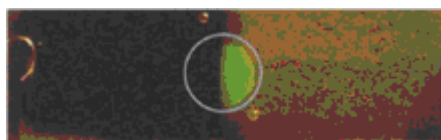


Enhanced fluorescence immunoassay utilizing metal particles and/or plain metal surface

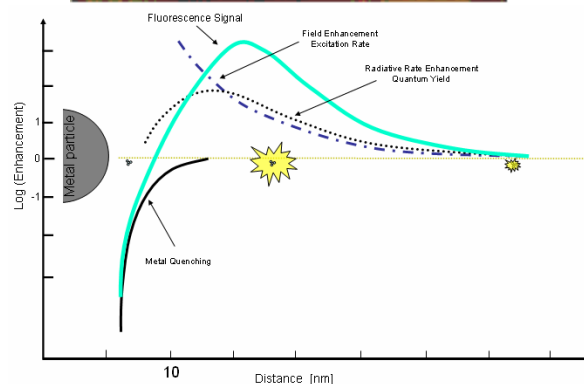
BACKGROUND

Enhanced fluorescence immunoassay utilizing metal particles or/and plain metal surface ("mirror") provides increased sensitivity and substantial background reduction due to exclusive collection of emitted light occurring only near the bio-affinity surface and particle-enhanced fluorescence, and is based on the coupling between fluorophores and surface plasmons.

Metal particle and/or metal mirror enhanced assays can be performed in optically dense or fluorescing samples directly, without any washing steps. Assay should be surface-based (include binding on the surface) and involve fluorophore or fluorophore-labeled substance (antigen or antibody).

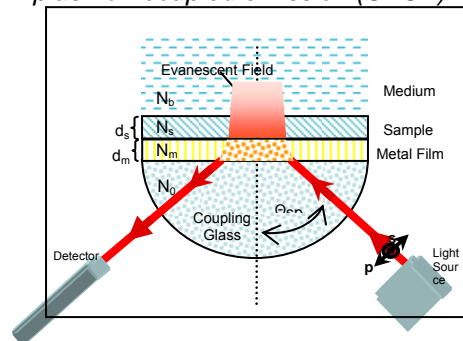


Glass slide with SIFs in the right half and covered with fluorophores. SIFs significantly amplify green fluorescence



Metal particle enhanced fluorescence.

Excited fluorophores near the metallic layer may induce surface plasmons in the metallic film that radiate at a sharply defined angle into the glass substrate; this phenomenon is called surface plasmon-coupled emission (SPCE).



PROGRESS TO DATE

Model immunoassay on silver island films (SIFs): model antigen (rabbit IgG) is immobilized on the surface and anti-rabbit IgG labeled with various labels (Rhodamine Red-X, AlexaFluor-647, and others) is binding to the antigen. Enhancement of the signal (caused by SIFs) is 3 to 20 times.

Matveeva E., et al. (2004) Anal. Biochem., 334, 303-311.

Myoglobin immunoassay on silver island films (SIFs) (sandwich format) (Rhodamine Red-X, AlexaFluor-647). Myoglobin detection is drastically improved when using SIFs.

Matveeva E., et al. (2005) J. Immunol. Methods, 302(1-2), 26-35.

Model or myoglobin immunoassay on metal mirrors: directional emission allows detecting multiple analytes (multiple colors). Assay can be performed in optically dense sample (such as non-diluted whole blood) or fluorescing sample: sample background is drastically reduced.

Matveeva E.G., et al. (2005). Anal. Biochem., 344(2), 161-167.; Lakowicz J.R., et al. (2005) Clin. Chem., 51, 1914-1922;

Matveeva, E., et al. (2004) Anal. Chem., 76(21), 6287-6292; Matveeva, E., et al. (2004) J. Immunol. Methods, 286(1-2), 133-140;

Matveeva, E., et al. (2004) Biochem. Biophys. Res. Commun. 313(3): 721-726.

Combination of metal particles and metal mirror results into 50-fold signal enhancement.

THINGS STILL TO DO

Apparatus for detection needs to be constructed (only low-power light source as laser pointer is needed).

Synthesis of the uniform metal particles (silver, 100 nm size particles on glass or plastic surface, or on metal mirror surface).

Enhancing approach can be utilized for the analyte of your interest.

CONTACT DETAILS

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