

PRESS RELEASE

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Livestream from the Digestive System: Magnet-Guided Camera Capsules for More Pleasant Gastrosopies

Many patients dread the thought of having to swallow tubes to give their doctors a look at their gastrointestinal tracts. Long waits caused by the lack of specialists offering the procedure make this experience even worse. Working with two dedicated partners, Fraunhofer IZM is researching a completely tubeless technology in the nuEndo project supported by Germany's Ministry of Education and Research. Their vision: a simple-to-swallow capsule, equipped with cameras and guided by an external magnetic system.

Abdominal pain, difficulty in swallowing, chronic coughing, vomiting, or unexplained weight loss: many symptoms can make a gastroscopic exam necessary. The everyday procedure uses a flexible endoscope to diagnose conditions affecting the upper digestive tract, but many patients are wary about having to swallow the tube and put off the often urgently required checkup.

To combat this problem, the partners on the nuEndo project have come up with a special capsule that may replace the endoscopy tubes used in traditional gastroscopic procedures with a completely wireless technology. An external magnetic system is used to guide the ingested capsule through the patient's body, from where it transmits live images captured with its built-in sensors. "The capsule has been made possible by technological breakthroughs in three areas: We have powerful cameras shrunk to a miniature scale of only a few millimeters. New wireless technology allows the camera feed to be relayed in real time. And finally, novel sensor-actuator systems help navigate the capsule intuitively in the patient's body", Dr. Sebastian Schostek, Consortium Coordinator at nuEndo and Vice President of Ovesco Endoscopy AG, explains.

One particular benefit of the new method: By contrast to the usual gastroscopic tubes, the capsules can be administered by regular medical staff. After swallowing the capsule, it takes approx. 20 seconds for the high-tech system to reach the stomach and start its diagnostic work. Certain conditions might still make traditional gastroscopy inevitable because of the established technology's higher resolution. The mobile and compact gastroscopic capsules do, however, promise to shorten the process by cutting out long waiting times before a first diagnosis can be made and any further analysis or treatment introduced.

Professor Dr. Jörg Albert, Head Physician at the Robert Bosch Hospital of Stuttgart in Germany and clinical associate partner of the nuEndo project, explains: "The

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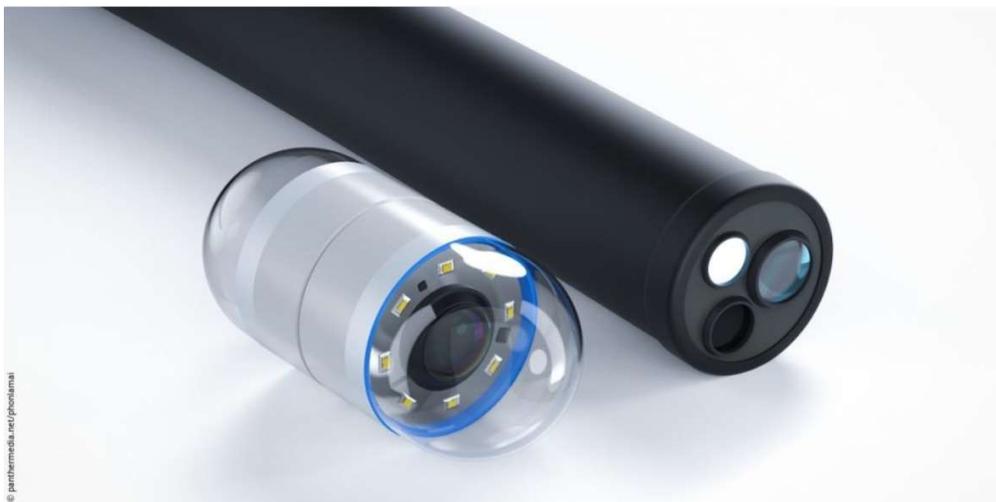
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noninvasive and painless method makes this new form of gastroscopy an easier choice for patients whose symptoms might not yet be severe enough to motivate them to undergo traditional gastroscopic analysis. They simply have to swallow a tiny capsule and can then relax and let the procedure run its course. This means that the nuEndo system promises to improve early recognition of many conditions, make treatment more effective, and help monitor the recovery process.”

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As leading experts for the miniaturization of electronic systems, the Fraunhofer Institute for Reliability and Microintegration was entrusted with the challenge of scaling down the capsule. Another partner in the project carefully coordinated by Ovesco Endoscopy AG, a medical technology enterprise committed to flexible endoscopy and endoluminal surgery, is SENSODRIVE GmbH, a spinoff of the German Aerospace Center, who contributed the external magnetic controls to manage the analytical procedure. The project has received approx. €1.7 million in funding from the German Ministry of Education and Research in support of the innovative research undertaken by the commercial partners and will run until 2022.



In contrast to an endoscope tube, the endoscope capsule with a diameter of 11 millimetres is simply swallowed by the patient. This makes it more comfortable for the patient and reduces the risk of complications.

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Research of practical utility lies at the heart of all activities pursued by the Fraunhofer-Gesellschaft. At present, it maintains 72 institutes and research units. The majority of the 26,600 staff are qualified scientists and engineers, who work with an annual research budget of 2.6 billion euros. Of this sum, 2.2 billion euros is generated through contract research. More than 70 percent of the Fraunhofer-Gesellschaft's contract research revenue is derived from contracts with industry and from publicly financed research projects. Almost 30 percent is contributed by the German federal and state governments in the form of base funding, enabling the institutes to work ahead on solutions to problems that will not become acutely relevant to industry and society until five or ten years from now.

Fraunhofer IZM specializes in industry-oriented applied research. With four technology clusters, Fraunhofer IZM covers the entire spectrum of technologies and services necessary for developing reliable electronics and integrating new technology into applications. Our customers are as varied as the applications for electronics. We take on development projects for the automotive industry, healthcare and industrial electronics and even textile companies. Fraunhofer IZM has two sites in Germany. Apart from its headquarters near Berlin Mitte, the institute is also represented in Dresden, a strategically important centers for electronic development and manufacturing.

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