



Be Inspired...

...by the Aachen Life Sciences Cluster

The Aachen Region

An inspiring Climate for Life Sciences Companies

Innovation is more than just inventions. Innovation is turning an invention into an economic benefit and successfully positioning a product on the market. True innovations also bring in the cash.

The foundations for innovation are laid by ideas and developments from academic institutions, research and development (R&D) centres, especially in the Technology Region Aachen. The Aachen Region is particularly well known for the field of life sciences as well as automotive and rail engineering, information and communication technologies (ICT), modern materials and production engineering.

The region has remarkable strength in scientific and industrial activities in biotechnology and medical device technology. It offers outstanding opportunities for innovation and new commercial initiatives.

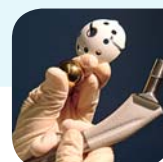
The biggest development potential for innovations appears wherever technological know-how exists, wherever people look further than their own noses and work together.

Therefore regional industry initiatives have been set up to encourage contacts between companies and R&D institutions. With conferences, joint stands at international fairs, business meetings or social events networks are cultivated and the interdisciplinary dialogue is being fostered.

**Come and meet
the Aachen Life Sciences Cluster!**



The Greater Aachen Region with its districts Düren, Euskirchen and Heinsberg as well as the Aachen Urban Region has around 1.3 million inhabitants. It is part of the Euregio Meuse-Rhine. It only takes 1.5 hours to go to either Eindhoven or Leuven by car.





Beyond our own noses



What could be the reason to look beyond one's own nose if a cooperative cluster is organized as internationally as the Aachen Life Sciences cluster? In the Aachen-Juelich region, you will not find any biotech company whose clientele is limited to the German speaking world. The

local medical technology enterprises often undertake the testing of their novelties in the close-by Benelux area. Anyway, the researchers of Aachen University, Aachen University of Applied Sciences and Research Center Juelich are linked all around the world – of course science is not restricted by national borders. Why then breaking new ground and making statements? An old Chinese proverb says: "When the wind of change is blowing, some build wind mills while others build walls." Change to us is an everyday experience, that's

just the way it is. Thus, let's make it happen in our network and be open for expansion. Here a Danish contract research institute looking for a partner in biomarker analysis, there a Portuguese manufacturer of medical devices looking for a local distribution partner. That's where we can help to create new business opportunities. So we are happy about each impetus from the outside. We are a fine local cluster, but we have not reached the final point of perfection. We can only get even better. Partners from all around the globe suit us well. Let the gateway to new horizons happen, let's look beyond our own nose!

Dr. Andreas Herrmann
Chair, LifeTecAachen-Jülich e.V.

Continuation of a long tradition



Health Care & Life Sciences have had a long tradition in the region of Aachen – starting the spa baths tradition of Bad Aachen 2000 years ago with a clientele of Roman legionnaires, continued by Franconian warriors and medieval monks. Even Charlemagne enjoyed the healing

effects of the thermal springs and the herbal remedies of the Eifel region.

Today the Aachen Technology Region is one of the world's leading locations for research, development and production in selected fields of life sciences. The close cooperation between engineers, natural scientists and medical doctors is characteristic for the region.

The distinctive research landscape, the high number of top-qualified graduates and a network of numerous life science companies offer ideal conditions for their commercial success to business founders and new companies from outside the region.

The Aachen region is the westernmost region of Germany, where the borders of Germany, Belgium and the

Netherlands meet. 1.3 million people live in the Aachen region on an area of over 3,500 km². This region is amongst the most innovative areas in Germany, not least thanks to the well-renowned RWTH Aachen University, Aachen University of Applied Sciences or research institutions such as the Forschungszentrum Jülich and 4 Fraunhofer Institutes. Over 4,000 graduates leave the universities every year, half of them are engineers. 66,000 enterprises in the Aachen region employ around 350,000 people. The 600 companies in the manufacturing trade alone have 76,000 employees and they achieved a turnover of 16.5 billion euros in 2008; their above-average export quota of 43.9 percent showing them to be very high-performance operations.

Ulrich Schirowski M.A.
Managing Director, AGITmbH

Much more than the MOT for band-aids

BMP can virtually nip in the bud expensive mistakes in development of medical products

“The MOT for band-aids” the company was jokingly called by a local newspaper a couple of years ago. BMP, however, the laboratory for medical materials testing excels in a lot more than band-aids. “We are exactly the right place for all types of medical products, be it suction devices, dental filling materials or anything from A to Z,” Dr. Ute Müller explains. She founded the company in 2000.

BMP was and still is the first German laboratory able to carry out complete hemocompatibility testing according to legal regulations. There are legal foundations for everything BMP do. Safety is the key topic. Apart from the basics, in many cases the company had to begin with developing suitable analysis methods e.g. regarding the activation of coagulation and immune system.

For BMP, a spin-off of the Aachen University Hospital, this did not constitute a problem. Meanwhile, the company has developed a full range of analytical tests from hemocompatibility over to cytotoxicity, genotoxicity/ carcinogenicity, irritation and sensitization, acute systemic and chronic toxicity up to microbiology and chemical characterisation on the basis of the Standard DIN EN ISO 10993.

“Customers, as a rule, will decide against us, if we cannot serve the full range of their demands. That is why, over the years, our range of offers has been continuously extending. BMP has become the one-stop-shop for medical materials testing.” This well renowned contract laboratory has been accredited by the German accreditation body, the Central Authority of the German States for Health Protection Regarding Medicinal Products and Medical Devices, in compliance with the Standard DIN EN ISO 17025. Apart from manufacturers of medicinal and medical products, governmental authorities, notified bodies, biotech companies, universities and research institutions count amongst their customers. In addition, BMP cooperates with consultants, developers and researchers on the basis of projects in order to preferably identify harmful materials in medical products as early as possible in material development and to find solutions there and then. At the stage of test tube and microtitre plate, BMP can virtually nip in the bud expensive mistakes, potential risks for patients and unnecessary animal testing.

