

MAGAZINE

LIFE
SCIENCE
NORD



MEDTECH, BIOTECH & PHARMA
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Hamburg, Schleswig-Holstein

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OPERATING IN THE THIRD DIMENSION

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SEEING MORE THAN THE DOCTOR

Early Alzheimer's risk diagnostic method thanks to mathematical algorithms



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Photo: HAAG-STREIT SURGICAL GmbH

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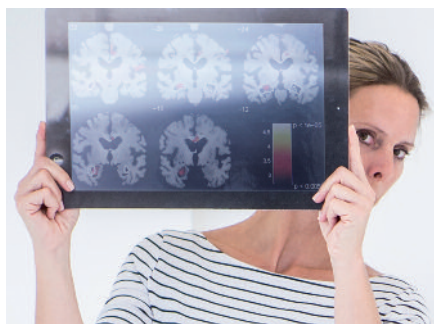


Photo: Christina Körte and Torsten Kollmer

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SUCCESSFUL NETWORK:

DISCOVER WHAT OUR REGION HAS TO OFFER IN THE FIELD OF LIFE SCIENCES



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www.facebook.com/LifeScienceNord


Photo: Christina Körte and Torsten Kollmer



Dr. Hinrich Habeck
Managing Director
Life Science Nord Management GmbH

Photo: Christina Körte
and Torsten Kollmer

Dear readers, welcome to the first issue of the Life Science Nord Magazine in a new fresh layout. We have completely modernized and harmonized our external communications. This harmonization has extended to our name as well: Norgenta has now become Life Science Nord Management GmbH. Naturally, you will still find the usual contact persons and the proven innovative medicine topics in the new design.

We present one example in the special, which also involves visual, or more precisely, computer-assisted medical image analysis. The Hamburg company jung diagnostics has teamed up with the Fraunhofer MEVIS Project Group Image Registration in Lübeck to develop a risk diagnostic system for Alzheimer's. The support this provides

makes it possible to extract far more information from standard MRI images than a doctor can see with the naked eye. Medical professionals also gain better insights with the aid of optical coherence tomography in the micrometer range, which we present in the know-how section. An iOCT camera, which can, for example, be attached to Haag-Streit surgical microscopes, delivers three-dimensional images during an operation as required.

However, it is not just technologies that offer potential. In our country focus section, we take a look at what our neighboring country Denmark has to offer. The Danish market provides growing opportunities for innovation and cooperation projects. One successful exchange with Denmark is already taking place in the COLLIN project between the University Medical Center Schleswig-Holstein, Campus Kiel, and Odense University Hospital in Denmark. One of the goals is to exchange new ideas in healthcare IT and telemedicine.

You can also learn about interesting life science developments in Mecklenburg-Vorpommern in the North-East section and, as usual, we offer our news and information roundup from Hamburg and Schleswig-Holstein. My team and I hope you find this issue enjoyable and informative.

Hinrich Habeck

CONTROLLING BIOPROCESSES SIMPLY AND SECURELY

Eppendorf, the global biotechnology group, has unveiled a range of new software packages to improve the control and management of demanding bioprocesses.

BioCommand, Eppendorf's new SCADA software package, can easily monitor and control cell culture processes with a PC and capture data. The tool consists of three modules: "Track and Trend" offers the ability to trend and control parameter set points. In addition, alarm settings can be established and batch records generated. The software's batch control package also offers additional enhanced control functions such as a programming module and an equipment lock-out feature. "Batch Control Plus" includes three levels of security, event logs and audit trail capabilities to be compatible with other systems.

Further information:
www.eppendorf.com

JOINING FORCES TO FIGHT CANCER

Indivumed, a leading provider of services for personalized cancer therapies, and the American health services provider Geisinger Health System are to team up in the future.

The collaboration is intended to give the approximately three million Geisinger patients access to advanced cancer therapies and clinical studies. "We are delighted to drive forward the development of the next cancer therapy generation together with Indivumed," says Glenn D. Steele, Jr., MD, PhD, president and CEO of Geisinger Health System. Prof. Dr. Hartmut Juhl, founder and CEO of Indivumed, expects Geisinger's electronic patient and clinical data systems and the ability to analyze a wide range of types of cancer will help to speed up the process of translating scientific discoveries into practice.

Further information:
www.indivumed.com

STRONG PARTNERSHIP

EXPERTISE COMBINED

The Fraunhofer Institute for Molecular Biology and Applied Ecology (IME) has a new site in the North. Since July, 30 employees of the Hamburg contract research organization European ScreeningPort (ESP) have added their expertise to the new Fraunhofer IME-ScreeningPort (IME-SP) to enhance the applied research capabilities of the Fraunhofer-Gesellschaft.

The Fraunhofer IME has taken a further step to strengthen its position in pharmaceutical drug research. "We are delighted that we have joined the Fraunhofer family and can continue to provide a strong link between basic research and industrial development," says Prof. Dr. Carsten Claussen, the new head of IME-SP, who views the transfer as recognition of the ESP's past success. Prof. Dr. Rainer Fischer, senior executive director of the Fraunhofer IME, confirms this assessment: "The excellent platforms that have been estab-

lished in Hamburg, the expertise and know-how of the staff, and the diversified project portfolio with academic and industrial partners fit perfectly with the positioning of the Fraunhofer Institute. The IME-SP will cover the "small molecules" research field and complement the IME's existing expertise in biologicals (antibodies and vaccines), drug repurposing and insect biology. On the basis of the translational approach in early-stage drug research, the Fraunhofer IME intends to pursue innovative targets from academic research and advance them further to contribute to applied drug research in Germany.

Evotec, the biotech company and founding member of ESP, has changed its status from associate into a new, strategic collaboration with the Fraunhofer IME. In the future, the two organizations will pool their technologies and resources in various disease areas for internal and external research projects. **nsw**
Further information:
www.ime.fraunhofer.de

MAGNETIC PARTICLE IMAGING (MPI) SYSTEM

PIONEERING TECHNOLOGY FOR THE UKE

With the world's first industrially manufactured magnetic particle imaging (MPI) system, the University Medical Center Hamburg-Eppendorf (UKE) wants to step up its research efforts in cardiovascular and neurovascular medicine, tumor medicine, and in inflammation and metabolism research.

Magnetic particle imaging is a completely new type of imaging technology that uses oscillating magnetic fields to measure signals. The key feature is that MPI delivers real-time medical data with up to 46 three-dimensional images a second. The system harnesses the magnetization properties of super-paramagnetic iron oxide, which is injected into the blood circulation as a tracer. MPI is able to measure these magnetic nanoparticles while they circulate in the blood stream with extremely fine quantitative and spatial resolution and translate them into images with the assistance of complicated computing processes.

"We are at the beginning of the development of a new method, which will open up new horizons in medical imaging," explains Prof. Dr. Gerhard Adam, Director of the UKE's Diagnostic and Interventional Radiology Department and Clinic. At present, the equipment is still in the experimental stage. To find out what applications may be relevant and helpful to humans, MPI will initially be used for medical imaging of models at the UKE. One potential clinical application is cardiovascular diagnosis – for example to show arteries or the blood supply to the cardiac muscle. Certain disease processes could also be understood with the aid of the new technology. The magnetic particle imaging device, which has been developed by Philips Healthcare, has received funding of about four million euros from the German Research Foundation (DFG). The University Medical Center has set up a separate professorship for research with MPI. **nsw**

Further information: www.ukc.de

INTERDISCIPLINARY RESEARCH CENTER

FOUNDATION STONE LAID

The first brick with memories for future generations: a time capsule that includes a newspaper, a USB stick and deactivated viral DNA. Matthias Wilmanns (EMBL), Ian Mattai (EMBL), Jan Grapentin (BMBF), Verena Börschmann (DESY), Dirk Heinz (Centre for Infection Research), Bernd Kretschmar (W&F), Christian Scherf (DESY), Dorothee Stapelfeldt (Ministry for Science and Research, Hamburg), Rolf Horstmann (BNI), Andrea Hoops (Ministry for Science and Culture, Lower Saxony), Heinrich Gräner (Uni Hamburg), left to right.



Photo: Deutsches Elektronen-Synchrotron DESY

A globally unique center for pathogen research is currently being built at the DESY Campus in Hamburg Bahrenfeld. Scientists from a range of disciplines will collaborate across institutions at the Centre for Structural Systems Biology (CSSB) in the future.

