Opportunities in Cancer Therapy:
An Overview of Cancer Diagnosis, Treatment and Surveillance and Directions for the Future

Mekhail Anwar
M.D., Ph.D. Department of Radiation Oncology University of California San Francisco, Helen Diller Comprehensive Cancer Center

Cancer is a name that often evokes a homogeneous entity that is the second leading cause of death in the US and responsible for over 7 million deaths annually worldwide. But these numbers often belie where the greatest near term solutions in fighting an extremely heterogeneous disease (with an equally diverse array of treatments) can be found. We have the tools to cure cancer, but unfortunately lack the ability to precisely target between normal and malignant tissue, notably in the area of microscopic disease. This talk will be an overview of the current treatment strategies for treating cancer from an engineering perspective: where many of the shortcomings are, and potentially, where engineering solutions can play a role in improving cancer care. We will discuss the three main areas in the life cycle of cancer therapy: Diagnosis and Staging, Treatment (surgery, chemotherapy, and radiation), and Surveillance, and a roadmap for where the field is heading, and ideally spawn new ideas for treatment. Using case examples, we will illustrate the limitations of current technology, its effect on patients, and specifically focusing on breast cancer, discuss a collaborative project between UCSF and UCB EECS for developing tools to look at microscopic residual disease in the tumor bed, a major source of cancer recurrence.

For more information please see:
http://www.eecs.berkeley.edu/Colloquium/