Chewing gum rapid test for inflammation

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Researchers from the Julius-Maximilians-Universität (JMU) Würzburg in Bavaria, Germany, are working on a chewing gum that is capable of detecting oral inflammation. Credit: JMU

Dental implants occasionally entail complications. Six to 15 percent of patients develop an inflammatory response in the years after receiving a dental implant. This is caused by bacteria destroying the soft tissue and

the bone around the implant, in the worst case.

In the future, patients will benefit from a quick and affordable method of assessing whether they carry such bacteria using a chewing gum-based diagnostic test developed by a pharmaceutical research team at the Julius-Maximilians-Universität (JMU) Würzburg in Bavaria, Germany.

In practice, the test works as follows: If there is an inflammation in the oral cavity, a bittering agent is released while chewing the gum. Patients can then visit their dentist to confirm the diagnosis and treat the disease. This type of early detection aims at preventing serious complications such as bone loss.

"Anyone can use this new diagnostic tool anywhere and anytime without any technical equipment," says Professor Lorenz Meinel says. He is the head of the JMU Chair for Drug Formulation and Delivery and developed the new diagnostic tool with Dr. Jennifer Ritzer and her team; the invention is currently featured in an article in the journal *Nature Communications*.

In the presence of inflammatory conditions, specific protein-degrading enzymes are activated in the mouth. In just five minutes, these enzymes also break down a special ingredient of the chewing gum, thereby releasing a bittering agent that could not be tasted before.

Meinel's team provided the proof that this principle actually works. First studies using the saliva of patients were conducted at Merli Dental Clinic in Rimini.

To launch the chewing gum into the market, Meinel's team plans to set up a company. The professor assumes that it will take two to three years until the gum is commercially available. Chewing gum rapid tests for other medical applications are presently under development. "We hope

to be able to diagnose other diseases with our 'anyone, anywhere, anytime' diagnostics to identify and address these diseases as early as possible," Meinel explains.

More information: J. Ritzer et al, Diagnosing peri-implant disease using the tongue as a 24/7 detector, *Nature Communications* (2017). DOI: 10.1038/s41467-017-00340-x

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