miR-10b inhibition: A strategy for treating metastatic breast cancer

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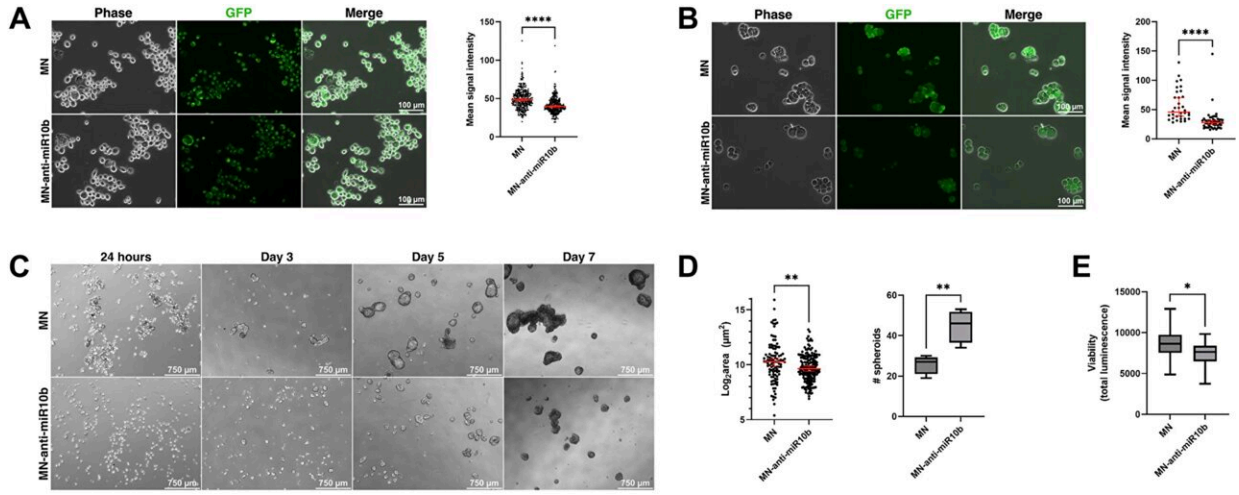

miR-10b inhibition by MN-anti-miR10b decreases Aldefluor accumulation and impairs spheroid formation. (A) Fluorescence microscopy of representative MDA-MB-231 cells after incubation with Aldefluor reagent. (B) Fluorescence microscopy of representative MCF-7 cells after incubation with Aldefluor reagent. A and B: Mean signal intensity = mean gray value in ImageJ. (C) Mammosphere formation over time of MCF-7 cells treated with MN-anti-miR10b or MN 48 hours prior to (adherent conditions) and during culture in mammosphere medium. (D) Spheroid size (left) and quantity in a field of view (right) of MCF-7 spheroids at Day 7 in treated medium. Plots represent mean ± SEM (left) and mean ± max/min (right). (E) Viability assay of MCF-7 spheroids at Day 7 in treated medium. Credit: Halim et al.

A new research paper was published in *Oncotarget*, titled "Inhibition of miR-10b treats metastatic breast cancer by targeting stem cell-like properties."

As stated within the paper, despite advances in breast cancer screening and treatment, the prognosis for metastatic disease remains dismal, with only a 30% five-year survival rate. This poor outcome is largely due to the failure of current therapeutics to target the unique properties of metastatic cells. One of the key drivers of metastasis is miR-10b, a small noncoding RNA implicated in cancer cell invasion, migration, viability, and proliferation.

Researchers Alan Halim, Nasreen Al-Qadi, Elizabeth Kenyon, Kayla N. Conner, Sujan Kumar Mondal, Zdravka Medarova, and Anna Moore from Michigan State University's Precision Health Program, College of Human Medicine, and College of Veterinary Medicine, and Transcode Therapeutics Inc. in Newton, Massachusetts, provide transcriptional evidence that inhibiting miR-10b with MN-anti-miR10b—a nanodrug designed to deliver anti-miR-10b antisense oligomers to cancer cells—activates developmental processes in cancer cells. They observed increased miR-10b expression in stem-like cancer cells.

In mouse models of metastatic triple-negative breast cancer, MN-anti-miR10b has been shown to prevent the onset of metastasis and eliminate existing metastases when combined with chemotherapy, even after treatment has been discontinued.

"Our results demonstrate that inhibition of miR-10b using MN-anti-miR10b decreases the stemness of breast cancer cells, supporting dedifferentiation as a mechanism through which the nanodrug may function as a therapy," explained the researchers.

More information: Alan Halim et al, Inhibition of miR-10b treats

metastatic breast cancer by targeting stem cell-like properties, *Oncotarget* (2024). DOI: 10.18632/oncotarget.28641