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Gail Gallessich

UCSB Nanotechnology Breast Cancer Study Receives \$2.8 Million Grant

Erkki Ruoslahti, professor at UC Santa Barbara's Burnham Institute for Medical Research, is the recipient of a \$2.8 million award from the Department of Defense for research into detection and therapies for breast cancer using nanotechnology.

"The prevalence of breast cancer and the large number of deaths from this disease underscore the need for a paradigm shift in the strategies toward developing a cure for breast cancer," said Ruoslahti. "The traditional first line approach still relies on surgery with chemotherapy for late stage or palliative effect. However, this regimen often fails to eradicate the disease, leading to recurrence and drug-induced side effects that adversely affect quality of life. We envision that the cure for breast cancer can be achieved by strategically integrating early detection with synergistic therapies. We believe that nanotechnology-based engineering solutions can provide the needed changes to drastically improve the cure rates."

Ruoslahti's team is developing new diagnostic tools that will improve early detection while reducing unnecessary procedures. The use of targeted nanoparticles as a contrast agent can improve sensitivity and provide molecular information on suspect lesions that cannot be obtained with MRIs alone. The novel in-vivo tests will add to the diagnostic arsenal by providing information not only on the presence of a tumor, but also on the stage of tumor development.

"As nanoparticles can be engineered to perform many functions, something that cannot be achieved with a simple drug, we can add a specific targeting function to the particles," said Ruoslahti. "Targeting can concentrate the therapeutic agent in the tumor, improving the efficacy of the treatment and reducing damage to healthy tissues. The diagnostic and therapy functions will be synergistic in that the diagnostic methods will provide information on the efficacy of individual homing peptides in targeting the tumor."

"Hybrid Nanotechnologies for Detection and Synergistic Therapies for Breast Cancer" is the name of the award that will run through October 20, 2014.

The awarding agency is the Department of Defense, under the Congressionally Directed Medical Research Programs (CDMRP). It is part of the Breast Cancer Research Program, U.S. Army Medical Research and Materiel Command. Collaborators on this grant are Roger Tsien of UC San Diego and Shiladitya Sengupta of Brigham and Women's Hospital, Boston. They will each receive their own awards.

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