO.NRW.eco supports actors from science, industry, politics, and society in collaborating to establish a sustainable economic system based on the model of the bioeconomy.

Spot on Biotechnology Business

Biotech Landscape in NRW

North Rhine-Westphalia (NRW) lies at the heart of Europe. This becomes particularly clear when you realize that 160 million people live within a day's journey of the state capital Düsseldorf[3]. With almost 18 million inhabitants, NRW is Germany's most populated federal state[4]. Already 10 million people live in the Rhine-Ruhr region, which is Germany's largest and densest metropolitan area[5]. The density is also reflected in the infrastructure: NRW has six international airports, Germany's densest rail network and, with the Port of Duisburg, the world's largest inland port. So it comes with no surprise that NRW is an attractive location for businesses. This is also illustrated by numbers: almost one-fifth of Germany's gross domestic product is generated in NRW and one-fifth of foreign companies are based in NRW (Figure 1)[3]. This puts NRW at the top of the German federal states. If classified as an independent exporting nation, NRW would rank between Netherlands and Saudi Arabia (Table 1).

Traditionally, NRW is Germany's most important location for the chemical and pharmaceutical industry. Many large companies and major brands have their headquarters here, including Bayer, Evonik, Henkel, Grünenthal, Johnson & Johnson and UCB. Building on this, NRW has now developed into one of the top locations for the life science industry.

In the last 25 years, about 500 life science companies have settled in NRW[6], 106 of which are biotechnology companies (Figure 2). NRW has thereby also developed as a hotspot for the biotechnology industry. Innovative technologies are applied to major industry branches serving health/medicine, chemistry, food and environment biotechnology and ensure that the biotechnology sector is growing rapidly. Major business areas covered are industrial, nano- and pharmaceutical biotechnology, and there is a focus on enabling technologies and supporting services as well. Biotechnology in NRW now represents an active, multicentric network, which is setting the pace for the powerful pulse of the state's life science business.

Stimuli for Start-Up's

Numerous successful start-ups and spin-off companies flourish alongside the strong chemical and pharmaceutical industry in NRW. This entrepreneurial excellence is supported by Europe's densest network of excellent academic institutions. It is therefore not surprising that many of today's successful biotechnology companies started out as university spin-offs. There is also a rich and robust funding environment to support and promote the industry, including venture capitalists and business development organizations.

Many start-ups also benefit from technology or incubator centers, of which there are about 60 in NRW[6]. Incubators act as a catalyst for economic development and promote technology transfer all the way from mind to market. They promote business start-ups and subsequently support the start-ups to ensure their survival and growth. Specific services provided by the centers include renting affordable laboratory and office space, arranging business contacts, advising on financing options and advising on starting or relocating a business.

At the editorial deadline of this brochure, 150 biotechnology and life science companies were incubated by 22 technology centers (page 13).

The technology park BioCampus Cologne deserves special mention as it is one of the largest of its kind in Germany. On a total area of more than 25 hectares, it houses more than 23,000 square meters of office and laboratory space, including state-of-the-art S1 and S2 laboratories as well as industrial production facilities.

And the success of the favorable conditions for start-ups can be proven with figures: 20 % of all German start-ups are based in NRW, which is the highest rate in Germany[13].

One of the startups that is currently writing success stories in NRW is NUMA-

- 17.9 million inhabitants[7]
- NRW generates 20.7 % (711 billion Euro) of the German GDP[7]
- NRW generates 4.5 % of the European GDP (EU-28)[7]
- 20,000 international companies are located in NRW[8]
- 427 foreign new settlements and expansion projects in 2019[9]
- 23 % of foreign direct investment flowig into Germany ends up in NRW[9]
- 438,943 million Euro trading volume in 2019 (summing in- and exports)[10]
- 6 international airports[11]
- 6,000 km rail network[11]
- The Duisburg inland port handles 128 million tonnes of goods annually[11]

Fig. 1: NRW at a glance

Table 1: NRW's GDP in international comparison (billion euros)[12]

Russia	1.518	Saudi-Arabia	708
Rep. Of Korea	1.467	Turkey	674
Spain	1.245	Switzerland	628
Australia	1,244	Poland	529
Mexiko	1.124	Thailand	486
Indonesia	1.000	Sweden	474
Netherlands	812	Belgium	473
North Rhine-Westphalia	711	Argentina	40

FERM. Founded in 2017, NUMAFERM has won several awards for the development of a platform technology for the biotechnological production of peptides of any length. The process is cheaper and more environmentally friendly than comparable chemical syntheses. Another example of a successful start-up from NRW is Acus Laboratories. Using a unique forward genetic screening technology, Acus Laboratories can validate and predict drug targets as well as drug resistance. Founded in 2018, the company has since expanded its business to China. The depletion of resources and climate change call for more sustainable production processes. The start-up b.fab, founded in 2018, has dedicated itself to this goal by using CO_2 as a raw material and converting it into higher-value products using a combination of biotechnology and electrochemistry. These are just a few examples representing NRW's versatile start-up scene.

Academic Biotech Landscape

North Rhine-Westphalia offers the most extensive network of academic institutions in Germany. Six of the ten largest German universities (by number of students) are located in NRW[14]. Almost one third of all students in Germany are enrolled at a higher education institution in NRW. In the academic year 2017/18, almost 40 % of these students studied one of the STEM subjects (natural sciences, technology, engineering, mathematics)[15]. In the field of biotechnology, students have the opportunity to specialize in cell biology, (bio)medicine, biochemistry, genomics, proteomics, metabolomics, molecular biology, systems and synthetic biology, analytics/microsystems, bioinformatics and process engineering.

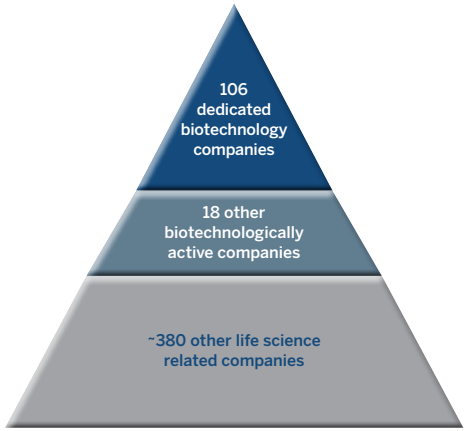


Fig. 2: Life Science Company Landscape in North Rhine-Westphalia

The RWTH Aachen University and the University of Bonn were awarded the rare "Elite University" label as part of the Excellence Strategy in 2019. This means that two of the eleven German elite universities are located in NRW. In addition, 14 of 57 Clusters of Excellence in Germany are funded in North Rhine-Westphalia[16]. Among them are five that deal with topics in the bioeconomy or life sciences. North Rhine-Westphalia is thus the federal state in Germany in which the most Clusters of Excellence were funded in 2019. In addition to the highest density of universities in Germany, the four major German research organizations, namely the Fraunhofer-Gesellschaft, the Helmholtz Association, the Leibniz Association and the Max Planck Society, operate several facilities with life science activities in the state.

NRW has an exceptional position in the research fields of health and sustainability, both of which are future-oriented topics in view of a growing and ageing world population and climate change. In stem cell research, NRW has been the leading region in Germany for over a decade, with Münster, Bonn and Cologne as hotspots. Cologne has also developed into a globally unique center of excellence for ageing research with the Cluster of Excellence Cellular Stress Responses in Aging-Associated Diseases (CECAD), the Max Planck Institute for Biology of Ageing, the Centre for Integrated Oncology and the German Centre for Neurodegenerative Diseases. Germany's first health campus is located in Bochum, where the Centre for Protein Diagnostics (ProDi) opened in June 2019. The science building links the Ruhr University Bochum, the university hospitals and the healthcare industry.

The Clusters of Excellence CEPLAS, PhenoRob, and Fuel Science Center as well as the Competence Centre Bioeconomy Science Center (BioSC), which supports research projects in the field of bioeconomy,

Biotechnology Map of North Rhine-Westphalia

Life Science Technology Parks and Incubators

Name		City	Companies*	Homepage
1	ZBMT - Zentrum für Bio-Medizintechnik	Aachen	12	www.agit.de
2	TZA -Technologiezentrum am Europaplatz Aachen	Aachen	not specified	www.tza-aachen.de
3	INCA Technologiezentrum GmbH	Ascheberg	1	www.inca-technologiezentrum.de
4	its-Internationales Technologie- und Service-Center Baesweiler	Baesweiler	4	www.its-center.de
5	Technologiepark Bergisch-Gladbach	Bergisch-Gladbach	2	www.tbg.de
6	Technologiezentrum Bielefeld	Bielefeld	1	www.technologiezentrum-bielefeld.de
7	BMZ - BioMedizinZentrum Bochum	Bochum	2	www.bmz-bochum.de
8	TZR - Technologiezentrum Ruhr	Bochum	1	www.chip-tzr.de
9	Bio-Security	Bönen	10	www.bio-security.de
10	BMZ - BioMedizinZentrum Dortmund	Dortmund	32	www.bmz-do.de
11	Zentrum für Mikro- und Nanotechnologie	Dortmund	1	www.mst-factory.de
12	LSC - Life Science Center Düsseldorf	Düsseldorf	14	www.lsc-dus.de
13	TPH - Technologie Park Herzogenrath	Herzogenrath	4	www.tph.de
14	TZJ - Technologiezentrum Jülich	Jülich	1	www.tz-juelich.de
15	BioCampus Cologne Grundbesitz GmbH & Co. KG	Cologne	14	www.biocampuscologne.de
16	RTZ - Rechtsrheinisches Technologie- und Gründerzentrum Köln GmbH	Cologne	10	www.rtz.de
17	Creative Campus Monheim	Monheim	11	www.cc-monheim.de
18	Technologieförderung Münster GmbH	Münster	15	www.technologiefoerderung-muenster.de
19	CeNTech - Center for Nanotechnology	Münster	4	www.centech.de
20	Gründer- und Technologiezentrum Rheinbach	Rheinbach	6	www.wfeg-rheinbach.de
21	Forschungs- und Entwicklungs-Zentrum Witten GmbH	Witten	1	www.fez.de
22	Technologiezentrum Wuppertal W-tec GmbH	Wuppertal	4	www.w-tec.de
Total: 22			**150**	

** Life Science Companies*

Table 2: Number of dedicated biotech companies

Business Year	NRW dedicated biotech companies	Germany (active companies)
2008	61	501
2009	68	531
2010	71	538
2011	77	552
2012	84	565
2013	87	570
2014	89	579
2015	95	590
2016	109	623
2017	108	647
2018	102	679

2007 - 2014 and 2018 based on survey by BIOCOM AG; 2015 - 2017 based on survey by BioDeutschland

are dedicated to the topic of sustainability. The bioeconomy in particular plays an important role in the structural change of the Rhenish mining area. In the field of plant genetics, the Max Planck Institute for Plant Breeding Research in Cologne deserves to be called Germany's "cradle of plant biotechnology" as the first plant transformation technologies were developed here.

The digital transformation is an important topic in many scientific disciplines. However, the rapid technical development also poses new challenges for the security in information technology. To address these, the new Max Planck Institute for Cyber Security and Privacy was founded in Bochum in May 2019. The institute is expected to comprise six departments and 12 research groups by the time it is finally completed.

In Aachen one of the biggest research landscapes in Europe is taking shape. After the realization of the new Campus Melaten on 473,000 m², the second expansion stage of the RWTH Aachen, the Campus West, is currently being built on 325,000 m². Together, the new campuses will house apartments, shops, restaurants and cultural offerings as well as several research clusters. This innovative technology campus is Aachen's largest urban development project in the coming years[17].

BIO.NRW provides detailed information and further developments of the academic life science landscape in NRW in its compendium Spot on Biotechnology Science. The brochure presents a total of 227 profiles of research institutes, centers, and facilities in NRW.

Table 3: Temporal Development Key Figures for the Biotechnology Industry of North Rhine-Westphalia

	2016	2017	2018	2019
Number of employees	4,963	5,573	4,930	5,210
Turnover	EUR 1.819 bn	EUR 2.073 bn	EUR 1.808 bn	EUR 1.932 bn
R&D expenditure	EUR 394 m	EUR 366 m	EUR 277 m	EUR 290 m
	Numbers based on company surveys by BIO Deutschland e.V., BIOCOM AG and BIO.NRW			

Biotech Business Landscape

In North Rhine-Westphalia, the biotechnology sector is a dynamic branch of the economy that has seen rapid development over the last 10 years. The number of biotechnology companies has almost doubled during this time (Table 2). NRW's advantages as an industrial location favor the establishment of companies. Six companies were newly established in NRW in 2019: Aachen Proteineers GmbH, Abalos Therapeutics GmbH, Emergence Therapeutics AG, Proteona GmbH, Serengen GmbH, Vaxxinova Research & Development GmbH.

Biotechnology has developed into a cross-sectional technology that is linked to various other industries, such as the chemical industry (Figure 3), and therefore also has a share in the economic success of other industries. For example, a recent report explained that the total turnover of the European bioeconomy industry in 2017 was more than €2.4 trillion (!) and more than 18.5 million people were employed in bio-based industries[18]. The bioeconomy routinely uses biotechnological processes to generate products from (renewable) raw materials. This example underlines the importance of biotechnology for the overall economy. In addition, other technologies are also applied within biotechnology, for example nanotechnology and engineering technology. All this

makes biotechnology a complex industry that cannot be easily separated from other, more "static" industries, and value chains cannot always be clearly assigned to one sector. To focus only on dedicated biotech companies leads to an underestimation of the biotech industry's influence on the economy as a whole. In order to follow the industry's development, however, it is still important to have a uniform definition of dedicated biotech companies. BIO.NRW therefore bases its classification of companies on the OECD definition of dedicated biotech companies (page 76).

In order to describe the biotechnology sector in NRW, BIO.NRW conducted a survey among local biotech companies. Together with the professional evaluation from BIOCOM AG, this provides a differentiated view of the biotechnology landscape in NRW. According to the evaluation, there were 124 companies in NRW in 2019 that were active in biotechnology. Of these, 106 companies were dedicated biotech companies, i.e., biotechnology is the core business of these companies[19]. The 18 other companies were active in a wide variety of areas, so that biotechnology represents only part of their activities. Most of these are global players from the pharmaceutical, chemical or seed production sectors. The biotechnological key figures of these companies cannot be determined separately and are therefore not included in the biotech key figures for NRW. Nevertheless, it should not be neglected that due to these companies and their biotechnological activities, the economic importance of biotechnology in NRW is higher than the key figures suggest. Examples include Bayer AG and Evonik Industries AG, whose turnover in 2019 alone was 43.5 billion[20] and 13.1 billion euros[21], respectively. Even if only part of the turnover can be attributed to NRW locations and not all products are manufactured using biotechnological processes, these two examples clearly illustrate the significance of biotechnologically active companies for the economy in NRW.

Table 4: Key figures of the NRW biotech scene at a glance

Number of companies	106
Number of employees	5,210
Turnover	EUR 1.900 bn
R&D expenditure	EUR 290 m
New companies	6
Financing	32,3

The key figures of the dedicated biotechnology companies (Table 3) primarily reflect the persistence of the industry. In 2019, the 106 dedicated biotechnology companies generated a turnover of 1.9 billion euros and employed 5,210 people (Table 4). Compared to 2018, turnover and employment have increased somewhat, by almost 7 % and 6 %, respectively. Overall, the sector has been stable for several years. On average, 15 %

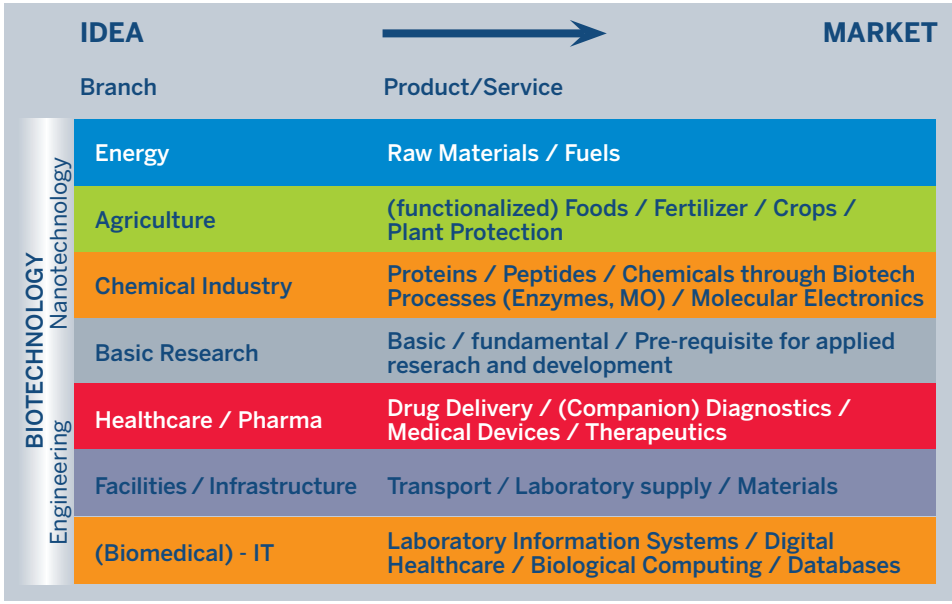


Fig. 3: Biotechnology is a strongly linked industry

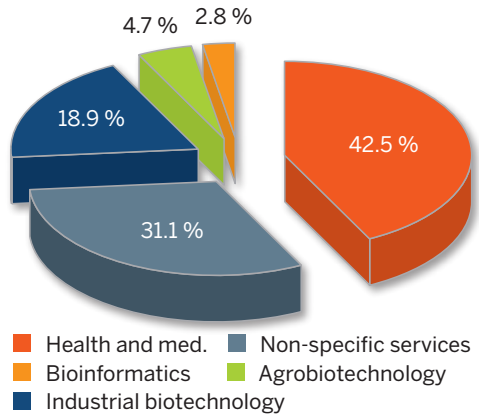


Fig. 4: Areas of activity (for definitions see page 76)

Indication	Number of Products
Neoplasms / cancer / oncology	27
Infectious and parasitic diseases	18
Diseases of the nervous system	13
Other	3
Skin and subcutaneous tissue	2
Musculoskeletal system and connective tissue	2
Respiratory	2
Digestive system	2
Symptoms, signs abnormal clinical and laboratory findings, not elsewhere classified	1
Mental and behavioural disorders	1
Endocrine, nutritional and metabolic diseases	1
Diseases of the blood and blood-forming organs; immune disorders	1
Total	73

Fig. 5: Drug Development Pipeline by Indication

of the turnover was reinvested in research and development. In 2019, this amounted to 290 million euros[19]. This underlines that the investments of the biotech companies in NRW are proactive and will drive the future market position of NRW biotechnology.