Development times for medical products are long as it is and they cost huge amounts of money. “The earlier we can start our mission, the better for the customer,” Ute Müller states. She is an engineer and she learned her craft from scratch – literally. After an apprenticeship in





Dr. Ute Müller
CEO BMP

glassblowing she studied glass and ceramics technology. Ute Müller then passed her doctorate on the topic of ceramic hip implants at Aachen University and at the same site, in the interdisciplinary centre for clinical research, she worked in the development of new medical products in the testing laboratory. In 1999 she took the decision: “I can do that myself” and hived off the testing laboratory. The entrepreneur has never had any second thoughts about that decision. “Our team has so much technical expertise that I am sometimes surprised myself of all that we succeed in. An individual can perhaps lay the foundation, but such a company is unthinkable without a good team, especially with quality being so much in the focus.”

BMP not only develop testing strategies for biocompatibility screening, assess bioassays and set up risk ana-



lyses, but they also carry out quality management for medical products. CE certification, Standard ISO 13485 ... Whoever flounders at these regulatory hurdles will be well advised by BMP in the Centre for Medical Technology in Aachen.



Pulse Wave Analysis:

A state-of-the-art approach to monitoring blood pressure

Mention of “pulse wave analysis” makes Achim Schwarz’s eyes sparkle. Achim is a key account manager at I.E.M. GmbH. From its main office in Stolberg, I.E.M. works in world-wide cooperation with researchers in medical science. The company’s range of products, which has already achieved commercial success internationally, features telemetric, use-at-home, long-term blood pressure monitoring devices, scales and ECG units. I.E.M. also provides logistic services to doctors, hospitals and health insurers. Set up by the Korth family in 1993, I.E.M. now employs a workforce of about 40 at its facility in the Cockerillstraße.

“When your heart beats, it generates a so-called pulse wave, transmitted via your arteries through to the tips of your toes. Sedimentation present in the arteries or a malfunctioning of the vascular walls will result in hindrance to this pulse wave. A counter-wave, which can

be thought of as a micro-tsunami, is produced. However, rather than flooding, the result may be a stroke or coronary or renal infarction. Pulse wave analysis enables doctors to assess the condition of a patient’s arteries in a way never before possible. And it doesn’t give them any extra work.”

The algorithms integrated by I.E.M. into the system are key in enabling the detection of information about vascular deficiencies. Alongside aortic pressure, this state-of-the-art device monitors cardiac output and provides information about arterial stiffness. “The device reveals information about the condition of a patient’s arterial vascular system,” Achim Schwarz explains. “For example, when patients suffering high blood pressure take their medication, the pulse wave performance data will show how the arteries are reacting.”



→ Since I.E.M.'s measuring device is telemetric, the blood pressure data measured can be forwarded directly to the treating physician. Importantly, this allows the fine-tuning of medication regimes without the need for a formal office consultation between doctor and patient. One third of all Europeans suffer from high blood pressure. 85% of those suffering hypertension do not receive adequate treatment. In fact, in many cases, the disorder is not even correctly diagnosed. The high number of strokes and heart attacks remains a major health concern.



Achim Schwartz
Key Account Manager, I.E.M. GmbH



“Hypertension requires close monitoring, both to detect changes in the patient’s condition and also to be able to take appropriate action in terms of medication regime adjustment. Our device provides the ongoing blood pressure monitoring which physicians need to treat patients in the right way,” says Achim Schwarz. “Telemetric data transfer is straightforward and low-cost. Effective blood pressure stabilisation can achieve cost savings of up to 80% in the case of cardiovascular disease and up to 30% in the case of cardiac insufficiency.”

A further important offering has been added to I.E.M.’s product portfolio from November 2009: the Beam® Recorder. A mobile mini 2-channel ECG recording device, the Beam® Recorder can forward ECG values to the general practitioner via mobile phone 24/7. This is important, for example, in the case of patients having recently undergone atrial fibrillation therapy. In only a matter of seconds rhythm and heartbeat frequency can be scaled for a period of several weeks, with no need for daily visits to the physician’s office.

February 2010 will see the worldwide launch of the first validated device able to provide 24 h pulse wave analysis. This is exactly the kind of monitoring which the European Society of Hypertension and Cardiology currently recommends for all high-risk patients. “We recommend the introduction of this technology into everyday practice,” says Achim Schwarz, “We are confident that because of the clear benefits provided in five years this will be an absolutely normal routine check in 50% of physicians’ offices.”

For I.E.M. the investment into this product line has been considerable. The development of devices and software which require CE certification for medical products comes at a substantial price. “At the same time, we have gained a tremendous competitive edge, which will keep us ahead of competitors in the short term,” points out Achim. Renowned research institutes starting clinical studies on pulse wave analysis in Berlin, New York or Shanghai are gathering their data using I.E.M. equipment. Pulse wave analysis is a topic currently widely discussed by the relevant professional bodies. And publications are making mention of I.E.M. and its cutting edge technology.

While playing some part in the distribution of its products in the domestic market, elsewhere in the world I.E.M. is represented by specialist supplier organizations. “One example of our success is Latin America,” says Achim Schwarz. “For certain products, our market share even exceed 80%.”

