Press release

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Additional partnership in medical technology: Bosch and R-Biopharm to strengthen Vivalytic analysis platform

Plans to use innovative Bosch BioMEMS technology in PCR tests for multiresistant bacteria

- Bosch and R-Biopharm are jointly investing 150 million euros in the development of new PCR tests and in marketing.
- PCR test for multiresistant gram-negative (MRGN) bacteria to be developed using novel BioMEMS technology.
- BioMEMS chips permit simultaneous testing of up to 250 genetic characteristics – in some cases, in less than 15 minutes.

Darmstadt, Gerlingen, and Waiblingen, Germany – The market for medical technology is innovative, dynamic, and growing. Bosch sees medical technology as a strategic growth field and intends to expand its Bosch Healthcare Solutions subsidiary, based in Waiblingen. Bosch has now entered into a new partnership with the German diagnostics solutions company R-Biopharm. This partnership will be focused on Bosch's universal, fully automated Vivalytic molecular diagnostic analysis platform. The two companies will invest a total of 150 million euros by the end of the decade. Within their strategic development and distribution partnership, the partners intend to develop new in vitro diagnostic tests[1] for the Vivalytic platform – including a PCR test[2] for multiresistant bacteria based on the innovative Bosch BioMEMS technology. They are also looking to strengthen their marketing operations.

[1] In in vitro diagnostic tests, samples such as blood or saliva are taken from the human body to be analyzed.

[2] PCR tests are a standard procedure for detecting pathogens such as viruses. The test is based on a biochemical reaction known as the polymerase chain reaction (PCR), which replicates the virus's DNA, making it possible to detect viruses even if only a few pathogens are present. The resulting high level of sensitivity means that PCR tests can detect the virus with a high degree of accuracy. PCR tests also have a high specificity, meaning they can test specifically for one particular virus.

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"We are expanding in medical technology, a market we have defined as a strategic growth field. The fact that we can apply our many years of expertise and experience in the research and development of microchips, molecular diagnostics, and miniaturization, as well as our manufacturing know-how, makes this an attractive prospect for us," says Stefan Hartung, chairman of the Bosch board of management. "In medical technology, partnership models are a useful way of shortening product cycles and opening up distribution channels in this dynamic, innovative market," he adds. Point-of-care molecular diagnostics is expected to become a market worth billions. Bosch Healthcare Solutions and R-Biopharm aim to achieve sales in the medium nine-figure range by 2030.

The R-Biopharm Group, based in Darmstadt, Germany, has many years of expertise in clinical and food diagnostics. In addition, the company has well-established sales channels worldwide and knowledge of the relevant markets. "Our partnership with Bosch Healthcare Solutions marks a significant milestone in the implementation of the R-Biopharm Group's growth strategy in the field of clinical diagnostics," says Dr. Frank Apostel, Chief Operating Officer Clinical Diagnostics and Nutrition Care at R-Biopharm. "Together, we will work toward the goal of offering excellent products and solutions that can play a major part in combating diseases and developing medicines," he adds.

Partnership goals: develop new PCR tests and strengthen sales

One development goal within the ten-year partnership is a test for multiresistant gram-negative (MRGN) bacteria[3], which is to be implemented using Bosch's innovative, novel BioMEMS technology. The healthcare system faces the challenge of coping with an increasing number of diseases caused by multiresistant bacteria: in 2019, antimicrobial resistance had a hand in 4.95 million deaths worldwide, and each year, 670,000 infections caused by antibiotic-resistant bacteria occur in Europe.[4] In recent years, these bacteria have become a problem in hospitals – which administer particularly large quantities of antibiotics in the course of treating patients. In addition to the health risks, the financial burden of hygiene and quarantine measures in the healthcare sector should not be underestimated.

