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IIT scientists discover biosensor for kidney disorders

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Indian Institutes of Technology at Bombay and Indore have jointly developed a biosensor that makes it possible to detect kidney disorders in less than eight minutes.

The biosensor can accurately measure both the pH and urea concentration with a single drop of urine. Researchers who developed the biosensor believe that it will help make a point-of-care test to ascertain if kidneys are functioning normally.

For a kidney function test, doctors need an estimate of pH and urea as most kidney disorders result in reduced pH and higher concentration of urea. The available methods urea are accurate patients have to undergo two tests. In addition, there is problem of contaminating components in urine such as calcium, chloride, ascorbic acid, sodium, and potassium.

It is made by encapsulating an enzyme urease and a molecule FITC-dextran in alginate microspheres. The combo emits fluorescence in response to chemical reaction with urea and changes in pH when urine is added. The fluorescence reduces when the pH is acidic and increases when it is alkaline. The changes in fluorescence intensity are measured, which helps to calculate the values of pH and urea.

It will help make a rapid and accurate point-of-care diagnostic test for kidney disorders.