PRESS RELEASE

The fast way to individual treatment

Automated tumor diagnosis at the MEDICA trade fair

Lymph node diagnosis helps to determine whether a tumor has already spread across the body and started to form metastases. An inter-disciplinary team across three Fraunhofer institutes has now optimized and automated this diagnosis method.

Life expectancy is on the rise, although the number of cancer patients is soaring in tandem. Each year, more than 10,000 people around the world are diagnosed with tumors. As a result, fast and reliable diagnosis methods as well as individualized treatment methods are needed.

Fraunhofer researchers have developed an automated procedure for lymph node diagnosis as part of an inter-disciplinary project. The method provides important information on the stage of cancer: Cells from a primary tumor can make their way to other parts of the body through the lymph system and form metastases. Therefore, the presence of tumor cells in the lymph nodes means that the cancer has already spread and must be treated accordingly.

Press communication
Jörg-Dieter Walz | Phone +49 711 970-1667 | presse@ipa.fraunhofer.de
Fraunhofer Institute for Manufacturing Engineering and Automation IPA | Nobelstrasse 12 | 70569 Stuttgart | www.ipa.fraunhofer.de

Until now, the lymph node tissue taken from patients has been solidified in paraffin in the laboratory, sliced into thin segments and examined under a microscope. "However, as pathologists are not able to examine all segments due to time constraints, some tumor cells may remain undiscovered", explains Sebastian Schoening, group leader of the project group for Automation in Medicine and Biotechnology at Fraunhofer IPA.

The new method that the researchers from three Fraunhofer institutes have developed means that all tumor cells can be detected: The new "high throughput diagnosis system for tissue-based personalized cancer treatment using lymph nodes as an example", in short "LyDia HD", will be presented at MEDICA 2018 from November 12-15 in Dusseldorf.

"This is a radically different approach to previous lymph node diagnosis", explains Schöning. Instead of cutting tissue, the samples are dissociated into individual cells. The grinding device required for this procedure, the so-called "Tissue Grinder", was developed by the IPA team. The trick is that cells are being so carefully separated that they still function. In the next phase, tumor cells are colored, analyzed under the microscope, and counted. All of this is fully automated without a laboratory technician. The expertise for this system was contributed by the research team at the Fraunhofer Institute for Integrated Circuits IIS. The tumor cells are subsequently examined for genetic changes in order to select the optimal treatment for individual patients. This molecular test method was developed at the Fraunhofer Institute for Toxicology and Experimental Medicine ITEM in Regensburg. The software Merlin, developed by the IPA team, digitizes the entire procedure and makes it available in an electronic lab notebook covering all laboratory steps: from processing the samples to filing the findings report.

Automation not only makes the new LyDia HD diagnosis more precise but also quicker and more cost-effective than previous methods. Additionally, it immediately provides important information on the nature of the tumor cells for further treatment. This helps doctors to select suitable medication for the patient as part of a follow-up treatment plan. As a result, the new system is therefore playing an important role in the personalized medication of the future.

Contact Partners
Sebastian Schoening | Phone +49 621 17207123 | sebastian.schoening@ipa.fraunhofer.de | Fraunhofer Institute for Manufacturing Engineering and Automation IPA | www.ipa.fraunhofer.de

Press communication
Jörg-Dieter Walz | Phone +49 711 970-1667 | presse@ipa.fraunhofer.de