The classification of NRW biotech companies by area of activity shows that 31 % of biotech companies are active in several sectors[19] (Figure 4). These biotech companies with "non-specific business activities" also include, among others, service providers and suppliers for the biotechnological sector. However, the majority of NRW biotech companies (42.5 %) are active in the field of health and medicine, including veterinary medicine[19]. At the editorial deadline for this brochure, according to information in the Biotechgate database, companies in the health and medicine sector had built up a drug pipeline of a total of 73 products and product candidates (Figure 5). In recent years, however, this number has been declining. Since 2018, the number of product candidates has fallen by almost 28 %. The classification of the candidates according to indications shows that a large proportion of the candidates are being developed in the categories "Oncology", "Infectiology / Parasitology" and "Neurology". Overall, almost 80 % of the product candidates fall into these three categories. The "Oncology" category has been the focus of product development for candidates for several years. The differentiation of drug candidates by phase shows that approximately 23 % of the candidates are in preclinical studies and 15 % are in clinical study phases 1 to 3[22] (Figure 6).

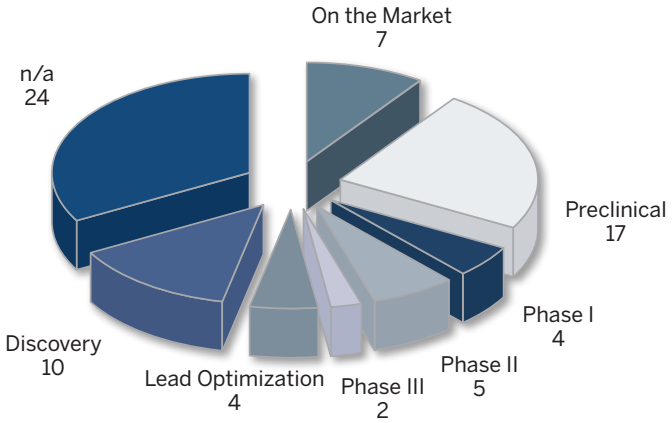


Fig. 6: Drug Development Pipeline by Phase

The companies listed in this brochure form the innovative core of biotechnological research and development. However, capital is needed to drive developments forward. Start-ups and SMEs in particular are innovative drivers of the industry that need support through funding and investment. In 2019, there was funding totaling 32.3 million euros, which went to Abalos Therapeutics GmbH, InfanDx AG and PAION AG[19]. Of course, the total amount of non-public investment in biotech companies in NRW was significantly higher than these figures show. In addition to the large community of business angels based in NRW, numerous (institutional) investors have settled on the Rhine in recent years. These investors strongly support young biotech companies. Investment activities in life science companies are also supported by the state, e.g., through the "BIO.NRW Business Angel Zirkel" and the annual "Business Angel Congress".

Situation during the Pandemic

North Rhine-Westphalia is looking back on an exceptional situation this year. The most populous federal state was one of the regions in Germany most affected by COVID-19. Many companies had and still have to struggle with the economic effects of the Corona crisis. Start-ups and small businesses in particular have been hit hard by the economic consequences.

However, the current crisis also shows how important the biotechnology sector is and that it plays a decisive role in combating the virus. Most biotechnology companies are SMEs, which are characterized by a high degree of flexibility. This has also been demonstrated in the current crisis. The industry has reacted quickly and many companies have adapted their activities to the new challenges. This includes, for example, the spontaneous adjustment and initiation of R&D activities to contain COVID-19. Throughout NRW, numerous companies already became active at the beginning of the crisis to help with a wide variety of means. This shows that in difficult times society and business are moving closer together. On pages 20 and 21 you will find an overview of some of the companies in North Rhine-Westphalia that are involved in the fight against the virus.

As a key technology, biotechnology contributes like no other technology to providing detection methods and test systems for SARS-CoV-2, finding a therapy against COVID-19 and developing a vaccine. It is therefore very important to ensure that biotechnological innovations are developed in Germany and Europe. In this context, the planned takeover of the Hilden-based biotechnology company Qiagen by the US company Thermo Fisher Scientific has attracted attention. Qiagen was one of the first companies to launch a SARS-CoV-2 rapid test. The diagnostics business has grown enormously since the beginning of the Corona crisis due to the extensive testing activities and continues to grow. As a result, the value of the stock has risen considerably. Qiagen was founded in 1984 as a spin-off of the Heinrich Heine University in Düsseldorf, where it pioneered innovative methods for the purification of nucleic acids. Today, Qiagen is a global player and one of the leading companies in the German biotechnology industry.

The company AiCuris has also demonstrated the flexibility of SMEs in this crisis. In spring, the Wuppertal-based company spontaneously started screening its own substance libraries to identify a drug candidate against COVID-19. In addition, AiCuris was committed to supporting local hospitals in the diagnosis of SARS-CoV-2 and cooperating with the NRW Ministry of Health in this regard. AiCuris is also part of the CARE (Corona Accelerated R&D in Europe) initiative, Europe's largest consortium to accelerate the development of a treatment for COVID-19.

Another supporter of the CARE initiative is Bayer. The Leverkusen-based company is actively involved in NRW, but also worldwide, in the fight against the virus and its effects, among other things by donating protective equipment, disinfectants and medicines, as well as financial resources.

In addition to identifying a treatment for COVID-19, the development of a vaccine is crucial to contain the pandemic. Janssen-Cilag, a Johnson & Johnson company, had already identified a promising vaccine candidate in March 2020. After convincing results of the preclinical and phase 1/2a clinical studies, an international phase 3 trial on 60,000 adults was started at the end of September.

But it is not only industry that is engaged in the fight against the virus; NRW's science community has also joined the fight. While biotechnology and pharmaceutical companies mainly focus on the development of vaccines and therapies, science is also interested in understanding the infection process and the background of the progression of the disease. This is also the case with the COVIMMUNE consortium, which is investigating the connection between the immune response and the clinical course of COVID-19. Possible long-term consequences are also being considered. Experts from the fields of virology, medicine, immunology, bioinformatics and systems biology from the University and the University Hospital in Bonn are involved in the consortium.

In order to investigate the mutability of the virus' genetic information, genome researchers throughout Germany have joined forces to form the German COVID-19 Omics Initiative (DeCOI). Sequencing is used to characterize changes in the virus genome and relationship structures of individual viruses. Through this analysis, the origin and variations of the virus in the population can be inferred. Metagenome analyses in patients should also provide information on which infections occur in connection with SARS-CoV-2. In NRW, DeCOI is supported by scientists from the university hospitals in Düsseldorf and Bonn and the universities in Aachen, Cologne and Bonn.

The project that is probably best known to the German public is the so-called Heinsberg Study by Prof. Dr. Hendrik Streeck and Prof. Dr. Gunther Hartmann

from the University of Bonn. This representative study examines the spread of the virus within the population of the Heinsberg district, which was particularly hard hit by the pandemic in spring 2020. In this way, conclusions can be drawn about the further course of infection.

Scientists at the University of Münster and the University Hospital Münster are investigating the origin of new types of viruses. Within the framework of the National Research Platform for Zoonoses, diseases that are transmissible between humans and animals are being investigated. The research platform links scientists from different disciplines and aims to improve the prevention, diagnosis and therapy of zoonoses.

Beyond the pandemic

In order to keep North Rhine-Westphalia an attractive location for innovative biotechnology companies in the future, it is important that the industry receives the necessary support. This includes the consistent promotion of R&D activities and, above all, support for the subsequent transfer of technologies into marketable products. In order to drive developments faster, the sector must be supported at an even higher level than before. This particularly concerns better access to capital (public, VC, corporate, business angels, private, etc.).
Biotechnology plays a crucial role in finding solutions to the major challenges of our time. Biotechnological innovations also contribute to discovering therapies for diseases other than COVID-19, which is particularly important for our ageing society. It is often mentioned that the economy should start more sustainably after the Corona crisis. Biotechnology can help make this sustainable reboot a reality. Biotechnological processes are often more sustainable because they require less energy/resources than e.g., chemical processes. Moreover, they also offer the possibility to process bio-based resources and waste streams, which enables the replacement of fossil-based resources. In this way, biotechnology also makes an important contribution to mitigating climate change.


NRW against COVID-19
The Netherlands
Weser
Münster
Biocheck
Ems
Rhine
Lippe
Dortmund
Lead Discovery
Ruhr
NUMAFERM
Düsseldorf
Wuppertal
Janssen-Cilag
attyloid
AiCuris Anti-infective Cures
Qiagen
Cube Biotech
ARTES Biotechnology
Bayer
CEVEC Pharmaceuricals
Taconic Biosciences
AYOXXA Biosystems
Miltenyi Biotec
Cologne
Proteona
Syntab Therapeutics
Aachen
Rhine
Germany
Belgium

DRUG DEVELOPMENT		
AiCuris Anti-infective Cures	Wuppertal	Examination of proprietary substances for effectiveness against COVID-19 and providing support in diagnostics
Lead Discovery Center	Dortmund	Development of novel vaccination methods against SARS-CoV-2 and identification of inhibitors and therapeutics
Miltenyi Biotec	Bergisch Gladbach	Antibody-based therapy development
Proteona Antibody Protection	Cologne	Development of antibody therapy against COVID-19 using proteogenomic single cell sequencing
Syntab Therapeutics	Würselen	Development of an antiviral agent
SUPPORTING ACTIONS		
attyloid	Düsseldorf	Platform technology for SARS-CoV-2 analysis
AYOXXA Biosystems	Cologne	LUNARIS™ Platform for cytokinin monitoring of severe COVID-19 cases
Bayer	Leverkusen	Global commitment to fight the pandemic including donation of protective equipment, disinfectants and medicines as well as support of research projects
Biocheck	Münster	Development of a SARS-CoV-2 antibody test
CEVEC Pharmaceuticals	Cologne	Adenoviral vectors for vaccine production
Cube Biotech	Monheim	Recombinant production of the trimeric SARS-CoV-2 spike protein
NUMAFERM	Düsseldorf	Production of a SARS-CoV-2 inhibitor as part of a global collaboration for the development of a single-domain antibody against SARS-CoV-2 lead by the Austral University of Chile
Qiagen	Hilden	Test kits and reagents for the detection of SARS-CoV-2
Taconic Biosciences	Cologne	Mouse models for research on SARS-CoV-2
VACCINE DEVELOPMENT		
ARTES Biotechnology	Langenfeld	Development of SARS-CoV-2 vaccine candidates based on virus-like particle based platform technologies
Janssen-Cilag	Neuss	Vector vaccine development

Networks and Competence Clusters in NRW

Industrial Biotechnology – CLIB

CLIB (Cluster Industrial Biotechnology) is an international open innovation cluster of large companies, SMEs, academic institutes, and universities, as well as other stakeholders active in biotechnology, and the circular bioeconomy as a whole. The cluster comprises about 100 members with a share of about 25 % international members. The overall goal of CLIB is to network stakeholders along and across value chains and to identify new opportunities for innovation, projects, and business. Through this, the cluster develops cross-sectoral biotechnological solutions for sustainable processes and products. Pertinent project areas are identified by the CLIB team in conjunction with members in an iterative process. CLIB is a non-profit association, with its members shaping the cluster's interests and activities. CLIB organizes a number of events throughout the year: the annual CLIB international conference (CIC), the CLIB Networking Day (CND) exclusively for its members, forum events, topic-specific workshops, dedicated small partnering meetings and visits to partners, sites, or meetings in Germany and abroad.

An NRW-based project is dedicated to improving identification and production of high performance ingredients (HiPerIn2.0) for markets like adhesives, personal care, textiles, or food and feed. This action is funded by the Ministry of Economic Affairs, Innovation, Digitalization and Energy of the State of North Rhine-Westphalia. Together with partners in Germany, Flanders, and the Netherlands, CLIB established the BioInnovation Growth mega-Cluster (BIG-Cluster), which aims at developing novel cross-border value chains based lignocellulose or C1 gases, and develops a cross-border education initiative. Within BIG-Cluster, CLIB is coordinating three ongoing projects: In ALIGN, the consortium aims at producing new low- and high-value aromatics based on lignocellulose. In BioCOnversion, the partners will develop a biotechnological process for CO/CO_2 gas conversion. In CROSSBEE, a cross-border bioeconomy education will be established. All three projects are funded by the German Federal Ministry of Education and Research (BMBF). Furthermore, CLIB is active in several Horizon 2020 projects, as well as in the INTERREG Deutschland-Nederland programme.

BioRegions in NRW

The biotechnology landscape in North Rhine-Westphalia is diverse and dense. Regional networks and initiatives have developed to support the industry. The various BioRegions that have emerged in this way are committed to business start-ups and technology transfer in biotechnology, network the sector and initiate cooperation between industry and science. The focus is on regional priorities and competencies. As the state organization, BIO.NRW acts as the umbrella organization for the BioRegions in NRW and through supra-regional cooperation the interests of the state are supported statewide. The BioRegions and networks with their different focuses and priorities are presented below and on the following pages.

Name	BioIndustry e.V.
Address	Otto-Hahn-Str. 15
Postal Code/City	44227 Dortmund
Fon	+49 238 3919 224
E-Mail	info@bioindustry.de
Internet	www.bioindustry.de

BioIndustry

BioIndustry e.V. is a regional life science cluster that has been committed to strong interdisciplinary networking between science and companies, especially in the Ruhr area, but also in eastern Westphalia, since 2000. This region offers a unique density of economic and scientific competence. The focus of BioIndustry's activities is the promotion of biotechnology in all its facets in science, research and application with the aim of generating product and process innovations through interdisciplinary transfer work. Accordingly, the actors of the association are biotechnological companies, universities, colleges, technology centers, service providers and municipal business development agencies.

Name	Gesellschaft für Bioanalytik Münster e.V.
Address	Mendelstraße 17
Postal Code/City	48149 Münster
Fon	+49 251 384 503 30
Fax	+49 251 384 503 31
E-Mail	info@bioanalytik-muenster.de
Internet	www.bioanalytik-muenster.de

bioanalytik-muenster
TECHNOLOGY FOR THE LIFE SCIENCES

The region Münster has, due to its long tradition in excellent analytic and bio-medical research, an international reputation in innovative nanoanalytics. The region's focus on nano-bioanalytics is a consequence of the international top research in the field of nanoanalytic and life science of the University of Münster, the Münster University of Applied Sciences and more than 30 companies in the region. On this basis and the long lasting experience of connecting partners from different life science technology fields as well as the expertise to develop regional innovation strategies for new technologies in the health care sector, Bioanalytic Münster increasingly focusses, as a local network of the region, on the topic "New technologies for the health care sector".

BioCologne is the network to support bioengineering and bioscience in the region of Cologne. Companies, research institutions, investors, banks, consultancies, and technology parks are engaged to promote the region as a science location. BioCologne facilitates the transfer of ideas, knowledge, and technologies from the life-science field into practice. Thereby they promote start-ups in close collaboration with RTZ Köln GmbH.

BioCologne is national and international interlaced and offers synergies and international cooperation. BioCologne works for fairs, congresses, working groups, and questions regarding business routines close together with BioRiver Life Science im Rheinland e.V.

Name	BioCologne c/o RTZ Köln GmbH
Address	Gottfried-Hagen-Str. 60-62
Postal Code/City	51105 Cologne
Contact Person	André van Hall
Fon	+49 221 839 110
E-Mail	contact@biocologne.de
Internet	www.biocologne.de

BioRiver is the regional industry association for life sciences and biotechnology in the metropolitan area Rhineland. Our Chairman Boris Stoffel, CEO of Miltenyi Biotec, together with representatives of other leading corporates as Bayer and Qiagen, innovative firms of all sizes, excellent academia and stakeholders of the industry drive BioRiver's business.

Member groups, networking events and seminars support the direct and equal exchange between experts of all levels. The startup competition BioRiver Boost! is our platform for young entrepreneurs for their companies' development. We are happy to be a requested contact for the state ministries.

Our member firms are active in the following fields: innovative products, technologies and services for research, development and production in biotechnology, life sciences and pharma.

Name	BioRiver – Life Science im Rheinland e.V.
Address	Merowingerplatz 1
Postal Code/City	40225 Düsseldorf
Contact Person	Dr. Frauke Hangen
Fon	+49 211 316 0610
Fax	+49 211 160 1953
E-Mail	bioriver@bioriver.de
Internet	www.bioriver.de

MedLife e.V. is the competence network of life sciences in the technology region Aachen. The aim is to strengthen our region as an innovation location for the healthcare industry, medical technology and biotechnology. MedLife promotes the dialogue between science, industry and facilitates interdisciplinary networking in the life sciences. In the BioRegion, innovations and competencies in the fields of biology and biotechnology are not only contributed by the research institutes of the RWTH Aachen University and the FH-Aachen, but are also enriched by the diverse expertise of the research centers DWI, Fraunhofer Institutes and the FZ-Jülich.

