

MAGAZINE

LIFE
SCIENCE
NORD



MEDTECH, BIOTECH & PHARMA
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THE STETHOSCOPE OF THE FUTURE

Outstanding young talent
from North Germany develops
an innovative product

NEW COMBINATIONS OF IMAGING METHODS

A promising research project
has received a grant from the
European Research Council

NEW WAYS TO COMBAT BACTERIA

Warding off pathogenic
infections in the future



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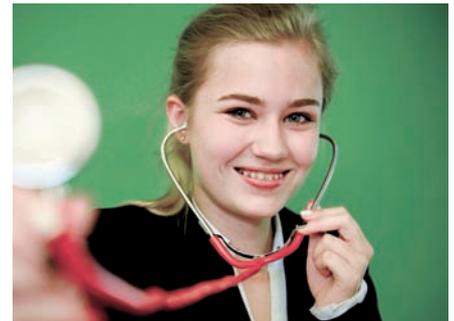
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SUCCESSFUL NETWORK

FOCUS ON DANGEROUS PATHOGENS



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Dr. Hinrich Habeck
 Managing Director
 Life Science Nord Management GmbH

Dear readers, Multidrug-resistant bacteria nowadays present not only clinics with huge challenges. Improved hygiene, faster diagnostics and individual therapy options are further areas that scientists are focusing on. In the Life Science Nord Cluster, there are many very interesting approaches to tackling antibiotic resistance in these fields. In this issue's special report, we have therefore asked experts from the region to offer their assessment on how to deal with multidrug-resistant bacteria.

We have channeled the expertise within the cluster into two projects which will start in the second half of the year – Qualifit and BoneBank. With University Medical Center Schleswig-Holstein – Campus Lübeck as lead manager, the BoneBank project aims to obtain bone marrow stem cells in routine operations in German and Danish trauma centers and create a cross-border biobank for bone marrow stem cells. The goal of the Qualifit project, which we participate in as lead partner, is to de-

velop relevant industry-specific training offers for specialist staff in the Life Science Nord region. At the end of the project we will have an extensive pool of high-quality training modules, which will be available through the e-learning specialist oncampus GmbH in Lübeck.

In our portrait, we present a company that normally shuns the limelight – Sysmex Europe, a global market leader in hematology. Sysmex is one of the largest employers in the Life Science Nord Cluster and celebrated the extension to its reagent plant in Neumünster in the summer. The company's roots go back to the Sysmex Corporation in Kobe, Japan – which is precisely where the country focus article in this magazine takes us. We collaborate closely with the local life science cluster there and outline the opportunities for exchanging ideas between North Germany and Japan.

Last but not least, we report on Rieke-Marie Hackbarth from Henstedt-Ulzburg. This year, the 15-year-old pupil won the Schleswig-Holstein regional “young researcher” award and was awarded the special prize in “natural sciences and technology” as the youngest participant in the national final. Her successful project involved a stethoscope that disinfects itself after every use and was widely admired even by hygiene professionals. My team and I hope that you find the magazine enjoyable and informative.

Hinrich Habeck

EU'S HORIZON 2020 PROGRAM FUNDS NEW PROJECT

CREATING NEW COMBINATIONS OF IMAGING METHODS

Prof. Dr. Robert Huber and his project partners will develop an optical coherence tomography (OCT) system, to deliver structural information to give guidance to doctors conducting endoscopic examinations or operations in tissue and help them navigate securely.



Prof. Dr. Robert Huber, who accepted a call to join the Institute of Biomedical Optics at the University of Lübeck in 2013, develops molecular imaging methods for medical diagnostics with his research group at the BioMedTec Science Campus. Its latest project has now received a grant from the European Research Council (ERC). Modern, optical imaging methods are to be combined to enhance the value of endoscopic in vivo diagnostics.

Combine optical methods of biomedical imaging and simultaneously implement an imaging and navigation system with elements of artificial intelligence – this is the goal that the partners in the “Endoscopic Comprehensive Optical Multimodal Molecular Intelligent Imaging” project – or Encomole-2i for short – have set themselves. The scientists plan to use a very fast, optical coherence tomography system which can capture billions of pixels per second with microscopic resolution. This optical coherence tomography (OCT) system delivers structural infor-

mation to give guidance to doctors conducting endoscopic examinations or operations in tissue and help them navigate securely.

In addition, the researchers want to combine the system with so-called Raman scattering – a further biomedical optical imaging method. At selected points, the system will automatically analyze the biomolecular composition of affected tissue to detect pathological changes at an early stage. The scientists assume that, on the basis of intelligent control of the imaging process and automatic adjustments to its measurement parameters, the value of endoscopic (in vivo) diagnostics will be greatly enhanced in the future.

The European Research Council is providing funding of two million euros for the project to develop an innovative endoscopic platform from January 2016. For the head of the project, Prof. Dr. Robert Huber, this is already the second ERC award.

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Further information:

www.uni-luebeck.de; www.bio-med-tec.de

CRM AND OCEANBASIS TEAM UP IN A JOINT PROJECT

FIGHTING CANCER WITH ALGAE EXTRACT

Certain substances from domestic macroalgae can inhibit the growth of cancer. This was the conclusion of the “Algae against Cancer” study – a joint three-year project in which numerous scientists from Germany and Italy took part. The project is managed by the marine biotechnology company CRM – Coastal Research & Management.

Pancreatic cancer is one of the most aggressive forms of cancer with a survival rate of less than five years. Novel therapeutic drugs with specific mechanisms of action are therefore urgently required. In recent years, the private marine research institute CRM has already demonstrated that substances gained from domestic macroalgae inhibit cancer growth. The current study is designed to support these findings by conducting more in-depth research on the structures and mechanisms of action of newly defined substances of potent algae. The results of the examinations are very promis-

ing. For example, the researchers at oceanBasis GmbH and its sister company CRM succeeded in purifying active substances from the domestic seaweed known as bladderwrack, which slows the cell growth of various cancer cell lines of the pancreas thanks to a special mechanism. The scientists observed that the cancer cells produced increased quantities of enzymes that hindered the cell multiplication process and thus slowed the rapid development of tumor cells. In addition, they determined that the seaweed extract developed no general, excessively toxic effect on the healthy cells.

