

### DNA Diagnoses using Scanning Near-field Optical Microscopy

박강민, 김종민, 장상목\*, 김우식<sup>1</sup>  
동아대학교; <sup>1</sup>경희대학교  
(smjang@dau.ac.kr\*)

Scanning near-field optical microscopy (SNOM) imaging was performed to allow for the direct visualization of damaged sites on individual DNA molecules to a scale of a few tens of nanometers. Fluorescence in situ hybridization on extended DNA molecules was modified to detect a single abasic site. Abasic sites were specifically labelled with a biotinylated aldehyde-reactive-probe and fluorochrome-conjugated streptavidin. By optimizing the performance of the SNOM technique, we could obtain high contrast near-field optical images that enabled high-resolution near-field fluorescence imaging using optical fiber probes with small aperture sizes. High resolution near-field fluorescence imaging demonstrated that two abasic sites within a distance of 120 nm are clearly obtainable, something which is not possible using conventional fluorescence in situ hybridization combined with far-field fluorescence microscopy. In the presentation, we will discuss near-field optical probe fabrication for high near-field optical efficiency as well as the DNA diagnoses results.