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RNA helicase DDX20, a novel prognostic marker defines metastatic potential of breast cancer

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Mortality from breast cancer is almost entirely the result of invasion and metastasis of neoplastic cells; therefore, understanding gene products involved in breast cancer metastasis is an important research goal. Prompted by a recent study showing increased expression of a DEAD-box family member, DDX20, in microarray data from lymphoma patients, a total of 194 breast tissue samples (97 breast cancers and 97 paired normal breast tissue) were retrieved. A high proportion of specimens show positive DDX20 (2+, 3+) expression in the tumor cores and negative (1+, 0) in their paired normal cores ($p<0.001$). Since positive MMP9 expression is closely associated with poor prognosis, same cohort was stained for MMP9. When grouping patients with positive DDX20 expression to MMP9 expression, Kaplan-Meier correlation analysis show patients with positive DDX20 and MMP9 expression have poorer survival outcomes ($p=0.029$). To explore a link between DDX20 and MMP9, we screened a panel of breast cancer cell lines for DDX20 and MMP9 expression. Interestingly, highly metastatic cell lines such as MDA-MB-231, BT549, and Hs578t have high expression levels of DDX20 and MMP9. Herein, we will present data for a functional consequence to decreased DDX20 in metastatic breast cancer cells. Together, our study identifies DDX20 as a new prognostic marker that is needed to identify patients who are at the highest risk for developing metastases, which might enable oncologists to begin tailoring treatment strategies to individual patients. This work is supported by grants from National Medical Research Council of Singapore (Grant R-713-000-119-275) and Cancer Science Institute of Singapore, Experimental Therapeutics I Program (Grant R-713-001-011-271) to APK.

Biography

Dr. Alan Prem Kumar earned his Ph.D. from University of North Texas, USA. From his Ph.D. work, he discovered a novel regulatory protein, PyrR for the pyrimidine biosynthetic pathway in Pseudomonas. Dr. Kumar then pursued Postdoctoral training in Cancer Research at Sidney Kimmel Cancer Center, California, USA. He was awarded a Postdoctoral Fellowship for his work on the role of nuclear receptors. Dr. Kumar relocated back to Singapore to join Cancer Science Institute of Singapore, National University of Singapore as an independent Principal Investigator to continue on his expertise on nuclear receptor and cancer pharmacology. His current research interest includes the role of nuclear receptors involved in the regulation of target genes and to elucidate mechanism and associated signal pathways. Another area of interest is aimed at developing new derivative drugs with hopefully fewer side effects. Over the years, Dr. Kumar and his laboratory have forged relationships with scientists in cancer research and with cancer advocacy groups in Singapore.