A large, interdisciplinary team of experts consisting of marine biologists, biotechnologists, tumor researchers, cell biologists, food researchers, pharmacologists, chemicals and bioinformatics scientists took part in the study. The German Ministry of Education and Research (BMBF) supported the project. **nsw**
Further information:
www.oceanbasis.de

CLINICAL STUDY OF CTC NORTH

COMBINATION THERAPY FOR STROKES TO BE TESTED

A consortium headed by the clinical research service company Clinical Trial Center North is starting a clinical study to test a new combination therapy for stroke patients. The project, which will receive funding of six million euros from the European Commission, will be organized and monitored in cooperation with University Medical Center Hamburg-Endorf (UKE).

In particular elderly people who suffer a stroke also often struggle with infections and fever as well. In the clinical study, which will cover 3,800 patients in 80 centers, the scientists want to explore ways in which such complications may be avoided in the future. They will examine the extent to which an additional therapy based on ceftriaxone (antibiotic), paracetamol (analgesic) or metoclopramide (antiemetic) can help stroke patients compared to a standard therapy.

“In the study, we will test a simple strategy for the preventive treatment of the complications that arise most frequently after a stroke and will consider the special needs of elderly people. This approach will very probably help us to significantly improve stroke treatment for one of the groups that suffers the most,” explains Dr. Götz Thomalla, head of the UKE’s clinical stroke research working group.

The European Commission will provide funding of six million euros in total to the “Prevention of complications to improve outcome in elderly patients with acute stroke” (PRECIOS) project over the coming five years. The University Medical Center Utrecht in the Netherlands will coordinate the project. CTC North and the UKE are jointly responsible for organizing and conducting the study in Germany and for safety monitoring. **nsw**
Further information:
www.ctc-north.com

PERSONALIZED MEDICINE

The Schleswig-Holstein “Inflammation at Interfaces” cluster of excellence has laid the foundations for the upcoming third funding period. Data infrastructures are to be expanded even more to support interdisciplinary research across various sites.

Big data-based analyses are becoming increasingly important in medical research and care. Scientists assume that more personalized treatment of chronic diseases is possible on the basis of systematic networking and the analysis of clinical patient data. “The cluster is conducting cutting-edge research, as inflammatory processes form the basis of a very large number of diseases,” states Prof. Rudi Balling, chairman of the cluster’s scientific advisory board. It is planned to further expand data infrastructures at Borstel, Lübeck, Kiel and Plön, and step up collaboration with University Medical Center Schleswig-Holstein.

Further information:
www.inflammation-at-interfaces.de

NEW ALZHEIMER’S COOPERATION MODEL

Evotec AG has joined a research initiative between Cure Network Ventures and Dolby Family Ventures. The goal is to identify new therapeutic approaches for the treatment of Alzheimer’s disease, which affects about 36 million people worldwide.

The initiative intends to examine mechanisms to block the degeneration of the neural network and to halt the development of the disease. However, the research work will also focus on cognitive and neuropsychiatric aspects associated with Alzheimer’s. “We are excited to be part of this initiative,” says Werner Lanthaler, Chief Executive Officer of Evotec. He added that translating academic innovation into tangible assets for the pharmaceutical industry in this entrepreneurial framework was a core part of the company’s strategy. All the requirements to find and develop new, innovative drugs to combat Alzheimer’s were in place.
Further information: www.evotec.com

LIFETIME LEARNING

MEETING FUTURE CHALLENGES

The Qualifit project is perfectly tailored to the needs of employees in life sciences.



In the coming two years, the “Qualifit” project will provide a range of appropriate training offers for employees in the Life Science Nord Cluster. To begin with, companies’ specific requirements with regard to qualification modules will be determined.

“Qualifit” – Qualification Initiative for Innovation and Technology – aims to create a range of offers that are tailor-made to meet the life science sector’s special requirements. Experts from a variety of fields will work closely together: project lead partner Life Science Nord Management, the Institute of Learning Services at the Lübeck University of Applied Sciences, oncampus GmbH and the Fraunhofer Research Institution for

Marine Biotechnology EMB. The first part of the offering will train employees in soft skills in single modules – namely communications, quality and project management, and entrepreneurship.

The second main area is innovation and is divided into two parts. On the one hand, it will revolve around innovativeness and open innovation. To make them attractive and competitive in the global marketplace, companies will become more innovative and better equipped to collaborate with public research institutions on the basis of their employees’ improved knowledge of innovation management, IP and contract law, and the structure of public development projects. On the other hand, technological changes and trends also fall under innovation. EMB is the

recognized leader in cell technology and offers regional companies access to a key life science technology.

One of the project partners’ main areas of focus is to design the project with a view to the future. “We want to provide these offers even after the project has ended in order to cover existing and new training needs in this innovative sector over the long term,” says Prof. Rolf Granow, managing director of the e-learning specialist oncampus GmbH, a subsidiary of the Lübeck University of Applied Sciences.

Most players in the region are SMEs that have no internal training facilities or are unable to release key employees for longer periods. “Designing content as online modules has the advantage that learners can work their way through them alongside their jobs. The high share of self-learning combined with the support provided by collaborative learning scenarios – for example in video conferences, chats, forum work and the joint creation of wikis – offers very cost-effective training opportunities. The Lübeck University of Applied Sciences and oncampus GmbH have specialized very successfully in this field in recent years,” says Granow. The project will receive 490,000 euros under the Schleswig-Holstein “Work” program, which receives funds, inter alia, from the federal state and the European Social Fund (ESF).

At the end of the project, an extensive pool of high-quality training modules will be available. Development represents the biggest cost item for online-supported offers and thus requires resources only once, while few costs are incurred in using and updating the offers. The project partners will therefore be able to cover the costs for maintenance and support. The courses will be offered jointly; oncampus GmbH will be responsible for technical implementation and administration. sm

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INTERREG DEUTSCHLAND-DANMARK

GAINING STEM CELLS

Prof. Arndt Peter Schulz and Dr.-Ing. Robert Wendlandt examining thighbones in the mechanical engineering laboratory.



The partners in the German-Danish BoneBank project have set themselves the goal of obtaining bone marrow stem cells in routine operations in German and Danish trauma centers and building up a cross-border biobank for bone marrow stem cells.

