



## Leaders' Update on Precision Medicine

Dear colleagues,

I am pleased to share some exciting developments in precision medicine occurring at Massey Cancer Center.

Massey is conducting two pilot studies with Tempus Laboratories, which is a precision medicine company that has developed the world's largest library of clinical and molecular data. They work with nearly 50 National Cancer Institute-designated cancer centers, as well as hundreds of other community hospitals, and their goal is to change how data is used to personalize and optimize treatments. Their genomic tests analyze DNA, RNA and proteomic data to understand a patient's tumor at the molecular level in order to identify treatment options tailored to each patient. They also ingest and organize clinical notes, lab reports, pathology images and radiology scans to capture phenotypic, therapeutic and outcomes data to understand the clinical context for each patient case. Their platform analyzes thousands of clinical and molecular data points, connecting physicians with up-to-date treatment options and relevant insights for patients based on their unique molecular profile and on advanced analytics and machine-learning algorithms.

A pilot study Massey is conducting with Tempus Laboratories, titled "Ancestry markers as predictors of gene expression differences and clinical outcomes in triple negative breast cancer," is led by PI Theresa Swift-Scanlan, Ph.D., R.N., from the VCU School of Nursing and Massey's Cancer Molecular Genetics program. The goal of the project is to obtain foundational data on gene expression and genetic variance in association with clinical, demographic and genetic ancestry variables within a group of African-American women diagnosed with triple negative breast cancer in order to identify patient subgroups with favorable versus poor outcomes. This project will provide contributing preliminary data for several investigator-initiated R-level proposals planned for 2018-2019.

The other study Massey is working on with Tempus, titled "The impact of obesity and race on molecular prognostic factors in endometrial cancer," is led by PI Sarah M. Temkin, M.D., from the VCU School of Medicine and Massey's Developmental Therapeutics program. The three aims of her project are to: (1) Determine whether incidence of known genomic prognostic markers (POLE, MSIH, CNL and CNH) are similar between white and black women with advanced endometrial cancer; (2) Explore differences in other genomic markers in advanced endometrial cancer between white and black women with this disease; and (3) Understand the association between how obesity modulates genomic markers in endometrial cancer differently in white women compared to black women in order to understand whether adjusting for BMI changes racial genomic differences identified in the first two aims.

Another precision medicine advancement at Massey is an addition to our in-house genomic sequencing capabilities. The Molecular Pathology Research Services Laboratory now offers Oncogenomic Dx One Hem v 2.0, which is a next-generation sequencing assay to detect and identify fusions and expression levels, point mutations and copy number variation of a comprehensive list of driver mutations present in myeloid and lymphoid malignancies. Some of the highlights of version 2.0 are: comprehensive fusion detection, covering all myeloid- and lymphoid-origin malignancies including known and novel fusion events; molecular barcode-enabled relative expression level detection in select genes; expression imbalance confirmation for most common fusion verification; and wide sample type compatibility, including FFPE, blood and bone marrow. Visit the [Laboratory's website](#) for more information and to request a service.

A third example of progress in precision medicine at Massey is the expansion of services offered by the Cancer Mouse Models Core. The CMMC is now providing immunohistochemistry and immunofluorescent services, which includes immunofluorescent multiplexing up to seven colors using PerkinElmer's OPAL staining.

The CMMC provides whole slide scanning for brightfield and fluorescent imaging with the Vectra Polaris (PerkinElmer), which provides automated quantitative pathology. The system integrates both multispectral imaging and automated slide scanning to better visualize, analyze, quantify and phenotype cell in tissue sections and tissue microarrays.

Additionally, the CMMC is developing patient-derived xenograft (PDX) models. It currently has three triple-negative breast cancer PDX developed from patients at VCU, and these are available for use. Visit [Massey's website](#) to learn more about the CMMC's services and to request a service.

Thank you to our Massey researchers and administrators whose work helps to advance our precision medicine capabilities. I look forward to continuing to collaborate with you to build on Massey's contributions to precision oncology and ultimately discover more effective strategies to prevent and treat cancer.

Regards,

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