On August 29, Hamburg's Science Senator Dr. Dorothee Stapelfeldt, Andrea Hoops from the Ministry of Science of Lower Saxony and CSSB's founding director Dr. Matthias Wilmanns laid the foundation stone for the new research building. In all, 11 research groups consisting of biologists, chemists, health professionals, physicians and engineers

will work at the CSSB to decipher how viruses, bacteria and parasites attack their hosts at the atomic level in order to develop tailor-made medicines to combat them. They will have state-of-the-art research light sources at DESY at their disposal. Using "supermicroscopes" such as PETRA III and in the future European XFEL, they will be able to examine biological samples in various ways and analyze the molecular basis of diseases with extremely high temporal and spatial resolution.

"With the Centre for Structural Systems Biology, we want to move up into the Champions League of structural biology research," said Dr. Matthias Wilmanns at the ceremony. He added that the new building located di-

rectly on the DESY site offered an outstanding environment for interdisciplinary research with novel methods. Dr. Dorothee Stapelfeldt described the new center as an important step that would further establish Hamburg and the Bahrenfeld research campus as a top international location for structural research and expand existing collaboration. The research building, which will cost about 50 million euros, is due to be completed by the end of 2016 and will accommodate some 180 scientists. The costs will be shared by the German government, Hamburg and Lower Saxony.

nsw

Further information:
www.cssb-hamburg.de

MEDICAL IMAGING

OPERATING IN THE THIRD DIMENSION

The universal iOCT camera of Lübeck-based OPMedT GmbH can be connected to an operating microscope and delivers touch-free coherence tomography images in the micrometer range during an operation. Besides the pure enlargement, doctors are therefore also provided with three-dimensional images of the underlying tissue. The camera is very flexible, making it ideally suited to the modular device concept of the exclusive distribution partner Haag-Streit Surgical, which was founded 150 years ago as Möller-Wedel. At present, iOCT is used mainly in ophthalmology. However, the potential for other medical disciplines is huge.

“Optical coherence tomography is of interest wherever just a few millimeters or micrometers make all the difference in medicine,” says Dr. Eva Lankenau. Together with Dr. Marc Krug, she manages OPMedT GmbH, the developer of a universal iOCT camera. Optical coherence tomography (OCT) is comparable to ultrasonic waves – but light waves are used instead of the former. This method can be applied to reveal structures and layers within human tissue at a resolution in the micrometer range. But it is not just the resolution of OCT that is far superior to that provided by ultrasonic waves. The measurement method is touch-free, guaranteeing sterility during an operation.

For the intraoperative application of OCT (iOCT), OPMedT has developed a camera that can be attached to the camera port on the operating microscope of the exclusive distribution partner Haag-Streit Surgical. “Intraoperative OCT adds the depth dimension to images during the operation in addition to the usual microscopic view,” says Stephanie Nerl, product specialist at Haag-Streit Surgical. “Depending on the type of tissue, we are talking here about a depth of just one to two millimeters, but these are crucial in eye or brain operations.”

This additional dimension ensures greater precision, minimizes operating risks and should soon be available in combination with other medical devices as well. “The universal use of our cameras considerably simplifies the method’s application, as it can be attached to various surgical microscopes and, in the future, endoscopes or colposcopes,” points out Dr. Lankenau. In other words, it is not necessary to develop – or buy – a completely new device.

“As a result, the iOCT camera is ideally suited to our device concept,” says Stephanie Nerl. “After all, one of the key features that distinguishes us from others is that we offer users the greatest possible degree of flexibility.” While other makers have developed devices with firmly integrated OCT, Haag-Streit Surgical’s operating microscopes can be extended like high-tech medical kits – for example, imaging modules for intraoperative videos or photos or an iOCT camera can be added.

“This offers our customers two crucial benefits,” adds Stephanie Nerl. “Working to tight budgets, customers can first invest in the basic model and simply add further components later. This naturally also makes our surgical microscopes especially flexible.”





The greatest possible degree of flexibility: Haag-Streit Surgical's operating microscopes can be extended like high-tech medical kits. For example the iOCT camera of OPMedT can be added, which delivers touch-free coherence tomography images in the micrometer range during an operation.

Photo: HAAG-STREIT SURGICAL GmbH

Thanks to the seamless integration, all the components work together perfectly. In the case of the iOCT camera for example, this means that the image of the OCT camera is also automatically available to the doctor if he adjusts the microscope's focus to a certain range.

"Our cooperation with Haag-Streit Surgical has developed not only from working in the same field, but also historically from our very good collaboration with Möller-Wedel GmbH," says Dr. Lankenau. This year, Möller-Wedel, which makes optical equipment for microsurgery, is celebrating its 150th jubilee. It has been part of the Haag-Streit Group since 1990.

OPMedT's OCT know-how originates from R&D experience at the University of Lübeck's Institute of Biomedical Optics and at the Lübeck Medical Laser Center. The foundation for the technology was laid as long ago as 1992 when Prof. Reginald Birngruber brought the idea for the OCT method back from MIT in Boston to the University of Lübeck. There, an OCT working group was established. Today, this is headed by Dr. Gereon Hüttmann at the Institute of Biomedical Optics. He in turn acts as a mentor to OPMedT.

"In developing our technology, our primary focus was on the needs of doctors in an operating environment," tells Dr. Lankenau. "The key question at all times was: How can we most effectively help the medical team?" One result of this approach, for example, is that the related software requires only a few control elements. This means that the surgeon can control the camera during the procedure on his own without the assistance of a second operator using only a touch screen – he can make exact adjustments, save single images and documentation for later analysis.

At present, iOCT is used mainly in eye surgery. However, ear, nose and throat (ENT) and neurosurgery are highly promising areas. "For example, the method is ideal as a navigation aid in operations on the inner ear and brain or for quality control in microsurgical procedures," says Dr. Lankenau. Various studies, the results of which should convince doctors working in fields other than ophthalmology of the benefits of iOCT, are already underway.

hk

Further information:

www.opmedt.com
www.haag-streit-surgical.com
www.moeller-wedel.com



More than the eye can see: existing MRI images can now be reevaluated with ARDX. The mathematical method diagnoses incipient Alzheimer's by detecting information that cannot be seen with the naked eye.

MEDICAL IMAGE ANALYSIS

SEEING MORE THAN THE DOCTOR



Photo: Christina Körte and Torsten Kollmer

The volume of the hippocampus is the key marker. If it has degenerated to a greater extent than is normal, it may indicate the start of Alzheimer's. ARDX supports the diagnosis of the status quo. However, it is not yet possible to predict dementia. "ARDX is a low-threshold test offered to people with memory impairment who fear they are suffering from early Alzheimer's dementia," explains Dr. Lothar Spies, managing director of jung diagnostics. The Hamburg company has specialized in medical image analysis services. It is the first company worldwide to have developed an image-based Alzheimer's risk diagnostic method and has marketed this as an approved medical product.

Every specialist, neurologist, psychiatrist and general practitioner can offer ARDX. Patients are first subjected to a memory test and examined radiologically with a conventional MRI system. At jung diagnostics, the MRI image data is then checked to ensure that the quality is good enough and analyzed with the aid of the computer. This means that a patient's data set is deformed in such a way that it fits optimally onto a standard head, a so-called atlas. However, the individual characteristics of the brain are also retained.

The computer program then analyzes the images of the brain regions pixel by pixel and recognizes them as gray or white substance or cerebral fluid. With the aid of mathematical and statistical methods, the distribution of the gray substance is then compared to a collective of healthy test persons. Finally, the result is documented in a report that is automatically generated by the program. However, no report leaves the lab without being checked first. "We subject every report to a comprehensive final check and review the results for consistency," emphasizes Dr. Spies. "In doing so, we use an extensive list of plausibility criteria."

EXCEPTIONAL ANALYTICAL PERFORMANCE THANKS TO MATHEMATICAL ALGORITHMS

The algorithm, which forms the basis for the exceptional analytical performance of ARDX and which jung diagnostics has refined for use in routine clinical work, originates from the Fraunhofer Institute for Medical Image Computing MEVIS in Lübeck. This is where Prof. Dr. Herbert Thiele and his team work in the image registration project



Photo: Christina Körte and Torsten Kollmer

group on new possibilities of computer-assisted analysis of medical image data. “Our research is practice-oriented,” says the project coordinator, emphasizing the significance of the close collaboration between science and industry. The Lübeck project group is well known for its expertise in image registration. Together with the Bremen parent institute, it is, for example, researching into and developing interactive assistance systems for daily use in clinics – including algorithms that can help doctors evaluate computer medical image data and identify risk factors.

