Sevtap Savas, Transl Med 2014, 4:3
http://dx.doi.org/10.4172/2161-1025.S1.011

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference on
Translational Medicine
November 03-05, 2014 Las Vegas, USA

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Choosing the best genetic model to investigate the genetic polymorphisms in survival analyses

One of the current hypotheses in biomedical research is that genetic polymorphisms affect the risk of patient outcomes. However, in contrast to other variables, identification of the genetic effects of the polymorphisms on survival outcomes requires distinct considerations, including choosing an appropriate genetic model for each polymorphism during the statistical analyses. Among the applied genetic models are the recessive, dominant, co-dominant and additive models. Each of these models investigates the patient groups based on their genotypes differently. For example in the recessive genetic model, patients with the minor allele homozygous genotype are assumed to have different survival characteristics compared to patients with the major allele homozygous or heterozygous genotypes. In the absence of a biological evidence, the majority of the studies investigate the polymorphisms assuming one or a few select genetic models (which causes potential loss of information) or to apply all genetic models (which creates multiple testing issue). Previously to overcome these issues, we had suggested selecting the best suitable genetic model by examining the Kaplan Meier survival curves of a polymorphism stratified by each genotype (major allele homozygous, minor allele homozygous and heterozygous genotypes). In this presentation, the author will first discuss this approach and then its application to numerous SNPs examined in relation to survival outcomes in a cohort of colorectal cancer patients. Please note this approach can be applied to other genetic variations, such as somatic mutations and copy number variations.

Biography

Sevtap Savas obtained her PhD in Molecular Biology and Genetics in 1999 from the Bogazici University, Turkey. She trained as a Post-doctoral Fellow and Research Associate in Louisiana State University (USA), Mount Sinai Hospital Research Institute (Canada) and Princess Margaret Hospital/Ontario Cancer Institute (Canada). Since 2008, she has been an Assistant Professor at Discipline of Genetics, Memorial University of Newfoundland (Canada). Her research program currently focuses on genetic prognostic studies in colorectal cancer using genetic, epidemiological, biostatistical and computational approaches and development of public databases. She also serves as a reviewer, academic editor or Editorial Board Member for several journals.

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