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MicroRNAs from bench to bedside

MicroRNAs have recently been reported to be present in human blood, stably circulating under the aegis of protein and lipid carrier forms. While the origins and purpose of circulating miRNAs remain unclear, considerable efforts have been made toward evaluating their potential for use as a practical and informative disease biomarker. Published evidence suggests that the content and composition of circulating miRNA in healthy individuals may be distinctly altered among those with certain diseases, including cancer. Given the urgent need for improved screening tests for human cancer, we wished to investigate whether serum miRNA could be used in breast cancer patients as a novel diagnostic and prognostic marker. Thus, we procured serum samples from over 100 breast cancer patients at various stages of management (including at the time of diagnosis, after endocrine therapy but prior to surgery and following completion of all management). Our goal here was to identify whether a particular miRNA or panel of miRNAs is able to detect the presence of breast cancer and whether it is likely to respond to a particular course of treatment better than others. An RNA-seq analysis of some samples revealed multiple miRNAs were altered between breast cancer and control patients. In triple negative breast cancer (TNBC) patients, miR-223 and miR-23a (among others) were increased significantly, while miR-375 and miR-10b were decreased. Remarkably, these trends were reversed in the samples from the very same patients following treatment. The return of these cancer-associated miRNAs to normal levels in response to treatment raises the possibility that these miRNAs could be tumor-derived. In summary, we believe these results need further investigation, currently validating the current RNA-seq findings by qRT-PCR. Additionally, we wish to explore whether these miRNAs are associated with patient outcomes as we continue to monitor the progress of patients during follow up.

Biography

Suresh K Alahari obtained his Bachelor of Science in Biology and Master of Science in Human Genetics from India in 1983 and 1986 respectively. His PhD in Molecular Biology was awarded by Drexel University, Philadelphia in the year 1994. From 1994 to 1998, he did a Post-doctoral Fellowship at the University of North Carolina at Chapel Hill. Since 1998, he has been a faculty member at the University of North Carolina and in 2004 joined the LSUHSC as Associate Professor of the Department of Biochemistry. During his tenure at the University of North Carolina, he discovered a novel protein that he termed, Nischarin. He has published several papers describing the function of Nischarin. He has served on Editorial Review Boards and studies sections. In addition, he availed Visiting Professorships at the University of Pennsylvania, Philadelphia and Rockefeller University, New York.

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