

PRESS RELEASE

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Press Release of the LPKF Laser & Electronics AG

Federal Ministry of Education and Research promotes joint project "B-cell immune"

Since September 2022, inno-train Diagnostik GmbH, Medizinischen Hochschule Hannover (MHH), the Fraunhofer-Institut für Lasertechnik ILT and LPKF Laser & Electronics AG have been pooling their expertise in a joint research project on the prevention and treatment of epidemic infections.

The partners have now received financial support from the German Federal Ministry of Education and Research (BMBF) for their project, which fosters the development of a new analysis method for determining the individual immune response to SARS-CoV-2. The financial support enables the Project "High-throughput analysis of virus-specific memory-B-cells to determine individual immune responses", or in short "B-cell-immune", and is part of the program "Prevention and Treatment of epidemic infections with innovative medical technologies".

The past pandemic shows how important rapid responses to new viruses, virus variants and unknown diseases are. Current technologies quickly reach their limits, whether due to the large amount of reagents required or the limited throughput of laboratory equipment.

As part of the "B-Cell-Immune" project, the partners are working together to develop a high-throughput method for selectively harvesting and sequencing virus-specific memory-B-cells and a diagnostic kit with PCR-based detection. Memory-B-cells represent the immune system's memory of previous infections or vaccinations. The goal is to highly simplify the determination of immune status in large populations. The developed high-throughput method can, for example, significantly reduce the costs for the health system in the event of a new pandemic and play an important role in political decisions.

The ARRALYZE single cell platform developed by LPKF and the glass microarrays produced by using the LIDE technology, play a central role in the project: By miniaturizing and automating the analysis of single cells and biological processes, the technology makes a significant contribution to the development of a high-throughput platform for analyzing the immune status of large populations.

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The microarrays are filled with cells, substrates, or media. For this purpose, the Fraunhofer ILT will work together with LPKF to further develop the "laser induced forward transfer" (LIFT) process. This highly precise and contact-free printing process is used to fill the microscopically small wells and to remove cells. Pipette tips become unnecessary in this context, and the sample volume required for diagnostics can be reduced.

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Founded in 1998, inno-train Diagnostik GmbH is an internationally active supplier of a complete product line in the field of human leukocyte antigens (HLA) and the world's first supplier of self-produced PCR-genotyping-assays for blood group determination. inno-train is using this know-how to develop a PCR-test based on new biomarkers that can be used to determine the immune status with regard to specific viruses.

Under the leadership of Prof. Dr. Blasczyk, a team of the MHH, takes over the central part of the biological research with the aim to analyze and characterize biological markers of virus-specific B-cells. The MHH has broad experience as a leading transplant center in Europe and contributes with large resources of the blood donation service to the project. "This method takes the antibody-based therapy and diagnostics to a completely new level," emphasizes Mrs. Dr. Bade-Döding, project leader at MHH.



Image 1:
Illustration depicts different cell types in different well types. f.l.t.r.: Adherent cell on microstructured soil, NK cell "attacking" tumor cell in U-well, cell dividing in F-well.
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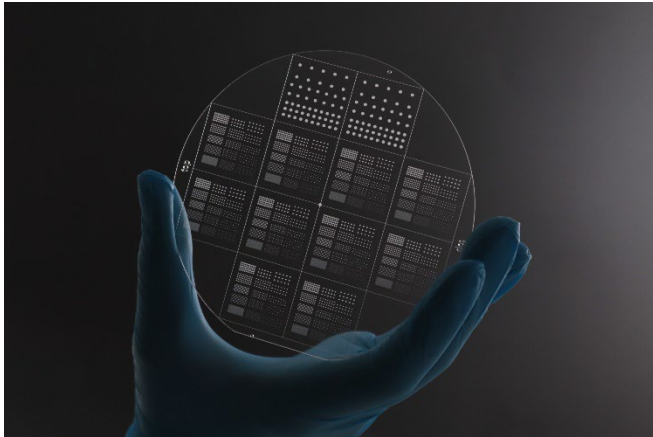


Image 2:
Employee holds
microstructured wafer in
hand showing individual
22 x 22 mm chips. Good to
see the micrometer-sized
wells into the glass.
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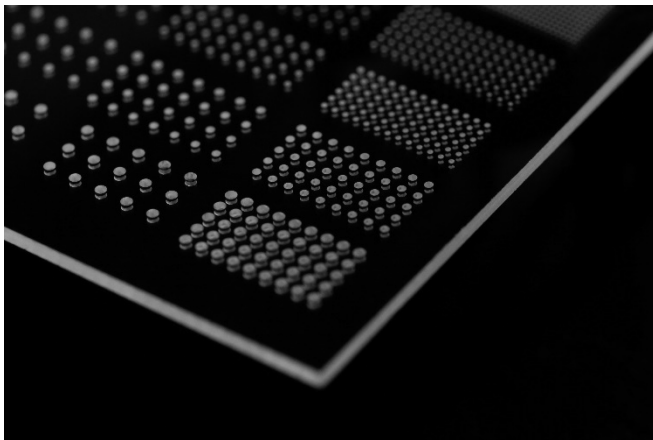


Image 3:
Single glass chip with wells
from 50 μm to 400 μm
diameter.
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LPKF Laser & Electronics AG is a leading provider of laser-based solutions for the technology industry. Laser systems from LPKF are crucial for the production of printed circuit boards, micro-chips, automotive parts, solar modules and many other components. Founded in 1976, the company is headquartered in Garbsen near Hanover, Germany, and is active worldwide through subsidiaries and representatives. LPKF Laser & Electronics AG shares are traded on the Prime Standard of Deutsche Börse (ISIN 0006450000).

The **Fraunhofer-Gesellschaft** based in Germany is the world's leading applied research organization. Prioritizing key future-relevant technologies and commercializing its findings in business and industry, it plays a major role in the innovation process. A trailblazer and trendsetter in innovative developments and research excellence, it is helping shape our society and our future. Founded in 1949, the Fraunhofer-Gesellschaft currently operates 76 institutes and research units throughout Germany. Over 30,000 employees, predominantly scientists and engineers, work with an annual research budget of €2.9 billion. Fraunhofer generates €2.5 billion of this from contract research.
