

New discovery: Molecule links asthma and cancer and could aid in developing new treatments

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A newly discovered molecule provides a new drug target for controlling both asthma-induced muscle thickening and cancerous tumor growth. This molecule, called "microRNA-10a," normally helps genes produce proteins or make copies of themselves, also play an important role in the growth or overgrowth of human airway smooth muscle cells and some forms of cancer. This newly discovered role, which was published in the May 2014 issue of *The FASEB Journal*, suggests that manipulating microRNA-10a could lead to new asthma and cancer drugs.

"We hope this study will serve as the fundamental building block for future follow-up studies on evaluating microRNA-10a's potential in treating asthma and uncontrolled [tumor growth](#)," said Quan Lu, Ph.D., a researcher involved in the work from the Program in Molecular and Integrative Physiological Sciences at the Harvard School of Public Health in Boston, MA.

Lu and colleagues made their discovery by using state-of-the-art sequencing to identify microRNA-10a as the most highly enriched microRNA molecule in the human airway [smooth muscle cells](#). To study the function of this microRNA, researchers then used an unbiased genomic approach (microarray gene profiling) to compare the differences between cells treated with microRNA-10a and not treated (control). They found that microRNA-10a regulates pathways that control cell proliferation. To further uncover the mechanistic link of

microRNA-10a and smooth muscle cell proliferation, a series of biochemical tests were conducted and demonstrated that microRNA-10a inhibits the PI3 kinase, a master regulator of [cell proliferation](#). This strongly suggests that microRNA-10a could become a novel asthma drug target to treat airway hypertrophy, and that microRNA-10a may be a therapeutic target to treat cancer tumor growth.

"Asthma and cancer may seem to be unrelated, but this report shows that both diseases may share a common molecular link," said Gerald Weissmann, M.D., Editor-in-Chief of *The FASEB Journal*. "With potential applications in asthma and [cancer](#) treatment, hopefully future research into this regulatory molecule can be accelerated."

More information: Ruoxi Hu, Wenchi Pan, Alexey V. Fedulov, William Jester, Matthew R. Jones, Scott T. Weiss, Reynold A. Panettieri, Jr., Kelan Tantisira, and Quan Lu. MicroRNA-10a controls airway smooth muscle cell proliferation via direct targeting of the PI3 kinase pathway, *FASEB J* May 2014 28:2347-2357; [DOI: 10.1096/fj.13-247247](#)

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