Our industrial players produce innovative products for biochemistry, chemistry and medicine and act as suppliers for biotechnological and pharmaceutical production.

Name	MedLife e.V
Address	Aachener - und - Münchener - Allee 9
Postal Code/City	52074 Aachen
Fon	+49 241 47 583 486
E-Mail	info@medlife-ev.de
Internet	www.medlife-ev.de

From Mind to Market

This chapter provides an overview of the dedicated biotech companies and the biotechnologically active companies in North Rhine-Westphalia.

For simplicity, the companies are grouped into six areas according to their main activity:

- Non-specific Services
- Health and Medicine (including Animal Health)
- Industrial Biotechnology
- Agri/Agrobiotechnology
- Bioinformatics
- Other biotechnologically companies

For a more comprehensive directory containing all life science and life science-related companies in NRW, please visit our company database at https://bio.nrw.de/firmendatenbank/.

BIO.NRW invites you to discover the North Rhine-Westphalian biotechnology community!

Biotechnology Map of North Rhine-Westphalia

Dedicated and other biotechnologically active companies

Dedicated companies[1]

QITHERA GmbH	Heinsberg	p. 53
QLi5 Therapeutics GmbH	Dortmund	
RHEINCELL Therapeutics GmbH	Langenfeld	p. 53
Ridom GmbH	Münster	p. 67
Saaten-Union BIOTEC GmbH	Leopoldshöhe	p. 65
SenseUp GmbH	Jülich	p. 61
Senzyme GmbH	Troisdorf	p. 62
Serengen GmbH	Dortmund	p. 40
SeSaM-Biotech GmbH	Aachen	p. 62
Soluventis Nanotherapeutics GmbH	Bochum	p. 53
Squarix GmbH	Marl	p. 40
Syntab Therapeutics GmbH	Würselen	p. 54
Taconic Biosciences GmbH	Leverkusen	
Transimmune AG	Düsseldorf	p. 54
TunaTech	Düsseldorf	
UGiSense AG	Dortmund	p. 54
Uricell	Düsseldorf	p. 55
Vaxxinova	Münster	p. 55
vivo Science GmbH	Gronau	p. 41
W42 Industrial Biotechnology GmbH	Dortmund	p. 62
WeissBioTech GmbH	Ascheberg	
XanTec bioanalytics GmbH	Düsseldorf	p. 41
Xell AG	Bielefeld	p. 41

Other biotechnologically active companies[1]

BASF Personal Care and Nutrition GmbH	Monheim	
Baxter Oncology GmbH	Halle/Westfalen	
Bayer AG	Leverkusen	p. 69
BAYER CropScience AG	Monheim	
Bayer Pharma AG	Wuppertal	
Cellex Collection Center Cologne	Cologne	p. 69
Deutsche Saatveredelung AG	Lippstadt	p. 69
Evonik Industries AG	Essen	p. 70
Evonik Industries GmbH	Marl	
Evonik Nutrition & Care GmbH	Halle/Westfalen	
German Seed Alliance GmbH	Cologne	p. 70
Grünenthal GmbH	Aachen	p. 70
Henkel AG & Co. KGaA	Düsseldorf	p. 71
MEDIWISS Analytik GmbH	Moers	
Monsanto Agrar Deutschland GmbH	Düsseldorf	
Octapharma GmbH	Langenfeld	
Oxprotect GmbH	Münster	
PerkinElmer chemagen Technologie GmbH	Baesweiler	p. 71
PHARMA WALDHOF GmbH	Düsseldorf	p. 71
Syngenta Seeds GmbH	Bad Salzuflen	p. 72
Taros Chemicals GmbH & Co. KG	Dortmund	p. 72
UCB Pharma GmbH/UCB Biosciences GmbH	Monheim	p. 72
W. von Borries-Eckendorf GmbH & Co. KG	Leopoldshöhe	p. 73

1 *Including companies that were established in NRW after 2019 and company sites that are not headquarteres and thereby not included in the key figures of 2019. OECD definition on page 76*

Non-specific services

Acus Laboratories GmbH was founded in 2018 as a spin-off company from the Max Planck Institute for Biology of Ageing in Cologne. Based on unique forward genetic screening technologies. Acus offers services for deconvolution and validation of molecular drug target structures, identification of off-targets, and drug resistance prediction to pharmaceutical industry and biotech partners.

Acus mid-term vision is to uncover novel drug target structures that initiate collaborative 'first-in-class' drug development projects.

Name	Acus Laboratories GmbH
Address	Joseph-Stelzmann-Straße 9b
Postal Code/City	50931 Cologne
Fon	+49 22137970-920
E-Mail	info@acuslabs.com
Internet	www.acuslabs.com
Employees	<10
Founded (year)	2018

ARTES Biotechnology is an independent technology provider for the pharmaceutical industry. Our business focus is on:

- vaccine development (VLP technology)
- process development of biopharmaceuticals
- transfer of biosimilar processes

Our technologies have resulted in innovative products marketed worldwide. WHO recommendation, international registration, EMA resp. FDA approval and GRAS certification are achieved in international collaborations. Expression platforms include high yield yeasts and E. coli system for efficient protein production. Our unique chimeric virus like particle (VLP) platform METAVAX® is best suited for the development of highly immunogenic vaccines in human and animal health.

Our proprietary technologies ensure freedom-to-operate and reliable, competitive production of innovative targets marketed worldwide.

Name	ARTES Biotechnology GmbH
Address	Elisabeth-Selbert-Str. 9
Postal Code/City	40764 Langenfeld
Fon	+49 2173 27587-0
Fax	+49 2173 27587-77
E-Mail	info@artes-biotechnology.com
Internet	www.artes-biotechnology.com
Employees	22
Founded (year)	2002

AYOXXA Biosystems GmbH is an international life science company based in Cologne. With LUNARIS™, its proprietary innovative beads-on-a-chip multiplexing platform for advanced protein analysis, the Company is paving the way for translating knowledge generated in basic research to clinical studies.

With its advantages in terms of quality, flexibility, robustness and efficiency, LUNARIS™ enables fully scalable quantitative validation of up to 12 biomarkers in minute amounts of biological samples. AYOXXA is commercializing a growing portfolio of standardized ready-to-use detection kits, with a focus on the biology of inflammation, immune-oncology and ophthalmology.

Name	AYOXXA Biosystems GmbH
Address	Nattermannallee 1
Postal Code/City	50829 Cologne
Fon	+49 221 222529-0
Fax	+49 221 222529-11
E-Mail	info@ayoxxa.com
Internet	www.ayoxxa.com
Employees	35
Founded (year)	2010

Name	BBT Biotech GmbH
Address	Arnold-Sommerfeld-Ring 28
Postal Code/City	52499 Baesweiler
Fon	+49 2401 93 310-0
Fax	+49 2401 93 310-90
E-Mail	office@bbt-biotech.de
Internet	www.bbt-biotech.de
Employees	30
Founded (year)	1999

BBT Biotech GmbH produces freeze-dried viable bacteria (probiotics like lactobacilli, bifidobacteria, yeasts) and metabolites not only in bulk but also in finished dosage forms to the pharmaceutical and health-food industry.

The fermenter capacity is up to 18.000 l. The downstream process is based on separators, filtration systems, chromatography and freeze dryers. On the basis of individual needs BBT Biotech GmbH also offers active pharmaceutical ingredients like thrombolytics (streptokinase, urokinase), fertility hormones (HCG, HMG, FSH), inhibitors (Aprotinin, UTI) and others (Hyaluronidase, Corticotrophin).

In addition we are offering a full service to our customer:

- early development
- manufacturing of the API under GMP conditions
- inclusive dossier writing in eCTD format.

Name	beniag GmbH
Address	Huthmacherstrasse 20
Postal Code/City	52428 Jülich
Fon	+49 2461 616 734
	+49 1578 0393 499
Fax	+49 2461 613 907
E-Mail	info@beniag.com
Internet	www.beniag.com
Employees	< 10
Founded (year)	2013

beniag is a biotechnology company providing unique and highly efficient solutions to incorporate molecules into living cells and tissue in vitro. Based on membrane fusion as a completely novel and patented transfer mechanism, beniag liposomes offer an outstanding opportunity for customers to incorporate any type of molecule or aggregate with extremely high efficiency within a few minutes. The unique transfer mechanism allows manipulation of basically every mammalian cell type and incorporates molecules directly into the cytosol, to guarantee their immediate bioactivity.

beniag focusses on production and development of customer oriented solutions with cooperation partners distributing the product line “Fuse-It” worldwide.

Name	BIBITEC GmbH & Co. KG
Address	Universitätsstr. 25
Postal Code/City	33615 Bielefeld
Fon	+49 521 106 6326
Fax	+49 521 106 156233
Internet	www.bibitec.de
Employees	12
Founded (year)	2001

BIBITEC Gesellschaft für Prozessentwicklung mbH & Co KG, a 100 % subsidiary of Nordmark Arzneimittel GmbH, is offering an all-in-one solution for mammalian cell culture technology.

Together with qualified partners, BIBITEC is able to cover the entire value chain from cell line and process development, analytics, GMP production of API and finished drug product up to regulatory affairs and market production. Our value added services also include pharmaceutical development, ICH conform stability and viral safety studies.

Our project manager is your primary contact and is responsible for steering the entire process. With our customized project support BIBITEC is the partner of choice for biotech companies with individual needs.

Founded 2016 by a team of experts in genomic sample preparation, BioEcho Life Sciences provides a new generation of kits and reagents for genomic research and molecular diagnostics. BioEcho develops single-step technologies for accelerated and simplified DNA and RNA purification and analysis processes.

One of the products allows 96 viral RNA & DNA isolation within 5-minutes for and is widely used in Covid-19 testing. We apply our technologies in the development of more convenient Liquid Biopsy procedures (isolation of circulating nucleic acids) and streamlined molecular diagnostics (including pathogen detection, oncology, human genetics and Point-of-Care applications) and selected customization projects.

Name	BioEcho Life Sciences GmbH
Address	Nattermannallee 1
Postal Code/City	50829 Köln
Fon	+49 221 9988 97-0
Fax	+49 221 9988 97-29
E-Mail	contact@bioecho.de
Internet	www.bioecho.de
Employees	35
Founded (year)	2016

Biofidus is an analytical company located in Bielefeld, Germany. Its services include a wide variety of bioanalytical methods such as spectroscopic, chromatographic, and mass spectrometric assays focused on characterization of proteins as well as small molecules. Biofidus is specialized in the characterization of biopharmaceuticals or biosimilars, including but not limited to monoclonal antibodies, Fc-fusion proteins, erythropoietin, and ADCs.

Additionally, Biofidus offers spent media analysis for fermentation and cell culture technology, which includes the analysis of amino acids, metabolites, and vitamins in culture media. The analytical service also includes the development of custom tailored and novel client-specific assays.

Name	Biofidus AG
Address	Morgenbreede 1
Postal Code/City	33615 Bielefeld
Fon	+49 521 89 739 060
E-Mail	info@biofidus.de
Internet	www.biofidus.de
Employees	12
Founded (year)	2015

With more than 50 years of experience and proven regulatory expertise, the Charles River Biologics group can address challenging projects for biotechnology and pharmaceutical companies worldwide.

Offering a variety of services such as contamination and impurity testing, protein characterization, bioassays, viral clearance studies and stability and lot release programs, we support clients throughout the biologic development cycle, from the establishment and characterization of cell banks through preclinical and clinical studies to marketed products.

Whether clients need stand-alone services, a unique package of testing, or insourced support, our Biologics group can create a custom solution to suit their needs.

Name	Charles River Laboratories Germany GmbH
Address	Max-Planck-Str. 15A
Postal Code/City	40699 Erkrath
Fon	+49 211 9255-300
Fax	+49 211 9255-333
E-Mail	askcharlesriver@crl.com
Internet	www.criver.com
Founded (year)	1993

Name	Chimera Biotec GmbH
Address	Emil-Figge-Str. 76a
Postal Code/City	44227 Dortmund
Fon	+49 231 9742-840
Fax	+49 231 9742-844
E-Mail	info@chimera-biotec.com
Internet	www.chimera-biotec.com
Employees	20
Founded (year)	2000

chimera biotec
ultra sensitive immunoassays

Chimera Biotec is a GLP/GCP certified CRO specialized in ultra sensitive large-molecule bioanalytical support on various technology platforms, including Imperacer®, our proprietary Immuno-PCR technology.

We are service provider for the development, transfer, validation and bioanalysis of technically demanding immunoassays for quantifying large molecule targets in virtually any biological matrix.

We provide ultra sensitive GLP/GCP bioanalytical support for all phases of drug discovery and development in accordance to guidelines (FDA, EMA, ICH10).

Chimera has the expertise and technical capabilities to identify the ideal platform technology based on and run according to your pharmacological and regulatory requirements.

Name	Cube Biotech GmbH
Address	Alfred-Nobel-Str. 10
Postal Code/City	40789 Monheim
Fon	+49 2173 99373-0
Fax	+49 2173 99373-99
E-Mail	contact@cube-biotech.com
Internet	www.cube-biotech.com
Employees	16
Founded (year)	2012

Cube Biotech

The Cube Biotech team serves the biotech and pharmaceutical community with its expertise on expression, purification, stabilization and functional/structural characterization of proteins. Our projects focus on the pharmaceutically relevant class of membrane proteins. Both products and services are offered: A broad range of products for the affinity chromatography of proteins and stabilization of proteins are manufactured in house at high quality. The product offering is complemented by reagents such as detergents, cell-free expression lysates, nanodisc scaffold proteins, and patented membrane protein crystallization plates. Some particularly relevant membrane proteins (GPCRs) are available as fully characterized preparations.

Our services cover the expression, purification, stabilization and crystallization of soluble and membrane proteins for applications like cryo electron microscopy, antibody generation, crystallization and assays.

Name	EVORION® Biotechnologies GmbH
Address	Mendelstrasse 17
Postal Code/City	48149 Münster
Fon	+49 251 287 693-39
E-Mail	info@evorion.de
Internet	www.evorion.de
Employees	13
Founded (year)	2017

EVORION® Biotechnologies

EVORION® Biotechnologies GmbH specialized in developing innovative high-performance live-cell analysis systems to decipher highly complex biological mechanisms like cellular communication at single cell resolution.

The unique microfluidic chip-based technology allows the user to manipulate single living cells in biological matrices, and to investigate individual cells for multiparametric analysis. The approach is highly parallelized, e.g. providing simultaneous and fast analysis of thousands of cell interactions at a time. This novel approach will accelerate cell biology research, clinical product development and the development of novel and effective cell therapies targeting cancers and many other diseases.

The Institut für Innovationstransfer GB Biotech (IIT Biotech) offers integrated genomic services. Since some years the main provided service is the "next generation sequencing".

The high-throughput techniques performed by Illumina HiSeq and MiSeq or by IonTorrent PGM can be offered combined with a powerful lab & bioinformatic pipeline providing full service tasks like genomic assembly, gap closure and annotation.

Furthermore we offer individual solutions for the bioinformatic evaluation of project data. This includes construction of draft-genomics, storage/care of genome projects, analysis in resequencing and metagenomics and development/customization of analysis-software.

Name	IIT BioTech - Institut für Innovationstransfer an der Universität Bielefeld GmbH
Address	Universitätsstr. 25
	University of Bielefeld
Postal Code/City	33615 Bielefeld
Fon	+49 521 106 8756
Fax	+49 521 106 89041
E-Mail	service@iit-biotech.de
Internet	www.iit-biotech.de
Employees	14
Founded (year)	1995

ISOLOID

AMYLOID PROTEINS AND PEPTIDES

High-purity samples of amyloid proteins and peptides are a key prerequisite for research and development on many severe diseases, such as Alzheimer's, Parkinson's and Diabetes mellitus type 2. However, the biotechnological production of these proteins turned out to be challenging due to harmful effects on the producing organisms.

Based on an innovative and proprietary technology Isoloid GmbH overcame this challenge to offer high purity protein samples and labeled derivatives to your lab.

As a joint spin-off from Heinrich-Heine-University Düsseldorf and Forschungszentrum Jülich we build on a strong expertise and plenty years of experience in structural biology and biophysics to promote your research project.

Name	Isoloid GmbH
Address	Erkrather Str. 401
Postal Code/City	40231 Düsseldorf
Fon	+49 211-81 15143
E-Mail	info@isoloid.de
Internet	www.isoloid.de
Employees	<10
Founded (year)	2015

At LenioBio GmbH, everything we do begins with our Mission: to provide our customers with innovative solutions that address their toughest challenges – easily, quickly and more efficiently. This deep commitment is at the core of our name: Lenio, from the Latin "to ease, make better".

LenioBio is a biotech company that develops and markets a novel and proprietary protein production platform, ALiCE®, which enables protein drugs to be brought to market faster and at lower cost. ALiCE® is exclusively licensed from DowDuPont and the Fraunhofer Institute.

ALiCE® will target to pharma & biotech sector to make development and manufacture of protein drugs faster and more efficiently than existing production systems.

ALiCE® offers a fully integrated protein production platform with unique capabilities and the ability to scale with customers' needs.

Name	LenioBio GmbH
Address	Erkratherstr 401
Postal Code/City	40231 Düsseldorf
Fon	+49 211 890940300
E-Mail	info@leniobio.com
Internet	www.leniobio.com
Employees	33
Founded (year)	2016

Name	Lonza Cologne GmbH
Address	Nattermannallee 1
Postal Code/City	50829 Cologne
Fon	+49 221 99199-190
E-Mail	info.cologne@lonza.com
Internet	www.bioscience.lonza.com
Employees	109
Founded (year)	1998

Lonza

The Lonza Cologne site develops, manufactures and markets a comprehensive product portfolio of life-science research tools around cultured cells, including non-viral gene transfer products for primary cells and hard-to-transfect cell lines.

