CANCER BIOMARKERS RESEARCH GROUP

IN THIS ISSUE

Early Detection Research Network (EDRN)
by Michelle Pitt, MHA and Felicia Evans Long, MBA

Upcoming EDRN Steering Committee Meeting

Get excited! The 33rd EDRN Steering Committee Meeting will take place from September 5-6, 2018 in Boston, MA. This meeting marks the half waypoint for this cycle of the EDRN. These scientists have come together to help accelerate the translation of biomarker information into clinical applications and to evaluate new ways of testing cancer in its earliest stages and for cancer risk. Presentation by the EDRN PIs will provide NCI Program Staff with updates on progress made by individual researchers and by the EDRN as a collaborative network.

The early detection of cancer greatly increases the chances of successful treatment. Far too often, however, cancers are diagnosed at later stages, when curative treatment is no longer possible. We are excited for updates and progression presentations from each institution.

Awards Corner

Daniel Crichton
**Recipient of:
The 2017 NASA Exceptional Achievement Medal**

Program Director of the Month

Dr. Krueger is a Program Director for the EDRN Lung and Upper Aerodigestive Cancers Collaborative group and program leader for the Alliance of Glycobiologists for Cancer Research. The Alliance seeks to understand how changes in carbohydrate expression help drive cancer progression to discover leads for effective early detection cancer biomarkers. He also spends significant effort helping to manage the NIH Glycoscience Common Fund Program which is bringing forth new tools and synthetic capabilities to make the study of glycoscience more amenable to the greater research community. His graduate training at Vanderbilt University in biochemistry started him on this track that eventually led to becoming a faculty at Georgetown University doing neuroscience research before coming to NCI.

Early Detection Research Network

RESEARCH SPOTLIGHT

Victoria Seewaldt, Ph.D.

Breast Magnetic Resonance Imaging (MRI) has revolutionized high-risk breast cancer screening. However, while breast MRI is extremely sensitive, MRI has poor specificity. As a result, women are required to undergo frequent biopsy and expensive repeat MRI imaging. The vast majority of abnormal MRI and MRI-generated biopsies do not identify cancer, but still require extensive follow-up. This is because we are unable to determine whether a non-cancerous lesion identified by MRI has benign or aggressive biological potential. Here we are working to combine breast MRI and Wnt/p53-biomarkers to differentiate non-cancerous breast lesions with benign biology from those with aggressive biological potential. Our goal is to use combined breast MRI and p53/Wnt biomarkers to improve the specificity of MRI and reduce overdiagnosis and overscreening.

Currently, we are working to assemble, curate, and integrate imaging/biomarker studies performed at Duke University from 2005-2015. These studies provide serial imaging, tissue collection, and outcomes data from 300 women at high-risk for breast cancer. The cohort is highly annotated with genetic studies, menstrual data, progression data, medication data, serial BMI, and progression to cancer. Serial breast MRI, mammograms, ultrasound, and image guided biopsy have been de-identified. Whole exome sequencing has been performed on the WBC DNA from all 300 women. Serial biopsy samples are currently being sectioned and will be tested for: 1) gene expression, 2) proteomic profiling, and 3) targeted immunohistochemistry.

Our prospective MRI/biopsy/biomarker studies have recruited close to 100 high-risk women over a 6-month period. Many sites are just gearing up for recruitment, so it is anticipated that we will recruit over 500 high-risk women over the next 12 months.

Investigator Spotlight

Radka Stoyanova, Ph.D.

"The Consortium for Imaging and Biomarkers (CIB) is a unique initiative with the goal of improving early cancer detection and differential diagnosis of indolent from aggressive disease by integrating quantitative imaging with biomarkers. My research is in the development of novel approaches for the analysis of multiparametric MRI of the prostate to detect aggressive cancer. At the University of Miami, techniques have been developed that enable the decryption of tumor heterogeneity by identifying spatially distinct regions (habitats) in the prostate gland. A "Habitat Risk Score" (HRS) system has been designed to assess risk on a pixel-by-pixel basis with increasing levels associated with a higher grade of disease, resulting in the depiction of tumor habitats in a 3D heat map. The HRS platform will be further informed by radiomics features complimented by biomarker/gene expression data. With the advent of deep learning techniques in medical imaging, we are on the brink of "unlimited" possibilities for cancer detection and differential diagnosis. The imaging and biomarker data acquired along the lines of the CIB initiative can be used for training of artificial intelligence networks, thus creating exciting new cancer diagnostic possibilities."

Significant Events in the Entire EDRN Family

The CBRG team is working diligently to prepare for the 3rd CIB Annual Meeting, to be held this upcoming Monday, August 6, 2018 at the National Cancer Institute. The agenda has been circulated and we are looking forward to seeing you there!