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Cancer Genomics

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National Cancer Institute-National Institutes of Health, USA

Integration of genomics with metabolomics and epigenomics and its implication in cancer control

Precision medicine is an emerging science with the potential to improve early cancer diagnosis and enable the development of treatment based on an individual's genetic background, family history and other characteristics. Identifying patients who may benefit from personalized and precision therapy depends on identifying accurate assays for the biomarkers that are needed to determine optimal treatment. Compared to the rapid progress in technology development, the progress in treatment timing has been slow. Most clinicians rely on pathology reports that become available in due time, which often is too late to control or treat cancer. Molecular profiling (mostly omics profiling based on genomics, metabolomics, epigenomics, transcriptomics and glycomics data) and molecular classification of cancer can be achieved in real time and may help to identify those cancer-associated biomarkers that are expressed much earlier than pathological symptoms and characteristics appear in histopathological analyses. Once these biomarkers are included in personalized medicine, it will enable treatment to be implemented earlier, which will produce better outcomes. Although the traditional approach to personalized medicine has been "reactive" in the future, it will be "Proactive." These approaches might be useful in controlling cancer which is a priority at the National Cancer Institute (NCI) and the National Institutes of Health (NIH). An update from the Common Fund Metabolomics, Epigenomics Roadmap, Molecular Transducers of Physical Activity and the Cancer Genome Atlas (TCGA) will be presented.

Biography

Mukesh Verma is a Program Director and Chief in the Methods and Technologies Branch (MTB), Epidemiology and Genetics Research Program (EGRP) of the Division of Cancer Control and Population Sciences (DCCPS) at the National Cancer Institute (NCI), National Institutes of Health (NIH). Before coming to the DCCPS, he was a Program Director in the Division of Cancer Prevention (DCP), NCI, providing direction in the areas of biomarkers, early detection, risk assessment and prevention of cancer and cancers associated with infectious agents. He holds MSc from Pantnagar University and a PhD from Banaras Hindu University. He completed Post-doctoral research at Howard University and George Washington University and was a faculty member at Georgetown University. He has published 151 research articles and reviews and edited three books in cancer epigenetics and epidemiology field.

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