Wearable medical devices, intelligent tissues and more MEDIT enables a greater autonomy at home for the elderly



Prof. Steffen Leonhardt
Helmholtz Institute for Biomedical
Engineering

Today, about 1.5 million people in the world suffer from chronic renal disease and depend on dialysis treatment. In chronic kidney failure, patients may not just have a deficit in detoxification of the body, but may also suffer from fluid overload and an oversaturation of the extra-cellular fluids with calcium and phosphate ions, due to the absence of natural mineral regulation. This, in addition to the lack of calcification inhibitors, may lead to a development of cardiovascular calcification associated with an increase in morbidity and mortality risk. “An optimal treatment of the patient is still difficult to achieve, since so far, there is no simple test to accurately estimate the calcification formation process and calcification-inhibitor concentration in the bloodstream”, explains Professor Steffen Leonhardt. He is the Director of the Philips Chair for Medical Information Technology (MEDIT) within the Helmholtz Institute for Biomedical Engineering at RWTH Aachen University. The Chair has two major focuses: personal health care and automation/control in medicine. In order to cope with the difficulty in the assessment of calcification formation, the MEDIT team is joining forces with the biochemist group of Professor Willi Jahnen-Dechent, also part of the Helmholtz-Institute. Together they are going to develop a new laboratory test based on in-situ measurements of mineral formation kinetics. It is intended to replace the state-of-the-art test based on the quantification of radioactive ^{45}C with the new option. “Numerous preparation steps and the 90 minutes required incubation period make the current tests inappropriate for daily clinical practice”, concludes Leonhardt.

The new biochemical test method will be developed applying Bio-Impedance Spectroscopy (BIS). “This method offers a non-destructive means for examining and cha-

racterizing a number of chemical and physical processes which occur in solution as well as in cell suspensions”, Leonhardt points out the advantages of the technology. The calcification inhibition capacity in serum samples will be determined using an impedance trace of the mineralization formation process. The project is funded by a project of the local University Hospital in Aachen.

In the field of automation and control in medicine, the MEDIT researchers are involved with the modelling and implementation of feedback controlled therapy



→ techniques. Next to dialysis regulation and optimization, research topics include tools and methods for the modelling of disrupted physiological systems, such as sensor supported artificial respiration and active brain pressure regulation.

MEDIT is one of the Chairs of the Helmholtz Institute for Biomedical Engineering, which houses a total of 7 Chairs. “Four facilities have joined forces to develop innovative solutions in medical technology”, explains Steffen Leonhardt. His Chair belongs to the faculty of Electrical Engineering, whilst other Chairs are part of the Medical Faculty, the Faculty of Mechanical Engineering and the Faculty of Natural Sciences. “This is a very challenging structure. We have regular exchange platforms that enable us to look further than our nose”,

describes Leonhardt. In the field of Personal Health Care, Leonhardt’s Chair focuses on wearable medical devices, particularly for diagnostic purposes, designed for use at home. Current technological developments are intelligent tissues, “Body Area Networks” and sensor fusion. Due to demographic trends, especially in developed nations, the MEDIT laboratory wants to meet the needs of the elderly in order to enable a greater autonomy at home.

Health Spa for Cells – open 24/7

Jülich based Celonic is a contract biopharmaceutical manufacturer



Cell culture work within the GMP facility

“We are entirely red”, explains Andreas Herrmann and he does not mean his political leanings but the orientation of his company. As representatives of “red biotechnology”, Celonic offer analytics services and contract manufacturing for biopharmaceuticals. In their laboratories, everything is focused on cells. They are the tools with which antibodies, cytokines or fusion proteins are being produced. So far, only few biopharmaceuticals are available on the worldwide marketplace. There are well-known examples, such as Remicade, based on an antibody against inflammatory diseases like Crohn’s disease or rheumatoid arthritis, or Erbitux, based on an antibody against bowel cancer. Currently, a high number of pharmaceutical and biotech companies are working on obtaining the marketing authorisation for new products. As a service provider, Celonic are ready to supply either individual stages of the development or the entire development process. “We can pick up customers at the genomic information for their active substance and lead them through to the GMP batch for clinical phases”, the managing director summarises. In individual projects, Celonic not only developed the cell lines, but they did



the preliminary work for the customer through to the clinical phase II, i.e. over several years. Supported by their cooperation partner, hameln rds, a Northern German pharmaceutical company, Celonic can now provide pre-clinical and clinical studies, themselves.

Precaution is of the essence upon entering the laboratory. Animal cells are susceptible to contaminations; therefore, in addition to the obligation to wear lab coats, there are specific rules for hygiene. Whilst in one room, you will find the incubators for cells and cleanbenches for adding new fluid, counting or separating cells, in the next room, several bioreactors are swinging their valuable load back and forth. “These are Wave bioreactors with disposable bags for the culture. The idea is based on the gentle movement of the sea. By way of moving back and forth, there is constantly oxygen being added, to the effect that the cells are optimally supplied.”

Wave bioreactors are not the only type of reactor, Celonic work with. “Even though we have made really good experiences with the Wave system, I am still a supporter of steel”, says Andreas Herrmann and

points to the stirrer tank. At the Celonic site in Basel, there are several such shiny apparatus, up to a volume of 300 litres. “In the Wave, we can currently process up to a maximum of 1,000 litres, the extension to 2,000 litres in a stirred tank is about to be implemented”, explains the managing director. In order to optimize a manufacturing process as early as possible, Celonic work with a 32 parallel culture system of their neighbouring company DASGIP which is also Jülich based. “A great system that saves us and our customers a lot of time in process development”, explains Andreas Herrmann.

