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Analytical Chemistry in biomedical area, synthesis of semiconducting polymers, surface chemistry of nanoscience

We are “Semiconducting Polymer Dots Research Group” in the Dept. of Applied Chemistry, NCTU. The research topics of our group mainly focus on three directions: (i) Point-of-Care on-site test strip detection for biomarkers by fluorescent polymer dots (Figure 1). (ii) Bioimaging and tumor targeting by using (Figure 2). (iii) Organic synthesis of biocompatible highly fluorescent semiconducting polymer dots with various emission wavelengths, especially for near-infrared (NIR) emission. (iv) Application of polymer dots for anti-counterfeiting security purposes. In recent years, semiconducting polymer dots (Pdots) have emerged as a new type of ultrabright fluorescent probes, which have been proved to be very useful for biomedical imaging. Pdots possess several exceptional advantages including high fluorescence brightness, fast radiative rate, excellent photostability, and negligible cytotoxicity. Among these new types of Pdots, the near-infrared (NIR) fluorescent Pdots appear to be the most urgent and important owing to their promising deep tissue imaging in the clinic. Our group work extensively on the design of NIR-emitting Pdots and their biomedical applications both in vitro and in vivo.

Key Facilities: NIR confocal microscope · NIR fluorometer.

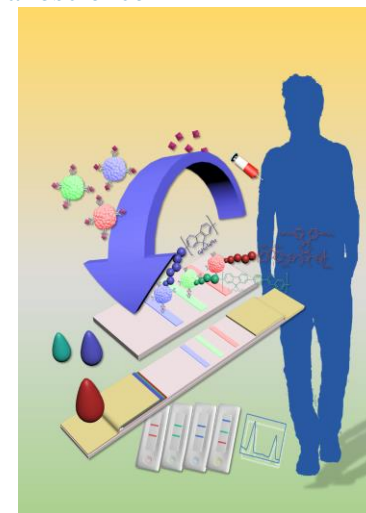


Figure 1: Test strips based on Pdots



Figure 3: Anticounterfeiting applications based on Pdot RGB inks

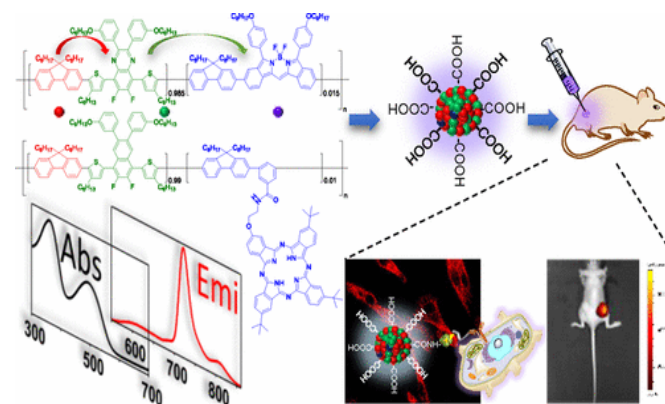


Figure 2: Specific tumor targeting by use of Pdots