



Physics Seminar

Dr. Kevin Hewitt
Physics Department, Dalhousie University

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PSC 3046
4:00 pm

Imaging cancerous cells over-expressing EGFR using Surface Enhanced Raman Spectroscopy (SERS).

Nearly one of two Canadians will experience some form of cancer in their lifetime. Methods which detect the early stages of cancer are critical to reducing mortality rates. A number of cancers are characterized by over-expression of the Epidermal Growth Factor receptor (EGFR), a membrane protein which mediates cell growth, proliferation and differentiation in multiple tissues. Many epithelial tumors have been found to express high numbers of EGF receptors, and receptor levels are associated with poor clinical prognosis in cancers of the bladder, breast and lung. Antibodies for EGFR tagged with fluorescent probes have been used as contrast agents. To overcome the limited contrast, we propose to use surface enhanced Raman spectroscopy.

Conventional Raman spectroscopy is a weak light scattering process which provides molecular specific information. By coupling the light to a nano-particle assembly an overall enhancement of 7-8 orders of magnitude is possible; this is referred to as the surface enhanced Raman scattering (SERS) effect. Recent experiments have used this idea by targeting EGFR over-expressing cells with Raman reporter molecule? embedded SERS particles to detect binding in-vivo. We use a more basic approach to target EGFR over-expressing cells and have found promising results.

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