At present, material such as bone marrow, blood and stem cells that arises from routine fracture-related operations is disposed of in clinics. This is the starting point for the BoneBank project launched in autumn 2015. Human stem cells are separated from material, processed and stored in a German-Danish biobank. The bone marrow stem cells gained in this way represent a new, high-quality resource which can be used autologously, i.e. by the patients themselves. In addition, stem cells can be used allogeneically in the future and donated to other patients. Moreover, research establishments and companies engaged in research can use them.

The eight project partners include, among others on the German side, University Medical Center Schleswig-Holstein (UKSH) –

Campus Lübeck as lead partner and the University of Lübeck with the Interdisciplinary Center for Biobanking and Life Science Nord Management GmbH, Soventec as IT specialist and Stryker Trauma as one of the world's foremost makers of implants and products used in bone surgery. "A unique new value chain is being created in the BoneBank project, which forms an important innovation platform for companies engaged in research to develop new medical products and therapies for regenerative medicine," says Prof. Dr. Arndt Peter Schulz, senior doctor at UKSH's Clinic for Orthopedics and Accident Surgery and a member of the board of Life Science Nord e.V. sm

Further information:
www.biomechatronics.de



INFECTIOUS DISEASE MEDICINE

NEW WAYS TO COMBAT BACTERIA

For decades, antibiotics were viewed as reliable all-purpose weapons against bacterial infections. Now, however, they are increasingly ineffective, because the pathogens mutate and develop resistance to the common drugs. To get to grips with the problem, scientists and medical experts are working on developments in many areas ranging from improved hygiene to faster diagnostics and customized therapy options.



“International studies confirm that resistance to antibiotics is a global problem,” reports Prof. Dr. Werner Solbach.

Probably well over 10,000 different types of bacteria live on and in the human body. Since the discovery of penicillin 70 years ago, medicine has successfully dealt with the tiny fraction of these bacteria that trigger harmful infections. It seems as if this will no longer be quite so simple in the future. Last year, the World Health Organization (WHO) submitted the first global report on the dissemination of resistant bacteria – and the results are alarming. The number of bacteria that can no longer be treated successfully with the antibiotics currently available is growing all over the world.

“International studies confirm that resistance to antibiotics is a global problem,” reports Prof. Dr. Werner Solbach, Director of the Institute of Medical Microbiology and Hygiene at UKSH Lübeck and spokesman for the “Infection Research and Society” working group at the Hamburg Academy of Sciences. Quick solutions are unlikely, since far too little research has been conducted on the huge universe of bacteria. “In day-to-day diagnosis, we frequently find patients with bacteria that behave totally differently in terms of their resistance to what we previously knew,” says the head of the institute – in other words, in tests made on regular smears and for patients that are specifically suspected of being infected.

Resistant bacteria mainly develop wherever antibiotics are used especially often – for example in hospitals or in intensive livestock farming. In Germany alone, about 1,500 tons of antibiotics are used in animal feed. It is estimated that doctors in private practice unnecessarily

prescribe antibiotics to about 30 percent of their patients. The problem is that bacteria multiply quickly. “Natural mutations arise and some of these are resistant to antibiotics,” explains Prof. Solbach. “These bacteria then multiply even under the influence of antibiotics and can also pass on the corresponding genetic information to other strains of bacteria.”

There is no simple solution to the problem. Instead, what is needed is a combination of consistent preventive measures, improved diagnostic procedures and individual therapy options. Hygiene measures are the first way to tackle an infection with resistant germs and prevent the infection from occurring in the first place. “Based on my experience, German clinics are already very sensitive to the need for hygiene,” says Prof. Solbach. “This is reflected, among other things, in the growing consumption of disinfectant.” However, the highest hygiene standards can only be achieved with well-trained medical staff and lean processes, into which the necessary hygiene action can be easily integrated (for more on hygiene, see the interview starting on p. 11).

Therapeutic alternatives are also in sight: “Antibiotics are not the only option when it comes to dealing with an infection,” says Dr. Lea Vaas, scientist at the Fraunhofer Institute for Molecular Biology and Applied Ecology IME ScreeningPort. The institute conducts research, among other things, into the development and application of new technologies to diagnose and treat human and animal diseases. “In the future, diagnostics will concentrate increasingly on the molecular level

in order not only to identify the pathogens precisely, but also to record their particular abilities,” says Dr. Vaas.

This requires diagnostic methods that deliver precise results far more quickly. “The available methods are simply too time-consuming,” says Prof. Solbach. In the current standard procedure, the first step is to take a smear and grow a culture in the laboratory. Only after the bacteria have multiplied sufficiently can the sample be examined for different pathogens. This may, in some cases, take several days – time that not every patient has. However, there are already highly promising diagnostic approaches that can deliver reliable results much faster (for more on diagnostics, see the contribution starting on p. 12).

INDIVIDUAL THERAPY OPTIONS THAT ARE AFFORDABLE AND EFFECTIVE

With new methods, drugs could be developed for much more specific cases – for example so-called pathoblockers. Instead of fighting bacteria indiscriminately, they selectively block the pathogenic characteristics – and could therefore outsmart even bacteria that have already developed resistance. To select the right pathoblockers, doctors must identify the pathogen as fast as possible and already know what they are resistant to prior to treatment. “UKSH cooperates with companies from the Life Science Nord Region such as the Lübeck-based Euroimmun AG and altona Diagnostics Technologies GmbH in developments in this field. The latter has created a reference database in cooperation with the Bernhard Nocht Institute to develop new tests,” says Prof. Solbach. “I am very optimistic and expect important developments shortly.”

However, it is not just newly developed methods that are needed to enable individual infection therapy to work everywhere. The knowledge already available on well-known bacterial strains, resistance and successful therapies must be collected and made accessible to the medical sector. Fraunhofer IME is currently working on both tasks. “One of our projects deals with gram-negative bacteria,” says Dr. Vaas. “This particular group has two cell walls and can thus react to environmental influences in lots of different ways.”

This bacterial species can remove antibiotics especially fast or switch off the transport process, so that the antibiotic no longer reaches the cell. “We want to decipher exactly how this process works, and identify chemical substances that block this removal,” says Dr. Vaas. The Fraunhofer IME is also developing a database, in which the pharmaceutical industry’s preclinical data are combined with current research data. Our goal is to learn from failed developments in the past and take account of these findings in current development work. These projects are part of the EU-wide initiative known as “ND4BB – New Drugs for Bad Bugs,” which was jointly launched by the public sector and pharmaceutical companies in 2012.

