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Multiplex coherent anti-Stokes Raman scattering microspectroscopy for monitoring molecular structural change in biological samples TAKAYUKI OHTA, Meijo University, HIROSHI HASHIZUME, KEIGO TAKEDA, KENJI ISHIKAWA, Nagoya University, MASAFUMI ITO, Meijo University, MASARU HORI, Nagoya University — Biological applications employing non-equilibrium plasma processing has been attracted much attention. It is essential to monitor the changes in an intracellular structure of the cell during the plasma exposure. In this study, we have analyzed the molecular structure of biological samples using multiplex coherent anti-Stokes Raman scattering (CARS) microspectroscopy. Two picosecond pulse lasers with fundamental (1064 nm) or the supercontinuum (460-2200nm) were employed as a pump and Stokes beams of multiplex CARS microspectroscopy, respectively. The pump and the Stokes laser beams were collinearly overlapped and tightly focused into a sample using an objective lens of high numerical aperture. The CARS signal was collected by another microscope objective lens which is placed facing the first one. After passing through a short pass filter, the signal was dispersed by a polychromator, and was detected by a charge-coupled device camera. The sample was sandwiched by a coverslip and a glass bottom dish for the measurements and was placed on a piezo stage. The CARS signals of the quinhydrone crystal at 1655, 1584, 1237 and 1161 cm-1 were assigned to the C-C, C=O stretching, O-H and C-O stretching vibrational modes, respectively.

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