These products support scientists worldwide, enabling more efficient identification of new targets for pharmaceuticals and therapies. Additionally Lonza Cologne GmbH offers customized services, e.g. transfection services, proliferating cell services and cell modification services.

Name	Miltenyi Biotec B.V. & Co. KG
Address	Friedrich-Ebert-Str. 68
Postal Code/City	51429 Bergisch Gladbach
Fon	+49 2204 8306-0
Fax	+49 2204 85197
E-Mail	macs@miltenyibiotec.de
Internet	www.miltenyibiotec.com
Employees	3,000
Founded (year)	1989

MACS
Miltenyi Biotec

Miltenyi Biotec develops products and services that advance biomedical research and cell therapy. Our technologies inspire scientists in basic and translational research, and support clinical applications. Our integrated solutions enable sample preparation, cell separation, cell sorting, flow cytometry, cell culture, and molecular analysis.

Over 30,000 scientific publications and the manufacture of more than 50,000 cell products for clinical use demonstrate the profound trust scientists and clinicians have in MACS® Technology.

Miltenyi Biotec has been at the forefront of immunology, stem cell biology, cancer research, and neuroscience, as well as the clinical areas of hematology, graft engineering, and apheresis, for nearly 30 years. About 3,000 employees in 28 countries are passionate about our cell and gene therapy solutions.

Name	PAIA Biotech GmbH
Address	Gottfried Hagen Str. 60-62
Postal Code/City	51105 Köln
Fon	+49 221 1686 2380
E-Mail	info@paiabio.com
Internet	www.paiabio.com
Employees	10
Founded (year)	2014

PAIA

PAIA Biotech GmbH offers assays for the rapid quantification of antibodies and proteins as well as glycosylation assays based on its proprietary technology. This technology uses proprietary 384-well microplates that drastically simplify the workflow of bead-based immunoassay with fluorescence detection. The assays are amenable to automation and run on fluorescence plate readers or microscopes. PAIA Biotech focuses on products for screening applications with limited sample volume and high throughput requirements, e.g. in early cell line development.

In addition to off-the-shelf products PAIA Biotech GmbH also offers custom assay development.

PAIA Biotech GmbH was founded in 2014 and is based at the RTZ in Cologne.

PL BioScience
WE DELIVER CELL SOLUTIONS

PL BioScience is an ambitious and dynamic life science start-up committed to cell expansion in animal-free conditions. The company has developed a platform of novel cell culture supplements derived from human platelets. The platform includes several innovations, e.g. a patent-protected 3D cell culture system and virus-inactivated solutions. The tailored cell culture supplements cover all needs of cell expansion in academic research, preclinical research and cellular therapy. The broad product portfolio ensures seamless transitions from bench to bedside to enable cellular therapeutics for patients in need.

Name	PL BioScience GmbH
Address	Dennewartstraße 25-27
Postal Code/City	52068 Aachen
Fon	+49 241 95719-100
Fax	+49 241 95719-109
E-Mail	info@pl-bioscience.com
Internet	www.pl-bioscience.com
Founded (year)	2015

PlasmidFactory®
The Minicircle Company

PlasmidFactory is the leading contract manufacturer of plasmid and minicircle DNA and the driving force in the development of non-viral vectors for gene therapy and genetic vaccination. PlasmidFactory's research and development as well as the complete service are located in Bielefeld, Germany. The company offers the production of plasmid and minicircle DNA in several quality grades: Research Grade and ccc Grade for research purposes and preclinical applications, High Quality Grade as starting material for e.g. GMP production of RNA and viral vectors and GMP Grade for clinical applications.

Besides production of individual plasmids and minicircles, In Stock products that are deliverable immediately "off-the-shelf", e.g. reporter genes and AAV Helper & Packaging vectors (pDG/ pDP family, several serotypes) are also provided.

Name	PlasmidFactory GmbH & Co. KG
Address	Meisenstr. 96
Postal Code/City	33607 Bielefeld
Fon	+49 521 2997-350
Fax	+49 521 2997-355
E-Mail	info@plasmidfactory.com
Internet	www.plasmidfactory.com
Employees	27
Founded (year)	2000

PROTAGEN
Protein Services

Protagen Protein Services (PPS) is a world leading CRO and recognized expert for analytical services in protein science. Since 1997 PPS has gained market experience and has set up a comprehensive spectrum of state-of-the-art analytical methods ensure highest quality.

PPS provides assistance to customers in the pharmaceutical, biotech and life science industry, partnering them throughout the entire process of developing biopharmaceuticals from candidate selection to approval.

Name	Protagen Protein Services GmbH
Address	Otto-Hahn-Straße 15
Postal Code/City	44227 Dortmund
Fon	+49 231 9742-6100
E-Mail	contact@ProtagenProtein Services.com
Internet	www.ProtagenProtein Services.com
Employees	130
Founded (year)	1997

Name	Proteona GmbH
Address Postal Code/City	 50931 Köln
E-Mail Internet	info@proteona.com https://proteona.com
Employees Founded (year)	10-20 2017

Proteona is a biomedical company in Germany, Singapore and the US that is pioneering the use of single cell proteogenomics to improve clinical outcomes in cancer. Using a combination of innovative single cell assays and AI-assisted bioinformatics, Proteona provides a comprehensive sample to answer service that enables users to phenotype cells using standard protein markers and gain a deeper understanding of cell activity based upon their gene expression profiles. Proteona is leading an international alliance to develop neutralizing antibodies against coronaviruses including SARS-CoV-2. In addition, Proteona supports partners developing COVID-19 therapies and vaccines with single cell immune profiling services.

Name	Serengen GmbH
Address Postal Code/City	Emil-Figge-Str. 76a 447227 Dortmund
Fon Fax E-Mail Internet	+49 231 9742 7227 +49 231 9742 7219 info@serengen.com www.serengen.com
Employees Founded (year)	1 2019

Serengen is a young start-up based on a step-changing DNA-encoded library (DEL) technology that constitutes the most rapid and economic lead generation method, which yet allows for invaluable serendipitous discoveries. Serengen will use its unique platform (CeDEC) to build a pipeline of lead candidates and provide early drug discovery services such as screening and customised synthesis of DELs.

CeDEC removes the existing limitations with DNA-compatible chemistry, thus delivering biologically relevant druglike DELs, which yield hits that can be directly fed into the drug discovery process. For the first time, the unbiased sampling of chemical space for hit identification becomes truly affordable for SMEs, start-ups and non-profit organisations due to the removal of the currently required prohibitively expensive DEL hit modification process.

Name	Squarix GmbH biotechnology
Address Postal Code/City	Elbestr. 10 45768 Marl
Fon Fax E-Mail Internet	+49 2365-20400-0 +49 2365-20400-60 info@squarix.de www.squarix.de
Employees Founded (year)	9 1992

Squarix GmbH is a privately-held primary manufacturer of high purity Discovery Chemicals and Immunoreagents. Since 1992, Squarix produces a broad product line of compounds that include innovative building blocks, reactive intermediates, natural products and derivatives, screening compounds for drug discovery industry and reagents for life science applications comprising antibodies, metabolic intermediates, fluorescent dyes & probes and different affinity matrices for proteins and cells. Moreover, Squarix is a custom producer of polyclonal and monoclonal antibodies for biomedical research and offers all type of immunoanalytical services in the field of antibody technology.

vivo Science is a GLP/GMP certified service company for the pharmaceutical industry (CRO) offering in vivo toxicology studies and is specialized in the testing of immunotoxicity (ICH-S8) and immunogenicity (ICH-S6) of new drug candidates, especially if derived from biotechnology. By merging with the international Texcell Group with subsidiaries in Europe, Asia and North America, vivo Science has expanded its portfolio and now acts as a full service provider in the preclinical testing of biologics, pharmaceuticals, medical devices and chemicals as well as in GMP cell banking and viral safety.

In addition, vivo Science can include immunological tests into standard toxicity studies. vivo Science will provide GLP/GMP compliant, validated study protocols and will assist you in setting up a customized test program for your special requirements.

Name	vivo Science GmbH
Address	Fabrikstr. 3
Postal Code/City	48599 Gronau
Fon	+49 2562 8170-0
Fax	+49 2562 8170-19
E-Mail	info@vivoscience.de
Internet	www.vivoscience.de
Employees	17
Founded (year)	2001

Nanobiotech company having more than 20 years experience in surface derivatisation with bioinert and biofunctional nanocoatings. Manufactures SPR or other biosensor chips, coated slides for protein, cell and DNA based assays. Custom coating of many materials, including glasses, metals and plastic, also for biomedical devices. The hydrogel nanolayers exhibit an excellent haemo- and tissue compatibility and can be derivatized with growth or adhesion factors.

As complement to the biochip product line, XanTec offers SPR biosensors, which allow highly sensitive real-time and label-free detection of biomolecular interactions at the molecular level. These instruments can analyze binding constants / kinetics and allow rapid concentration determination, drug screening, epitope mapping, or adhesion studies with cells or viruses.

Name	XanTec bioanalytics GmbH
Address	Merowingerplatz 1a
Postal Code/City	40225 Düsseldorf
Fon	+49 211 9936-4744
Fax	+49 211 9936-4746
E-Mail	info@xantec.com
Internet	www.xantec.com
Employees	12
Founded (year)	1997

Xell is an innovative partner for the biotech and pharmaceutical industry, providing efficient solutions in cell culture technology. Based on its proprietary technology, Xell has developed a range of customized as well as commercial culture media and feeds for the most commonly used cell types (CHO, HEK, etc). Our chemically defined products are animal-component free and compliant for GMP manufacturing. Apart from the media platform we offer fast and reliable analytical services - among others, proprietary methods for amino acid, vitamin or polyamine analyses. Additionally, cell culture and process services are provided to better understand cellular behavior and optimize cultivation processes. At our production site, we offer large scale production of liquid and powder media as well as related solutions approved by ISO 9001 QMS.

Name	Xell AG
Address	Alte Verler Strasse 1
Postal Code/City	33689 Bielefeld
Fon	+49 521 96989-200
Fax	+49 521 96989-201
E-Mail	info@xell.de
Internet	www.xell.de
Employees	40
Founded (year)	2009

Health and Medicine (including Animal Health)

ABALOS THERAPEUTICS

Abalos Therapeutics has harnessed the unique immune stimulation of the arenavirus to develop a novel anti-cancer approach that provides the full breadth of the immune system's power specifically against cancer cells. Through viral replication within cancer cells, Abalos' arenavirus-based drug candidates are designed to awake precise innate and adaptive immune responses and activate all relevant immune cell types against primary tumors and metastases. Led by experienced biotech entrepreneurs and immunology pioneers, Abalos' goal is to achieve a quantum leap in immuno-oncology.

Name	Abalos Therapeutics GmbH
Address	Merowingerplatz 1 A
Postal Code/City	40225 Düsseldorf
Fon	+49 211 540104-0
E-Mail	info@abalos-tx.com
Internet	www.abalos-tx.com
Employees	10
Founded (year)	2019

Adhesys Medical

Adhesys Medical GmbH develops fully synthetic, biodegradable surgical adhesives. The first product FLIX® is designed for dermal use, to close a great variety of topical wounds, and has received its CE-mark in January 2018. Based on its unique polyurethane platform technology Adhesys develops further products for use inside the human body: either as an adhesive, to seal areas of leakage or re-attach tissue, or as a hemostat, to stop bleeding. The company was founded in 2013 in Aachen, Germany. In February 2014, the founders closed a 7-digit seed investment round with S-UBG, KfW and a group of private investors. In April 2014 the team won the Rice Business Plan Competition in Houston, Texas and expanded to the United States. In April 2017 the company was acquired by the pharmaceutical company Grünenthal and operates now as a whollyowned subsidiary with offices in Aachen, Germany and Boston, United States.

Name	Adhesys Medical GmbH
Address	Zieglerstraße 6
Postal Code/City	52078 Aachen
Fon	+49 241 41250320
E-Mail	info.eu@adhesys-medical.com
Internet	www.adhesys-medical.com
Employees	25
Founded (year)	2013

AiCuris Anti-infective Cures

AiCuris is focused on the discovery, research and development of novel, resistance breaking antiviral and antibacterial agents for the treatment of severe and potentially life-threatening infectious diseases. Marketed products:

- Prevymis® (Letermovir), a terminase-inhibitor of the human cytomegalovirus (CMV), was licensed to MSD and is approved (since 2017) in all major markets for the prophylaxis of CMV infections in bone marrow transplant recipients. Global clinical development in additional indications is ongoing.

Projects in development:

- Pritelivir, a helicase-primase inhibitor, to treat recurrent herpes simplex virus
- AIC649, a novel biological immunomodulator targeting Hepatitis B cure
- Artilysin™ project in cooperation with Lysando targeting multi-drug resistant bacteria
- A number of early stage programs in Virology and Bacteriology

Name	AiCuris Anti-infective Cures GmbH
Address	Friedrich-Ebert-Str. 475
Postal Code/City	42117 Wuppertal
Fon	+49 202 31763-0
Fax	+49 202 31763-1177
E-Mail	info@aicuris.com
Internet	www.aicuris.com
Employees	65
Founded (year)	2006

Name	Algiax Pharmaceuticals GmbH
Address	Max-Planck-Str. 15a
Postal Code/City	40699 Erkrath
Fon	+49 211 617851-15
Fax	+49 211 617851-50
E-Mail	info@algiax.com
Internet	www.algiax.com
Employees	6
Founded (year)	2011

ALGIAX PHARMACEUTICALS

Algiax Pharmaceuticals is a clinical-stage biotechnology company established in 2011. It is dedicated to the discovery and development of innovative products to treat diseases with a high unmet medical need. Algiax' lead candidate AP-325 is a small-molecule GABAA receptor modulator in clinical development as a therapy for neuropathic pain. The comprehensive Phase I program has been finalized in >100 subjects and showed a good safety and tolerability profile in healthy volunteers. Our phase II clinical trial (CURE Study) is up and running. The objective of this study is to show proof-of-concept in patients with post-operative neuropathic pain and results are expected for 2021. Next to AP-325 Algiax has discovered novel GABAA receptor modulator compounds called Thioacrylamide (ThAc) derivatives. The company is advancing a selection of ThAcs derivatives from its discovery to preclinical characterization.

Name	arrows biomedical Deutschland GmbH
Address	Heisenbergstraße 11
Postal Code/City	48149 Münster
Fon	+49 251 534064-00
Fax	+49 251 534064-01
E-Mail	raem@arrows-biomedical.com
Internet	www.arrows-biomedical.com
Employees	10
Founded (year)	2005

arrows biomedical GmbH

arrows biomedical Deutschland carries out contract research and clinical routine analyses, and also pursues its own R&D projects. The firm's areas of focus are primarily in the fields of molecular oncology and neurodegenerative disease. Its portfolio of molecular analytics includes RNA/DNA. Services like RNA/DNA isolation, microarrays(GenExpression, Array-CGH, ChIP on chip, DNA-Methylation-Microarrays), PCR (RT-qPCR, Dpca) and bioinformatics. In the area of medical diagnostics, the portfolio includes routine analysis (testing for all clinical relevant biomarkers and the complete range of blood analysis), flow cytometry (NAVIOS), HPLC analysis, diagnostic microarrays, detection of freely circulating tumor cells, and chemosensitive analysis. Furthermore, FISH analysis, general microscopy with the Zeiss axio imager M 2 in combination with the MetaSystemsSoftware and Pyro-, NGS and Sanger sequencing.

Name	attyloid GmbH
Address	Merowingerplatz 1A
Postal Code/City	40225 Düsseldorf
Fon	+49 211 81 10377
E-Mail	info@attyloid.com
Internet	www.attyloid.com
Employees	<10
Founded (year)	2018

attyloid

attyloid is a biotech spin-off built on strong scientific expertise in protein misfolding and aggregation. We have developed an ultra-sensitive quantitative technology platform with value-adding potential as biomarker of CNS diseases and drug effect assaying, development and QC of biologicals, and counting of viral particles. attyloid is granting access to its proprietary technology as clinical and pre-clinical drug development tool, particularly as biomarker assay for de-risked pharmaceutical drug development. Furthermore, various iterations and custom-made modifications of sFIDA allow the generation of added value in each, and across all, of these R&D work packages.

In this manner, attyloid enables its collaboration partners to generate higher-quality biologicals with increased reproducibility, saving time and costs for the R&D partner.

POLYCHECK® | A BRAND OF BIOCHECK
Diagnostics made in Germany

The Polycheck® Platform Technology was introduced by Biocheck GmbH as a tool for medical in vitro diagnosis of allergies and autoimmune diseases. The solid phase immunoassay technology is a multiparameter test device for serological quantitative screening of disorder-specific immunoglobulins using monoclonal detection antibodies.

Biocheck GmbH offers a broad range of different Polycheck® test panels which can be performed manually or fully automated matching with central Laboratory Information Systems (LIS). Evaluation and calculation is done by picture scanning and by Biocheck Imaging Software.

Name	BioCheck GmbH
Address	Vorbergweg 41
Postal Code/City	48159 Münster
Fon	+49 251 2150-868
E-Mail	office@polycheck.de
Internet	www.polycheck.de
Employees	25
Founded (year)	1999

Biofrontera
Deep in dermatology

Biofrontera AG is a biopharmaceutical company specializing in the development and sale of dermatological drugs and medical cosmetics. Biofrontera develops and markets innovative products for the care, protection and treatment of the skin. The company's lead product is the combination of Ameluz®, a topical prescription drug, and medical device BF-RhodoLED® for the photodynamic therapy of certain superficial skin cancers and their precursors. Ameluz® has been marketed in the EU since 2012 and in the US since May 2016. In addition, the company markets the prescription medication Xepi™ for the treatment of impetigo in the United States. In the EU, the company also sells the dermocosmetics series Belixos®, which offers specialized care for damaged or diseased skin. Biofrontera is the first German founder-led pharmaceutical company to receive a centralized European and a US approval for a drug developed in-house. Biofrontera is listed on the Frankfurt Stock Exchange (Prime Standard) and on the US NASDAQ.

