

## PRESS RELEASE

PRESS RELEASE

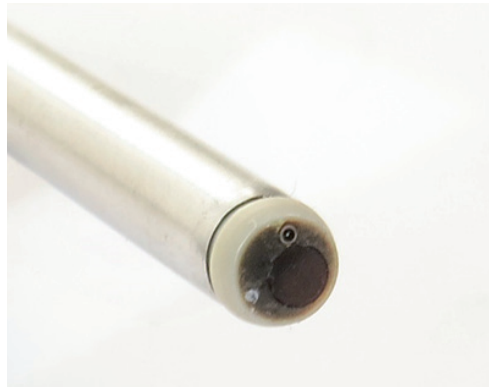
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### For the first time, Fraunhofer ENAS shows a MRI-safe microendoscope with ultrasonic function together with PolyDiagnost GmbH at the COMPAMED 2015.

The Fraunhofer Institute for Electronic Nano Systems ENAS shows together with cooperation partners developments for medical systems at the IVAM Product Market „High-tech for Medical Devices“ on booth H23.2 in hall 8a at the COMPAMED 2015 in Duesseldorf from November 16 until 19, 2015.

#### MRI safe micro endoscope system with integrated ultrasonic function

Population ageing is a challenge for the future of healthcare systems. Often, an elderly individual may suffer from more than one disease or medical condition, while the diagnostic and therapeutic techniques for one may be incompatible with those of the others. The fact that more people with multiple chronic conditions will require health services clearly demands for compatibility of therapy and diagnosis. On the other hand, active devices can offer new and effective solutions for health check and treatment. Therefore, many patients will be wearing such implants in their bodies for short or lifetime periods. These devices are not always compatible with the key diagnostic tools, one of them being Magnetic Resonance Imaging (MRI), a very accurate disease detection technique.



Endoscop tip with ultrasonic transducer.

Photo © Fraunhofer ENAS |

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Finding a solution for this situation will not only help patients to benefit from a broader range of medical advancements, but also contribute to the development of more effective “combined” therapeutic and diagnostic techniques.

As a step in this direction we have developed a MRI safe endoscopic probe demonstrator for brain surgery. The so-called “ $\mu$ endoscope” integrates ultrasonic and optic components into a single device for use in intraoperative procedures.

The optical functionality (light and image fibers) is used to guide the  $\mu$ endoscope’s tip and locate the tumour tissue. Once temporarily implanted, the  $\mu$ endoscope is fixed in the desired position for the duration of examination. Ultrasound functionality of the

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**POLYDIAGNOST**



#### Editorial notes

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FRAUNHOFER INSTITUTE FOR ELECTRONIC NANO SYSTEMS ENAS

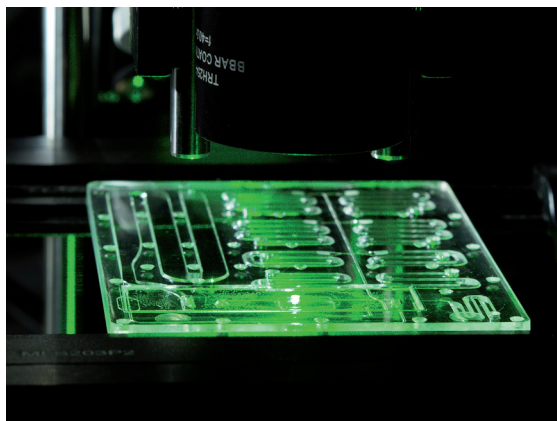
μendoscope is then employed to obtain high resolution and depth scans of the target and identify tiny areas of the brain tissue. This approach also allows for a therapeutic application of the μendoscope, so that by delivering the sufficient acoustic energy the tumour cell destruction can be achieved. The diameter of the current probe is 5 mm. Further miniaturization will enable positioning the tip much closer to the affected tissue and detect much smaller lesions.

As MR safety considerations have been taken into account in the design and operation procedure of the μendoscope, MRI could be performed while the μendoscope is inserted into the brain. This way, these two powerful modalities complement each other and increase the accuracy of diagnosis and therapy. The μendoscope is developed by the German partners PolyDiagnost GmbH, Fraunhofer ENAS und MR:Comp GmbH within the ENIAC Joint Undertaking (JU) DENECON.

**Fully-integrated Lab-on-Chip Systems for Point-of-Care diagnostics, health monitoring, infectious diseases, environmental monitoring and veterinary diagnostics**

Point-of-Need analytical systems enable the complex chemical and bio-chemical analytical procedures without the need for highly specialized laboratory equipment or staff. The presented chipcard-sized systems contain various functions: integrated microfluidic pumps, heaters, PCR, bio sensors and reagents.

This portfolio enables the integration and miniaturization of nearly every assay in cost optimized disposable systems. Presented applications include immunoassays (various types), tropical and other infectious diseases, antibiotic resistance testing by SNP (single nucleotide polymorphism) detection, and biosensor and assay test platforms. From the project VIP SERON the integration of a novel highly sensitive SERS-biosensor, which is freshly generated for every measurement, will be presented.



Fully-integrated Lab-on-Chip Systems for on-site analytics and Point-of-Care diagnostics - here with a novel highly sensitive integrated SERS biosensor, which is freshly generated for every measurement by laser. (project: VIP SERON)

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**bi.FLOW**  
systems GmbH  
biofluidic integration

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**FRAUNHOFER INSTITUTE FOR ELECTRONIC NANO SYSTEMS ENAS**

The Fraunhofer researches talk about the following topics at the COMPAMED HIGH-TECH FORUM by IVAM in hall 8A:

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Smart Sensor Solution Day  
November 17, 2015 (11:40-12:00 a.m.)  
Maik-Julian Bükler, Fraunhofer ENAS  
Wireless Active Implants

Smart Sensor Solution Day  
November 17, 2015 (2:30-2:50 p.m.)  
Dr. Mario Baum, Fraunhofer ENAS  
Biocompatible Thin Film Encapsulation

Brazilian Session  
November 18, 2015 (3:15-3:45 p.m.)  
Dr. Jörg Nestler, BiFlow Systems GmbH / Andreas Morschhauser, Fraunhofer ENAS  
Point-of-Care Diagnostics for Tropical Diseases (PodiTrodi): Lab-on-a-Chip Development for Chagas' Disease in a Joint European-Brazilian Project