

Glucose monitoring for diabetes made easy with a blood-less method

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Treating Diabetes – a major scourge of humanity bothering millions of people – requires a constant monitoring of the human blood for glucose concentrations. While current schemes employ electrochemical methods, they require extraction of blood samples. By using glucose-sensitive dyes and a nano-plasmonic interferometer, a research team from Brown University has shown how to achieve much higher sensitivities in real-time measurements while using only saliva instead of blood.

In their article titled "A plasmonic cuvette": dye chemistry coupled to plasmonic interferometry for glucose sensing in the journal *Nanophotonics* the research team led by Domenico Pacifici describes how a suitable mixture of enzymes can be employed to selectively generate a red fluorescent molecule. These can then be selectively optically detected in a complex environment full of a plethora of other substances such as human saliva. Tiny volumes of the compound are investigated by means of a nano-structured surface of silver and aluminum oxide. As a plasmonic [interferometer](#) this structure facilitates the interactions of light with the mixture under investigation. By measuring the absorption of light of a specific wavelength the concentration of glucose can be inferred.

Non-invasively studying saliva is made possible due to the high sensitivity of this method. Although a strict dependence between [glucose concentrations](#) in blood and saliva exist, the latter is smaller by a factor of hundred. Additionally only a tiny volume of material – around the a quarter of the volume of a water droplet – is required to achieve this.

More information: "A 'plasmonic cuvette': dye chemistry coupled to plasmonic interferometry for glucose sensing." Vince S. Siu / Jing Feng / Patrick W. Flanigan / G. Tayhas R. Palmore. Nanophotonics, Volume 3, Issue 3 (Jun 2014). www.degruyter.com/view/j/nanoph-2013-0057.xml

Provided by De Gruyter

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