New microRNA Data Could Classify Bladder Cancer by Type

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(PhysOrg.com) -- Data published in *Cancer Research*, a journal of the American Association for Cancer Research, offers new insights into the biology of urothelial carcinoma of the bladder. Specifically, microRNA profiles differ according to clinical disease phenotype, therefore, scientists may be able to use these profiles to identify gene-regulatory and biological differences between tumors.

“We identified new mechanisms of urothelial carcinogenesis. Consequently, microRNA could be used as disease biomarkers and therapeutic targets,” said lead researcher Freddie C. Hamdy, M.D., professor of surgery and professor of urology and head of the Nuffield Department of Surgery at the University of Oxford, United Kingdom.

Hamdy, along with Jim Catto, M.D., Ph.D., a GlaxoSmithKline clinician-scientist and senior lecturer in urology at the University of Sheffield, United Kingdom, and their research team evaluated microRNA expression levels in urothelial carcinoma of the bladder. The aim was to better understand the disease biology. Using real-time polymerase chain reaction, these researchers examined the expression of 322 microRNAs and their processing machinery in 78 normal and malignant urothelial samples, according to the study.

Results showed differences in microRNA expression between low- and high-grade urothelial carcinoma. Compared to disease-free controls, 11 percent of microRNAs in patients with urothelial carcinoma of the bladder had altered expression levels. Phenotype-specific microRNA

changes facilitated gene-regulatory events typical for these tumors, indicating their importance in disease pathogenesis, Hamdy said.

The research team also found that DNA methyltransferase inhibition was associated with significant upregulation of six miRs in low-grade urothelial cell carcinoma.

“We expected differences to occur between these distinct tumor phenotypes, as they are known to share very few molecular mechanisms,” he said. “However, we did not expect FGFR3 upregulation by microRNA to occur prior to the onset of mutation. This finding suggests novel epigenetic-genetic interactions.”

Stephen J. Meltzer, M.D., an editorial board member for Cancer Research, believes this study - one of the first to evaluate altered microRNA expression levels in this form of cancer - is novel and well-designed.

“It is possible that in the future, these altered microRNAs could be investigated as potential biomarkers for the early detection of primary or metachronous bladder cancer,” he said.

Additional studies are now indicated to evaluate levels of these microRNAs at discrete stages of urothelial carcinogenesis, according to Meltzer, who is the Harry and Betty Myerberg/Thomas R. Hendrix Professor of Gastroenterology in the Departments of Medicine and Oncology at The Johns Hopkins University School of Medicine and Sidney Kimmel Comprehensive Cancer Center.

Provided by American Association for Cancer Research (news : web)