The GLP laboratory (good laboratory practice) in Jülich is equipped with everything that is needed for immunological and cell-based assays. A particular favourite at Celonic is working with electrochemiluminescence, a substantially more sensitive alternative to the well-established immunological technology of ELISA. “The American Food and Drug Administration showed in a White Paper that the sensitivity of ELISA is limited and that, in the meantime, better options have been developed, e.g. for quantifying the concentration of the active substance in the serum or for testing of antibodies against



Management Team
Celonic GmbH



→ the active substance. We are convinced that electrochemiluminescence is a wonderful alternative.” Whereas usually new technologies are related to a cost increase, the cost structure for ELISA and electrochemiluminescence assays is all but comparable.

Celonic have obtained a brand new GMP certificate (good manufacturing practice) at their Jülich site. Whilst in Basel, they have been producing active substances according to GMP for years already, Jülich had so far focused on the GLP certificate for analytical purposes. But as customers meanwhile have begun asking for GMP, e.g. for batch release of medicinal products, Andreas Herrmann saw a need for action. “We do not reinvent the wheel in terms of analysis technologies;

they are all methods we have a wide range of expertise in. Dealing with various quality standards is not new to us, either.” Thus, Celonic have been certified according to ISO standard since 1999 ISO and they have certainly understood over the years how to combine the requirements of ISO and GLP standards. However, Andreas Herrmann was very happy with the successful GMP certification: Champagne corks were popping in Jülich ...



Facilities to enhance expertise

Planning and architectural design firm Carpus+Partner is a specialist for the Life Sciences Industry

“We implement for our customers the philosophy by which we are living ourselves, that is to say highly networked and communicative facilities.”

This description given by the engineer Wolfgang Fränzel drafts the philosophy of Carpus+Partner AG. Founded over 25 years ago by Günter Carpus, the engineering design office has been developed into an internationally acting consulting and planning company by the current Board of Management, Günter Carpus and Peter Winkler. At present, there are 200 employees working on four sites in Germany. Experts from all areas of process, laboratory, construction, infrastructure and project management in a joint team are at their customers’ disposal.

Boehringer Ingelheim, Merck, Stada – big players in pharmaceuticals are customers of Carpus+Partner as are biotech companies. “We build facilities that enhance expertise”, Albert Borucki explains, the project manager of Qiagen Campus, the current showpiece project. “Innovation and research and thus the accrument of new expertise are our customers’ livelihood. Therefore, we

create architecture encouraging the exchange of knowledge.”

Qiagen is Germany’s biggest biotech company. A round figure of 1,000 staff work at the Hilden site, worldwide, there are 3,100 people working for Qiagen. This biotech giant has seen rapid growth during the previous years. Now the company wants to meet this development facility-wise. Qiagens standards are as high as those of their planners – two partners that seem to be made for each other. There was quite a challenge constituted by the task of networking the different sections of the company: research and development, administration, pro-



Peter Winkler and Günter Carpus
Managing Board, Carpus+Partner AG



Innovationscampus Biotechnologie Qiagen GmbH

duction and logistics. The responsible Qiagen managers were dreaming of a research campus atmosphere like at Harvard, clearing the way for 30 million euros for the target of this major project.

Carpus+Partner designed the vision of a Qiagen avenue, set up along the value-added chain and banking on a permanent exchange between the different areas. How is that possible? For instance by creating espresso lounges, production corridors made of glass and numerous facilities for meetings and communication. “Qiagen are looking for the next million-dollar product idea. We create the constructional prerequisites for employees feeling happy and being able to set free their creativity”, Thomas Habscheid-Führer explains, chief architect at Carpus+Partner. In addition, all buildings are set out to be certified “green building”, which meets planners’ and operators’ focus on environmental compatibility and sustainability.

In the Aachen region, Carpus+Partner not only designed the HighTechMall in Jülich, but also the facilities of the process developing company DASGIP.

Various other buildings of RWTH Aachen University show the hand of these well-renowned planners. “We do have other sites in Germany, but there is a commitment to Aachen because of the close connection to its university”, Wolfgang Fränzel explains. For instance, planners make use of the virtual space of a CAVE, at the Center for Computing and Communication of RWTH Aachen University in order to help customers towards spatial understanding of projects. This is also how the Qiagen deciders were able to stroll on Qiagen Avenue before construction start. “For this reason, too, we have decided to commit ourselves to the planned RWTH. The idea of linking institutes and companies closely together in clusters, in order to cooperate in research projects, is ideal for our company. This way, we too can keep developing new innovative ideas for our customers.”





Wolfgang Fränzel, Project Manager Pharma and Laboratory

various events”, Wolfgang Fränzel clarifies. Flexibility is of particular importance, because focuses of research can alter. This, too, is taken into account by the Carpus+Partner planners.

“For example, we work for start-ups, in the case of concept studies for financing.” Being specialised in the pharmaceutical and biotech industries, subjects such as GMP compliance do not cause any hurdles, Wolfgang Fränzel assures: “On the contrary, we have clients who had problems in their process development that could be helped through our contacts.”