Dr. Vaas is convinced that “the era of antibiotics is definitely not over. Over the coming years, the manner in which doctors deal with infectious diseases and the offerings of the pharmaceutical industry will change very considerably. While treatment very often involves broad-spectrum medication according to the general recommendation, diagnostics will become much faster and more data-based. This gives rise to hopes that individual therapy options that are affordable and effective will become available.”



Dr. Florian Brill says:
“In collaboration with clinics and their hygiene specialists, we develop specific processes and measures based on current hygiene regulations.”

MICROBIOLOGY

IN THE SERVICE OF HYGIENE

The Hamburg company Dr. Brill + Partner GmbH Institut für Hygiene und Mikrobiologie offers a broad range of services – from efficacy tests and verification of antibacterial agents and measures to advice, training and hospital hygiene laboratory service. Dr. Florian H. H. Brill is the managing shareholder and considers that, while German hygiene rules are sufficient, more could be done in terms of implementation.

Dr. Brill, what role does antibiotic resistance play in a hospital environment?

Brill: The hospitals are definitely aware of the problem, which is also discussed in the medical world through many channels: in the specialist press, at congresses and, of course, in numerous MRP networks. The Commission for Hospital Hygiene and Infectious Disease Prevention at the Robert Koch Institute (KRINKO) regularly publishes recommendations on how to deal with these pathogens. Unfortunately, these are sometimes rather complicated and difficult for clinics to put into practice.

And this is where you come into play.

Exactly. One of our strengths is to enable these very far-reaching recommendations and the legal requirements to be put into effect in daily hospital routines. In collaboration with clinics and their hygiene specialists, we develop specific processes and measures based on current hygiene regulations. Finally, we train doctors and nurses to enable them to implement them properly.

What, in general, are the most important measures to prevent the spread of multiresistant bacteria?

First and foremost, hand hygiene in the five traditional situations: before and after patient contact, before aseptic activities, after contact with surfaces in the patient's immediate environment, and after contact with potentially infectious materials.

What other approaches are there?

Screening risk groups – in other words the microbiological testing of patients on admission to hospital that are at greater risk of being MRP-positive – is a good prevention strategy. In the case of positive findings, appropriate action can then be taken: for example, isolating patients in single-bed rooms to prevent the pathogens from spreading.

This sounds very time-consuming.

It is – and this makes diagnostics a key issue. Faster delivery of reliable results means improved organization of such screening. No clinic can afford to accommodate patients under suspicion in single rooms for several days – even though, medically, it would make sense to do so.

Do we need stricter laws?

No. In my view, the statutory rules in Germany are absolutely sufficient – in some areas, for example in rehabilitation clinics, they are even stricter than really necessary. However, their implementation creates additional work. This becomes a problem if most clinics have to keep an eye on costs and, if anything, reduce personnel.

In other words, there are not enough staff?

In many cases, there are not. Proper implementation of the necessary hygiene measures means, for example, that one nurse should be responsible for two patients in intensive care. In Germany, the average is three and a half. The problem therefore raises a social question: How much do we actually value our health?

Further information: www.brillhygiene.com

CONFERENCE OF APPLIED HYGIENE, MICROBIOLOGY AND VIROLOGY

The first Conference of Applied Hygiene, Microbiology and Virology took place in Hamburg, Germany, in October. The initiators were Dr. Brill + Partner GmbH Institut für Hygiene und Mikrobiologie and DR. BRILL ACADEMY in cooperation with Life Science Nord Management GmbH. The topical nature of the subject and the numerous contributions from renowned scientists and experts attracted a great deal of interest and attendance was high on both days of the event. Further events are planned – not just to provide information and present current research projects, but also as a forum for discussions and a supraregional network event.



“Insert the sample, press the button, and in less than one hour the result is there,” explains Dr. Stefan Kulick.

DIAGNOSTICS

THE ACCELERATORS

To combat multiresistant bacteria successfully in the future, medicine needs faster diagnostic methods. The market is in a state of flux in North Germany, too, and young companies are developing new, highly promising methods – for example YAYA Diagnostics GmbH and KSK Diagnostics GmbH from Hamburg.

“Our diagnostic method saves time,” says Joachim Dyck, managing director of the Hamburg-based YAYA Diagnostics GmbH. Established in 2013, the company is developing a method to enable the specific pathogen to be determined faster in the case of blood poisoning so that the effective antibiotic can also be selected faster.

A very small number of pathogens suffice to trigger a sepsis. They have to be multiplied in the lab before they can be identified. Nowadays, this is done through blood culture bottles and generally takes two to three days. However, Joachim Dyck explains that “the problem is that the body is faster than any incubation system.” This means that the sepsis pathogens in the patient’s blood may have already multiplied to a life-threatening level.

“Our method will probably halve the time before the result from the diagnostics laboratory is available,” says Joachim Dyck. YAYA Diagnostics’ method will be very simple to use and will not need special equipment. How exactly it works remains a secret for the time being. However, Joachim Dyck does reveal: “Our method will permanently change the laboratory environment.”

Dr. Stefan Kulick has similar plans. “We are in the process of bringing a test system to the market that requires far less than one hour to deliver reliable results,” says the managing director and co-founder of the Hamburg-based KSK Diagnostics GmbH. As a result, laboratories can also test single samples quickly, and it is ideal for clinics that want to set up admission screening systems for patients potentially at risk.

As the cultivation of bacteria takes a very long time, the KSK method does not reproduce the bacteria themselves, but rather their genomes. What is the difference to established PCR test systems, which require very complex and expensive equipment that can handle several temperature cycles? “Our test is based on an isothermal method,” explains Dr. Kulick. “In other words, it works at constant temperature.” This makes it very fast, less fault-prone and the necessary equipment has to meet far lower standards.

KSK plans to make its test system available in two phases: “In the first phase, our method in terms of handling is comparable to solutions that are already available,” says Dr. Kulick. “It is just simpler and much faster.” In the second phase, a separate device will be available, which will deal with the entire process from the sample to the result in one single workflow. Or, as the managing director puts it: “Insert the sample, press the button, and in less than one hour the result is there.”

Further information: www.yayadx.com
www.ksk-diagnostics.com

PRIMARY TUBE SORTING

MODULAR APPROACH TO AUTOMATED SAMPLE TREATMENT

Products to automate pre-analytical processes in IVD laboratories are the core business of the Schleswig-Holstein company T&O LabSystems GmbH & Co. KG. It aims to tap new markets with a modular rack system to sort primary tubes. At the same time, the company is moving to create more space for a growing team and new product ideas.

