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New pH sensor to provide insights into tumor metabolism

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The pH value at any examined location in the tissue can be represented based on pH-dependent molecular changes in the zymonic acid.



A team from the Technical University of Munich (TUM) has developed a pH sensor that renders pH values visible through magnetic resonance imaging (MRI) in a non-invasive, radiation-free manner.

Tumors, inflammation and circulatory disorders locally disturb the body's acid-base balance. These changes in pH value could be used to verify the success of cancer treatments.

In order to make pH values visible, a molecule called zymonic acid is injected into the body and then a magnetic resonance imaging (MRI) investigation is made of the object tissue. The data is used to calculate frequency spectra that in turn provide information about the chemical properties of the molecular surroundings of the nuclei. Ultimately, the pH value at any examined location in the tissue can be represented based on pH-dependent molecular changes in the zymonic acid.

Additional pre-clinical studies are planned in order to ascertain the advantages of this new imaging biomarker compared to conventional methods and to further improve the spatial resolution of pH imaging.