Little molecule makes big difference in bladder cancer metastasis

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In order to kill, bladder cancer must metastasize, most commonly to the lung – what are the differences between bladder cancers that do and do not make this deadly transition? Research presented by the Director of the University of Colorado Cancer Center at the AACR Annual Meeting 2013 shows that one big difference is a little molecule known as hsa-miR-146a.

Messenger RNA or mRNA carries gene blueprints to sites where the plans are read and made into proteins, and to a large degree microRNA or miRNA tells mRNA what to do. Theodorescu's work shows that in 256 samples of human bladder cancer, especially the tiny miRNA, hsa-miR-146a is overexpressed in the most metastatic tumors. The molecule tells its mRNA partner to manufacture genes in a way that makes bladder cancer metastatic.

"Not only did we discover one specific molecule involved in bladder cancer metastasis, but we discovered a host of miRNA and mRNA pairs that bear further study," says Dan Theodorescu, MD, PhD, director of the CU Cancer Center and the paper's senior author.

Consider this: researchers used to data-mine tumor genomes for mutated genes that could cause cancer. Then researchers discovered that even healthy genes turned on and off or over/under-expressed at unfortunate times could cause cancer and so started looking for mRNA causes of this mis-expression. And now researchers including Theodorescu and colleagues are exploring a layer deeper to discover how miRNA affects

mRNA, which affects gene expression, which causes cancer.

"You dig deep enough into these causal chains and you start to learn basic things about this disease and its progression," Theodorescu says.

Provided by University of Colorado Denver