The automatic tube registration and sorting system (ATRAS) is a sorting machine for the optimum handling of closed primary tubes. The tubes are delivered in variable numbers as so-called bulk material to the IVD laboratories (in vitro diagnostics). ATRAS's automatic presorting of the tubes considerably reduces work in the incoming area of medical laboratories. It does away with the important and time-consuming pre-sorting by qualified staff. The system operates faster and with a lower error rate than comparable manual

sorting. The product family of T&O LabSystems is in demand internationally. Besides Germany and Austria, systems have already been installed in Turkey and Brazil.

A further product is now ready to be marketed. In the new rack system the samples are sorted into racks beside the bulk sorter. This involves the use of a small robotic swivel arm, which was also developed by T&O LabSystems. This system's modular design enables samples to be sorted either into target bins or racks. The two modules can also be combined. Moreover, depending on customer requirements, several modules can be arranged in line to enlarge the sorting volume. T&O LabSystems hopes that the new rack system will open the door to the Scandinavian market and Poland. The first inquiries have already been received.

With its steadily expanding team and new products, the company outgrew its previous premises in Henstedt-Ulzburg. In September,

T&O relocated to Kaltenkirchen. The new facilities have been built and designed according to Feng Shui principles. Bathed in light, the square construction consists largely of wood and is based on four self-supporting wooden beams. A lounge area at the center of the building opens out to all sides, leading to the open production facilities and offices. The separate island with fireplace and aquarium creates a relaxed atmosphere for discussions. In this environment, the company hopes to create further leading-edge technologies on the basis of the proven flat hierarchy and the interdisciplinary collaboration between highly qualified experienced technicians and young graduates. Tom Lorenzen, managing director of T&O LabSystems GmbH, says pragmatically: "We need this lightness as a counterweight to the very demanding nature of our core business." [hp](#)

Further information:
www.to-labsystems.com

IN VITRO VERIFICATION

SIGH OF RELIEF – NEW TOOLKIT FOR MERS CORONAVIRUS DETECTION

Severe acute respiratory illness including fever, cough and shortness of breath are symptoms of an infection with MERS-CoV (Middle East Respiratory Syndrome Coronavirus). So far, the appropriate laboratory investigation is time-consuming. This is going to change fundamentally.

In 2012, MERS was first reported in Saudi Arabia. Since then, it has spread to several other countries. The latest MERS outbreak was reported in Korea in May 2015. Speeding up confirmation as to whether symptoms match up to a bad cold or to a MERS infection was the purpose of Hamburg-based Altona Diagnostics GmbH's research project. It succeeded. The "RealStar MERS-CoV RT-PCR Kit U.S." received emergency-use authorization (EUA) from the Food and Drug Administration (FDA) for the United States.

Under this authorization, the real-time reverse transcriptase/polymerase chain reaction (rRT-PCR) based nucleic acid test can be used as a molecular diagnostic tool. In vitro, it detects RNA from MERS-CoV in lower respiratory samples, e.g. tracheal aspirate or

tracheal secretions, from individuals with signs and symptoms of MERS-CoV infection in conjunction with clinical and/or epidemiological risk factors.

The kit consists of two independent assays, one targeting a region upstream of the E gene (upE) and the other targeting open reading frame 1a (orf1a) of the MERS-CoV genome. Both assays include a heterologous amplification system (internal control) to identify possible RT-PCR inhibition and confirm the integrity of the reagents of the kit.

The test performance was verified in collaboration with the German Conciliar Laboratory for Coronaviruses at the Institute of Virology, University of Bonn, Germany. [hp](#)
Further information:
www.altona-diagnostics.com



The crane is a symbol of longevity and happiness in Japan – and in the life sciences, too.

NIPPON OPENS UP

NEW IDEAS FROM THE LAND OF THE RISING SUN

Japan and Germany are faced with the same social challenges: a rapidly aging population and a decline in the birth rate. Shaping a decent future calls for creative and efficient approaches for the “silver generation” – especially in the health sector. State development programs and cross-border collaboration offer excellent prospects for life science companies.

Japan is the world’s third-largest economy after the US and China. At the same time, it offers its inhabitants the highest standard of life internationally. To maintain this first-class level of care and in particular raise the quality of life for elderly people, the Japan Agency for Medical Research and Development (AMED) was set up in April. AMED’s goal is to accelerate the commercial use of high-class medical innovations. The research infrastructure is to be expanded with a budget of around 140 billion yen (some 1.09 billion euros) and relations between scientific institutions and industry are to be improved. The focus is on drug research, cancer research, neurology, regenerative medicine, rare refractory illnesses and infectious diseases.

The nucleus of Japanese life sciences is located in the center of the main island. The heart of biosciences beats in the Kansai region, home to the cities of Osaka, Kyoto and Kobe. More than 150 research institutes and universities perform excellent research work and more than 300 firms of many sizes are engaged in this field. Most companies are located in Osaka and Kobe.

In the Life Science Park to the north of Osaka, the cluster’s expertise is primarily in fighting infectious diseases and oncology.

The port of Kobe is home to Kobe Medical Industry City, one of the world’s leading clusters of excellence for biotechnology, pharmaceuticals and medical technology. In 1995,

6,000 people died in Kobe after a severe earthquake and large parts of the traditional infrastructure were destroyed. In the reconstruction, the Japanese built a separate port island, offering perfect infrastructure for biosciences, under a pioneering investment program. With the FBRI (Foundation for Biomedical Research and Innovation) acting as coordinator, international networks are created and strategic alliances set up from Kobe. Cooperation between academic institutions and industry is explicitly desired and promoted.

In particular in the development of diagnostic methods with imaging methods and in cell technology, the competence center in Kobe and Life Science Nord are working with complementary methods. The aim now is to channel the large overlap in research and development and the sale of innovative products into joint projects.