Vivalytic: even faster and more efficient with Bosch BioMEMS technology

As compact as a desktop computer tower, the universal, fully automatic Vivalytic Analyser is a platform for which various manufacturers can quickly and easily adapt and implement tests. The test cartridges already contain all the necessary reagents. "You could say we've shrunk a laboratory down to the size of a

[3] Multiresistant gram-negative (MRGN) bacteria is a collective term for a large group of different bacteria, including *Escherichia coli* and *Klebsiella pneumoniae*.
[4] https://www.bfarm.de/DE/Aktuelles/Blog/_docs/2021-11-18-antibiotikaresistenzen.html.

smartphone," says Marc Meier, president of Bosch Healthcare Solutions. "BioMEMS technology makes our Vivalytic platform even faster and more efficient, since this high-performance silicon chip, developed and manufactured by Bosch, enables fully automatic, simultaneous testing of up to 250 genetic characteristics such as pathogens in a single test cartridge, in some cases in less than 15 minutes," he adds. "This marks the entry of Bosch and its partners into nanofluidics, which processes very small quantities of liquids in the nanoliter range." This further miniaturization underscores the advantages of the Vivalytic platform: its compact size enables fast and targeted diagnostics directly at the point of sample collection – either at the doctor's office or in the hospital – without the frequently time-consuming detour via a central laboratory. Medically trained specialists can carry out the PCR tests without special laboratory training.

The two companies want to develop further PCR tests to detect tuberculosis and determine any drug resistance. A few days ago, Bosch announced its first partnership with the Northern Irish medical technology company Randox Laboratories Ltd. By the end of the decade, Bosch and its two partners will have invested some 300 million euros in the further development of the Vivalytic analysis platform.

Press photos and infographics are available on the Bosch Media Service at [www.bosch-press.com.](http://www.bosch-press.com)

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About Bosch:
The Bosch Group is a leading global supplier of technology and services. It employs roughly 429,000 associates worldwide (as of December 31, 2023). The company generated sales of 91.6 billion euros in 2023. Its operations are divided into four business sectors: Mobility, Industrial Technology, Consumer Goods, and Energy and Building Technology. With its business activities, the company aims to use technology to help shape universal trends such as automation, electrification, digitalization, connectivity, and an orientation to sustainability. In this context, Bosch's broad diversification across regions and industries strengthens its innovativeness and robustness. Bosch uses its proven expertise in sensor technology, software, and services to offer customers cross-domain solutions from a single source. It also applies its expertise in connectivity and artificial intelligence in order to develop and manufacture user-friendly, sustainable products. With technology that is "Invented for life," Bosch wants to help improve quality of life and conserve natural resources. The Bosch Group comprises Robert Bosch GmbH and its roughly 470 subsidiary and regional companies in over 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. Bosch's innovative strength is key to the company's further development. At 136 locations across the globe, Bosch employs some 90,000 associates in research and development, of which nearly 48,000 are software engineers.

The company was set up in Stuttgart in 1886 by Robert Bosch (1861–1942) as "Workshop for Precision Mechanics and Electrical Engineering." The special ownership structure of Robert Bosch GmbH guarantees the entrepreneurial freedom of the Bosch Group, making it possible for the company to plan over the long term and to undertake significant upfront investments in the safeguarding of its future. Ninety-four percent of the share capital of Robert Bosch GmbH is held by Robert Bosch Stiftung GmbH, a charitable foundation. The remaining shares are held by Robert Bosch GmbH and by a corporation owned by the Bosch family. The majority of voting rights are held by Robert Bosch Industrietreuhand KG. It is entrusted with the task of safeguarding the company's long-term existence and in particular its financial independence – in line with the mission handed down in the will of the company's founder, Robert Bosch.

Additional information is available online at www.bosch.com, www.iot.bosch.com, www.bosch-press.com.

About R-Biopharm:
R-Biopharm AG, located in Darmstadt, is one of Germany's leading biotechnology companies. It considers itself as a pioneer for health and quality of life. The company´s aspiration is to provide the highest possible precision, safety, clarity and certainty with excellent products and solutions – in prevention, therapy and healing. Research and development at R-Biopharm has developed agile processes in order to take on new challenges to accompany a steadily growing world population into a new health era with sustainable solutions.

As an internationally recognized leader, R-Biopharm stands for the development of excellent technologies, products and solutions in the fields of Clinical Diagnostics, Nutrition Care and Food and Feed Analytics. R-Biopharm is the global market leader for test systems in the field of allergen analysis. The biotechnology company is known for its products that are of high importance for human health. To this end, it unites development, production and sales under one roof and is successfully represented in more than 120 countries worldwide – through 29 subsidiaries and 128 distributors. Founded in 1988, the family-run company employs a total of around 1,400 people worldwide and was repeatedly recognized with the "Sustainability Award" for sustainable and profitable growth. R-Biopharm is cultivating a value-oriented corporate culture and management and is family-run in the second generation. The Chairman of the Board of Directors is Christian Dreher.

More information at https://r-biopharm.com/