

PRESS RELEASE

Funding approval in infectiology in the ZukunftBIO.NRW program

Rapid, resource-efficient disease and pandemic detection by InfektoFlex - an adaptive and innovative diagnostic platform designed to test a wide range of pathogens

The Fraunhofer Institute for Microelectronic Circuits and Systems IMS, together with its partner, has been selected by the ZukunftBIO.NRW program to carry out the InfektoFlex¹ project. From April 2023 to May 2025, this project will develop a modular and rapidly adaptable platform for the diagnosis of dangerous pathogens to improve pandemic preparedness and response. To this end, engineered recognition structures, known as clickmers, will be combined as determinants with carbon nanotubes as optical sensors. In this way, the diagnostic functionality can be validated and the transferability to several relevant pathogens can be demonstrated. The required expertise and technology development are covered in this project by the company ClickmerSystems GmbH and by the Fraunhofer IMS, so that at the end of the project a solution close to the market can be expected.

Viral and bacterial infections are one of the leading causes of death in the world. The Corona pandemic has shown us how important it can be for a society to be prepared for new infectious diseases and to identify them quickly. The InfektoFlex project aims to develop a novel sample test (so-called assay test) that can quickly and effectively identify new pathogens. In addition, a platform for testing viral and bacterial pathogens is to be developed that can be adapted flexibly and time-efficiently to new pathogens. The platform should also not require antibodies, which would otherwise be time-consuming and also need to be produced in animals. This will be realized by coupling the clickmers to highly sensitive optical nanosensors. The clickmers can be produced via a repeatable and evolutionary selection process and can be flexibly adapted to new pathogens as well as to new evolutionary resistance. Fraunhofer IMS uses biochemical processes

¹ InfektoFlex is funded by the Ministry of Economic Affairs, Industry, Climate Action and Energy of the State of North Rhine-Westphalia under the code IN-1-10B as part of ZukunftBIO.NRW.

Editorial

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to manufacture these optical sensors for the detection of molecules from carbon nanotubes. The carbon nanotubes glow in the near infrared, which is a decisive advantage for biomedical applications because there are far fewer background signals here than in the visible infrared, thus enormously increasing the signal-to-noise ratio. The nanotubes can be modified chemically in many ways so that a wide variety of recognition structures can be attached to them. For example, when a viral protein binds to such a structure, it causes changes in the fluorescent signal.

The complex of clickmer and optical nanosensor replaces the use of labeled antibodies as used in ELISA (Enzyme-linked Immunosorbent Assay, another detection method) or viral rapid tests. This reduces costs, increases the speed of adaptation and reproducibility, and it addresses important sustainability aspects such as animal welfare or the saving of resources.

More information about ZukunftBIO.NRW (DE): [Project InfektoFlex - ZukunftBio.NRW](#)
To the press release of the Ministry (DE): [ZukunftBIO.NRW: State supports biotechnological innovations from North Rhine-Westphalia with around 9 million euros | Wirtschaft NRW](#)



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Pictures and captions



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