Getting to know partners personally as well always represents the basis for close cross-border cooperation based on mutual trust. For this reason, intensive talks took place between business representatives of FBRI, JETRO, HWF and Life Science Nord in two meetings in Hamburg in 2014. At the start of March this year, Dr. Hinrich Habeck deepened the dialogue when he visited Kobe. He summarizes his impression of increased collaboration as follows: "The exchange between the two life science clusters was very important for both partners. In view of the similar structures and related challenges facing the life sciences industry, many further connecting factors and synergies will arise in the future as well." North German firms and representatives of the Kobe cluster held further discussions in September this year during a three-day delegation visit from Kobe to the Life Science Nord region. To step up collaboration, the region of Kobe, together with JETRO (Japan External Trade Organization), will develop the so-called RIT project ("Regional Industry Tie-up Program") to promote exchanges between Japanese and foreign companies. It pays the costs incurred by Japanese and German firms in traveling to and staying in Germany or Japan as the case may be. Life Science Nord companies will be offered the first chance to apply for assistance under the RIT program in 2016. The dates for the next opportunities to exchange ideas with the Kobe Cluster are already set: On November 20, 2015, a delegation from Kobe will come to Hamburg for a business match-making event, while a delegation from Life Science Nord will visit Kobe from February 21 to 25, 2016. Interested parties may contact Damir Pavkovic (pavkovic@lifesciencenord.de, +49-40-4719-6421). [hp](http://www.jetro.go.jp/en/)

Further information: www.jetro.go.jp/en/



CUTTING EDGE TECHNOLOGIES

INNOVATION BY MEANS OF COLLABORATION AND INTEGRATION

Dr. Takeshi Osugi is Senior Manager Pro-Cluster of Kobe Foundation for Biomedical Research and Innovation (FBRI). He trusts that innovative technologies in the life sciences field, such as human health and the related projects, overcome the aging problems and contribute to the world healthcare.

Dr. Osugi, what are the future challenges for the life science sector in Japan?

Dr. Osugi: We aim to promote the innovation in our cluster through the collaboration and integration among national research institutes, highly specialized hospitals, large Japanese pharmaceutical companies and other global companies. It would be the key and of significant importance to attract them to liaise with each other, and what is more, share with Asian countries in particular the cutting-edge technologies born here in Kobe. Immediately, we should promote the collaboration with German state-of-the-art technologies to establish the innovative technologies in these projects.

Which areas of activity are coordinated by the FBRI?

As a core institution of the Kobe Biomedical Innovation Cluster, FBRI has decided to conduct translational research to bring achievements in basic research into clinical applications on the basis of high ethical standards, legitimate scientific rationality and bold creativity. Also, FBRI shall endeavor to develop and proliferate new medical technologies by assisting medical research, especially translational research, both in Japan and abroad, based on the Kobe Biomedical Innovation Cluster. Last but not least, FBRI shall support the general public to allow them to live healthy lives, and strive to actively provide them with leading-edge medical therapies.

Is there a symbol that comes to your mind when you think about Japanese-German cooperation?

We are planning to collaborate with Life Science Nord regarding the creation of innovative products notably in the fields of both medical device and IVD development technologies. It would be great if this integration of both clusters could come to be the first, and symbolic, German-Japanese cooperation for the future life science technologies development on a global basis.

What are your milestones for the next three years?

For the RIT program this year: German/Japanese companies will find appropriate counterparts through business matching. The second year: these companies conduct collaborative research/development and prepare regulatory issues. The third year: we are expecting that the innovative medical devices/tools, diagnostic reagents and new drugs will be on the market globally.

Due to specified text length, this is an excerpt.

You may read the entire interview at: www.lifesciencenord.de in the News section. Release date: 14.10.2015

35 YEARS OF SYSMEX EUROPE IN NORTH GERMANY

SETTING NEW BENCHMARKS

Founded in 1968 in Kobe, Japan, the Sysmex Corporation has become one of the leading healthcare companies around the world. Its flagship hematology concept is the XN-Series, which offers small, smart and compact automation.



Sysmex Europe is the global market leader in hematology. Moreover, the company has proven strength in products and services for urinalysis, coagulation, life sciences and biosciences, point-of-care diagnostics and intelligent laboratory automation. Sysmex aims to develop and reinforce this position through targeted growth.

While Sysmex Europe may have been fairly reserved over the years, its business success is now evident even to outsiders. In July, the company celebrated the opening of its extended reagent facility in Neumünster. This is the second expansion in production capacity at that location, and the plant now covers 7,200 square meters and offers nearly twice as much space as before. The reagents produced in the facility are solutions for diluting and examining blood and urine samples in in-vitro diagnostics, and for cleaning the required laboratory instruments.

In terms of its high-tech features, the plant itself is as advanced as the company's products and solutions. For example, an advanced solar ice air-conditioning system provides about 70 percent of the energy that is needed to cool or heat the plant.

"The facility in Neumünster is an example of Sysmex's ongoing commitment to innovation, customer satisfaction and sustainabili-

ty," says Jens Behrens, Director of Marketing Communications. "The high quality of our work is unquestioned. However, we also place enormous value on having satisfied employees." For example, the company has created a full-time job for health and safety issues and offers a wide array of voluntary healthcare options to ensure employees can remain fit and active. Behrens adds: "In our headquarters in Norderstedt we have an international perspective with a very good and well developed corporate culture. In addition, we attach huge importance to the quality of our services, training and advice, and are also very strong in scientific work."

Alongside its human resources work, Sysmex maximizes its strengths through selective acquisitions and partnerships in specific diagnostic and technological fields. These offer the company a basis for successful and consistent long-term growth. For example, since April 2013 Sysmex has been the exclusive

distribution partner of GLP systems, a specialist in intelligent laboratory automation. In the last two years, Sysmex has acquired two firms – Inostics and Partec – that ideally complement the current portfolio.

Sysmex Inostics, a molecular diagnostics company, was established in 2008 in Hamburg and has a wealth of expertise in the field of liquid biopsy. Its core competency is detecting mutations using highly sensitive technologies such as plasma sequencing and BEAMing (beads, emulsions, amplification, and magnetics). The blood-based test procedures offer a minimally invasive alternative to characterize cancer diseases and improve therapy planning. There are many parallels to Sysmex Europe's life science business unit, which enables the entire lymph node to be analyzed on a standardized basis in breast and bowel cancer with the aid of the molecular biological diagnostic method OSNA (one step nucleic acid amplification), among others.