The cooperation with jung diagnostics started with a personal meeting at an event. “At that time, we very quickly decided to pool our know-how in a joint project,” recalls Prof. Thiele, who sees huge potential in collaborating with small and mid-sized firms. “If firms have small or no development departments, we can jointly extend their innovative lead. The types of collaboration are very individual and range from providing advice to product component development.”

Good prospects for patients, as ARDX can analyze the previously generated MRI scans of the brain regions pixel by pixel. With the aid of mathematical and statistical methods, it delivers evidence of early dementia.

The Fraunhofer researchers cover a huge range. The current projects range from algorithms aimed at improving tumor diagnosis in digital pathology to the optimized positioning of brain stimulation electrodes for Parkinson’s patients. To bring together the right partners in these complex subjects, the professor says that the good network of clinics, business and research that Life Science Nord Management GmbH has helped to create is especially valuable. “The support the agency gives us is very effective,” says the professor. “And this is a key factor in scientific and commercial success.”

EARLY ALZHEIMER DIAGNOSIS WITH THE HIPPOCAMPUS VOLUMETRY METHOD

ARDX shows what can be created when the right partners come together. Even though the method of hippocampus volumetry is still too complex and costly to be available as a standard procedure in general healthcare, the market is growing. “At present, we are pioneers in this field,” tells Dr. Spies. “However, the technology is also increasingly being used in specialized clinics and experts to diagnose dementia. This is arousing the interest of other firms that now also see opportunities.” A further positive signal is that the assessment of the hippocampus as a biomarker of Alzheimer’s disease has been incorporated into the European guidelines on the diagnosis of Alzheimer’s. While patients still have to pay for ARDX themselves, the managing director of jung diagnostics is convinced that the method’s economic benefits will be accepted in the future. “If Alzheimer’s can be diagnosed earlier with our methods, this will help not only patients, but will also lower the costs for the health insurance carriers in the long term.”

Until then, the research team headed by Prof. Thiele and jung diagnostics are already working on the next joint project: “We are developing a method to measure the spinal cord in the region of the cervical spine,” says Dr. Spies. In the case of multiple sclerosis patients, pathological changes that could lead to paralysis occur there. Once again, the computer can extract more from the image data than a human, and accordingly these changes can be detected at an early stage and therapy can be adapted accordingly. Does that represent a further step in computer-assisted image analysis – namely that the doctor will be completely replaced eventually? “I can’t see that happening,” says Prof. Thiele, and Dr. Spies also shakes his head. “Our technology aims to assist health professionals in time-consuming routine tasks and give them more time for demanding diagnoses. The human factor will still play a role even in medical image analysis.” hk
Further information: www.jung-diagnostics.de
www.mevis.fraunhofer.de

WILL CAD REVOLUTIONIZE DIAGNOSIS?

What role can mathematical and statistical methods play in the future in providing diagnostic support?

We pose three questions to three experts: Prof. Dr. Jörg F. Debatin, former CEO of amedes Holding AG and now Vice President and Chief Technology Officer at GE Healthcare; Prof. Dr. Jürgen Stettin, CEO Prosystem AG; and Klaus Rupp, Head of Care Management at Techniker Krankenkasse.

How do you assess the medical and economic potential of mathematical and statistical methods to aid diagnosis?

Debatin: In my view, the potential for computer-assisted diagnosis (CAD) is vast. In modern medicine, it is necessary to filter out the relevant aspects from a flood of data. Computers provide ideal support here. They can also make a decisive contribution when it comes to correctly interpreting data. It is also conceivable that patient-specific data in the cloud can be compared to well-known patterns and thus the diagnosis can be finalized.

Stettin: In the future, these methods will frequently be used for diagnostic support purposes in medical technology. A second opinion aided by this method is also conceivable – in radiology for example. Adaptive systems, which help to avoid or minimize errors of use, are a further area.

Rupp: Mathematical and statistical methods calculate probabilities and do not deliver definitive prognoses or diagnoses. Their potential depends on the degree to which such methods can be used in a targeted manner, how well they are validated and how well doctors and patients are able to interpret and evaluate the test result. Often, the additional benefit of new methods is unclear and questions remain unanswered.

To what extent does this issue play a role in your daily work?

Debatin: We are at the very start of CAD implementation. The first applications can be seen in laboratory analysis and CAD is being used in some cases in radiology: in most cases, the computer flags abnormalities – for example on CT images of the lung or in a mammography.

Stettin: The incorporation of such methods into medical products is progressing very slowly for approval reasons. However, in the field of medical apps, we are currently seeing a boom in such applications – for example to evaluate blood sugar levels, for drug dosage or even to offer a full diagnostic assessment. But frequently there are software producers involved that have never heard of the strict requirements that medical products have to meet. This means that a great deal of support is still needed.

Rupp: Methods designed to provide mathematical and statistical support to diagnostic work have appeared increasingly in the market in

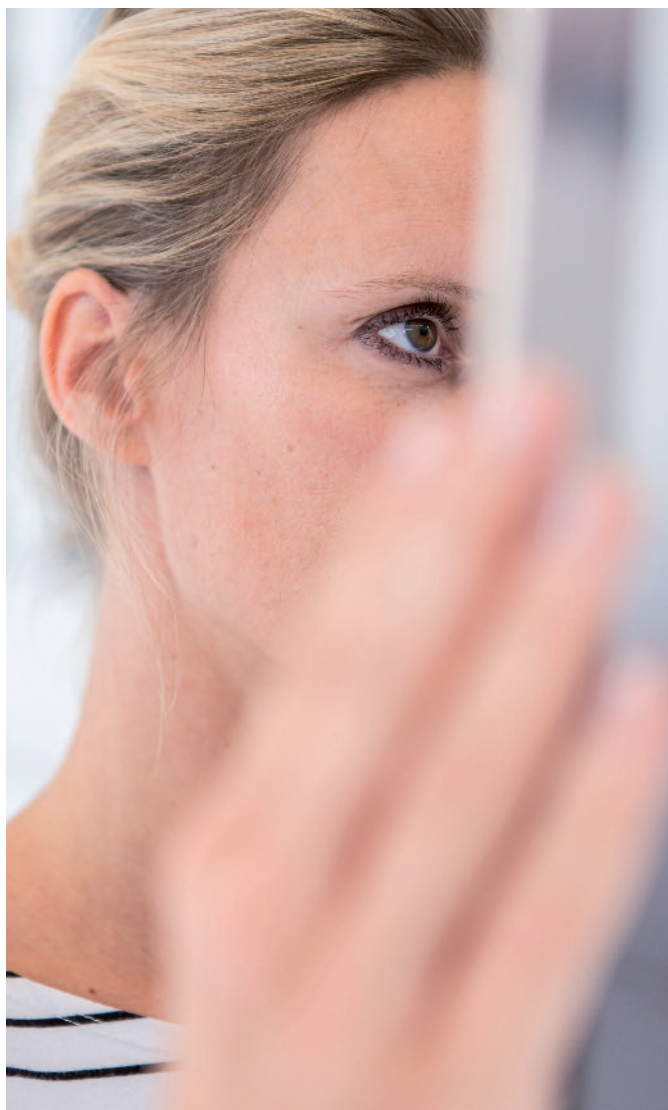


Photo: Christina Körte and Torsten Kollmer

recent years. As these methods are insufficiently covered by the fees for physicians contracted to the state healthcare system or not at all, we are often asked whether we will cover the costs. However, we ourselves attempt to filter out methods that demonstrably help to improve the care of our insured members.

Will this type of diagnostic support become established in Germany in the foreseeable future?

Debatin: Over the coming decade, CAD will revolutionize diagnostics in many ways. The doctors themselves are the biggest obstacle, since many are afraid that their work will be replaced by computers. Personally, I believe that CAD will remain just an aid. However, it will make a major contribution towards making diagnosis more efficient and above all more accurate medically.

Stettin: These methods will certainly become established. Verification, validation and approval are problematic.

Rupp: It is hardly possible to make a generally valid forecast at present. How well a method can become accepted depends on a range of factors – not least the additional clinical benefit, the alternatives that are available and the price. Each individual method has to be reviewed and assessed on its own.