CARPUS+PARTNER

→ One of the current projects at the RWTH is the new building for the German Wool Research Institute (DWI). “Basically, there is a trend towards more networking of workgroups and rendering facilities more flexible. At the DWI, there are two workgroups engaged in developing biologically inspired materials. We want the teams of researchers to have a maximum of contact points. The new laboratories and clean rooms will have high transparency. Meeting points and pathways are connecting the existing building and the extension to form a unit. The atrium can be used multi-functionally for

No innovation without cooperation

m2p-labs is part of an axis for bioprocess technologies

How to find the fastest way from a clone to production of biomolecules? Answers to this question can be found in a very concentrated way in the West of North Rhine-Westphalia. “We consider ourselves to be part of an axis for bioprocess technologies that extends between Aachen, Jülich and Wuppertal, with players like m2p-labs, RWTH Aachen University, DASGIP, the Research Centre Jülich and Bayer Technology Services as well as Bayer Health Care”, explains Frank Kensy. He is an engineer, and together with three colleagues he founded the company m2p-labs in November 2005. m2p stands for “microreactor to process”. The company’s mission statement could easily be “even smaller, even more parallel and at the same time more process information”.

The central product that the company offers, the BioLector, is designed to understand and optimize biological production processes as early as possible and this at a scale between 100 micro- and 2 millilitres. At first m2p-labs focused on microbial organisms in the batch procedure. Nowadays, animal cells and the fed-batch procedure are also being screened. “It would be the crowning achievement to offer fedbatch in the microtitre plate”; that is how Frank Kensy explains where the journey is leading. So far, the BioLector is able to analyse and online monitor fermentations with high throughput (48-fold). The m2p developers have several times already implemented an integration into pipetting robots. It allows for further possibilities of

process manipulation and automation. m2p-labs do not only focus on product optimisation of biopharmaceuticals, but the company also is “as red as white”. “Of course pharmaceutical developers of active substances are our target group, but furthermore also manufacturers of enzymes and vitamins.”

From studies on culture media optimisation for fermentation a composition has derived for so-called fedbatch media that allow a release of glucose in different supply rates, and therefore, to cultivate microbial cells at different growth rates and to high cell densities. These fedbatch media are currently offered for microbial fermentation, but they are to be extended for cell cultures. Whatever is growing and prospering at m2p-labs has mostly arisen from regional networking, e.g. the Flowerplate. This, their own m2p microtitre plate has flower-shaped cavities, so-called “wells”, that drastically improve mixing and oxygen supply of cells. “It has been identified that in common microtitre plates, the oxygen supply of a high number of microbial cells is insufficient. The Flowerplate, however, has the optimal shape for an excellent mass transfer and was selected from more than 30 different geometries. We supply them as



cultivation platforms in the BioLector but also for the normal shaker. The Flowerplate was developed in close cooperation with the Chair for Bioprocess Technology at Aachen University, it was injection moulded in Belgium and laser welded at the Fraunhofer ILT.” The ILT, as the Fraunhofer Institute for Laser Technology is called in short, is within eyeshot of m2p-labs that is based in the new buildings of the Fraunhofer Institute for Molecular Biotechnology and Applied Ecology. Working is a pleasant duty and inspiring for innovations in this stylish ambience including Japanese gardens. “In terms of distribution, we cooperate with the Jülich based company DASGIP, but we also market our technologies all over Europe in direct sales”, Frank Kensy explains. m2p-labs have a regular appearance at venues like the Biotechnica in Hannover, the ESBES



Frank Kensy
m2p-labs GmbH

Meeting of the European Federation of Biotechnology, the European Congress on Biotechnology or the Euregional Biomedica. The company has just won the innovations award 2009 of the North Rhine-Westphalia Centre for Innovation and Technology that this year was held under the slogan “No innovation without readiness for cooperation”. Surprised?

↓ Biotechnology



Agro Protect GmbH
www.agroprotect.de

AgroProtect GmbH have at their command a platform technology that renders economic plants resistant against fungi and bacteria using antibodies and fusion proteins. The principle applied allows for a production of the cellular myotoxins within a plant in very low quantities. It is therefore possible, to achieve high yields with the plant, whilst at the same time, maintaining high quality. It is therefore possible to achieve high yields with the plant maintaining, at the same time, high quality.

Biotechnology



Analytical Services
www.analytical-services.com

Analytical Services provides GMP-release analytics, special analytics and CMC-documentation support for the Pharmaceutical Industry. Analytical Services has a strong background in Method Development, Structure Elucidation, Project Management and Quality Management.

Biotechnology



Aplagen GmbH
www.aplagen.com

AplaGen is a biopharmaceutical company with broad expertise in peptide design, synthesis and analysis. AplaGen has successfully created a portfolio of its own products with independent patent protection for major indications and markets. In parallel to developing its own pipeline products, the company engages in "Innovation Partnerships", collaborations with pharmaceutical and biotech companies. The platform technologies include both HES conjugation and peptide development capabilities.

Biotechnology



Celonic GmbH
www.celonic.com

Since its inception in 1998, Celonic has been focusing on mammalian cell culture technology. A well trained team of scientists, GLP-/GMP-compliant laboratories and a broad pattern of validated methods and qualified equipment are the basis of Celonic's services portfolio for preclinical and clinical development as well as biopharmaceutical manufacturing.

Biotechnology

↓ Biotechnology



CEVEC Pharmaceuticals GmbH
www.cevec-pharmaceuticals.com

CEVEC offers human-cell expression systems for the production of safe and effective therapeutic proteins. Proteins manufactured in our human cells show substantial advantages in post-translational modifications compared to other systems. The stable producing CAP and the new transient CAP-T cells meet all regulatory guidelines and are perfectly designed to exceed any competitive expression yields.

Biotechnology



chemagen Biopolymer-Technologie AG
www.chemagen.com

chemagen's chemagic Kits for nucleic acid isolation facilitate the time consuming and cost-intensive sample preparation step prior to downstream applications significantly. Based on the company's patented Magnetic Bead technology and together with its proprietary automation they represent worldwide leading systems suitable for an unlimited variety of different sample materials and applicable for every sample volume. Diagnostic applications like virus identification or SNP genotyping now have become faster and more reliable.