Following its acquisition of the Saxony-based company Partec, Sysmex Europe now also has a partner that is positioned close to the core business and can act as a door opener to Africa and Asia in essential healthcare. Sysmex Partec, as part of the Sysmex group, offers biotechnology and diagnostics expertise and specializes in developing, producing and selling highly sensitive flow cytometry solutions for a range of applications. According to Jens Behrens, new pioneering systems and services will be developed through joint synergies and visions. "As a company, we will move a step closer towards our goal of helping those who ultimately benefit from this work – namely the patients. This is entirely in line with our corporate mission to shape the advancement of healthcare." Setting new standards and growing therefore remain Sysmex Europe's main objectives. sm

Further information:
www.sysmex-europe.com

INNOVATIVE PRODUCT DEVELOPMENT

LABEL-FREE BIOANALYTICS

Byosens, a spin-off from the Christian Albrechts University of Kiel (CAU), is launching a research tool for cellular and biochemical examinations using light and photodiodes.

Unlike marker-based tests, the new procedure requires no fluorescent or radioactive markers. As a result, the duration of experiments and error sources caused by the use of markers can be reduced. The market for label-free technologies is currently dominated by large and expensive instruments, since they use readout methods requiring sophisticated instrumentation, explains Byosens managing director Dr. Yousef Nazirizadeh.

"Our research has created an optical technology that makes it possible to use a revolutionary form of construction. Unlike manufacturers already in the market, we are therefore able to offer an analytical instrument with the same measurement accuracy, which is unique in terms of compactness and mobility and

which is also far cheaper to produce." Users do not therefore have to perform experiments on a stationary instrument, but can instead move the instrument freely about in the laboratory. In addition to mobility, the instrument makes it possible, among other things, to achieve a high sample throughput rate on the basis of parallel reading of 96 single channels and enables usable data to be recorded in milliseconds even during the addition of substances.

The team headed by Nazirizadeh emerged from the Integrated Systems and Photonics working group at the Institute for Electrotechnology and Information Technology at CAU and was awarded a prize in the Schleswig-Holstein New Ideas Competition in 2014. In addition, Byosens received funding in 2015 from Hamburg's investment and development bank (IFB) under the InnoRampUp program. The instrument is due to be launched in the first quarter of 2016. sm

Further information: www.byosens.com

**IBN
INDUSTRIELLE
BIOTECHNOLOGIE
NORD**



TEN YEARS OF POOLING EXPERTISE IN NORTH GERMANY

Industrielle Biotechnologie Nord (IBN) is an association that was established in 2005 as a network initiative to strengthen industrial biotechnology in research and development in North Germany.

Against this backdrop, the experts from the federal states of Bremen, Hamburg, Mecklenburg-Vorpommern, Lower Saxony and Schleswig-Holstein joined forces to combine existing expertise in science and industry and initiate joint projects. The IBN's goals are to promote basic and applied research, create networks of scientific and business activities and to lobby politicians and funding institutions at regional, national and European level.

Biotechnology is viewed as a key industry of the future with enormous potential to solve major problems in nearly all areas of life. Industrial or white biotechnology is playing an evermore important role. It uses the huge potential of enzymes or whole cell systems for the sustainable production of fine chemicals, food and feed additives, agricultural and pharmaceutical precursors, and technical enzymes and biofuels. Industrial biotechnology is a driver of innovation that generates important ideas for numerous areas of application.

The new findings in life sciences are increasingly making industrial biotechnology a lower-cost and more environmentally friendly alternative. Raw materials and energy are saved and processes considerably simplified. As a result, fewer resources are required. Multistage synthetic chemical processes can be replaced by biotechnological processes.

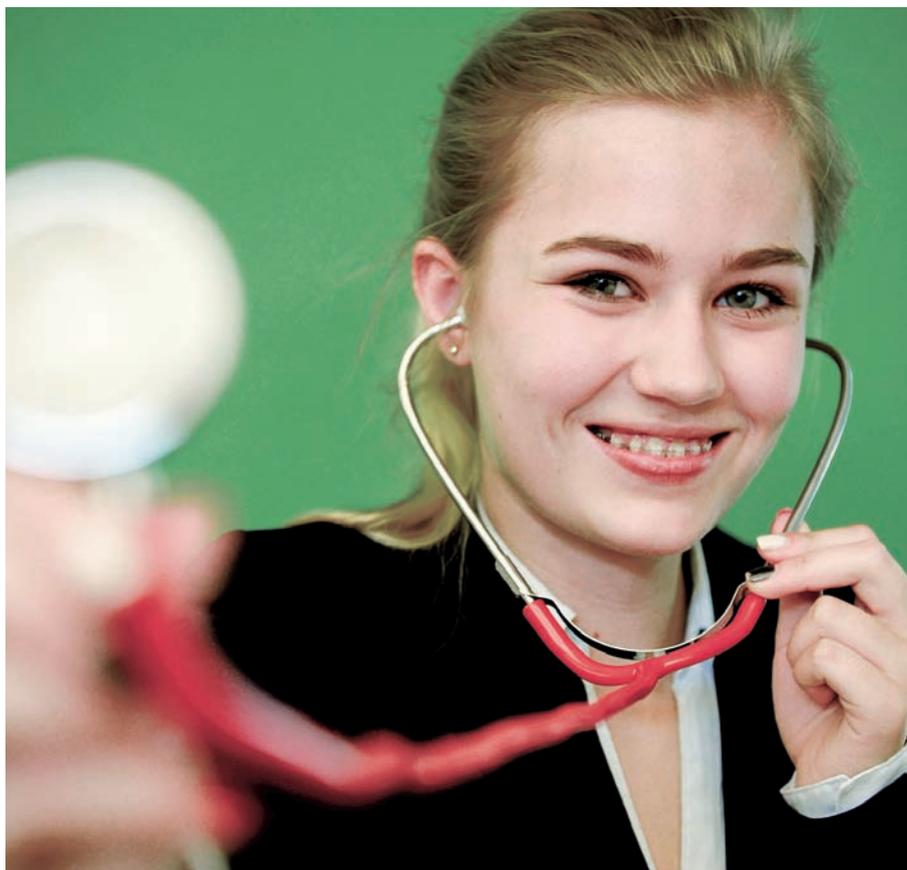
Together with its partners, IBN is today the cradle of groundbreaking projects of national significance, for example in the clusters BOKATALYSE2021 and BIORAFFINERIE2021 funded by the German Ministry of Research.