DIAGNOSTICS CLOSE TO PATIENTS

RAPID TESTS FOR INFECTIOUS DISEASES AND ONCOLOGY

The newly formed KSK Diagnostics GmbH develops rapid tests for on-site molecular diagnostics. The detection method can be used close to patients and is designed to replace time-consuming laboratory tests.

The detection of norovirus clearly illustrates the need for rapid testing systems. If samples are sent to a laboratory, detection currently takes 6 to 8 hours. Further time is spent transporting the samples and sending the test results. In the worst case, patients and establishments have to wait one night for the results before they can take targeted measures. KSK aims to change this.

From left: The founders of KSK Diagnostics Dr. Peter Scheinert, Dr. Guido Krupp and Dr. Stefan Kulick; Dr. Heiko Milde, Investitionsbank Hamburg; Dr. Thomas Frahm, Life Science Nord Management GmbH and Gratian Permien, Investitionsbank Hamburg.

KSK Diagnostics GmbH was formed in June to develop and market a method for rapid on-site diagnostic tests that can be used universally. The company's founders, Dr. Stefan Kulick, Dr. Peter Scheinert and Dr. Guido Krupp, have developed a basic technology which makes it possible to obtain robust and accurate results without the need for much equipment.

Start-up capital was required. This was provided by the InnoRampUp program of the development bank Hamburg Investitions- und Förderbank. "We were convinced by the founding team's business idea. We see an attractive market for the products in the future," says Dr. Heiko Milde, managing director of IFB Innovationsstarter GmbH, which is responsible for managing InnoRampUp. Without this initial funding, the founders would have found it difficult to start the business. Dr. Peter Scheinert sums it up: "The InnoRampUp funding has enabled us to set up the company. In addition, Life Science Nord Management gave us a great deal of assistance in applying for the funds. This support was extremely valuable for us."

Work can now get underway. The goal is to develop a universally applicable nucleic acid amplification technology within two years to enable a molecular diagnostic test to be performed in just 30 minutes. Infectious diseases and oncology will be areas in which the test can be used. The test systems will, for example, be of interest to medical practices and medical departments on ships as well as to hospital laboratories.

With regard to the huge potential of this project, Dr. Thomas Frahm from Life Science Nord Management GmbH says: "We are delighted about this successful and highly promising start-up in diagnostics close to patients. The know-how and expertise of the KSK Diagnostics founding team provides the foundation for a promising development." [hp](https://www.innovationsstarter.com/innorampup)

Further information:

www.innovationsstarter.com/innorampup



Photo: Markus Scholz

SCHLESWIG-HOLSTEIN IDEAS COMPETITION

WANTED: BRIGHT MINDS AND FRESH IDEAS

On November 6, this year's winners of the Schleswig-Holstein competition for new ideas will receive their awards. The competition is designed to elicit innovative ideas from universities and research institutes that are commercially feasible and can be put into effect.

Technologies, concepts, products, innovative methods and services – the inventiveness of scientists in North Germany knows no bounds. To offer these ideas a platform for further development, the universities and research institutes in Schleswig-Holstein have

taken the initiative and launched the “Schleswig-Holstein Ideas Competition.”

This year's competition kicked off in May. The organizers are looking for practical ideas that offer a realistic prospect of being marketable. It should be possible to put them into effect in Schleswig-Holstein and they must not have formed the basis for a previous start-up. Participating is well worthwhile. The competition alone opens the door to a strong network of sponsors and multipliers. Prizes totaling 12,500 Euros will be awarded to the most outstanding ideas. There will also be non-monetary prizes, including

rent-free office space or coaching for persons interested in starting a business.

This year, the competition is being organized by Dr. Werner Jackstädt Center for Entrepreneurship and SME Flensburg and the Business Development and Technology Transfer Corporation of Schleswig-Holstein (WTSH). The competition's patron is Reinhard Meyer, Minister of Economic Affairs, Employment, Transport and Technology of Schleswig-Holstein. hp

Further information:
www.seedfonds-sh.de/idee2014-wettbewerb.html

AUTOIMMUNE DISEASES

NANOPARTICLES TO COMBAT MULTIPLE SCLEROSIS

What autoimmune diseases such as multiple sclerosis (MS) and type 1 diabetes have in common is a misdirected immune system. New therapies are needed to suppress the body's destructive immune response directed against the central nervous system in a targeted manner. The German Ministry of Education and Research has provided funding of about 2.8 million euros to the NANodeLIVER project.

At present, it is not possible to cure autoimmune diseases – but it is hoped that this will change. The application of nanotechnologies is giving rise to entirely new approaches and therapies. It is now planned to try and use nanoparticles to induce a natural liver function in MS patients, leading to immune tolerance. In a properly functioning organism, the liver performs the important task of suppressing immune responses to harmless antigens. In the case of multiple sclerosis patients, this mech-

anism could be used to “switch off” the incorrect response to the body's own antigens.

Immunosuppressives are frequently prescribed as a therapy for patients with autoimmune diseases. However, these also suppress all the immune responses that are important for the organism. The NANodeLIVER method causes by using nanoparticles a much more targeted – and therefore largely free of side effects – antigen-specific tolerance induction, which emanates from the liver.

NANodeLIVER GmbH (NdL) was formed as a spin-out from a highly promising project collaboration between Bionamics GmbH and University Medical Center Hamburg-Eppendorf (UKE). The name says it all – NdL's main activities relate to the use of nanoparticles to transport peptides that induce immune tolerance into the liver.

The catalyst for the start-up was the preceding recommendation of the NEU² consortium to review this innovative technology approach with regard to its suitability as an MS

therapy. To gain investors and sufficient capital to expand the platform and its numerous clinical applications, a suitable corporate framework has been established in the shape of NdL. At the same time, a licensing agreement has been concluded with the UKE to cover the underlying intellectual property.

The 2.8 million euros provided by the BMBF funds the project for the first step towards a NANodeLIVER-based therapy for multiple sclerosis. The successful testing and clinical validation of this technology approach could trigger a large number of therapy developments for various immune-related diseases. Further projects are already at the application stage on a national and European level. Dr. Johannes Pohlner, managing director of NANodeLIVER GmbH, is planning the next steps: “Solid private funding is essential to establish NdL, but we are making good progress!” hp

