New work sheds light on inner working of cells

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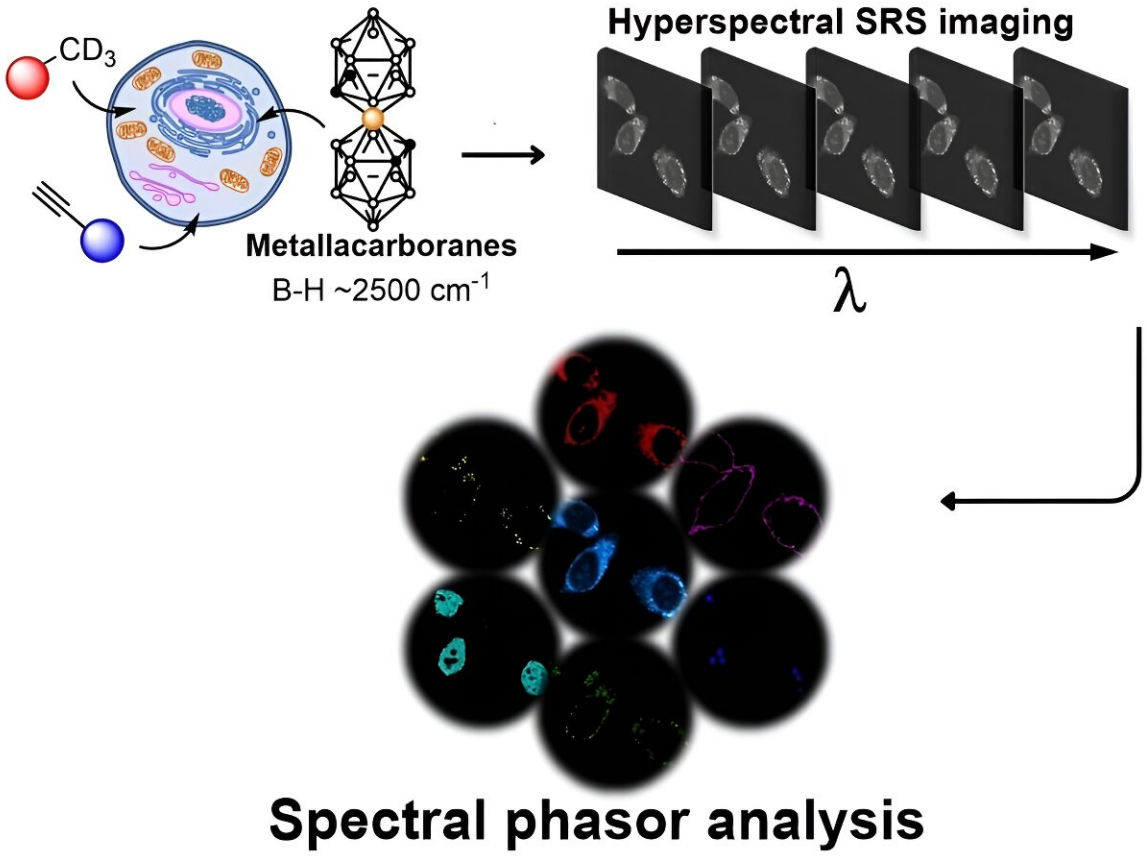

High resolution visualization of cell components using three chemical probes. Credit: CÚRAM/Pau Farras

CÚRAM researchers at University of Galway, together with colleagues at the Centre for Molecular Nanometrology at University of Strathclyde have published work unveiling the inner workings of cells.

Published recently in *Angewandte Chemie International Edition*, the work provides a deeper understanding of the way components within cells are interconnected. This research has been on the agenda of scientists worldwide for many years, and has yielded plenty of useful information on how certain diseases behave.

Through cellular visualization using SRS microscopy, the team have addressed the challenge of attaining clear images of individual processes. Both time consuming and difficult to analyze due to combinations of poor image quality, previous efforts in multiplex optical detection in live cells has been imitated in how many processes can be tracked and having to physically alter the cell to get a clear image.

The presented work utilizes dyes which make no adjustment to the cell itself, is completed within minutes and tracks up to nine different aspects of the cell structure simultaneously. This represents a significant advancement in the field, improving on seven trackable processes in previous work.

Lead author Dr. Pau Farras, Associate Professor in Inorganic Chemistry in the School of Biological and Chemical Sciences, at the University of Galway and Principal Investigator at CÚRAM SFI Research Centre for Medical Devices, said, "This work will provide scientists with a tool to garner lots of information out of cells within a short space of time. This has the potential to assist in understanding how current drugs developed for a range of applications are fighting disease and even provide hints on how to improve treatments."

More information: Neville Murphy et al, Expanding the Range of

Bioorthogonal Tags for Multiplex Stimulated Raman Scattering Microscopy, *Angewandte Chemie International Edition* (2023). DOI: 10.1002/anie.202311530