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## Intracellular pH detection of *Brachionus plicatilis* with pMBA pH nanosensor

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An important application of Surface Enhanced Raman Scattering (SERS) is the potential of intracellular analysis based on Raman reporters attached to nanoprobes. SERS is an appropriate technique for identification of molecular species of a biological system; measuring local chemical changes at the subcellular level with high spatial and temporal resolution. Measuring pH utilising the enhanced Raman response from pMBA when it has functionalised gold nanoparticles (Au NPs) has attracted significant attentions. Thus, the application of such a system to the measurement of intracellular pH is a key aspect of current development. The importance of monitoring the intracellular pH appears in gaining a better understanding of the occurrence and progression of diseases. Herein, the sensitivity of pH nanoprobe based on pMBA functionalised 30 nm Au NPs to the pH changes of the surrounding solutions has been investigated not only with a pure stock solution of pMBA-Au but also when internalised inside *Brachionus plicatilis*. The preliminary results show that the chemical sensing of the nanoscales probe is maintained when inserted into living cells giving an evidence of the ability of such probe to monitor intracellular pH changes. The sensitivity of such nanoprobe to the pH changes inside the organism is reflected in the changes of the SERS response of the pH calibration modes at  $696\text{ cm}^{-1}$ ,  $1393\text{ cm}^{-1}$  and  $1702\text{ cm}^{-1}$  which shows a similar trend to the pure stock solution of pMBA-Au.

### Biography

Nadiah Aldaleeli received her BE degree in Physics from the King Faisal University, Saudi Arabia, in 2003 and the Master's degree in Laser and Spectra from King Saud University in 2008 and her Master's project (Spectral diagnosis of cancer samples before and after surgery) was awarded the golden medal for the best research in that year. In 2010, she joined the Department of Physics, Aljouf University, Saudi Arabia, as a Lecturer and since 2013, have been with the Department of Physics, Education Collage, Imam Abdulrahman Bin Faisal University, Saudi Arabia, as a Lecturer as well. She is currently at Swansea University for a PhD program in the field of Nanotechnology and her research interests lie in laser diagnostics and spectroscopy.

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