Further information:
www.neu-quadrat.de

LIFE SCIENCES IN DENMARK

A VIBRANT COMMUNITY

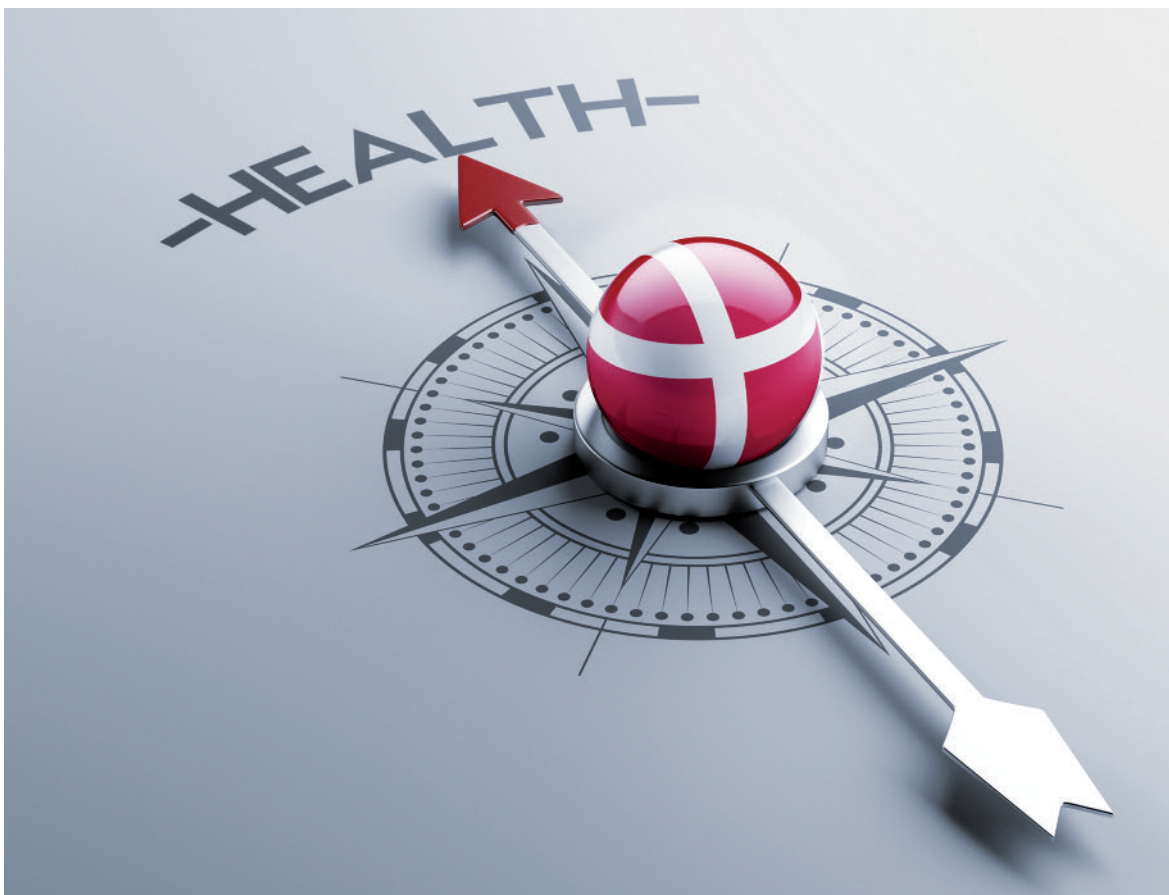


Photo: xtock

Denmark is one of the leading life science locations in Europe. The smallest of the Scandinavian countries offers huge potential in medical engineering and biotechnology.

Denmark has a great deal to offer in life sciences: a vibrant group of small and mid-sized biotech companies, giant global pharmaceutical groups, a first-rate research landscape and closeness to clinics.

The links between Germany and Denmark are growing ahead of the construction of a Fehmarnbelt crossing. It will take several years before the first vehicles use the crossing. How-

ever, even today, it makes sense for businesses and research establishments in Schleswig-Holstein and Hamburg to look to Scandinavia, and especially the Öresund region.

For foreign firms offering medical and rehabilitation equipment, the sales opportunities in the Danish market are growing. The favorable forecast is based not only on the marked increase in the proportion of elderly people in the population. The entire public sector hospital system is being restructured. For example, numerous hospital construction and modernization projects are being implemented. There is a huge pent-up need to invest in state hospitals as a result of the ongoing austerity measures. By 2020, just un-

der 5.6 billion euros are due to be invested in clinic modernization and construction. The procurement and installation of medical and IT technology should account for some 20% to 25% of that amount. Significant hospital projects are those in Odense and Aarhus as well as in Køge and North Jutland and Copenhagen/Bispebjerg. In addition, the private health sector is gaining momentum. Besides consumables, the main growth drivers are orthopedic products. From 2015 onward, demand for diagnostic imaging equipment should also pick up appreciably.

The kingdom also scores with a record research and development budget of 2.7 billion euros in 2013 and a well-filled project

pipeline. Given the large number of preclinical and clinical studies, observers expect a sharp rise in Danish-made biotech medicines. Tax concessions that make the location more attractive are also available. For example, foreign specialists pay a flat rate 26% income tax for up to five years. Companies in particular appreciate the tax relief for investment in research and development (R&D).

Most biotech firms and research institutes have settled in and around Copenhagen. The binational Medicon Valley, home to about four-fifths of all biotech firms in Denmark, stretches over the entire Øresund region from the island of Zealand to the southern Swedish region Skåne and is a leading life science cluster in Europe. Biopeople is another innovative health and life science network that aims to bring together Danish researchers and life science players with experts from other countries.

The process of creating a networked science region has long been underway. For example, more and more initiatives in business and science are being set up ahead of the upcoming construction of the Fehmarnbelt tunnel. One of these is the “FBÖ TransTechTrans” initiative of the Lübeck Chamber of Industry and Commerce, the Danish Ministry of Research, Innovation and Higher Education and the Swedish region Skåne. The initiative encourages businesses and research institutes from the medical engineering, biotechnology and life sciences sectors to develop joint cross-border projects.

To bring together organizations and companies, the project partners provide funds for the cross-border secondment of employees for periods of up to four weeks – in that period the partners are supposed to devise projects jointly, develop ideas for innovations – and funding opportunities for their implementation.

In all three countries, funds are still available from the initiative. Applications can be submitted on an ongoing basis.

The pilot phase of the initiative terminates at the end of 2014 and will be followed by an evaluation. In all three countries, funds from the initiative are available. Applications can be submitted on an ongoing basis.

Under the initiative, the partners regularly organize events. For example, the “Medico Bazar” will again be held in January 2015 on the site of the Danish Technical University (DTU) near Copenhagen. Interesting medical engineering research and development projects will be presented there. With over 400 visitors from the medtech industry, the event also offers for participants from Germany outstanding opportunities to establish networks in Denmark. **bp**

Further information: www.fbo-corridor.eu, www.ihk-schleswig-holstein.de

LIFE SCIENCE CLUSTER BIOPEOPLE

INNOVATION ACROSS DISCIPLINES

Biopeople is Denmark's Innovation Cluster for Health & Life Sciences, covering pharma, biotech, medtech and food ingredients. Science & Innovation Cluster Manager Elias Zafirakos explains the opportunities for German companies.

What are the major tasks of Biopeople?

The purpose of the cluster is to stimulate life science innovation through activities that bring researchers and stakeholders together across disciplines, sectors and public-private boundaries. The major task is to facilitate innovation in life sciences through various networking activities together with our cluster partners and to help companies and researchers from Denmark and abroad to meet potential collaboration partners, and initiate collaborations between interested parties. Another function is to provide input for and help execute the Danish innovation strategy as outlined by the Danish Ministry of Science, Innovation and Higher Education.

How does Biopeople support German companies in initiating collaborations?

Biopeople is involved in a number of activities that can help German companies to in-

itiate collaborations. One example is the FBÖ TTT initiative, a German, Danish and Swedish collaboration which provides travel grants and supports German firms and researchers in the Lübeck area – and Danish companies and researchers as well – to identify and initiate cross-border collaboration. In connection with the Lübeck partnering mission – a yearly business delegation trip to Lübeck/the Hansebelt region – Biopeople invites Danish companies and researchers to meet German firms and find new collaboration partners.

In addition, the BSR innovation express program, FoodIN2Health, can help German companies in the Lübeck area to find Danish partners within food biotech. IN2LifeSciences, also offers travel grants to German companies from Stuttgart and Lower Saxony. In addition to these activities Biopeople offers German firms the chance to join the Biopeople network and increase their exposure to Danish business and research organizations free of charge.

Which collaborations are particularly attractive?

Denmark is very strong in all the areas that Biopeople covers – biotech, medtech, phar-

ma and the food ingredients industries – and these areas may therefore be attractive to German companies.

How does the collaboration between Denmark and Germany work?

The working culture of North Germany and Denmark is very similar and this makes collaboration much easier.

Further information: www.biopeople.dk



Photo: Biopeople Denmark

BIOTECHNOLOGY

THE CELL MAKERS

A strong team of five:

Prof. Dr. Christine Klein, Dr. Philipp Seibler, Prof. Jeanette Erdmann and Dr. Stephanie Stölting (left to right) missing their colleague Dr. Anne Grünewald.

A team of five Lübeck scientists has refined a method under which cells can be analyzed in connection with hereditary diseases, eliminating the need for biopsies of tissue from the affected organs. Instead, skin cells from patients are first reprogrammed to induced pluripotent stem cells (iPS) and then developed into nerve or muscle cells that reveal the donor's complete genetic profile. The biotechnology start-up project iPS-HL has been awarded the BioMedTec 2014 prize by the Lübeck Sparkasse.

“At present, we are working on further standardizing our method and making it marketable,” says Prof. Dr. Christine Klein. The director of the Institute of Neurogenetics at the University of Lübeck along with Prof. Dr. Jeanette Erdmann, head of the Department for Integrative and Experimental Genomics, and Dr. Philip Seibler, Dr. Anne Grünewald and Dr. Stephanie Stölting form the five-strong founding team of the future iPS-HL GmbH. “Even in the future, we will not have one single standard method that can be applied to all cells,” says Prof. Erdmann. That would only be possible if all cells behaved in a completely identical manner. However, they are as individual as the patients they are taken from and exhibit clear differences, for example with regard to reprogrammability. This means that the method to develop cardiac muscle or nerve cells will have to be slightly adapted constantly.