Name	Biofrontera AG
Address	Hemmelrather Weg 201
Postal Code/City	51377 Leverkusen
Fon	+49 214 87632-0
Fax	+49 214 87632-90
E-Mail	info@biofrontera.com
Internet	www.biofrontera.com www.biofrontera-us.com
Employees	154
Founded (year)	1997

Black Drop

Black Drop Biodrucker GmbH is a leading bioprinting company focused on 3D-printing of living cells. Bioprinting is a biomedical key technology that has the potential to improve medical patient treatment in multiple ways. Bioprinted tissue analogues, such as skin, liver, or heart muscle patches offer an ideal platform for drug and toxicity screening. In the future bioprinted tissue implants could be used to maintain, restore, or substitute the function of damaged tissues. As experts in 3D-bioprinting we provide our clients with outstanding bioprinting hard- and software, highly biofunctional bioinks, and bioprinted in-vitro models.

Besides our compact 3D-bioprinter series, Black Drop SuperFill, we construct individualized bioprinting systems and develop tailored organ models.

Name	Black Drop Biodrucker GmbH
Address	Gasborn 41
Postal Code/City	52062 Aachen
Fon	+49 173 2618 104
E-Mail	bioprinting@black-drop.de
Internet	www.thebioprinting.com
Employees	5
Founded (year)	2017

Name	Carpegen GmbH
Address	Mendelstr. 11
Postal Code/City	48149 Münster
Fon	+49 251 980-2320
Fax	+49 251 980-2321
E-Mail	info@carpegen.de
Internet	www.carpegen.de
Employees	12
Founded (year)	2001

CARPEGEN®
individual diagnostic solutions

Carpegen is a provider of high quality molecular diagnostics. The company focuses on developing real-time PCR assays and point-of-care (POC) diagnostics for the diagnosis of specific infections and the detection of genetic biomarkers. Carpegen has developed Carpegen® Perio Diagnostics, a powerful real-time PCR based system that sets new standards in microbiological periodontal diagnostics. A main objective of Carpegen's research program is to develop and out-license POC/PCR systems for diverse applications in human and veterinary medicine, as well as in food/beverage and environmental analytics. Recently, Carpegen developed a new platform for analytics of water pathogens in a joint R&D project.

Since 2020, Carpegen offers sensitive and specific real-time PCR diagnostics for the detection of the coronavirus disease 2019 (COVID-19).

Name	CellAct Pharma GmbH
Address	Otto-Hahn-Str. 15
Postal Code/City	44227 Dortmund
Fon	+49 231 9742-6350
Fax	+49 231 9742-6355
E-Mail	info@cellact.eu
Internet	www.cellact.eu
Employees	7
Founded (year)	2007

cellact

CellAct's small molecule compound, named CAP7.1, targets Topoisomerase II and has shown efficacy and tolerability in various advanced cancer disease in phase I and II clinical studies.

CAP7.1 received orphan drug status for biliary tract cancers from the EMA.

CAP7.1 was acquired by MundiPharma for over >$250 million after a randomized, multi-center, phase II proof-of-concept study in adults with end-stage biliary tract cancer in 2017.

Name	CEVEC Pharmaceuticals GmbH
Address	Gottfried-Hagen-Str. 60-62
Postal Code/City	51105 Cologne
Fon	+49 221 46020-800
Fax	+49 221 46020-801
E-Mail	info@cevec.com
Internet	www.cevec.com
Employees	44
Founded (year)	2003

cevec

CEVEC Pharmaceuticals is a leading provider of high-performance cell technology for the manufacturing of advanced biotherapeutics from R&D to manufacturing scale.

The company's product portfolio comprises platform technologies for gene therapy viral vectors, viral vaccines, Exosomes and complex recombinant proteins. ELEVECTA® is specifically designed for AAV manufacturing, while CAP® addresses Adenoviral vectors, Lentiviral vectors, Oncolytic viruses and Exosomes. CAP®Go is the platform of choice for complex recombinant proteins.

Cilian AG is a biotechnology company developing and marketing a novel expression system. The company uses a species of Ciliates, a eukaryotic single-cell organism, for the production of vaccines, monoclonal antibodies and therapeutic enzymes.

Name	Cilian AG
Address	Johann-Krane-Weg 42
Postal Code/City	48149 Münster
Fon	+49 251 6203-114
Fax	+49 251 6203-116
E-Mail	info@cilian.de
Internet	www.cilian.de
Employees	29
Founded (year)	2001

CreativeTherapeutics GmbH (CT) is a privately-held biotechnology company designing innovative, tailored cancer therapeutics causing genomic and metabolic instability resulting in epigenetic changes leading to activation of the immunesystem.

CT offers collaboration to advance its lead asset CT913 through IND enabling studies to pave the way for Phase I in cancer patients.

Currently there are no approved targeted therapies of this type with such a multifaceted mode of action.

Recognizing the science-based chance to realize the vision for a much more selective and well tolerated anticancer principle CT was founded and started to realize its mission.

Name	Creative Therapeutics GmbH
Address	Am Rohm 86
Postal Code/City	42113 Wuppertal
Fon	+49 178 7272118
E-Mail	zeiler@creative-therapeutics.com
Internet	www.creative-therapeutics.com
Employees	2
Founded (year)	2009

Cygenia is the first company to provide service on epigenetic biomarkers. Epigenetics is a new area of research that holds great potential for cellular analysis.

We have established biomarkers to characterize cell culture with regard to replicative senescence, pluripotency, cellular composition, or classification of mesenchymal stromal cells. In addition, we provide biomarkers to determine the state of aging in blood samples of mice and men.

We are experts in project design and advice you to find the best suitable biomarker for your project. We address particularly scientists and clinicians.

Name	Cygenia GmbH
Address	Am Alten Kalkwerk 14
Postal Code/City	52078 Aachen
Fon	+49 241 53108060
Fax	+49 241 53108069
E-Mail	w.wagner@cygenia.com
Internet	www.cygenia.com
Founded (year)	2014

Name	Evotec SE - Cologne Site
Address	Nattermannallee 1, Building S20
Postal Code/City	50829 Cologne
Fon	+49 221 998818-0
E-Mail	info@evotec.com
Internet	www.evotec.com
Employees	>3.000
Founded (year)	1993

Evotec is a drug discovery alliance and development partnership company focused on rapidly progressing innovative product approaches with leading pharmaceutical and biotechnology companies, academics, patient advocacy groups and venture capitalists. Drug discovery solutions are provided in form of fee-for-service work, integrated drug discovery alliances, development partnerships, licensing of innovative drug candidates and consulting arrangements. Evotec operates worldwide and is headquartered in Hamburg, Germany.

Evotec's Cologne site leverages induced pluripotent stem cell (iPSC) technology for neural and cardiac drug development. This includes bulk production of differentiated cells, assay development and customised services in the context of safety / toxicology studies, in vitro disease modelling and drug discovery screening.

Name	ImmunoQure AG
Address	Königsallee 90
Postal Code/City	40212 Düsseldorf
E-Mail	info@immunoqure.com
Internet	www.immunoqure.com
Founded (year)	2011

ImmunoQure AG is a young biotech company focusing on the research and development of human-derived autoantibodies for the treatment of common human diseases.

Through our unique access to ultra-rare APECED/APS-1 patient populations, we are able to identify patients harboring autoantibodies against naturally occurring self-proteins. The autoantibodies have been optimized by the human immune system for functionality and are outstanding modulators of key proteins involved in e.g., inflammation and autoimmune disorders.

ImmunoQure has established a strategic partnership with Servier Laboratoires, Paris France for the development and commercialization of autoantibodies targeting Interferon-alpha for the treatment of certain human diseases.

Name	InfanDx AG
Address	Nattermannallee 1 Geb. S20
Postal Code/City	50829 Köln
Fon	+49 221 2927-1401
E-Mail	+49 221 2927-1490
Internet	info@infandx.de www.infandx.de
Employees	< 10
Founded (year)	2010

Develops first diagnostic test to detect perinatal asphyxia (PA, oxygen deficit during birth) and related braininjury. PA is very prevalent in childbirth world-wide with 0.5-4 % of births affected, but 5-10% of newborns being at risk while initially being largely asymptomatic, but still develop later e.g. cerebral palsy/spasticism,etc. Available and reimbursed therapy underpins the high medical need, but treatment needs to start within 6 h after delivery. InfanDx conducted 2 clinical studies and currently miniaturizes the system to a blood based point-of-care test.

Technology origin is metabolomics research. Product-pipeline holds further patent backed applications.

InfanDx seeks partnerships such as

- pharma-partnering, („companion diagnostic", therapy monitoring)
- manufacturer of point-of-care devices
- marketing co-operations

The Lead Discovery Center GmbH (LDC) was founded in 2008 and is a professional drug discovery company with all required infrastructure, core competencies and disciplines operating in a fully integrated way at highest industrial standards. LDC is working closely together with a broad academic and industrial network, e.g. the Max Planck Society, universities, pharmaceutical companies, and the Technology Transfer Fund KHAN-1.

LDC functions as facilitator to translate basic research results into professional drug discovery projects. LDC is working on a broad portfolio of early stage drug discovery projects. The indications include cancer and metabolic syndromes, neurodegenerative diseases, inflammatory disorders and infections, as well as other conditions with high, unmet clinical needs.

Name	Lead Discovery Center GmbH
Address	Otto-Hahn-Str. 15
Postal Code/City	44227 Dortmund
Fon	+49 231 9742-7000
Fax	+49 231 9742-7039
E-Mail	info@lead-discovery.de
Internet	www.lead-discovery.de
Employees	86
Founded (year)	2008

LIFE&BRAIN is a biomedical enterprise serving as commercial hub of the University of Bonn Medical Center. Integrating a unique set of expertise, we aim at delivering future-oriented services and products for disease-related research and the development of novel therapies with a focus on neurological and neuropsychiatric diseases.

The four business divisions Cellomics, Genomics, Electrophysiology Services and NeuroEconomics provide human stem cell-based cell culture systems and services for neurological disease modelling and compound development, genome and gene expression analysis, electrophysiology services to characterize small molecules in target engagement, efficacy and potency in human and rodent models and neuroscientific methods for testing marketing effects.

Name	Life & Brain GmbH
Address	Venusberg-Campus 1
	Gebäude 76
Postal Code/City	53127 Bonn
Fon	+49 228 6885-100
Fax	+49 228 6885-101
E-Mail	info@lifeandbrain.com
Internet	www.lifeandbrain.com
Employees	35
Founded (year)	2002

Matricel GmbH develops and produces innovative medical class III collagen implants and biomatrices for applications in medicine and biotechnology.

Matricel´s proprietary technologies are the key to successfully produce biocompatible and biodegradable matrices in a wide range of modifications suitable for the cultivation with human cells in tissue engineering and regenerative medicine. The products serve different medical fields like ACI-Maix and Cartimaix for tissue engineering of articular cartilage and other orthopedic applications and Remaix as a dental membrane for guided bone regeneration.

Matricel´s product Optimaix is dedicated for research in 3D cell culture. Matricel has a promising product pipeline in further medical fields like dermal and nerve regeneration with customized scaffolds.

Name	Matricel GmbH
Address	Kaiserstr. 100
Postal Code/City	52134 Herzogenrath
Fon	+49 2407 5644-0
E-Mail	info@matricel.com
Internet	www.matricel.com
Employees	40
Founded (year)	2001

Name	MLM Medical Labs GmbH
Address	Dohrweg 63
Postal Code/City	41066 Mönchengladbach
Fon	+49 2161 4642100
Fax	+49 2161 4642190
E-Mail	info@mlm-labs.com
Internet	www.mlm-labs.com
Employees	90
Founded (year)	1993

MLM Medical Labs is a GLP-certified and CLIA-and CAP- and ISO15189-accredited central laboratory dedicated exclusively to clinical trials. MLM offers full laboratory services, including a whole range of analytics such as standard safety profiles and analyses of biomarkers, drug compounds and molecular diagnostic parameters.

The MLM lab is on duty 365 days a year to ensure valid results with a quick turnaround time. In December 2019 MLM became part of Great Point Partner's impressive portfolio of growing, profitable health care companies. With their strategic partners in the US and China, MLM offers worldwide central lab services, especially for Europe, USA and China.

The extensive lab portfolio is complemented by a superior IT infrastructure (e.g. mlm online®) and the MLM Kit Building® services for customized sampling kits.

Name	Morphoplant GmbH
Address	Universitätsstr. 136
Postal Code/City	44799 Bochum
Fon	+49 234 7772870
Fax	+49 234 7772870-20
E-Mail	info@morphoplant.de
Internet	www.morphoplant.de
Employees	14
Founded (year)	2002

Morphoplant GmbH is a bio-/ medtec company headquartered at the BioMedizin-Zentrum in Bochum and focused on the integration of biotech functionalities into medical devices. Laboratories equipped with state-of-the-art technology for recombinant protein production, protein chemistry, molecular and cell biology, isotope protein labeling/ monitoring and optical biosensor technology are available to our experienced and multidisciplinary R&D team. Morphoplant's proprietary technologies provide our customers with ultrahydrophilic and osteophilic long-term storable metal implant surfaces and solutions for biocoating of a variety of implant materials with recombinant growth factors (bone/ vascular). Our outstanding expertise in surface functionalization, protein adsorption, kinetics monitoring and animal testing is also available for contract research.

Name	MukoCell GmbH
Address	Otto-Hahn-Straße 15
Postal Code/City	44227 Dortmund
Fon	+49 231 97 42 63 70
Fax	+49 231 97 42 93 71
E-Mail	info@mukocell.com
Internet	www.mukocell.com
Employees	5
Founded (year)	2013

MukoCell GmbH, a pharmaceutical company with headquarters in Dortmund / Germany, has developed an innovative and gentle method for the surgical repair of urethral strictures. Using an autologous cell transplant (Mukocell®), the patient's own cells are used for treating the patient's urological disease. The replacement tissue emerged from the company's own research and development and is the first tissue engineering product in the urology field worldwide that is based on the patient's own cells.

myriad®
WHEN DECISIONS MATTER

Myriad International GmbH in Cologne is part of the Myriad Genetics group of companies, a global leader in molecular diagnostics. We develop and distribute molecular pathological in-vitro diagnostic tests with the aim of improving individual therapy selection for oncological diseases through precise diagnostics.

Our team is highly committed to the development of diagnostic tests, using advanced technologies, to provide patients with personalized medicine and support.

Name	Myriad International GmbH
Address	Nattermannallee 1 Geb. S19
Postal Code/City	50829 Köln
Fon	+49 221 669561-00
Fax	+49 221 669561-99
E-Mail	info@myriad-international.de
Internet	www.myriadgenetics.eu www.endopredict.eu
Employees	25
Founded (year)	2010

NEUWAY Pharma GmbH, Bonn, Germany, is focusing on the preclinical and clinical development of innovative therapeutics for treatment of severe orphan brain diseases based on its proprietary CNS Drug Delivery Platform. The company uses this technology to encapsulate active drug substances that do not cross the blood brain barrier to successfully treat severe orphan brain diseases with a very high medical need. Besides these in-house projects, NEUWAY Pharma also intends to partner its CNS Drug Delivery Technology for application to proprietary compounds of pharmaceutical companies to exploit its therapeutic use in the field of gene therapy and rare CNS indications. The company is backed with venture capital from renowned investors and a strong board.

Name	NEUWAY Pharma GmbH
Address	Ludwig-Erhard-Allee 2
Postal Code/City	53175 Bonn
Fon	+49 228 522798-0
Fax	+49 228 522798-99
E-Mail	info@neuway-pharma.com
Internet	www.neuway-pharma.com
Employees	21
Founded (year)	2014

Oncimmune®

Our intimate understanding of the human immune system enables us to harness its sophisticated response to disease to detect cancer earlier and to support the development of better therapies.

The key to improving cancer survival is early detection and optimal selection for therapy. As a company, we are driven by our passion to improve cancer survival and to give people extra time. Oncimmune's immuno-diagnostic test, EarlyCDT, can detect and help identify cancer on average four years earlier than standard clinical diagnosis.

The unique combination of our core technology and understanding of the immune system, powers our ImmunoINSIGHTS service; a proprietary platform that enables life-science organisations to optimise drug development and delivery, leading to more effective, targeted as well as safer treatments for patients.

Name	Oncimmune Germany GmbH
Address	Otto-Hahn-Str. 15
Postal Code/City	44227 Dortmund
Fon	+49 231 9742-6300
Fax	+49 231 9742-6301
E-Mail	info.do@oncimmune.com
Internet	www.oncimmune.com
Founded (year)	1997

Name	Paion AG
Address	Martinstr. 10-12
Postal Code/City	52062 Aachen
Fon	+49 241 4453-152
Fax	+49 241 4453-523
E-Mail	info@paion.com
Internet	www.paion.com
Employees	50
Founded (year)	2000

PAION AG is a publicly listed specialty pharmaceutical company developing and aiming to commercialize innovative drugs for out-patient and hospital-based sedation, anesthesia and critical care services. PAION's lead compound is remimazolam, an intravenous, ultra-short-acting and controllable benzodiazepine sedative/anesthetic. Remimazolam is partnered in multiple territories outside of Europe, and was approved in Japan, China and the U.S. in 2020.

In Europe, PAION is seeking approval of remimazolam for general anesthesia and for procedural sedation.

