Mukesh Verma, J Cancer Sci Ther 2014, 6:9
http://dx.doi.org/10.4172/1948-5956.S1.039

OMICS Group Conferences
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Global Cancer Conference & Medicare Summit
September 15-17, 2014 Hyderabad International Convention Centre, India

Epigenetic approaches in cancer therapy

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The National Institutes of Health (NIH) has initiated the Epigenomics Roadmap Program which is comprised of five major initiatives: Reference Epigenome Mapping Centers, Epigenomic Data Analysis and Coordinating Centers, Technology Development in Epigenetics, Discovery of Novel Epigenetic Marks, Epigenomics of Human Health and Diseases. This program proposes that the origins of health and susceptibility to disease are the result of epigenetic regulation of the genetic information. Specifically, epigenetic mechanisms that control stem cell differentiation and organogenesis contribute to the biological response to environmental and other factors in the form of stimuli that contribute in disease development. Epigenetic and genetic approaches in cancer epidemiology and risk assessment will be discussed. Epidemiology is the scientific study of the causes and distribution of disease in populations. The National Cancer Institute's Epidemiology and Genetics Research Program (EGRP), in the Division of Cancer Control and Population Sciences, provides opportunities for investigators to increase understanding of cancer causes and prevention in human populations. EGRP supports research in four areas: (1) Clinical and translational epidemiology, including factors that influence development of cancer among persons with underlying diseases and conditions; the progression, recurrence, and mortality from cancer; and development of new primary cancers; (2) Host susceptibility factors that influence personal susceptibility to cancer in humans, such as genetic, epigenetic, immunological, hormonal, and biological pathways; and social, cultural, racial, and ethnic factors; (3) Methods and technologies for epidemiologic data collection, study design and analysis, and development and adaptation of laboratory and technical approaches for large studies in human populations; (4) Modifiable risk factors to reduce cancer risk in humans, such as diet and nutrition; alcohol; physical activity and energy balance; tobacco; infectious diseases; physical and chemical agents; and medical exposures, including medications and treatments. Different funding mechanisms of grants and contracts, and collaboration opportunities will be discussed.

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 an MSc from Pantnagar University and a PhD from Banaras Hindu University. He did Postdoctoral research at George Washington University and was a Faculty member at Georgetown University. He has published 146 research articles and reviews and edited three books in cancer epigenetics and epidemiology field.

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