Research Hotline

UPDATE FROM THE CUTTING EDGE

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The abstracts of the recent research information appearing in Vol.8 No.10-12 of "AIST TODAY" are introduced here, classified by research area.
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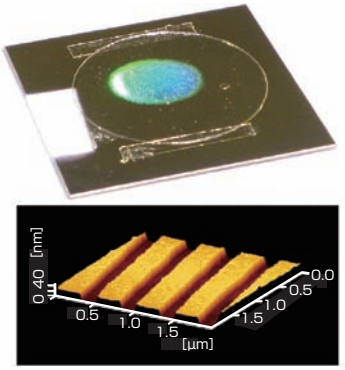
Life Science and Biotechnology

Enhanced fluorescence biochips with sub-wavelength periodic structure

Application for a sensitive fluorescence microscope and biosensor

Surface plasmon resonance is recently familiar as a detection tool for a bio-sensor or a biochip. On the other hand, surface plasmon-field enhanced fluorescence spectroscopy (SPFS) is studied as a powerful technique to detect a small number of molecules at an interface and the application of SPFS to bio-related research and medical field is expected. In this study, metal-coated substrates with sub-wavelength periodic grating pattern are fabricated, and the chips are applied to the grating coupled-surface plasmon resonance (GC-SPR) possible to provide the strong photon-molecule coupling field without complicated optical system using prisms. The fluorescence enhancement of fluorescence-labeled protein bound to the chip surface was more than 20 times compared with that on the a normal slide glass. We apply the GC-SPR to a fluorescence microscope system possible to obtain a surface-selective enhanced fluorescence image and to a biochip system for clinical diagnosis.



A photograph of a fabricated chip with the sub-wavelength periodic grating pattern (upper) and a scanning probe microscope image measured (bottom)

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