PAION's mission is to be a leading specialty pharmaceutical company in the fields of anesthesia & critical care by bringing novel products to market to benefit patients, doctors & stakeholders in healthcare.

Name	Priavoid GmbH
Address	Merowingerplatz 1a
Postal Code/City	40225 Düsseldorf
Fon	+49 211 942 522 98
Fax	+49 211 942 522 99
E-Mail	info@priavoid.com
Internet	www.priavoid.com
Employees	7
Founded (year)	2017

Priavoid is developing disease-modifying therapies for patients with severe neurological disorders like Alzheimer's dementia (AD).

The proprietary development candidates are based exclusively on D-enantiomeric amino acids (D-peptides) and therefore suitable for oral drug administration as capsules or tablets. Priavoid's most advanced compound PRI-002 for the treatment of AD acts via a novel mechanism of action. Aβ peptides play a crucial role in AD. Aβ monomers can assemble to form toxic oligomers that replicate in a prion-like manner. PRI-002 is the first drug substance that acts as an anti-prionic in animals and is safe in humans.

The new mechanistic principle of direct dissolution of toxic oligomers can be applied to other neurodegenerative diseases. Priavoid advances several programs at different stages of pharmaceutical development.

Name	QIAGEN GmbH
Address	Qiagen Str. 1
Postal Code/City	40724 Hilden
Fon	+49 2103 29-0
Fax	+49 2103 29-22000
E-Mail	pr@qiagen.com
Internet	www.qiagen.com
Employees	5,300 worldwide
Founded (year)	1984

QIAGEN is the leading global provider of Sample to Insight solutions that enable customers to gain valuable molecular insights from samples containing the building blocks of life. Our sample technologies isolate and process DNA, RNA, and proteins from blood, tissue and other materials. Assay technologies make these biomolecules visible and ready for analysis. Bioinformatics software and knowledge bases interpret data to report relevant, actionable insights. Automation solutions tie these together in seamless and cost-effective workflows.

QIAGEN provides solutions to more than 500,000 customers around the world in Molecular Diagnostics (human healthcare) and Life Sciences (academia, pharma R&D and industrial applications, primarily forensics). Further information can be found at http://www.qiagen.com.

Qithera

Qithera, Germany, is a "Business Angel Boost" that was founded by Prof. Edgar Dahl (RWTH Aachen University) together with experienced biotech experts of the BIO.NRW network.

The company is developing innovative drugs to suppress tumor progression and metastasis with the goal to improve survival of cancer patients. Qithera's R&D is based on new molecular findings from RWTH research and is implemented in close collaboration with the Hospital of RWTH Aachen University.

By addressing internally validated target molecules that are known to abrogate aggressive characteristics of cancer (stem) cells, Qithera is currently characterizing pharmacologically active compounds that suppress tumor spreading. The first indication of choice is a clinical important subset of bladder cancer whose disease management has been stagnant for decades.

Name	Qithera GmbH
Address	Talstraße 14
Postal Code/City	52525 Heinsberg
E-Mail	info@qithera.com
Internet	www.qithera.com
Founded (year)	2012

RHEINCELL THERAPEUTICS

RheinCell Therapeutics GmbH specializes in the GMP-compliant manufacturing of human induced pluripotent stem cells (iPSCs) as fully characterized starting materials for a new generation of "off the shelf" regenerative therapies. A core product offering is a library of distinct HLA-homozygous iPSC lines produced from rigorously selected, patient-consented cord blood units. As such, each cell line potentially matches thousands to millions of recipients and permits allogeneic cell therapies through significantly reduced immunogenicity.

With state-of-the-art cell culture and processing facilities, RheinCell also offers expert services along the complete iPSC workflow. iPSC experts and production engineers develop and implement protocols for cell differentiation, rigorously characterize and release-test generated cell lines, and establish cell banks in RheinCell's high-security storage facilities.

Name	RheinCell Therapeutics GmbH
Address	Berghausener Str. 98
Postal Code/City	40764 Langenfeld
Fon	+49 2173 32820
Fax	+49 2173 3282015
E-Mail	contact@rheincell.de
Internet	www.rheincell.de
Employees	18
Founded (year)	2017

SOLUVENTIS NANOTHERAPEUTICS

The Soluventis-platform is a powerful drug delivery system, an entirely new type of Nanocarrier characterized by high efficacy and a good safety profile.

The Soluventis Nanocarrier shields transported siRNA or other oligonucleotides from blood and immune system and reaches reliably target organs including poorly vascularized tumor tissue. The active substance is loaded into the liver and into tumors in comparable concentrations.

The targeting of metastases is excellent. The frozen ready-to-use Nanocarrier has a long shelf life in ampoules whereas in the organism it is completely eliminated within two days.

Soluventis has a portfolio of oncologic siRNAs and has experience with different drug candidates of customers. This novel drug delivery system opens the door to therapeutic oligonucleotides and we are facing the first clinical studies.

Name	Soluventis Nanotherapeutics GmbH
Address	Universitätsstrasse 136
Postal Code/City	44799 Bochum
Fon	+49 234 32 29125
Fax	+49 234 32 14191
E-Mail	soeren.schreiber@soluventis.de
Internet	www.soluventis.com
Founded (year)	2018

Name	Syntab Therapeutics GmbH
Address Postal Code/City	St.-Jobser-Straße 56 52146 Würselen
Fon E-Mail Internet	+49 2405 40 999 50 info@syntab-therapeutics.com www.syntab-therapeutics.com
Founded (year)	2010

syntab therapeutics

Syntab Therapeutics is committed to the exploration und development of innovative drugs against severe diseases such as cancer. Syntab's Immune System Engagers (ISErs) exhibit all desirable properties of conventional antibodies while, at the same time, being significantly smaller, chemically accessible molecules.

The company strives for the early outlicensing of product candidates. Syntab's platform technology enables the chemical synthesis of highly effective drugs for immuno-oncology. The flexibility of the technology is based on the application of highly specific binders against cell surface proteins. Furthermore, the technology has the potential to vary the number and specific properties of binders and effectors within the ISEr molecules. The effector part activates the patients' immune system with strong efficacy.

Name	Transimmune AG
Address Postal Code/City	Königsallee 90 40212 Düsseldorf
Fon Fax E-Mail Internet	+49 211 6413 6110 +49 211 8693 1614 info@transimmune.de www.transimmune.com
Founded (year)	2012

TRANSIMMUNE

Transimmune AG is developing novel immunotherapies based on its unique understanding of the physiologic processes underlying the activation of antigen presenting cells. This understanding derives from nearly 30 years of research into the mechanism of action behind Extracorporeal Photopheresis (ECP), arguably the first FDA-approved cellular immunotherapy. ECP is a highly successful immunological treatment used for many years, mainly in cutaneous T cell lymphoma (CTCL), graft versus host disease (GVHD) and organ transplant rejection. Transimmune has created two core technologies; Transimmunization and Transtolerization. These involve protocols for manipulating the immune system that have been reduced to practice through our mouse-to-man development platform, generating compelling preclinical proof-of-concept data. These technologies have the potential to significantly enhance current ECP practice as well as drive its application more broadly into numerous other indications.

Name	UGISense AG
Address Postal Code/City	Otto-Hahn-Straße 15 44227 Dortmund
Fon E-Mail Internet	+49 231 97427063 contact@ugisense.com www.ugisense.com
Employees Founded (year)	2 2016

UGISense

UGISense AG is a mostly virtual biotech company developing Ugimers™, a new type of antisense drugs.

Ugimers™ solve the challenging problems that antisense products have faced: delivery, stability and toxicity.

Their basic structure is a fully artificial peptidic backbone that provides Ugimers™ with stable properties. In addition, this structure also allows for a rational design with regard to modifications, e.g. amphiphilic- and customizable PK-properties in addition to homing tags/peptides. Through these capacities, Ugimers™ can address the specific requirements of envisaged targets.

UGISense has established projects in the fields of oncology, metabolic diseases, muscular dystrophies and peripheral neuropathies.

In comparison to competitor molecules, Ugimers™ have shown up to 10fold efficacy in tissue. IP protection is strong and durable.

UriCell is a spin-off project from the Institute for Stem Cell Research and Regenerative Medicine at the University Hospital Düsseldorf. It is currently funded by the German Federal Ministry for Economic Affairs and Energy through the program "EXIST Transfer of Research I". UriCell aims to establish a personalized kidney screening platform based on an innovative process which allows the isolation and expansion of kidney stem cells from urine samples.

This platform technology includes 3 application fields: i) Nephrotoxicity testing ii) Drug candidate testing for kidney diseases iii) in vitro patient mirroring with individual therapy development.

Our mission is to make a significant and long-lasting impact in the kidney field.

We are looking for investors and partners to engage in exciting collaboration projects to create innovations together.

Name	UriCell
Address	Moorenstraße 5 building 14.80
Postal Code/City	40225 Düsseldorf
Fon	+49 211 81 08260
Fax	+49 211 81 17858
E-Mail	info@uricell.de
Internet	www.uricell.de
Founded (year)	2020

Vaxxinova develops, produces and markets a wide range of innovative vaccines to protect livestock and fish against disease. We create high quality solutions to improve animal health and to support the business of our customers. We believe that innovation and excellence in research are essential to produce premium products that match the current and future requirements in animal health.

The Vaxxinova Group, headquartered in Nijmegen, the Netherlands, was officially named and founded in 2010 but can rely on expertise and presence originating from the 1960s onwards. Our current network comprises production, research & development, sales and diagnostic facilities in 10 countries: Brazil, Chile, Germany, Italy, Japan, Jordan, Norway, the Netherlands, Thailand and the USA. Vaxxinova is active in more than 60 countries.

Name	Vaxxinova Research & Development GmbH
Address	Johann-Krane-Weg 42
Postal Code/City	48149 Münster
Fon	+49 2513 96260712
E-Mail	jaap.kool@vaxxinova.com
Internet	www.vaxxinova.com
Employees	14
Founded (year)	2020

Industrial Biotechnology

b.fab turns CO_2 into value-added products. We are specialized in C1 Bioeconomy and use CO_2 as our feedstock. In a first step, we efficiently convert CO_2 into formate with an electrolyzer. In a second step, formate is used in a bioprocess which converts formate into value-added chemicals, feed proteins and biofuels. We apply Synthetic Biology to engineer microbial cell factories for production of specific products. Our technology platform is built on anaerobic and aerobic microbial cells to provide flexibility in the process design and adaptation to specific product requirements. b.fab offers pathway design, strain engineering, process development and technology licenses to its customers from the chemical, cosmetic, feed and energy industry. b.fab is strongly dedicated to establish the C1 Bioeconomy in the coming years.

Name	b.fab GmbH
Address	Carlo-Schmid-Allee 5
Postal Code/City	44263 Dortmund
Fon	+49-231-55033770
E-Mail	info@bfab.bio
Internet	www.bfab.bio
Founded (year)	2018

bitop

Extremolytes for life

bitop is a global market leader and expert in the biotechnological production and development of extremolytes.

Extremolytes are natural molecules, which protect biological structures. They are found inside of extremophilic plants and microorganisms. Protected by extremolytes, these fascinating living beings can thrive in the harshest habitats one can imagine: salt lakes, deserts, hot springs, the arctic ice or deep sea.

With more than 25 years of experience and passion in the manufacturing of 100% natural, pure and GMO-free extremolytes, bitop is a reliable partner for the pharma, consumer healthcare, cosmetics and life science industry. We develop unique, extremolyte-based medical products and concepts for human and animal health and offer our raw material as multifunctional cosmetic active ingredients to our worldwide customers.

Name	bitop AG
Address	Carlo-Schmid-Allee 5
Postal Code/City	44263 Dortmund
Fon	+49 231 98 77 44-0
Fax	+49 231 98 77 44-10
E-Mail	info@bitop.de
Internet	www.bitop.de
Employees	70
Founded (year)	1993

BSV BioScience GmbH

BSV BioScience GmbH was founded in Oct. 2007 in Baesweiler, near the historical city of Aachen. Since June 2010, the company manufactures and markets biological pharmaceutical active ingredients for different therapeutic areas.

One of our key strengths is based on the production of fertility hormones, being supplied either as API or finished injectables, in co-operation with an also GMP approved German license manufacturer. Our main products are:

- Human Chorionic Gonadotrophin (HCG),
- Human Menopausal Gonadotrophin (HMG),
- Follicle Stimulating Hormone (FSH),
- Urokinase (UK), Streptokinase and Ulinastatin (UTI).

BSV BioScience GmbH is focused on different R&D activities, continuously pursuing improvements in the field of API´s and finished dosage forms.

Name	BSV Bioscience GmbH
Address	Max-Planck-Strasse 12
Postal Code/City	52499 Baesweiler
Fon	+49 2401 8047-10
Fax	+49 2401 8047-198
E-Mail	office@bsvbio.de
Internet	www.bsvbio.de
Employees	40
Founded (year)	2007

Name	Cysal GmbH
Address	Mendelstraße 11
Postal Code/City	48149 Münster
Fon	+49 251 980 2490
Fax	+49 251 980 2499
E-Mail	info@cysal.de
Internet	www.cysal.de
Employees	5
Founded (year)	2012

The innovative biotechnology company Cysal GmbH was founded as a spin-out of the University of Münster, Germany.

Cysal focuses on the production of novel biomaterials in the area of biopolymers, peptides, amino acids, and dipeptides on an industrial scale at unprecedented low-cost, and also develops application fields for these biomaterials to serve humans and animals. Cysal's business strategy aims at out-licensing its technology platform to interested companies and/or offering its raw materials for incorporation into consumer products for various markets.

The main target markets are those for energy food additives and sport nutrition, cosmetics and skin care, dental hygiene, clinical nutrition, immunomodulation, impotence and infertility, as well as in the area of animal feed production, especially for aquaculture.

Name	Enzymaster Deutschland GmbH
Address	Neusser Str. 39
Postal Code/City	40219 Düsseldorf
Fon	+49 211 15821610
Fax	+49 211 15821612
E-Mail	info@enzymaster.de
Internet	www.enzymaster.de
Employees	5
Founded (year)	2018

Enzymaster provides a one-stop solution for the development and commercialization of innovative and sustainable enzyme catalysis technologies. With our proprietary BioEngine® platform and long-term experience, we offer R&D services combined with establishment of complete technology transfer packages, and manufacturing collaborations to fine chemical, pharmaceutical, and other industries. Our portfolio includes enzyme panel screening, smart enzyme engineering, process development, enzyme preparation by fermentation, and biocatalytic manufacturing.

Enzymaster Deutschland GmbH, a subsidiary of Enzymaster (Ningbo) Bio-Engineering Co. Ltd., represents your partner in the international market for enzyme applications and products manufactured by biocatalytic processes. Green Magic Happens Here!

Name	evoxx technologies GmbH
Address	Alfred-Nobel-Str. 10
Postal Code/City	40789 Monheim am Rhein
Fon	+49 2173 4099 40
Fax	+49 2173 4099 440
E-Mail	contact@evoxx.com
Internet	www.evoxx.com
Employees	25
Founded (year)	2006

evoxx technologies GmbH, a German Industrial Biotechnology Company, is focusing on the development and production of industrial enzymes. As European subsidiary of the global enzyme manufacturer Advanced Enzymes Technologies Ltd. a comprehensive product portfolio of enzymatic solutions for human nutrition, animal nutrition, bio-processing and pharma industries is offered. Product development is based on the proprietary technology platform covering the whole value chain from early enzyme and process development to industrial scale production and product deregulation.

evoxx industrial partners and customers benefit from the unique metagenomics libraries, the enzyme development skills and tech-transfer and production capabilities. evoxx is located on the Creative Campus in Monheim am Rhein and on the Biotech Campus Hermannswerder in Potsdam.

GEN-IAL GmbH is a specialist laboratory for DNA based food and feed analyses. GEN-IAL offers services and kits for GMO-, allergene- and animal identity analyses as well as bacteria- and yeast detection and differentiation. We offer training in PCR, contract research, several kits for DNA-extraction, PCR-kits for beer/wine spoilage bacteria and yeast, pathogenes, genetically modified organism (GMO), allergenes, plant and animal-identity. The laboratory is accredited (DIN EN ISO/IEC 17025) and official cross checking laboratory. We are member in the German official working group for method development for GMO detection and quantification. We are an approved laboratory for the German VLOG (Verband Lebensmittel ohne Gentechnik e.V.) for GMO-free labeling.

New: Capturing of microorganism by polymer technology.

Name	GEN-IAL GmbH
Address	Heuserweg 13-15
Postal Code/City	53842 Troisdorf
Fon	+49 2241 252-2980
Fax	+49 2241 252-2989
E-Mail	info@gen-ial.de
Internet	www.gen-ial.de
Employees	10
Founded (year)	1998

IMAX Discovery is a research driven company, creating new product innovation through the generation and development of novel and natural ingredients for the food, beverage, perfume and cosmetic industries. IMAX Discovery offers its clients and partners integrated solutions for the entire flavour, fragrance and cosmetic discovery process starting from target identification and validation up to the selection and development of new bioactive compounds by providing services, tools and integrated solutions tailored to the client's and partner's specific needs. Using its strong technology platforms and expertise around taste, olfactory receptors and natural products, IMAX Discovery also generates proprietary product pipelines of natural product based on novel taste and fragrance modulators. IMAX Discovery is a subsidiary of Axxam SpA in Milan, Italy.

Name	IMAX Discovery GmbH
Address	Otto-Hahn-Str. 15
Postal Code/City	44227 Dortmund
Fon	+49 160 90890824
E-Mail	info@imax-discovery.com
Internet	www.imaxdiscovery.com
Founded (year)	2010

Legendairy Foods is Europe's first cellular agriculture company for clean dairy products. We are developing real bovine proteins through biotechnology to produce the world's first animal-free cheese. But we are not stopping there: we are on a mission to revolutionize the food sector as a whole.