In recent years, analysis techniques in molecular biology have advanced at such a pace that the causes of numerous hereditary diseases have been discovered. Scientists seeking to analyze these causes need cells with the corresponding genetic information. However, the ability to acquire cell samples directly from the organs of sick patients is limited – especially in the case of brain, heart or lung diseases, for which a biopsy is very time-consuming and costly, painful and risky.

This is where the Lübeck start-up team's method comes into its own. For the examinations that have to be carried out, they do not have to take cells from the diseased organ, but instead breed them from the patient's skin cells, which raises absolutely no ethical issues. “They are removed with the aid of a small skin punch and reprogrammed into iPS cells in the laboratory,” explains Dr. Seibler. The researchers are then able to develop the adult pluripotent stem cells into the cell type that is of relevance for the disease in question – for example into nerve cells for brain diseases or into cardiac muscles. The result reveals the respective donor's full genetic profile, making it ideally suited for function tests and examinations needed in drug development.

Prof. Klein, in collaboration with the then doctoral student Philip Seibler, established the underlying technology, for which the Briton John Gurdon and Shinya Yamanaka



Photo: Christina Körte and Torsten Kollmer

from Japan were awarded the Nobel prize for medicine in 2012, in their institute. Seibler later performed research at the Harvard Medical School in Boston, examining, among other things, the effects of certain mutations on nerve cells that have developed from pluripotent stem cells. Armed with this know-how, the scientists were also able to make crucial improvements to their methods.

iPS-HL GmbH is due to be set up in mid-2016. "By then, we will have to sort out licensing issues among other things," says Prof. Erdmann. However, once these have been resolved, iPS-HL has a good chance of succeeding in the market. The target groups are academic researchers and the pharmaceutical industry. Patients will naturally have to give their consent before their cells may be used for further examinations. "However, this will not be an issue for most of them," says Prof. Klein. On the contrary, persons suffering for example from a rare hereditary

disease are normally very interested in better research into the condition.

During the start-up process, the team will be able to rely on expert assistance. "The university and especially Dr. Raimund Mildner from the Technology Center Lübeck (TLZ) have already offered us excellent support so far," emphasizes Prof. Erdmann. The TLZ is a joint venture of the Lübeck business community to promote innovation, know-how transfer and start-ups. Dr. Werner Marnette is available to help the founders in matters regarding iPS-HL's business development. The former Schleswig-Holstein minister for science, economic affairs and transport is working as a mentor to the project. Will the researchers end their academic careers if iPS-HL proves successful? "At heart, we are all scientists and not entrepreneurs," laughs Prof. Erdmann. "I at any rate cannot envision ever giving up research." **hk**

Further information: www.uni-luebeck.de

SMARTPHONE APPLICATIONS

PATIENTS AS DEVELOPERS

Moritz Göldner, doctoral student at the Institute of Technology and Innovation Management at the Hamburg University of Technology (TUHH), is the winner of the R&D Management Conference 2014 Best Paper Award.

The internationally renowned Conference for Research and Development was organized by the Fraunhofer IAO (Institute for Industrial Engineering). Göldner's paper entitled "Are patients a valuable source of innovation for R&D of medical devices? The case of medical smartphone applications" received the award as best paper. As co-authors, the two students Alexander Kaufmann and Vivienne Paton as well as Prof. Dr. oec. publ. Cornelius Herstatt, head of the Institute for Technology and Innovation Management, also participated in the prize. Göldner outlined the research results in a three-minute presentation. The "innovative patient" forms the basis of

his scientific work with regard to intelligent smartphone medical apps. In his research, the young scientist determined that patients and their relatives are extremely innovative and develop by far the most popular medical apps for smartphones. "Smartphones can make life easier for chronically sick persons. There should be little doubt about this," said Göldner. In diseases such as diabetes mellitus or hypertension, self-measurements and the documentation of the readings play an important role in therapy management. The doctoral student concludes: "Patients or customers should never be underestimated. Persons that are especially affected develop optimal solutions for their needs – often better than firms or physicians. If companies involve them at an early stage in the product development process, unpleasant surprises, for example on the market launch of a product such as a medical app, may be avoided." **sm**

Further information: www.tuhh.de

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DEVELOPING A BIO-BASED ECONOMY

For the seventh time TUHH Hamburg University of Technology invited scientists and specialists from biology, biochemistry, chemistry and engineering to attend the International Congress on Biocatalysis from August 31 to September 4.

New screening strategies and concepts of metabolic engineering and synthetic biocatalysis continue to drive the growth of industrial biotechnology. Optimizing biochemical pathways leads to the sustainable production of bioeconomically high-value products used in the chemical, pharmaceutical and cosmetics industries. The International Congress on Biocatalysis contributes to the development of a sustainable and successful future.

Developing a bio-based economy is a worldwide strategy aimed at addressing the global challenges of dwindling fossil energy reserves, environmental pollution and climate change in the light of a growing world population. Biocatalysis is one of the key technologies to address this complex task, helping to produce sustainable raw materials and energy supplies from biomass while at the same time taking responsibility for the world's food supplies. Biotechnological products are already used in the chemical, pharmaceutical and cosmetics industries and the developing bioeconomy is expected to create new processes and products as well as new job opportunities.

Conference chair Prof. Garabed Antranikian, President of the TUHH, says: "To face the enormous and diverse challenges of our time, bridging the gap between research and markets of the future is particularly important. The successful concept of our biocat conferences is based on an interdisciplinary approach that integrates the know-how of highly respected biologists, biochemists, chemists and engineers from academia and industry, and offers a platform for forming strategic alliances for future projects."

Further information:
www.biokatalyse2021.de

INNOVATION PROJECT COLLIN

“KEEP THE PATIENT OUT OF THE HOSPITAL”

Almut Kalz is project manager of COLLIN. She offers interesting insights into the Danish-German collaboration and its results.



Photo: UKSH

In June 2014 the Danish partners of the innovation project COLLIN (collaboration for innovation) visited the University Hospital Schleswig-Holstein (UKSH). Project manager Almut Kalz provides information about the synergies of the German-Danish collaboration.

What are the main areas of interest and research in the COLLIN project?

COLLIN was started to initiate and intensify the collaboration between the UKSH and the Odense Universitetshospital and the multiple network partners from the field of clinical innovation. A major focus has been on robotic and automation solutions, which are particularly relevant in hospital logistics. In Odense, for example, blood samples are transported by means of a high-speed tube system, which has recently been developed by the hospital and a small Danish company. Further examples are electric bed transporter systems, self-navigating robot vehicles for small transports and fully automated systems like the unique robot-controlled central sterile services department in Gentofte. In view of the UKSH plans for comprehensive renewal of many buildings both in Lübeck and Kiel, solutions like the above are highly relevant for logistics planning. In addition, there has been collaboration in the field of robot-assisted surgery, as both hospitals set up da Vinci surgical centers recently.

But COLLIN has also been looking for new impulses in healthcare IT and telemedicine. In

these fields, Denmark has gained a kind of international pole position, mainly due to the fact that some years ago Danish hospitals were not able to cope with the large patient numbers. The innovation motto frequently quoted is therefore: “Keep the patient out of the hospital.”

How can German patients profit from the so-called “Patient Briefcase,” developed in Odense?

This solution is essentially a simple hinged case with a monitor for video conferencing and encoded data pathways. The most important feature is its simplicity: anybody without previous knowledge of a computer can use it. Acute or chronic COPD patients, for example, can use it to contact their physician or rehabilitation specialists to train and monitor their lung function.

What is special about the automated central sterile services department in Gentofte?

The crucial feature is a completely secluded storage area for surgical equipment and consumables behind glass walls. The staff work on PC ports on the other side of the glass and order the required material per surgical intervention by editing a standard list. The robotic storage system “knows” exactly where everything is and combines the material into ready-to-use case carts, specifically labeled for each patient and surgery.

What are the special features of the electric bed transporters?

Instead of having to push the bed over long distances, which is a strenuous task and often causes back problems, the staff become a “hangers-on,” maneuvering the towing vehicle via an ergonomic steering unit. From the patient perspective, the benefit lies in decreased wheel vibration and ultrasoft braking of the transport machine. At the same time the transport staff are free to give the patient increased attention. At the Odense Hospital, these transporters have been in use for some years; in Germany, the UKSH could become the first hospital to employ this innovative technology. A recent test trial in Lübeck showed promising results: staff and patients were equally satisfied with the innovation.

