Supplementary Material (ESI) for Chemical Communications

Electronic Supplementary Information

Quenching of CdSe Quantum Dot Emission, a New Approach for Biosensing.

L. Dyadyusha,[b] H. Yin, [b] S. Jaiswal, [c] T. Brown,[d] J.J. Baumberg,[c] F. Booy[e] and T. Melvin[*a]

[a] *Optoelectronics Research Centre,, University of Southampton, Highfield, SO17 1BJ, U.K.. Fax: 44 (0)2380 593029; Tel: 44 (0)2380 596505; E-mail: tm@ecs.soton.ac.uk*
[b] *School of Electronics and Computer Science, University of Southampton, Highfield, SO17 1BJ, U.K.*
[c] *School of Physics and Astronomy, University of Southampton, Highfield, SO17 1BJ, U.K.*
[d] *School of Chemistry, University of Southampton, Highfield, SO17 1BJ, U.K.*
[e] *Woolfson Laboratory, Imperial College, University of London, Exhibition Road, London, SW7 2AZ, UK.*

Additional experiments performed using QD-DNA-biotin on streptavidin surfaces.

QD-DNA was mixed in a ratio of 1:1 at a concentration of 0.4 μM in 0.3 M sodium chloride, 10 mM sodium phosphate buffer solution (pH 7.0) with either:-

i) complementary sequence (5'-CTG CTA TCT ATC TGC-3')
ii) Au-DNA, or
iii) 3'-gold nanoparticle labelled samples were prepared with the non-complementary sequence 5' T-GCA-GAT-AGA- TAG-CAC-T-3' aminomodifier C7 CpG by the same chemistry and purification methods as previously used to prepare the DNA-Au

The samples were incubated at room temperature for 1.5 hrs. After incubation, each of the three samples was diluted with further buffer (0.3 M sodium chloride, 10 mM sodium phosphate buffer) to a final concentration of 0.156 μM. 10 μl of each of the three samples was spread on separate streptavidin-coated glass slides over an area of ~ 1 cm^2, covered with a cover-slip and incubated at 4 ^oC for 12 hours in a humid chamber. The slides were washed in water and then observed by epi-fluorescence microscopy (Zeiss Axiovert 200 M microscope equipped 100x oil immersion objective (NA = 1.4) with Axio Cam HRm, HBO 50W mercury lamp and N2 filter set (excitation G365 emission LP420, beamsplitter FT 395)). The resulting images are shown in Figure 1 below.

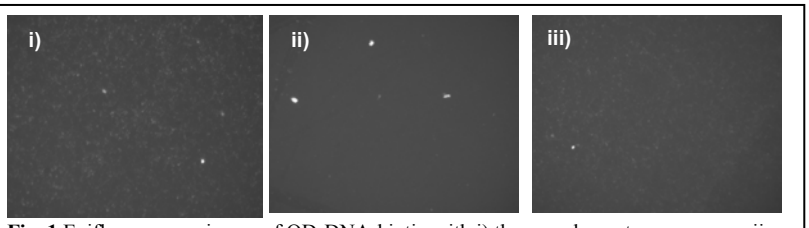

Fig. 1 Epifluorescence image of QD-DNA-biotin with i) the complementary sequence, ii Au-DNA, iii) the gold nanoparticle-non complementary sequence conjugate. The QD-DNA-biotin was incubated first in solution before addition to the streptavidin coated glass slide. The larger bright spots in the image are larger particles used to achieve focus.

The QDs can be seen as small bright spots in the image i and iii. A long exposure (12.6s) was used and the images accumulated.