We are a venture-backed fast-growing company based in Berlin and Rheinbach. We employ a global team of highly skilled entrepreneurs and scientists. Our common thread? A passion for challenging the status quo and transforming the food industry.

Name	LegenDairy Foods GmbH
Address	Marie-Curie-Str. 1
Postal Code/City	53359 Rheinbach
Fon	+49 2226 872980
E-Mail	britta@legendairyfoods.de
Internet	www.legendairyfoods.de
Employees	18
Founded (year)	2019

Name	m2p-labs GmbH
Address	Arnold-Sommerfeld-Ring 2
Postal Code/City	52499 Baesweiler
Fon	+49 2401 805-330
Fax	+49 2401 805-333
E-Mail	info@m2p-labs.com
Internet	www.m2p-labs.com
Employees	60
Founded (year)	2005

m2p-labs high-throughput microbioreactors (BioLector®) provide intelligent, online monitored (biomass, fluorescence, pH and DO) micro fermentation technology for screening and bioprocess development.

The systems increase the number of microbial experiments (aerobic/microaerophilic/strict anaerobic) as well as the information content, and are approved for bacterial, yeast, fungi, plant and insect cells. The BioLector® Pro with its microfluidic chip technology, continuously controls the pH value of each culture individually as well as the feeding for realizing fed-batch cultivations.

The microbioreactor systems combined with a standard liquid handling robot (RoboLector®) allow automated micro fermentation of the whole bioprocess.

Name	multiBIND biotec GmbH
Address	Gottfried-Hagen-Str. 60-62
Postal Code/City	51105 Clogne
Fon	+49 221 2780-211
Fax	+49 221 2780-213
E-Mail	info@multibind.de
Internet	www.multibind.de
Employees	3
Founded (year)	2005

multiBIND develops innovative disinfection and decontamination solutions for research and healthcare. Core technology are two patent pending solution systems to generate new disinfectants and decontamination agents with high antimicrobial activity efficacy especially against all viruses including coronavirus. Currently bioDECONT® is the only agent that in addition to the effective killing of microorganisms also accomplishes safe and complete elimination of genetic material (DNA/RNA) to avoid cross-contaminations in PCR analysis and DNA testing. Besides its high antimicrobial activity and decontamination properties, bioDECONT® is nontoxic for humans, noncorrosive and free of alcohols or other hazardous chemicals. multiBIND pursues a partnering strategy and respective products are on the markets of the EU, USA and China.

Name	NUMAFERM GmbH
Address	Merowingerplatz 1a
Postal Code/City	40225 Düsseldorf
Fon	+49 211 9753290-0
E-Mail	info@numaferm.com
Internet	www.numaferm.com
Employees	12
Founded (year)	2017

NUMAFERM has developed an efficient and effective biotechnology for the production of recombinant peptides. The drawbacks of available bioprocesses are overcome – for example proteolytic damage, aggregation and toxicity issues. Our technology serves as a reliable platform for peptides of any length.

Our mission is to make peptides cheaper and their production more eco-friendly in comparison to predominant chemical synthesis. With lower prices and a scalable process, they also become accessible for non-pharmaceutical applications.

Founded in 2017, NUMAFERM is a venture capital-backed startup company headquartered in Düsseldorf, Germany.

PHYTOLINC

Phytolinc is a spin-off from the University of Cologne and has developed an innovative photobioreactor for microalgae production as well as water purification purposes.

The unique membrane system enables a highly efficient cultivation of microalgae, the pro- duction of new algae species and perfectly suits applications in the water treatment industry.

For more information, feel free to visit our website or contact us directly (www.phytolinc.com).

Name	PHYTOLINC UG
Address	Vitalisstraße 67
Postal Code/City	50827 Köln
E-Mail	info@pyhtolinc.com
Internet	www.phytolinc.com
Employees	4
Founded (year)	2017

phytowelt GreenTechnologies GmbH

Phytowelt operates industrial plant biotechnology to help unleashing the potential of plants. It is a leading provider for the identification and expression of genes encoding plant enzymes. These enzymes offer new possibilities for industrial fermentation, targeting fatty acids, terpenoids and plant P450 enzymes. Additionally,

Phytowelt offers solutions in plant breeding to improve plants by protoplast fusion, genome editing and double haploid production. Like this for example biomass and secondary metabolite production can be optimized.

A big poplar collection for biomass production combined with a unique fermentation process for terpenes in E.coli, especially carotenoids, is a big success factor and USP for Phytowelt. The raspberry flavour, R-Alpha-Ionone is Phytowelt`s first fermentatively produced product and on the market available product.

Name	Phytowelt GreenTechnologies GmbH
Address	Kölsumer Weg 33
Postal Code/City	41334 Nettetal
Fon	+49 221 669 639-03
Fax	+49 221 669 578-361
E-Mail	contact@phytowelt.com
Internet	www.phytowelt.com
Employees	30
Founded (year)	1998

SenseUP BIOTECHNOLOGY

SenseUp develops microbial production strains for industrial application by natural evolution. Based on our Corynebacterium platforms for small molecule production, protein & peptide secretion or nucleic acid production, we establish tailor-made production strains and fermentation processes for our customers.

Name	SenseUP Biotechnology GmbH
Address	Campus Forschungszentrum
Postal Code/City	52428 Jülich
Fon	+49 2461 615529
E-Mail	info@senseup.de
Internet	www.senseup-biotech.com
Employees	10
Founded (year)	2015

Name	Senzyme GmbH
Address	Gierlichsstr. 6
Postal Code/City	53840 Troisdorf
Fon	+49 2241 9715-2000
Fax	+49 2241 9715-2499
E-Mail	info@senzyme.de
Internet	www.senzyme.de
Employees	42
Founded (year)	2000

Senzyme GmbH develops and produces technical enzymes and functional feed materials for the bioenergy and animal nutrition markets.

The production process is based on solid-state-fermentation using filamentous fungi, where the company has a many years experience and substantial Know How.

Name	SeSaM-Biotech GmbH
Address	Forckenbeckstraße 50
Postal Code/City	52074 Aachen
Fon	+49 241 93856979
E-Mail	info@sesam-biotech.com
Internet	www.sesam-biotech.com
Founded (year)	2008

SeSaM-Biotech is dedicated to the directed evolution of enzymes. With our comprehensive KnowVolution strategy we help companies from biotech and pharma with their enzyme developments. We provide the best combination of top-of-the-line mutagenesis technologies and rational design by computational modelling and simulation to successfully increase your enzyme's performance.

SeSaM-Biotech tunes enzyme properties like activity, thermal resilience, protease resistance, solvent/pH stability, and substrate/product inhibition. The track record of 10 years of successful protein engineering includes enzymes of all classes for the biotechnological sectors pharma, chemistry, cosmetics, flavors, nutrients, feed, laundry, food/beverages, biofuel, textiles and paper.

Name	W42 Industrial Biotechnology GmbH
Address	Otto-Hahn-Straße 15
Postal Code/City	44227 Dortmund
Fon	+49 176 82182604
E-Mail	info1@w42biotechnology.de
Internet	www.w42biotechnology.de
Employees	3
Founded (year)	2005

W42 GmbH is your partner for enzyme production and process development. We offer: High performance heterologous protein production in Pichia sp. Wide range of different strains and promoters – best choice for your project. Methanol dependent and customer specific 'fine-tuning' process control for high yield protein production. Complete processes are offered including: strain development – fermentation – DSP – enzyme immobilisation – biocatalytic process development. Since 2005 W42 GmbH has carried out many successful projects for industrial partners in Europe and P.R. China. Several improved strains are running on industrial scale for production of technical enzymes.

Recently W42 has established a European Network for the development, production, licensing and marketing of vaccines for animal health with focus on aquaculture sector. Focus is the development of 2nd generation recombinant vaccines. We are offering complete service for your vaccine candidate.

Apply Now

startups4.eu

BIO Clustermanagement NRW GmbH
Merowingerplatz 1
40225 Düsseldorf, Germany

phone: +49 (0) 211 942 150 49
mail: info@bioclustermanagement.de
web: www.bioclustermanagement.de

Agrobiotechnology

It is estimated that plant pathogens are responsible of world-wide losses in the range of billions of euros per year. Therefore, there is a strong need to provide effective, broad range and environmentally friendly approaches to ensure protection of plants from pathogens. We developed a patented platform based on antibody fusions which ensures plant protection from fungal and bacterial infections. This alternative approach for controlling plant pathogens and parasites aims at minimising the costs for cultivation of crops thereby reducing the toxic effects of pesticides and toxins for human beings.

AgroProtect GmbH licences its proprietary technology and offers the generation of pathogen resistant plants as well as access to novel resistant cultivars of several crops.

Name	AgroProtect GmbH
Address	Pfarrer-Holzberg-Straße 20
Postal Code/City	52511 Geilenkirchen
Fon	+49 2451 914 8783
Fax	+49 2451 914 8784
E-Mail	info@agroprotect.de
Internet	www.agroprotect.de
Founded (year)	2010

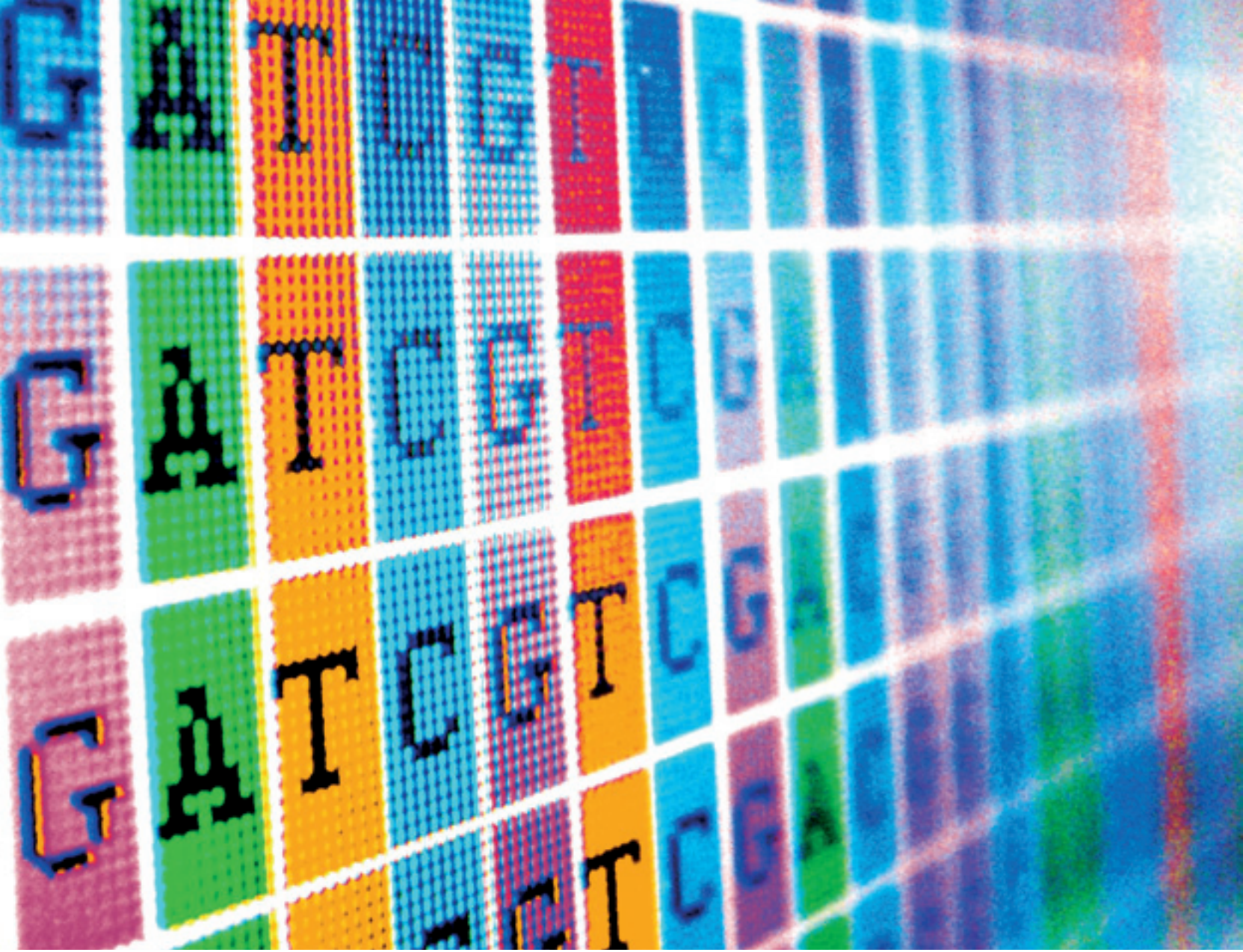
Bex-Bio-Tec is engaged in plant-system-diagnostics. With our specialized approach, we help to find the most efficient, sustainable and individual solutions to finally enhance yields in agriculture. Plant performance is tremendously influenced by plant varieties, location-specific parameters (soil, temperature, water), fertilizers, and other plant-treatments. Even though we cannot control the weather, we facilitate solving problems in agriculture of today and, especially, tomorrow. Our scientific approach reproducibly identifies influences on growth, yield, fruit quality and stress-tolerance. Consequently, we can assess and improve efficacy by identifying "horses for courses".

With our unique laboratory test system, we can provide data in exceptionally short time and even detect on a molecular level what happens in the plant.

Name	Bex-Biotec GmbH&Co.KG
Address	Siemensstr. 42
Postal Code/City	59199 Bönen
Fon	+49 2383 919270
E-Mail	info@bex-biotec.com
Internet	www.bex-biotec.com
Employees	3
Founded (year)	2018

Saaten-Union Biotec offers services and contract research in the field of plant breeding (rapeseed, barley, wheat, triticale, durum, spelt, oat, potato). The development of new varieties of cereals, rapeseed and other crops is strongly build upon innovation. Application of tissue culture technologies (doubled haploids, embryo rescue) and molecular marker applications are routinely used in a wide range of crops and for a significant number of breeding traits.

Name	Saaten-Union BIOTEC GmbH
Address	Hovedisser Str. 94
Postal Code/City	33818 Leopoldshöhe
Fon	+49 5208 95971-0
Fax	+49 5208 95971-96
E-Mail	info@saaten-union-biotec.com
Internet	www.saaten-union-biotec.de
Employees	80
Founded (year)	1984



Bioinformatics

BioSolveIT

expect actives!

BioSolveIT visualizes drug discovery. Our fast and easy-to-use software enables every chemist to advance their research. Perceptive visualization helps you to understand computational results at a glance. We believe in full transparency, and all the science behind our software is published. Our trusted platforms SeeSAR and infiniSee support you in structure-based and ligand-based drug discovery and inspire you with new, vivid ideas. We are passionate about the needs of our customers and live this through the discovery services we offer. Working together with users in this way helps us to stay at the forefront of current research, addressing the questions that chemists are interested in right now. We aspire to develop software that is indispensable to drug discovery and, more importantly, software that is a pleasure to use every day.

Name	BioSolveIT
Address	An der Ziegelei 79
Postal Code/City	53757 Sankt Augustin
Fon	+49 2241 25250
Fax	+49 2241 25255-25
E-Mail	contact@biosolveit.de
Internet	www.biosolveit.de
Employees	17
Founded (year)	2001

noscendo

In order to successfully treat the infected patient, you have to recognise and diagnose most reliably the infecting microbe.

Noscendo GmbH, a Duisburg (Germany) based molecular diagnostics company, changes the way infection causative microbes are identified. Introducing a paradigm shift using proprietary algorithms and software harnessing next generation sequencing of cell free nucleic acids isolated from patient samples Noscendo brings the concept of liquid biopsy into the field of infectious diseases.

Noscendo's software solution is capable of differentiating infection from non-infectious signals and thereby aiding intensive care clinicians in their daily task to find the right decisions, enabling a targeted and successful treatment in an actionable timeframe.

Name	Noscendo GmbH
Address	Königstr. 34
Postal Code/City	47198, Duisburg
Fon	+49 2066 50687 80
E-Mail	info@noscendo.com
Internet	www.noscendo.com
Employees	<10
Founded (year)	2017

ridom

BIOINFORMATICS

The Ridom GmbH (Münster, Germany) was founded January 2003. The company develops software for DNA re-sequencing analysis for physicians and epidemiologists on routine basis. The company has in the meantime by its software products a well-recognized name in the field of sequence based microbial typing; e.g., every European National Health System Authority (e.g., RKI, RIVM, HPA, Serum Statens) has bought in the last 10 years and is using since then at least one software product from Ridom. Ridom has pioneered typing efforts with a software tool for Staphylococcus aureus. The company has developed and maintains the worldwide largest sequence-based microbial typing database (Ridom SpaServer). The SPA typing software Ridom StaphType is currently used by approximately 400 users in 36 different countries worldwide. The new Ridom SeqSphere+ software provides a bacterial typing solution for any bacteria, any study type, any lab.

Name	Ridom GmbH
Address	Mendelstr. 11
Postal Code/City	48149 Münster
Fon	+49 251 490931-50
Fax	+49 251 490931-51
E-Mail	info@ridom.de
Internet	www.ridom.de
Employees	4
Founded (year)	2003

Other Biotechnologically Active Companies

Bayer is a global enterprise with core competencies in the life science fields of health care and nutrition. Its products and services are designed to benefit people by supporting efforts to overcome the major challenges presented by a growing and aging global population. At the same time, the Group aims to increase its earning power and create value through innovation and growth. Bayer is committed to the principles of sustainable development, and the Bayer brand stands for trust, reliability and quality throughout the world.

