Photoswitchable Carbon-Dot assembly

Tzu-Heng Chen*[1] and Huan-Tsung Chang†[1]

[1]National Taiwan University – Department of Chemistry, National Taiwan University, 1, Section 4, Roosevelt Road, Taipei 106, Taiwan, Taiwan

Abstract

Carbon-dot (C-dot) assembly consisting of several thousands of C-dots prepared from shows interesting photoswitching properties. Through self-assembly, C-dots form aggregate with an average size of 103 nm. The water dispersible C-dot assembly possesses intrinsic photoluminescence (PL) and is stable against salt (e.g. 1 M NaCl) and photoirradiation. The PL of C-dot assembly can be turned off and then on under photoirradiation over the wavelength regions of 510-540 nm and 365-420 nm, respectively. Like reported C-dots, the C-dot assembly emits various colors when excited at different wavelengths. Having great stability and high contrast, images of individual C-dot liposome have been recorded, showing negligible photoblinking. By applying a simple photolithographic approach, micropatterns of C-dot assembly emitting different colors have been fabricated.

Keywords: Carbon dot assembly, photoswitching, multiple emission, high contrast, micropatterns

*Speaker

†Corresponding author: changht@ntu.edu.tw