Yale and Asuragen Scientists Show that a microRNA Can Reduce Lung Cancer Growth

New Haven, Connecticut and Austin, Texas – March 25, 2008 – A microRNA (miRNA) molecule known as let-7 substantially reduced cancer growth in multiple mouse models of lung cancer as reported by researchers at Yale University School of Medicine and Asuragen, Inc. in the journal Cell Cycle.

Cancer afflicts 1.5 million people a year in the United States alone, and lung cancer is the most common and deadly form of cancer worldwide. This study indicates a direct role for a miRNA in cancer progression and introduces a new therapeutic paradigm that features the treatment of cancer with a naturally occurring small RNA.

"We believe that our studies provide the first direct evidence in mammals that let-7 functions as a tumor suppressor gene and that this is the first report of a miRNA being used to a beneficial effect on any cancer. Our work is particularly noteworthy given that the let-7 miRNA inhibits the development of lung cancer, the deadliest of all cancers worldwide," said senior author Frank Slack, Associate Professor of Molecular, Cellular and Developmental Biology at Yale University.

Slack's research group initially discovered the let-7 miRNA in C. elegans, a tiny worm used as a model system for studying development. In collaboration with several scientists at Asuragen, the Slack lab has studied the tumor suppressor activity of this small RNA. The Slack/Asuragen collaboration has revealed that let-7 is commonly down-regulated in lung tumors and that this down-regulation likely contributes to the development of lung tumors. The tumor suppressive function of let-7 can be explained by the observation that let-7 regulates the expression of RAS and other oncogenes. These discoveries have focused increasing public attention and research efforts to understand the potential use of miRNAs like let-7 to combat cancer.

The new work reported in Cell Cycle by the Yale and Asuragen labs demonstrates that let-7 inhibits the growth of lung cancer cells in culture and lung tumors in mice. Because multiple lung cancer cell lines and mouse models of lung cancer were used, it appears that the therapeutic application of let-7 might provide benefits to a broad group of lung cancer patients.

"This has been a very productive industry-academic collaboration between Yale and Asuragen scientists," commented Matt Winkler, CEO of Asuragen. "This work provides further evidence of the importance of miRNAs in the development of cancer and provides additional support for miRNA replacement therapy as an important component of effective cancer treatment regimens in the future."

Among the authors on the paper were Aurora Esquela-Kerscher, Phong Trang and Joanne Weidhaas from Yale and Jason Wiggins, Lubna Patrawala, David Brown and Andreas Bader from Asuragen, Inc. The work was partially funded by a grant from the State of Connecticut Department of Public Health and fellowships from the National Institutes of Health.

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