How does the robot-assisted surgical da Vinci system function?

Both UKSH, Campus Kiel, and OUH have recently established da Vinci surgery centers and in both hospitals the da Vinci is shared by urologists, gynecologists and thorax surgeons. The physician guides the endoscopic instruments via finger straps and a 3D vision console. He sees a maximum enlargement of the surgical field and is able to move the endoscopic instruments tremor-free and with high precision. Large numbers of patients can now profit both from the benefit of minimally invasive surgery and improved surgical results. Further collaboration between the two centers for research on robot-assisted surgery has been agreed on. bp

Further information:

www.collaboration-for-innovation.eu

UNIVERSITY OF LÜBECK

CHANGE
AT THE TOP

Photo: University of Lübeck

Prof. Dr. med. Dr. h.c. Hendrik Lehnert is the new president of the University of Lübeck. He took up his position on 2 August and succeeds Prof. Dr. Peter Dominiak, who did not seek a further term due to his age.

Lehnert will be the university's president for the coming six years. He studied psychology and medicine at the University of Münster and has been Professor of Internal Medicine at the University of Lübeck and Director of the Medical Clinic I of the University Medical Center Schleswig-Holstein, Lübeck Campus, since 2007. In addition, he was the university's Medical Director from 2012 to 2013. A ceremony marking his appointment as president will take place during the celebration of the university's 50th jubilee in St. Petri Church on 3 November. In addition to Prof. Lehnert, the University of Lübeck's Board of Directors consists of the three Vice Presidents Prof. Dr. Enno Hartmann, Prof. Thorsten Buzug and Prof. Detlef Zillikens, and the Chancellor Dr. Oliver Grundei. sm

Further information: www.uni-luebeck.de

GEOMAR – HELMHOLTZ CENTRE
FOR OCEAN RESEARCHPROFESSORSHIP
FOR THE
CHEMISTRY
OF MARINE
NATURAL
PRODUCTS

Photo: A. Villwock, GEOMAR

Prof. Dr. Deniz Tasdemir will be in charge of the Kiel Center for Marine Natural Products (KiWiZ) in the future. The scientist has joined the GEOMAR Helmholtz Centre for Ocean Research as a result of a successful appointment procedure under the so-called Helmholtz recruitment initiative.

The professorship of Prof. Deniz Tasdemir at GEOMAR will receive annual basic funding of 600,000 euros from the Helmholtz Association. Tasdemir will use the funds to establish and expand her research group. In addition to KiWiZ, she will head the new research unit for the chemistry of marine natural products, which is part of the marine ecology research field. The scientist said she was looking forward to new challenges and opportunities offered by the excellent infrastructure in deep sea research and the collaboration possibilities in marine ecology and marine biogeochemistry at GEOMAR. Tasdemir previously worked at the National University of Ireland in Galway as Professor of Marine Biodiscovery. sm

Further information:
www.geomar.de

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QUALIFIED PERSONNEL – A KEY SUCCESS FACTOR

GOOD PERSPECTIVES FOR YOUNG PEOPLE

The apprentices come from all over Germany to OR Technology.



Photo: foto@Andreas-Duerst.de

The Rostock-based company OR Technology represents 23 years of experience in offering software and hardware solutions for digital X-rays, imaging and Web-based applications in human and veterinary medicine, industry, the point-of-care market and the security sector. Personnel are a key success factor.

Clemens Wluczka from the island of Usedom is one of 13 young people that are currently being trained at the owner-managed medical IT business OR Technology in Rostock. The company has focused on creating a pool of qualified personnel for itself and Mecklenburg-Vorpommern for many years. The local chamber of industry and commerce has frequently awarded it the prize as “top training business” – which endorses this approach.

“At present, our firm is training IT systems technicians and electronic specialists, among others. Many of our apprentices are from Mecklenburg-Vorpommern. But young apprentices also come to us from Saxony and Rhineland-Palatinate. We see the chamber of commerce’s award as an additional spur to continue this work,” says Bernd Oehm, managing shareholder responsible for marketing and sales. He adds that it is naturally in the firm’s own interest to maintain high standards in practice and in theory.

OR Technology GmbH represents innovative, high-quality medical software and hardware solutions in digital radiography. The company’s own product lines in a broad range of fields are in demand all over the world. Clemens Wluczka was also attracted by the international nature and range of the business. In August this year, the 23-year-old started an apprenticeship at OR Technology to qualify as an IT expert with a focus on systems integration.

“I am always fascinated by the regions throughout the world from where we receive enquiries and orders, as well as by the variety of uses to which our products are put. These range from medical radiology in big hospitals as well as small clinics to pearl X-rays (non-destructive testing (NDT)) in Hong Kong and the installation of our systems on cruise liners.” The apprentice says that the work is very varied and therefore extremely stimulating. There is no danger of becoming bored. Besides their IT skills, the young people have very good language skills – a further benefit for the company. OR employees communicate with their clients in a wide range of languages. Questions regarding offers or support can even be answered in Arabic. This not only makes the company more competitive. It is also one of many little things that are making Mecklenburg-Vorpommern increasingly attractive to highly qualified young people as a location offering a host of career opportunities. **sm**

Further information: www.or-technology.com

PLASMA MEDICINE

WOUND HEALING ON A NEW LEVEL

The use of physical plasmas for therapeutic purposes is still a relatively new therapy in medicine. As one of the world's leading research centers for plasma medicine, the Leibniz Institute for Plasma Science and Technology (INP) in Greifswald is working successfully at the interface between plasma physics, medicine, pharmacy and biology.

Adding energy to a gas creates the fourth state of matter – plasma. Most natural plasmas are hot – lightning is an example. However, adding energy can also produce low-temperature plasmas. In Europe, INP is the largest non-university research institute in the field of low-temperature plasmas, their basics and technical applications. It also promotes the development of plasma-assisted processes and products. Worldwide, there is huge interest in the variety of areas in which plasma medicine

could be applied. Besides the plasma-supported modification of biorelevant surfaces, for example in implants and the plasma-based sterilization of medical products, the INP scientists' research focuses mainly on direct therapeutic plasma applications. In June 2013, neoplas tools GmbH obtained approval for the first German plasma pen designed to treat infectious skin diseases and improve wound healing. This medical product is the result of research at INP in collaboration with the medical school at the University of Greifswald, the Berlin Charité and the Greifswald-based companies neoplas GmbH and neoplas tools GmbH.

At the beginning of the year at Arab Health in Dubai, the largest healthcare exhibition and medical congress in the Middle East and Asia, INP provided an overview of the current results of plasma research and an outlook on future medical areas of application such as dental or implant medicine. As an innovative

therapy for the treatment of chronic wounds and infectious skin diseases, INP also unveiled the plasma pen to an audience of international experts. "We were mainly interested in potential partners from industry, research and medicine, first, to back up the results to date with further clinical studies and, second, to advance research into mechanisms of biological plasma effects," says INP director Prof. Klaus-Dieter Weltmann. "We also succeeded in establishing promising cooperation arrangements with healthcare facilities and companies in Dubai. There is particular interest in the opportunities for therapeutic plasma applications in veterinary medicine." The institute will be present at MEDICA in Düsseldorf in November and also plans to be represented at Arab Health in January 2015 as an exhibitor on the joint North German stand. **sm**
Further information:
www.inp-greifswald.de

MEDICAL INFORMATICS

MAKING NERVES MORE VISIBLE

At the Institute for Applied Computer Science (IACS) in Stralsund scientists are working hard to raise the visibility of neural pathways in the brain.

Neurosurgical procedures remain one of the biggest challenges facing surgeons despite advances in technology. Doctors find it especially difficult to know whether nerves are already affected or could be damaged during surgery. One of the goals of Prof. Hans-Heino Ehrlicke from the Stralsund University of Applied Sciences is to change this state of affairs. In the Department of Electrical Engineering and Informatics, he teaches a number of subjects, including graphic data processing and medical image analysis.

In the Health Informatics Competence Center at the IACS, he develops noise suppression and regularization methods for diffusion profiles in MRI datasets and algorithms for the visualization of neural pathways.

"The diffusion of water molecules is restricted by the myelin sheath around nerve fibers, resulting in a directed diffusion, whose extent and direction can be determined quite well," explains Prof. Ehrlicke. From the measurement data, fiber tracking methods can be applied to reconstruct the course of neural pathways and create three-dimensional visualizations.