In fiscal 2018, the Group employed around 117,000 people and had sales of 39.6 billion euros. Capital expenditures amounted to 2.6 billion euros, R&D expenses to 5.2 billion euros. For more information, go to www.bayer.com.

Name	Bayer AG
Address	Kaiser-Wilhelm-Allee 1
Postal Code/City	51368 Leverkusen
Fon	+49 214 30-1
Internet	www.bayer.com
Employees	117,000

MANY TASKS. ONE NAME: CELLEX CELL PROFESSIONALS

Cellex offers a broad spectrum of services for clinical as well as for research institutions in the field of cellular therapies. In Cellex apheresis centers, haematopoietic blood stem cells, lymphocytes, erythrocytes and granulocytes are collected for patients all over the world.

We also operate a database for lymphocyte donations, which can be requested for research purposes. In our state-of-the-art GMP facility, cellular components can be separated and frozen, genetically modified and analyzed. We are active in the research and development of cancer therapeutics. We take care of fast and safe cell transports to worldwide destinations. Cellmo Cellex molpe IT Solutions develops and validates software programs.

Cellex Foundation supports medical research and treatment and human appreciation.

Name	Cellex Cell Professionals GmbH
Address	Im Mediapark 6B
Postal Code/City	50670 Köln
E-Mail	info@cellex.me
Internet	www.cellex.me
Employees	261
Founded (year)	2001 Dresden 2009 Köln

Deutsche Saatveredelung AG is an international plant breeding company with headquarters in Germany. The main focus is on research and development in breeding and seed production for different crop plant species.

Our major products include rapeseed, wheat, barley, corn/maize, pasture and turf grasses, and different intercrop species. Breeding is run on nine breeding stations in Europe and two in Canada. We are dedicated to our purpose: Innovation for your growth. Seed of new varieties is produced and processed mostly in Europe and sold world-wide.

In the framework of several cooperations in breeding, production, marketing and sales DSV is partner of several competitive enterprises on the national and international level. Presently, DSV Group employs around 600 people and has a turnover of around EUR 200 million.

Name	Deutsche Saatveredelung AG (DSV)
Address	Weissenburger Straße 5
Postal Code/City	59557 Lippstadt
Fon	+49 2941 296-0
Fax	+49 2941 296-100
E-Mail	info@dsv-saaten.de
Internet	www.dsv-seeds.com
Employees	600
Founded (year)	1923

Name	Evonik Industries AG
Address	Rellinghauser Str. 1-11
Postal Code/City	45128 Essen
Fon	+49 201 177 01
Fax	+49 201 177 3475
E-Mail	bioeconomy@evonik.com
Internet	www.evonik.com
Employees	33,000
Founded (year)	2007

Evonik, the creative industrial group from Germany, is one of the world leaders in specialty chemicals. Profitable growth and a sustained increase in the value of the company form the heart of Evonik's corporate strategy. Its activities focus on the key megatrends health, nutrition, resource efficiency and globalization. Evonik benefits specifically from its innovative prowess and integrated technology platforms.

Evonik is active in over 100 countries around the world. In fiscal 2015 more than 33,000 employees generated sales of around €13.5 billion and an operating profit (adjusted EBITDA) of about €2.4 billion.

Evonik innovates and serves the bioeconomy markets. Products are i. a. Biolys®, DYNACOLL® Terra, DYNAPOL® Terra, RESOMER®, ThreAMINO®, TrypAMINO®, and VESTAMID® Terra.

Name	German Seed Alliance GmbH
Address	Aachener Str. 1053-1055
Postal Code/City	50858 Köln
Fon	+49 221 162 506-0
Fax	+49 221 162 506-29
E-Mail	info@german-seed-alliance.de
Internet	www.german-seed-alliance.de
Employees	45
Founded (year)	2008

German Seed Alliance GmbH is an alliance of five leading German plant breeding companies in international agriculture: Deutsche Saatveredelung, Norddeutsche Pflanzenzucht, Nordsaat Saatzucht, Saatzucht Streng-Engelen and SaKa. The company and its shareholders are internationally experienced enterprises in the field of plant research and development, breeding, seed production and distribution. The main focus is on oilseed rape, potatoes, corn, sunflower, grasses, peas and cereals (especially wheat, barley, rye, oat and triticale).

German Seed Alliance is involved in research programs of the group and is partner of the national and international scientific community in plant research and biotechnology. New varieties are developed and high quality seeds are produced for different climate regions. In sales the first focus is on Russian Federation, with innovative solutions and wide range of seed products combined with professional service and individual consultancy.

Name	Grünenthal GmbH
Address	Zieglerstr. 6
Postal Code/City	52099 Aachen
Fon	+49 241 569-0
E-Mail	info@grunenthal.com
Internet	www.grunenthal.com
Employees	4,700 worldwide
Founded (year)	1946

Grünenthal is a global leader in pain management and related diseases. As a science-based, privately-owned pharmaceutical company, we have a long track record of bringing innovative treatments and state-of-the-art technologies to patients worldwide. Our purpose is to change lives for the better – and innovation is our passion. We are focussing all of our activities and efforts on working towards our vision of a world free of pain.

Grünenthal is headquartered in Aachen, Germany, and has affiliates in 29 countries across Europe, Latin America and the US. Our products are available in more than 100 countries. In 2019, Grünenthal employed around 4,700 people and achieved sales of € 1.4 bn.

Follow us on:
LinkedIn: Grunenthal Group
Twitter: @grunenthalgroup
Instagram: grunenthal

Henkel operates globally with a well-balanced and diversified portfolio. The company holds leading positions with its three business units in both industrial and consumer businesses thanks to strong brands, innovations and technologies.

For more than 140 years, Henkel has been taking a visionary approach to supporting environmental and social progress. We've integrated these criteria into our innovation process, because we recognize the potential impact of our products and technologies being used millions of times around the world every day. Henkel Adhesive Technologies is the global leader in the adhesives market – across all industry segments worldwide.

In its Laundry & Home Care and Beauty Care businesses, Henkel holds leading positions in many markets and categories around the world. Henkel employs more than 52,000 people globally and reported sales of more than 20,0 bn euros in fiscal year 2019. Henkel's preferred shares are listed in the German stock index DAX.

Name	Henkel AG & Co. KGaA
Address	Henkelstr. 67
Postal Code/City	40191 Düsseldorf
Fon	+49 211 7979 630
Fax	+49 211 7982 245
Internet	www.henkel.com
Employees	52,000
Founded (year)	1876

PerkinElmer chemagen Technologie GmbH is a key player in the field of automated nucleic acid isolation with vast experience in the field of DNA and RNA isolation for human genetics, HLA typing, blood banking, and pathogen detection. chemagen's technology for the purification of genomic DNA, cfDNA, RNA, and viral nucleic acids is based on the use of proprietary M-PVA Magnetic Beads in combination with our high-performance instruments.

chemagen has developed numerous kits for the isolation of nucleic acids from various sample materials such as blood, serum or plasma, tissue, saliva, buccal swabs, amniotic fluid or stool samples. PerkinElmer chemagen routinely develops customized solutions addressing any specific requirements for DNA or RNA purification in close coordination with clients. IVD versions of instruments and kits are available.

Name	PerkinElmer chemagen Technologie GmbH
Address	Arnold-Sommerfeld-Ring 2
Postal Code/City	52499 Baesweiler
Fon	+49 2401 805500
Fax	+49 2401 805519
E-Mail	support.chemagen@perkinelmer.com
Internet	www.chemagen.com
Employees	>60
Founded (year)	1997

Since more than 70 years, Pharma Waldhof GmbH is experienced in Nucleic Acid Biochemistry and Co-Enzymes. Our success is based on delivering quality value added products in various segments like Pharma APIs and Intermediates, Cosmetics- and Cell Culture Media Ingredients, and Diagnostics. Pharma Waldhof belongs to the multinational Aceto Group.

Pharma Waldhof maintains manufacturing and technical collaboration with selected and world-renowned biotechnology companies and research institutions as well, qualifying us to flexibly respond to specific customer demands and developments.

Name	Pharma Waldhof GmbH
Address	Hansaallee 159
Postal Code/City	40549 Düsseldorf
Fon	+49 211 52602-0
Fax	+49 211 52602-60
E-Mail	info@pharmawaldhof.de
Internet	www.pharmawaldhof.de
Employees	13
Founded (year)	1974

Name	Syngenta Seeds GmbH
Address	Zum Knipkenbach 20
Postal Code/City	32107 Bad Salzuflen
Fon	+49 5222 5308-0
E-Mail	internet.marketing@syngenta.com
Internet	www.syngenta.de
Employees	150
Founded (year)	2000

Syngenta is a leading agriculture company helping to improve global food security by enabling millions of farmers to make better use of available resources.

Through world class science and innovative crop solutions, our 28,000 people in over 90 countries are working to transform how crops are grown. We are committed to rescuing land from degradation, enhancing biodiversity and revitalizing rural communities.

To learn more visit www.syngenta.com and www.goodgrowthplan.com. Follow us on Twitter® at www.twitter.com/Syngenta.

Name	Taros Chemicals GmbH & Co. KG
Address	Emil-Figge-Str. 76a
Postal Code/City	44227 Dortmund
Fon	+49 231 226198-11
Fax	+49 231 226198-19
E-Mail	info@taros.de
Internet	www.tarosdiscovery.com
Employees	65
Founded (year)	1999

Taros, a privately owned chemistry CRO and custom synthesis company has been serving pharmaceutical, biotech and chemical companies since 1999. Within our drug discovery division, our mission is to create clinical candidates as potential new medicines. Taros has a strong scientific track record on many biomolecular targets in all main therapeutic areas and thereby adding considerable value to collaborations from target validation and hit identification to lead optimization. Taros' chemical services include custom synthesis, process chemistry, medicinal chemistry, computational chemistry and molecular design, as well as compound library design and production. Taros was leading the chemistry activities of the European Lead Factory (ELF), EU's 196 million EUR drug discovery platform and is also part of its recent continuation (ESCulab).

Name	UCB Pharma GmbH UCB Biosciences GmbH
Address	Alfred-Nobel-Str. 10
Postal Code/City	40789 Monheim
Fon	+49 2173 4848-48
Fax	+49 2173 4848-41
E-Mail	ucbcares.de@ucb.com
Internet	www.ucb.com; www.ucb.de
Founded (year)	1928 (Belgium)

Inspired by **patients.**
Driven by **science.**

UCB is a global biopharmaceutical company with around 7,500 people worldwide. We focus on neurology and immunology disorders – putting patients at the center of our world. UCB is connecting science in new ways, notably chemistry and biology, so that they can leverage the potential of these two disciplines, as well as illuminate the biological pathways involved in severe diseases. The complexities of severe diseases are beyond the expertise and resources of a single organisation.

Developing and commercialising innovative therapies is often the result of strong partnerships. That is why we value partnering with leading academic, biotech and pharma companies to bring new solutions for patients. There is no such thing as an "average patient". We are seeking to embed the real needs of specific patient populations in our science and innovation process.

W. von Borries-Eckendorf is a medium-sized family-owned company, founded in 1849 by Wilhelm von Borries (1805-1890), a prominent farmer and talented plant breeder. Starting with the "Eckendorfer" fodder beet, WvB is nowadays well known for strong breeding programs in oilseed rape, barley and high yielding wheat varieties.

The company based in Lippe is founding member of the Rapool Ring GmbH and the Saaten-Union Biotec GmbH.

Along with other breeding companies, Eckendorf is significantly involved in one of the largest distributors in the German sector of seed, the Saaten-Union GmbH.

Name	W. von Borries-Eckendorf GmbH & Co. KG Pflanzenzuchtbetrieb
Address	Hovedisser Strasse 94
Postal Code/City	33818 Leopoldshöhe
Fon	+49 5208 9125-30
Fax	+49 5208 9125-49
E-Mail	info@wvb-eckendorf.de
Internet	www.wvb-eckendorf.de
Employees	40
Founded (year)	1849

The BIO.NRW Team

Dr. Nils Schrader

Head of BIO.NRW Office

phone: 0211 385 469 – 9203
n.schrader@bio.nrw.de

Key topics

International relations

Dr. Jasmin Schubert

Science Officer

phone: 0211 385 469 – 9204
ja.schubert@bio.nrw.de

Key topics

Bioeconomy
Biotech Databases

Dr. Martina Weßling

Science Officer

phone: 0211 385 469 – 9205
m.wessling@bio.nrw.de

Key topics

Pharmaceutical Biotechnology
BIO.NRW.red

Zaklina Bozic

Team assistant

Phone: 0211 385 469 – 9200
z.bozic@bio.nrw.de

Dr. Katharina Gräfe

Science Officer

phone: 0211 385 469 – 9206
k.graefe@bio.nrw.de

Key topics

Industrial Biotechnology
Spot on Biotechnology Business

Uwe Stetskamp

Finance and Controlling

phone: 02461 61-85046
u.stetskamp@fz-juelich.de


Denmark
Kiel
Hamburg
Schwerin
Netherland
Bremen
Poland
Berlin
Magdeburg
Hannover
Potsdam
Düsseldorf
Dresden
Erfurt
Belgium
Frankfurt
Luxembourg
Mainz
Czech Republic
Saarbrücken
Stuttgart
France
München
Austria
Switzerland

Glossary

Organisation for Economic Co-operation and Development (OECD)

The OECD is a unique forum where the governments of 30 democracies work together to address the economic, social and environmental challenges of globalisation.

The OECD Biotechnology Statistics, which brings together the latest available economic and activity data on biotechnology and innovation, is collected by OECD member and non-member countries.

The report builds on the extensive work of the OECD and national experts to improve the comparability of biotechnology statistics.

www.oecd.org

OECD Definitions

Biotechnology company

... is defined as a application of science and technology to living organisms, as well as parts, products and models thereof, to alter living or non-living materials for the production of knowledge, goods and services.

Dedicated biotechnology companies

... are defined as biotechnology active firms whose predominant activities involve the application of biotechnology techniques to produce goods or services and/or the performance of biotechnology R&D.

Other biotechnologically active companies

... firms that apply biotechnology techniques for the purpose of implementing new or significantly improved products or processes. This definition excludes end users that innovate simply by using biotechnology products as intermediate inputs (for instance, detergent manufacturers that change a formulation to include enzymes produced by other firms via biotechnology techniques).

Business Areas of Activity

– Health/Medicine (including animal health)

Development of therapeutics and/or diagnostics for the field of human medicine, drug delivery, human tissue replacement.

– Agri/Agrobiotechnology

Biotech focussed on genetically modified plants, animals or microorganisms, as well as non-genetically modified plants grown using biotechnological procedures for use in agriculture or forestry.

– Industrial biotechnology

Biotechnological products and processes for the handling of waste or sewage, for chemical synthesis, for the extraction of raw materials and energy, etc.

– Non-specific application

Equipment or reagents based on biotechnological principles for research or provision of services in this field ("ancillary industry").

Source: biotechnologie.de

Sources, Literature, Links

[1] *https://www.vci.de/dib/themen/gesundheitswirtschaft/medizinische-biotechnologie/info.jsp*
[2] *www.vfa-bio.de*
[3] *https://www.nrwinvest.com/de/standort-nrw/das-spricht-fuer-nrw/dynamischer-wirtschaftsstandort/*
[4] *https://www.it.nrw/nrw-einwohnerzahl-lag-auch-mitte-dieses-jahres-bei-179-millionen-97556*
[5] *https://en.wikipedia.org/wiki/Rhine-Ruhr*
[6] *https://www.nrwinvest.com/de/branchen-in-nrw/biotechnologie/*
[7] *https://www.nrwinvest.com/en/nrw-as-location/this-speaks-well-for-nrw/dynamic-business-location-in-the-center-of-europe/*
[8] *https://www.nrwinvest.com/en/nrw-as-location/international-companies-in-nrw/*
[9] *https://www.nrwinvest.com/pl/o-nas/publikacje-prasowe/detail/news/detail/News/foreign-direct-investment-in-north-rhine-westphalia-in-2019-remains-on-course-for-success/*
[10] *https://www.it.nrw/statistik/eckdaten/aus-und-einfuhr-zeitreihe-2095*
[11] *https://www.nrwinvest.com/en/nrw-as-location/this-speaks-well-for-nrw/europes-gateway/*
[12] *https://www.nrwinvest.com/en/nrw-as-location/this-speaks-well-for-nrw/dynamic-business-location-in-the-center-of-europe/*
[13] *https://deutscherstartupmonitor.de/wp-content/uploads/2020/09/dsm_2020.pdf*
[14] *https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bildung-Forschung-Kultur/Hochschulen/Publikationen/Downloads-Hochschulen/studierende-hochschulen-endg-2110410197004.pdf?__blob=publicationFile*
[15] *https://webshop.it.nrw.de/gratis/Z249%20201951.pdf*
[16] *https://www.dfg.de/gefoerderte_projekte/programme_und_projekte/listen/index.jsp?id=EXSf*
[17] *https://www.rwth-campus.com/konzept/*
[18] *http://nova-institute.eu/press/?id=211*
[19] *Analysis by BIOCOM AG*
[20] *https://www.bayer.com/sites/default/files/geschaeftsbericht-2019-der-bayer-ag.pdf*
[21] *https://corporate.evonik.com/Downloads/Corporate/BPK/Evonik_Finanzbericht_2019.pdf*
[22] *https://www.biotechgate.com/web/cms/index.php/start.html*

All links were last accessed on 21.12.2020

BIO.NRW
Merowingerplatz 1
40225 Düsseldorf, Germany
Fon +49 211 385469-9200
Fax +49 211 385469-9220
bio.nrw@bio.nrw.de
www.bio.nrw.de

Ministry of Economic Affairs, Innovation, Digitalization and Energy of the State of North Rhine-Westphalia
40213 Düsseldorf
www.wirtschaft.nrw