CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS

Award ID:
RP140517

Project Title:
Optimal Biomarkers for Personalized Cancer Therapy: A Network-Based Approach

Award Mechanism:
Individual Investigator

Principal Investigator:
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Entity:
The University of Texas at Dallas

Lay Summary:

Cancer is the most individual of diseases, in that no two instances of the disease are alike, even when they occur in the same organ. 'Personal medicine' refers to stratifying patients into small groups so that the treatment can be fine-tuned to be most effective for each group. In this project we will develop several tools for personal medicine, with emphasis on four specific forms of cancer: ovarian, endometrial, breast and lung. For endometrial tumors larger than 2 cm in diameter, the recommended procedure is to remove not just the uterus but also the pelvic lymph nodes. However, 78% of lymph node surgeries are unnecesssary. We have identified 13 parameters to identify most of the patients who actually require surgery. The next step is to validate these findings. The standard front-line chemotherapy for ovarian cancer does not work for about 10% to 15% of patients. Our preliminary work shows that, by examining fifteen genes, it is possible to predict which patients would be poor responders, so that the physician can devise alternate therapies. In both lung cancer as well as ovarian cancer, it is very useful to be able to predict the likely time before the tumor recurs, so that the surgeon can schedule post-operative follow-up care. Our preliminary work indicates that such prediction is possible with an average error of about 10%, using just 15 genes. It is proposed to improve these predictions. There are four major sub-types of breast cancer. At present these subtypes are distinguished by the presence or absence of mutations in three families of genes. Our proposed research is to explore the differences between these sub-types more deeply, so as to assist in designing therapy that is appropriate for each sub-type.