Research team identifies role for a microRNA involved in prostate cancer metastasis

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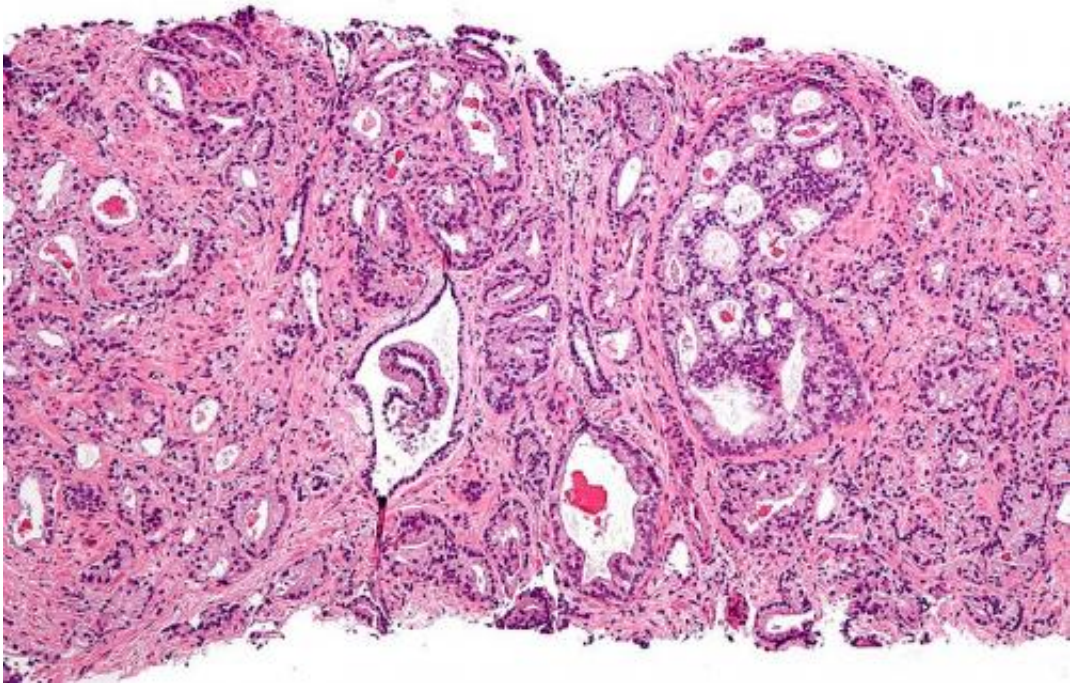

Micrograph showing prostatic acinar adenocarcinoma (the most common form of prostate cancer) Credit: Wikipedia, CC BY-SA 3.0

Metastasis, or spread of a tumor from the site of origin to additional organs, causes the vast majority of cancer-related deaths, but our understanding of the molecular mechanisms behind metastasis remains limited. A research team led by Dean Tang, PhD, Chair of the

Department of Pharmacology and Therapeutics at Roswell Park Cancer Institute, examined the multistep process that leads to metastasis and their work, which illuminates the role of prostate cancer stem cells that promote tumor growth and metastasis, has been published online ahead of print in the journal *Nature Communications*.

MicroRNAs (miRNAs) are small genetic molecules that play an essential role in regulating many aspects of cancer cell behavior. When they performed a screening of the miRNA library, Dr. Tang and colleagues found that, surprisingly, only a few miRNAs are commonly deficient or not expressed in prostate cancer stem cells.

The team found that one specific miRNA molecule, miR-141, not only inhibited tumor growth but significantly retarded cancer metastasis in several preclinical prostate cancer models. Taken together with the findings from previous studies reporting the molecule's powerful tumor-suppression capability, the current study demonstrates the potential of miR-141 as an inhibitor of prostate cancer cell invasion and metastasis, and suggests that synthetic miR-141 may be developed as a "replacement" therapeutic to target prostate cancer metastasis.

"This study represents the most comprehensive investigation to date of the role of the miR-141 molecule in regulating prostate cancer stem cells and their role in metastasis," says Dr. Tang, senior author of the new study. "These preliminary findings suggest that miR-141 may suppress the metastatic cascade at an early stage and that the overexpression of miR-141 in prostate cancer cells results in less metastasis. Our observations provide a rationale for developing these targeted miRNA molecules into novel antitumor and antimetastasis replacement therapies."

More information: Can Liu et al. MicroRNA-141 suppresses prostate

cancer stem cells and metastasis by targeting a cohort of pro-metastasis genes, *Nature Communications* (2017). DOI: 10.1038/ncomms14270