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### Mechanism of cancer sensing using quantum dots and metallic nanostructures

We study new types of the sensing mechanism for cancers sensing from quantum dots (QDs) and metallic nanoparticle hybrids. It is well known that the metallic nanoparticles have negative electric permittivity which leads to the formation of new particles called surface plasmon polaritons which may generate exceptionally strong localized electromagnetic fields. On the other hand quantum dots have electronic particles called excitations. The QDs interact with surface plasmon polaritons of the metallic nanoparticles. We have calculated the energy exchange between the QDs and the nanoparticles in the presence of exciton-surface plasmon interaction. It is found that energy transfer is enhanced in the presence of the nanoparticles when the excitons and surface plasmon frequencies are resonant. The energy transfer can be switched on and off by applying the external fields such as lasers or stress fields. The energy transfer can be used as sensing mechanism for cancer treatment. The present results can be used to make new types of nanoscale cancer detection devices based on these hybrid nanostructures.

### Biography

Mahi R Singh received PhD (1976) degree from Banaras Hindu University, Varanasi in Condensed Matter Physics. After that, he was awarded an Alexander von Humboldt Fellow in Stuttgart University, Germany from 1979 to 1981. Currently, he is Professor in the same university. He was a visiting Professor at University of Houston. He also worked as a Chief Researcher at CRL HITACHI, Tokyo and he was a visiting Professor and Royal Society Professor at University of Oxford, UK. He was the Director of the Centre of Chemical Physics and Theoretical Physics Program at Western. He has worked in many fields of research in science and technology including nanoscience, nanotechnology, nanophotonics, optoelectronics, semiconductor structures, high temperature superconductors, nanophotonics, plasmonics, polarotonics and nanoscience and technology.

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