

## Multiplexed Wide-Field Raman Bio-Imaging using Nanobridged Nanogap Particles

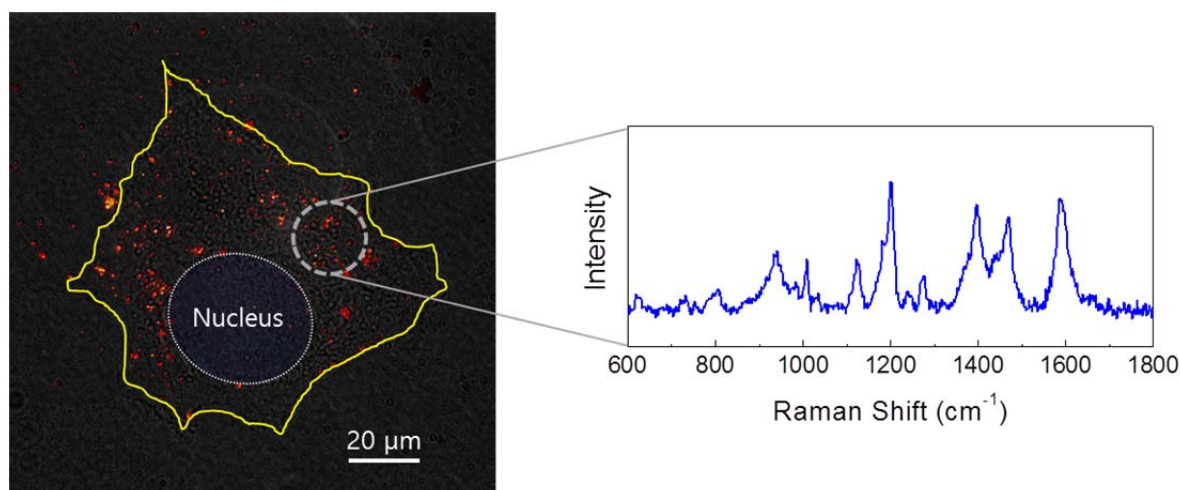
Jongwoo Kim, Nam Hoon Kim, Yung Doug Suh, Sang Hwan Nam\*

Research Center for Convergence NanoRaman Technology, Korea Research Institute of Chemical Technology (KRICT), Daejeon 34114, Republic of Korea

E-mail: shnam@kRICT.re.kr

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We demonstrated multiplexed Raman bio-imaging of high-speed and high-resolution by using custom-built wide-field Raman imaging system. The system is free from pixel-by-pixel scanning, which is typically used in conventional confocal microscopy and slit scanning [1]. Gold surface roughness-controlled nanobridge nanogap particles (Au-RNNPs) that were used in the imaging have stronger nanogap-enhanced Raman scattering signals, which are attributed to their enhanced electromagnetic field due to increased surface roughness. We observed that the Au-RNNPs can successfully target cells of interest and be imaged inside cells with the rapid, wide-field Raman imaging setup. In addition, the Au-RNNPs are found to be compatible with five different Raman dyes. Our results provide strategies for detection and imaging with Raman nanoprobes for optical and biomedical applications.



**Figure 1: An image and its corresponding spectrum of a BT474 cell (breast cancer cell) with Her2-targeting Au-RNNPs**

[1] A. F. Palonpon, J. Ando, H. Yamakoshi, K. Dodo, M. Sodeoka, S. Kawata, and K. Fujita, “Raman and SERS microscopy for molecular imaging of live cells”, *Nat. Protoc.*, **8**, 677 (2013)