Biotechnology



LCL-Biokey GmbH
www.lcl-biokey.com

The business of LCL biokey GmbH is gene diagnostics using DNA probes and microarray technology. Methods are established to detect gene sequences in organic, especially clinical, specimens. The results support the diagnosis of (infectious-) diseases. In addition, consultation in scientific studies is offered.

Biotechnology



PAION AG
www.paion.de

PAION is a biopharmaceutical company specialized in developing and commercializing innovative drugs for the hospital-based treatment of central nervous system (CNS) disorders and thrombotic/cardiovascular diseases, indications for which there is a substantial unmet medical need.

Biotechnology

↓ Biotechnology

Biotechnology



PharmedArtis GmbH
www.pharmedartis.de

PharmedArtis GmbH is a biotechnology company specialized in recombinant technologies and Protein Production. As one-stop-shop PharmedArtis offers a wide range of services from gene to product including GMP-production for clinical trials.



TÜV Rheinland Agrois@lab GmbH
www.agrois@lab.de

The TÜV Rheinland Agrois@lab GmbH is one of the leading laboratories for isotope analytics in Europe. Agrois@lab has an outstanding field of competence in the area of declaration and origin testing, source monitoring organic material of any kind, in particular applying to food products and agricultural raw materials.

Biotechnology

↓ Consulting

Consulting



AKM Innovationsmanagement GmbH
www.akm-aachen.de

AKM was one of the eight award winners of a competition held by the German Ministry of Education and Research in 2000. What began as a partnership between research institutes, clinics and companies has today established itself as the Aachen Centre of Competence for Medical Technology – AKM. The agency AKM Innovationsmanagement GmbH takes care of the operations management as well as providing services along the supply chain in the field of medical technology.



Bayer Innovation GmbH
www.bayer-innovation.com

BAYER INNOVATION GmbH (BIG) is part of Bayer's innovation strategy and complements the innovation activities of the different subgroups in the fields of health care, nutrition and high-quality materials. Objective of BIG is to identify and develop new growth opportunities. Currently the focus is on medical technology and the production of plant-made pharmaceuticals.

Consulting

↓ Health Care Others

Health Care Others



Aix Scientifics®
www.aix-scientifics.com

Aix Scientifics® is an independent Contract Research Organisation (CRO) consisting of an academic staff with long-term experience in clinical research for new pharmaceutical products and medical devices. Clinical trials are planned, conducted and evaluated based on scientific criteria, which are in accordance with the legal framework, national and international guidelines, and internal SOPs.



Dr. Babor GmbH & Co. KG
www.babor.de

BABOR Cosmetics have achieved a position as one of the most important brands in the world of professional cosmetics as well in cosmetic centres as in exclusive hotel spas. At a wealth of experience of over 50 years and a worldwide representation in more than 60 countries, BABOR has become synonymous for exclusive cosmetics and health spa products, outstanding product quality, active ingredient performance and professional treatment systems.

Health Care Others



Weyergans High Care Aktiengesellschaft
www.high-care.com

Weyergans High Care AG offer:

- 1) HIGH CARE cosmetics: development, manufacturing and distribution of cosmetic products, anti aging and curative cosmeceuticals;
- 2) HIGH CARE medical: development, manufacturing and distribution of medical and med.-cosmetic devices, in particular against leg complaints;
- 3) HIGH CARE center: practice / salon concept (franchise) for cosmetics and differentiated cellulite treatment;
- 4) HIGH CARE lounge: studio concept for cosmetics and health oriented body shaping without any licence fees.

Health Care Others



↓ Medical Technology



Abiomed Europe GmbH
www.abiomed.com

Abiomed develops, manufactures and markets circulatory support systems for numerous indications in the fields of cardiology and cardiac surgery. These products provide a temporary solution while the patient is waiting for further treatment (cardiological or cardiosurgical intervention) and/or help the heart in recovering its own capabilities (bridge to recovery).



Biosteel Medical Han/Sellin GbR
www.biosteel-net.de

Biosteel Medical is poised to become an intelligent market player in providing biocompatible and drug-eluting solutions for a wide range of implantable devices, such as coronary, micro, and peripheral stents, grafts, guide-wires, heart-valves, bio-plates and orthopaedic implants, making them compatible with specific physiological requirements of tissues and organs and simultaneously providing a delivery platform for pharmacological agents.



BYTEC Medizintechnik GmbH
www.bytec-gmbh.de

BYTEC Medizintechnik GmbH develop and produce medical devices as complete systems – demanding tasks from the areas of surgery, therapy and diagnostics. On a safe basis of well-tried technologies and new findings, BYTEC implement tasks for the requirements of medical practice and the expectations of the market.



FEG Textiltechnik Forschungs- und Entwicklungsgesellschaft m.b.H.
<http://de.dyna-mesh.com>

Based on highly motivated and well-trained employees, their own R&D capacities and intelligent production plants FEG Textiltechnik mbH is currently Germany's leading manufacturer of medical textile implants. Under the brand name DynaMesh®, the award-winning mesh products are successfully marketed in numerous countries worldwide.

↓ Medical Technology



HEMOTEQ AG
www.hemoteq.com

Hemoteq is the leading designer and manufacturer of customized coatings for medical devices. A broad repertoire of unique platform technologies and a strong intellectual property portfolio allow to create innovative surface solutions in a wide range of clinical and bio-medical applications.