Further information: www.ibnord.de

YOUNG RESEARCHERS

THE STETHOSCOPE OF THE FUTURE

Holding pathogens at bay: Rieke-Marie Hackbarth has invented a self-disinfecting stethoscope.



Rieke-Marie Hackbarth from Henstedt-Ulzburg has achieved what many dream of: She has won the regional final of the contest for young researchers and received the special prize for entrepreneurship. As the youngest participant in the national final, she then won the special prize for natural sciences and technology. Her award-winning project involved a stethoscope that disinfects itself.

The comment made by her pediatrician in the past that stethoscopes were veritable sources of bacteria was what prompted the 15-year-

old to embark on her project in February 2014. The pupil attended a course on research and invention at the Harksheide Gymnasium school in Norderstedt. "At that time, I read a great deal about hospital bacteria and I suddenly recalled the story about the stethoscope," says Rieke-Marie. Even professionals confirm that the young pupil is on the right lines with her approach. In 2014, Professor Didier Pittet, Director Infection Control Programme at the University of Geneva Hospitals, took part in a study that demonstrated that, in the context of infection prevention, stethoscopes are certainly relevant with regard to the transmission of microorganisms. The

authors of the study concluded that it was necessary to systematically disinfect stethoscopes after every use.

To verify this herself, Rieke-Marie was allowed to carry out tests at short notice at Schülke & Mayr GmbH, a global leader in hygiene and infection prevention and the inventor of Octenisept. She was assisted, among others, by Dr. Katrin Steinhauer, Head of Schülke's Microbiology Department in Norderstedt, and her team. "The tests that Rieke performed in our laboratory clearly showed how microorganisms can accumulate on the stethoscope's membrane and how disinfection can effectively stop this." However, it was not just the lab results that impressed Katrin Steinhauer. "Rieke didn't merely come up with the idea about this device. She has also built and programmed it herself. Her achievement is truly remarkable!"

In February 2015, Rieke-Marie Hackbarth completed her first prototype. The second prototype was created in time for the regional competition in Kiel in April. "In the intervening period, I worked almost day and night to develop it further. As a result, I was even able to take a third prototype to the national competition in May," explains the young inventor. "It was very painstaking work, because I developed everything on my own, and I have to say that I was utterly exhausted after the two finals. I had made calls to people all over Germany to ask for parts and make progress. One juror from the competition for young researchers from Kiel was kind enough to help me etch a circuit board. Apart from that, I did the design and programming myself."

The effort has paid off. Victory at the regional competition in Kiel and the special prize for entrepreneurship at national level show how remarkable the development of the self-disinfecting stethoscope is. Patent and utility model protection has already been applied for. Rieke-Marie herself intends to stick with medicine; she wants to become a doctor. sm

Further information:
www.jugend-forscht.de



EPENDORF AG

NEW CEO WITH STRATEGIC VISION

Thomas Bachmann has been the new chief executive officer of the Eppendorf Group since August 1. He replaces CFO Detmar Ammermann, who had also acted as CEO on an interim basis. Previously, Bachmann sat on the company's supervisory board for two years.

Thomas Bachmann is an experienced leader with expertise gained over many years in the life science industry. He has demonstrated his strategic vision on many occasions during a career spanning more than 25 years. In 2005, he took over the reins at Tecan, a group headquartered in Switzerland with global opera-

tions. Before assuming the position of CEO at the Eppendorf Group, Bachmann was president of the Bruker BioSpin Group. The 56-year-old had also sat on Eppendorf's supervisory board since 2013.

On taking up office, Bachmann praised Eppendorf as an innovative and customer-oriented company which regularly makes significant contributions to analytical, medical, diagnostic and life science laboratories. The new CEO intends to work with the skilled and dedicated global management team to drive the company forward over the coming years and achieve sustainable success. nsw

Further information: www.eppendorf.com



LIFE SCIENCE NORD MANAGEMENT GMBH

INTERNATIONAL EXPERT IN BUSINESS TRAINING

Heike Herma Thomsen is the new project manager at Life Science Nord Management GmbH. She will be responsible for the project "Qualifit" (Qualification Initiative for Innovation and Technology), funded by ESF (European Social Fund) and the federal state of Schleswig-Holstein. She will work as business coach and trainer in the Life Science Nord Cluster.

In the Qualifit project, Heike Thomsen will work with project partners to establish and develop relevant training offers for employees in small and mid-sized companies in Life Science Nord. Heike Thomsen has worked in

human resources development, training and coaching for more than 20 years and has a wealth of international experience. The 54-year-old has, for example, worked for a large number of international organizations and managed projects in Germany and elsewhere. Most recently, Heike Thomsen managed EU projects at BEUC, the "European Consumer Organisation" in Brussels, and worked as an expert in capacity expansion. In the future, she wants to apply her know-how in sustainable training and human resources development in Life Science Nord and create innovative training opportunities. nsw

Further information: (see page 6) www.lifesciencenord.de

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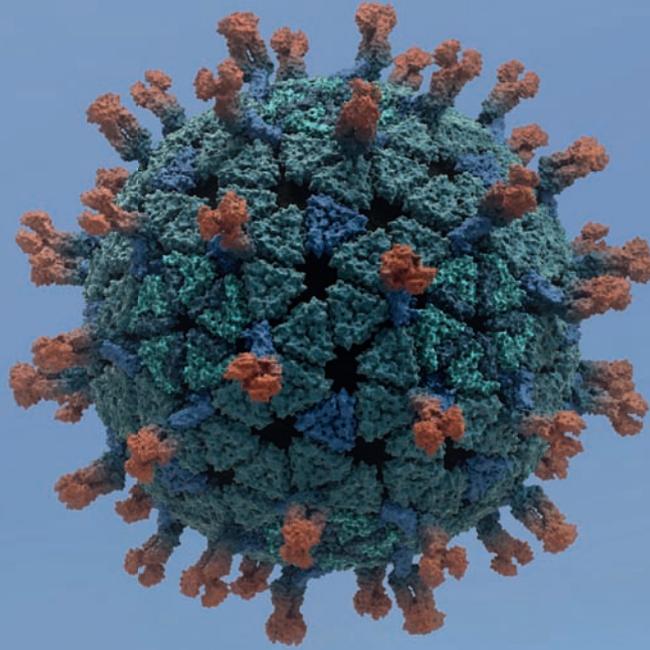
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