UPDATE FROM THE CUTTING EDGE

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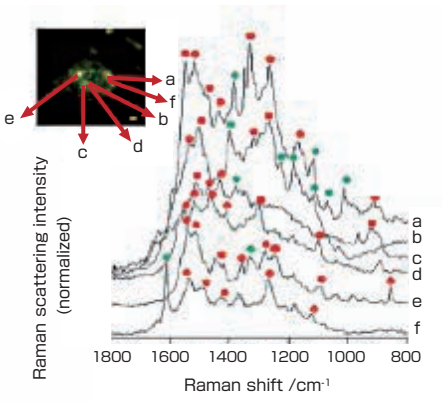
The abstracts of the recent research information appearing in Vol.8 No.7-9 of "AIST TODAY" are introduced here, classified by research area.
For inquiry about the full article, please contact the author via e-mail.

Life Science & Technology

Development of ultrasensitive analytical method for cell surface proteins

Surface enhanced Raman scattering measurement of one single protein on a living cell wall

We have developed a new analytical method to detect surface proteins on cell surfaces using surface enhanced Raman scattering (SERS). We labeled a living yeast cell surface (*Saccharomyces cerevisiae* strain W303-1A) by Ag nanoparticles which can form nanoaggregates and found to show SERS activity. Blinking of SERS and its polarization dependence revealed that SERS signals are from amplified electromagnetic (EM) fields at nanometric Ag nanoparticle gaps with single or a few protein molecule sensitivity. We tentatively assigned SERS spectra from the yeast cell wall to mannoproteins. Nanoaggregate-by-nanoaggregate variations and temporal fluctuations of SERS spectra are discussed in terms of inhomogeneous mannoprotein distribution on a cell wall and possible ways of Ag nanoaggregate adsorption respectively.



SERS spectra from each single Ag nanoparticle
Left top is the SERS image of a yeast cell.
Red dots indicate the scattering from nitrogen of protein.

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