I.E.M. Industrielle Entwicklung Medizintechnik und Vertriebsgesellschaft mbH
www.iem.de

I.E.M. Industrielle Entwicklung Medizintechnik und Vertriebsgesellschaft mbH is a developer and manufacturer of innovative blood pressure measurement methods and interventional telemetry.



Jürgen Claßen MEDICAL
www.classen-medical.com

Jürgen Claßen Medical is a young company working in advisory service and distribution of innovative and high-quality medical products for hospitals and surgeries. Jürgen Claßen Medical offer supplies for surgeries and consultation for doctors and automatic external defibrillators (AED), under the brand name PRIMEDIC produced by the sole German manufacturer Metrax GmbH.



Leufen Medical oHG
www.leufen-medical.de

Leufen Medical is a developer and manufacturer of self-expandable non-vascular Nitinol Stents for Gastroenterology and Pneumology.



MagnaMedics GmbH
www.magnamedics.com

MagnaMedics is active in the field of developing and commercializing Nano tools and systems for Life Science Research, analytical laboratories, medical diagnostics and therapies. The start-up company possesses a proprietary IP portfolio and has a team able to create new trends in NanoMedicine.

↓ Medical Technology



Matricel GmbH
www.matricel.com

Matricel is a Life Sciences company whose mission is to develop and produce optimized collagen-based biomaterials and system components for applications in cell cultivation systems and guided tissue regeneration in humans. Current products and product developments are in the fields of cartilage-, skin-, and nerve-regeneration and cell carrier systems.

Medical Technology



Medos Medizintechnik Aktiengesellschaft
www.medos-ag.de

MEDOS Medizintechnik AG, with their headquarters in Stolberg near Aachen, founded in 1987 is one of the leading developers and manufacturers of medical products for heart surgery, extracorporeal membrane oxygenation (ECMO) and ventricle-assist devices (VAD). The MEDOS product portfolio comprehends i.e. cannulae, individual tubing sets, oxygenation systems and blood pumps as well for adult patients as for paediatrics and infants.

Medical Technology



Nivoclean GmbH
www.nivoclean.com

Nivoclean is a young company, active in the area of environmental hygiene. In addition to the production of EO sterilisers, Nivoclean offer a comprehensive service and product package for dentists and dental institutions. Furthermore, Nivoclean is a leading supplier for archives remediation and a manufacturer of products for mould remediation.

Medical Technology



Sectra Medical Systems GmbH
www.sectra.com

Sectra Medical Systems is one of the worldwide leading suppliers of innovative hardware and IT systems and products for radiology, mammography and orthopaedic departments. Thus, the Swedish company provides for its customers reliable and efficient solutions, whose functionality is guaranteed in the future, in the area of PACS (Picture Archiving and Communication System), digital mammography and orthopaedics.

Medical Technology

↓ Medical Technology



Spintec Engineering GmbH
www.spintec-engineering.de

Spintec Engineering develops bioresorbable silk devices for applications in regenerative medicine. The company's product pipeline comprises devices without and with integrated biological molecules such as growth factors which confer therapeutic efficacy to the silk device through release or presentation of those biological molecules at the site of implantation.

Medical Technology



SurgiTAIX AG
www.surgitaix.com

SurgiTAIX AG, in addition to their own products in medical technology, develop ways of how to transform customers' innovative ideas into actual products. Their services comprehend consulting for founders, finding solutions to any issues of technical and legal requirements, through to the market launch. One of their in-house products is the inexpensive CARAD risk analysis software.

Medical Technology



T.MED GESELLSCHAFT FÜR MED. SYSTEME MBH
www.tmed.de

Fritz Ruck/T.MED offer a comprehensive range of trend-setting products and technologies for diagnosis and therapy of the most various eye complaints, i.e. operation systems for cataract and retina surgery, intra-ocular lenses, laser, eye pressure measurement devices, implants for the treatment of Dry eye syndrome, orbital implants and devices for ultrasonic pachymetry.

Medical Technology



Vimecon GmbH
www.vimecon.com

Vimecon GmbH develop and distribute innovative products for therapy and diagnostics of heart diseases (cardiology). A novel laser catheter allows for a low impact remedy to atrial fibrillation and other cardiac arrhythmias, micro catheter systems are, in particular, applied in the areas of genetic engineering and stem cell research and therapy.

Medical Technology



↓ Pharma



Grünenthal GmbH
www.grunenthal.com

Grünenthal is passionate about globally being the preferred partner in pain management for patients, health care professionals and payors. The corporation drives innovation to expand European market leadership in moderate to severe pain. Grünenthal is an independent, family-owned German corporation with companies in 34 countries all over the world.



HOMEDA® Pharma GmbH
www.homeda.de

HOMEDA Pharma is the market leader for homeo-isopathic preparations from umbilical cord blood and body substances through to support in individual holistic therapies. HOMEDA produce over 700 homeopathic medicines in the dilutions C12 and C30.



Takeda Pharma

Takeda Pharma GmbH
www.takeda.de

Takeda Pharma GmbH is a 100% affiliated company of Takeda Pharmaceutical Company Limited, Osaka, Japan's biggest pharmaceutical group. Takeda Pharma currently have at their disposal highly efficient products for the indication areas of urology/gynaecology, diabeto-logy, cardiology, oncology and gastroenterology and, therefore, represent a German-Japanese history of success in Aachen.

↓ Supplier



Aixmed GmbH
http://web.aixmed.de

Aixmed GmbH was founded in 1998 as a distribution company in Stolberg (Rhld.), Germany. Subject of company operations is the distribution of innovative, bioelectronic medical devices.

