Quantitative Molecular Sensors and Imaging Techniques for Diagnostic Detection of Infectious Diseases

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Bio-imaging Showcase
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I. Malaria infected human red blood cells

Fuyuki Tokumasu (NIAID)

Goals: quantitative imaging of the following aspects of malaria infection in human red blood cells:

- Change in membrane protein components
- Hi-f component of thermal vibration of RBC
- Clustering of Band3 proteins
Bio-conjugated quantum dot (QD)

- Attractive fluorophores for bio-imaging due to its broad absorption and narrow symmetric emission spectra
- Higher quantum yield and more photostable than conventional organic dye
- Size and composition dependent tunable absorption and emission pattern
- Bio-functional Coating

A family of Qdot particles can be made to emit a full spectrum of colors when excited with a single excitation source.

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Optical characterization of single QDs

Imaging cellular processes with nanosensors

Review of Nanomedicine and Nanotechnology, in print
Opportunities…

Microarray fabrication for high-throughput ELISA

Analysis of single CD4 proteins on T cell membrane
Contact Information

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For further details, check with posters by Matthew Clarke and Georgeta Crivat