However, he says there are limitations: "Current visualization possibilities are not very suitable for clinical use, as they deliver imprecise or incorrect information. This is especially true in the case of crossing, branching or touching nerve fiber bundles, which we find, for example, in the brain." For the visualization of diffusion data, he and his staff have therefore developed and patented a method based on the line integral convolution (LIC) algorithm for vector field visualization. A color coding method has also been developed. This enables the related LIC

image to be superimposed over an anatomical MRI cross-section.

Prof. Ehrlicke and his colleagues are currently working on the evaluation of their method on the basis of various clinical questions. These include clinical conditions such as ataxia, demyelination and different types of tumors. This evaluation is being undertaken in close cooperation with the Department of Diagnostic and Interventional Neuroradiology at the University of Tübingen. The next goals are to improve the computing power of the software so that doctors do not have to wait a full hour for the images of the neural pathways. "We would also like to place the software online as freeware to allow other medical professionals to use and test it." Ideally, says Ehrlicke, we will then find an MRI equipment manufacturer as a partner that will incorporate our software into its devices. **sm**
Further information:
<http://iacs.fh-stralsund.de>

OUTSTANDING IMAGING

Together with the Harvard Center for Biological Imaging and Carl Zeiss Microscopy GmbH, the Rostock company Arivis has received this year's Microsoft Life Sciences Innovation Award.

At the Drug Information Association's annual meeting in San Diego, the winners received their awards for imaging solutions for stitching, visualization, sharing and analysis of very large mouse brain volumes. These are acquired with a Zeiss lightsheet fluorescence microscope in a number of single image stacks, imported into an Arivis software program and stitched to one volume of approximately 1 terabyte with special tools. This volume can then be visualized and analyzed interactively in 2D, 3D and 4D. Through a server-based Web Arivis application, the imaging data can be shared and processed with other research groups.

Further information:
www.arivis.com

COMPETENCE CENTER TO BE ENLARGED

The medical technology company Cortronik GmbH is enlarging its facilities in Rostock-Warnemünde.

On about 2,200 square meters, the company is creating additional space for production, engineering, storage, locks, offices and social facilities. It is also investing in modern technology such as laser cutting systems and production lines to produce absorbable metal stents and in laboratory, testing and safety equipment. Overall, the costs will amount to 18.2 million euros. The Economics Ministry of Mecklenburg-Vorpommern is providing funding of some 4.7 million euros for the project. Cortronik GmbH, which was set up in Warnemünde in 1998, develops and produces vascular stents. The company has extensive know-how in the microprocessing of a wide variety of implant materials and in various coating technologies.

Further information:
www.cortronik.de

MULTIDRUG-RESISTANT PATHOGENS

GERMS KNOW NO BORDERS

Techniker Krankenkasse, the University of Greifswald Medical School and the Polish EMC Medical Institute have signed the first international cooperation agreement on the management of multidrug-resistant pathogens.

The Wrocław-based EMC Medical Institute with its hospital in Kamień Pomorski, the University of Greifswald Medical School and Techniker Krankenkasse (TK) in Mecklenburg-Vorpommern want to build up a joint cross-border network to reduce infections with multidrug-resistant pathogens. EMC Medical Institute AG is the largest private clinic operator and provider of medical services in Poland. The group currently consists of eight hospitals and 16 medical care centers.

The Greifswald Medical School and TK have worked in HICARE (Health, Innovative Care and Regional Economy), a regional alliance against multidrug-resistant pathogens in Mecklenburg-Vorpommern, for several

years. "Patient flows have been crossing borders in Europe for a long time. This is why the European states have to step up collaboration in the fight against the dangerous hospital germs," says Dr. Thorsten Wygold, Medical Director of the Greifswald University Medical School.

The partners agree that multidrug-resistant pathogens can only be successfully tackled if a number of necessary measures regarding prevention, diagnostics and therapy are also consistently carried out. Besides risk-dependent screenings, these include the restrictive and responsible use of antibiotics. In addition, outpatient and inpatient healthcare establishments should be better networked. Besides the future cooperation with Poland, the HICARE competence network is working on further international collaboration agreements, for example with the Netherlands, which has been very successful in coming to grips with multidrug-resistant pathogens. **sm**

Further information:
www.medizin.uni-greifswald.de

DIABETES

20 YEARS OF TOP CLASS MEDICINE

The Klinikum Karlsburg has celebrated its first 20 years as a heart and diabetes center and laid the foundation stone for a new diabetes innovation center.

In 1994, the clinic group Dr. Guth acquired the former hospital for diabetes in Karlsburg. Its goal was to continue to operate the diabetes clinic and establish a new heart clinic for Mecklenburg-Vorpommern. Today, the clinic is one of the most modern heart centers in North Germany and offers a unique service thanks to the integration of diabetes treatment. According to the clinic, some 2,500 cardiovascular operations and about 5,000 cardiological procedures are performed each year. "Many of our patients are from abroad. The Klinikum Karlsburg helps to raise international awareness of the excellent work done in Mecklenburg-Vorpommern," emphasizes Harry Glawe, Minister for Economics, Construction and Tourism of Mecklenburg-Vorpommern at the ceremony. The clinic coop-

erates with and has contacts to partners in the United States, the United Arab Emirates, China, Japan, Russia and Scandinavia.

A diabetes innovation center is also currently under construction in Karlsburg. Treatment and applied clinical research will be combined in one center of competence. For instance, a cooperation with the Leibniz Institute for Plasma Science and Technology is planned. The Economics Ministry is providing some eight million euros from the European Fund for Regional Development for the new building. The multifunctional building with 2,000 square meters of space will have a septic operating room, laboratories as well as seminar and study rooms for scientists and students. The upper floor will house the clinic area with 26 beds. The first patients with chronic wounds and infections are due to be treated in the new, pavilion-style building at the end of 2015. **sm**

Further information:
www.drguth.de/klinikum-karlsburg

OPHTHALMOLOGY

GLAUCOMA IN FOCUS

With a new microstent Prof. Dr. Anselm Jünemann has lowered a young girl's intraocular pressure.



Photo: Tanja Bodendorf

Prof. Dr. Anselm Jünemann has been Director of the Department of Ophthalmology at the University Medical Center Rostock since July. His aim is to expand the clinic into a competitive leading center in its field.

The ophthalmologist, who was born in Münster, is a specialist for glaucoma. Most recently, he was the managing medical director at the department of Ophthalmology at the University of Erlangen. There, he headed numerous scientific projects in glaucoma research. At the University Medical Center in Rostock, he also intends to develop this field further. "Rostock is a very good and internationally respected center for the development of innovative implants," says Prof. Jünemann. He uses such implants to treat patients and develops them further in his department. "Glaucoma surgery using minimally invasive methods is very close to my heart. While we are unable to eliminate glaucoma surgically, we can at least normalize the intraocular pressure," explains Jünemann. As he has a special interest in pediatric surgery, he inserted a new microstent for the very first time in the eyes of a six-year girl from Wrocław in Poland. The young girl's intraocular pressure had to be lowered as a matter of urgency.

The microstent is a tube-shaped channel that is just six millimeters long. The aqueous humor can be drawn off through the microstent and drainage permanently improved. Prior to the operation, little Ka-

milla already had a long history of suffering, as children can also be affected by glaucoma. "In her case, recurrent eye inflammations were probably the cause of the glaucoma," surmises Jünemann. "The statistical value for the pressure is about 15mm Hg," explains the doctor. In the case of Kamilla, the final level was between 30 and 40, despite the maximum therapy with drops. For the young girl, the outcome could have been bad: as a disease of the optic nerve, glaucoma is one of the most frequent causes of blindness worldwide.

To make sound diagnoses, Jünemann aims to expand telemedicine in the long term. He says it is not absolutely essential for patients to travel long distances to his clinic. "Nowadays, we can make clear statements based on videos and photos instead."

Jünemann also aims to establish a study center at the University Medical Center in Rostock to gain new knowledge, also on an international level, and develop better materials. He wants doctors, nurses and patients to receive further training to keep abreast of the latest developments. "I also want to show our students that ophthalmology is a fantastic field," says Jünemann. Many view it as a small discipline in which they can get away with selective learning. However, he adds: "If they are later able to detect a squint in children and do not mistake a protracted glaucoma attack for a case of stomach cramps, I will be satisfied."

sm

Further information: www.med.uni-rostock.de



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