↓ Supplier

antibodies^{-online.com}

antibodies-online GmbH
www.antibodies-online.com

www.antibodies-online.com is the leading international marketplace for research antibodies with more than 200.000 different research antibodies available to scientists across Europe, US and Asia. Scientists can both find and order antibodies from a large number of international antibody suppliers. Antibody suppliers or distributors can leverage our marketplace to reach out to the scientific community researching for products on the internet.



BMP – Labor für med. Materialprüfung GmbH
www.bmp-aachen.de

BMP GmbH is one of the few accredited testing laboratories for the evaluation of the biological compatibility of medical devices and biomaterials in Germany and Europe for the achievement of the CE mark according to European guidelines 93/42 and 90/385. Furthermore, BMP gives support for several documents of the quality management system (project plan, CE-list, technical documentation, risk management and risk analysis).



Carpus+Partner AG
www.carpus.de

Carpus+Partner is the industry's partner for development, manufacturing plants and life science corporations for their advisory, planning and executive needs. We offer the whole range of services from consultancy to conceptualization and detailed planning, all the way to the implementation of pharmaceutical production factories, R&D and QC laboratories, logistics and offices.



Caspar & Co
www.caspar-labora.de

Caspar & Co. LABORA produces and assembles laboratory installation systems with a high quality prefabrication degree to meet customer standards for industries / research and universities paying regard to maintain product specific norms and standards. Caspar & Co. LABORA makes use of exceptional production procedures, i.e. complete mechanical production facilities.

↓ Supplier

Supplier

CPS Chemie+Service

CPS Chemie+Service GmbH
www.chemie-plus-service.com

CPS Chemie+Service GmbH supply cyclophosphamide D6 and Garamin as well as syntheses of organic compounds. For fine chemicals and products for biology and biochemistry, we represent manufacturers from abroad in the German marketplace.



Supplier

DASGIP AG
www.dasgip.com

DASGIP develops and manufactures technologically advanced Parallel Bioreactor Systems for the cultivation of bacterial, phototrophic, animal and human cells at bench top scale. DASGIP is located in Juelich (Germany) and Shrewsbury MA (USA). We provide highly engineered equipment and sophisticated software enabling scientists to achieve superior results in research and development. Excellent products and outstanding service are our commitment to support the success of each customer.



Supplier

DIA-Nielsen GmbH & Co KG
www.dia-nielsen.de

DIA-Nielsen - "The Intelligent Alternative", represents innovative, customized plastic products in the Life Science, Biotechnology und Laboratory area. For these business areas our core competences in membrane processing technology are particularly interesting - if you require a partner to assemble plastics and membranes we are the specialist to realize your product ideas!



Supplier

Hitec Zang GmbH
www.hitec-zang.de

HiTec Zang is a systems house offering a wide range of turnkey solutions, individual components and services for the areas of laboratory, technical schools and mini plant. The product and delivery range comprises everything that is required for research and development with small reactor technology. Our customers are mainly from the industries of chemicals, pharmaceuticals, biotech and food.

↓ Supplier

Supplier



m2p-labs GmbH
www.m2p-labs.com

m2p-labs GmbH is a German biotechnology company focusing on microreaction solutions for screening and bioprocess development. We empower the biotechnology, chemical and pharmaceutical industry to increase the number and information of cell culture experiments. m2p-labs offers the BioLector screening technology, microreactor disposables, contract research for clone screening and media optimization as well as consulting in microreaction engineering and automation.



Supplier

OUTPUT Pharma Services GmbH
www.outputpharmaservices.com

As an experienced partner in IMP (investigational medicinal preparations) management, OUTPUT Pharma Services does not only specialize in secondary packaging and packaging of clinical material, but also in high-security, temperature-controlled (-190o C to 25o C) Import, Export, Manufacturing, and Storage of IMPs, anaesthetics and GMOs (Biohazard level S1 and S2 including cell therapeutics), in accordance with legal permission from national and international authorities, cGMP, GCP, and GSP worldwide.



Supplier

SGB-Pharma-Maschinen Handelsges. mbH
www.pharma-maschinen.com

Pharma Maschinen offer well-preserved, reconditioned second hand machinery for the pharmaceutical industry as a realistic alternative to expensive new machinery with long delivery times. On a total surface of 4,000 m² of facilities, Pharma Maschinen permanently have more than 600 production and packaging machines available. Their functionality can be demonstrated any time and - if possible - also with the customer's products.



Supplier

phi-med Gesellschaft für Medizintechnik mbH
www.phi-med.de

phi-med GmbH work in the area of repair, maintenance and checks of medical products and laboratory devices.

Vividlinks:
the online Career Community where Life Sciences professionals meet!



Vividlinks is a career portal where vacancies and company profiles within the Euregional Meuse-Rhine Life Sciences Cluster are displayed to stimulate cross-border labour mobility, provide information about working and living in the region and create a Life Sciences community.



LifeTecAachen-Jülich e.V.

www.life-tec.org

LifeTecAachen-Jülich e.V. is the “platform life sciences” in the Aachen Region. LifeTecAachen-Jülich was founded in 2000 and aims at pooling and strengthening life sciences activities within the region of Aachen-Jülich. Comprising nearly 70 members, the association encompasses more life sciences players than most other regions in Germany and Europe.



AGIT Aachener Gesellschaft für Innovation und Technologietransfer mbH

www.agit.de

AGIT, the Aachener Gesellschaft für Innovation und Technologietransfer, is the regional development agency for the Technology Region Aachen. AGIT's main activities include advising technology-oriented start-ups and innovative enterprises, advising and assisting international investors, international marketing of the Region, regional development and cluster development, support for selected fields of technology and the management of the two Aachen Technology Centres.

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