RNA Therapy: The Future Of Treating Breast Cancer

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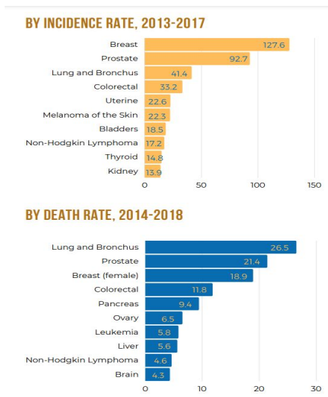
UNIVERSITY OF COLORADO **ANSCHUTZ MEDICAL CAMPUS**

RNA and its importance

- Only 2% of all of our DNA makes RNA, which in turn makes proteins- Proteins help our bodies function.
- Some genes only make RNA but no proteins
- These RNAs' that don't make proteins do have a job in our bodies. For example: they can help transport proteins across the cell.
- But if the RNAs' malfunction in any way, they can make us sick.

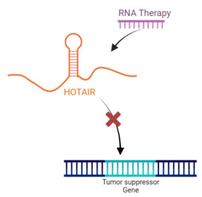
Breast cancer in Colorado



There is a higher incidence rate of breast cancer in colorado (1 in 7 women) compared to the national average (1 in 8). It is also the third deadliest cancer in the state according to the Colorado Cancer Coalition

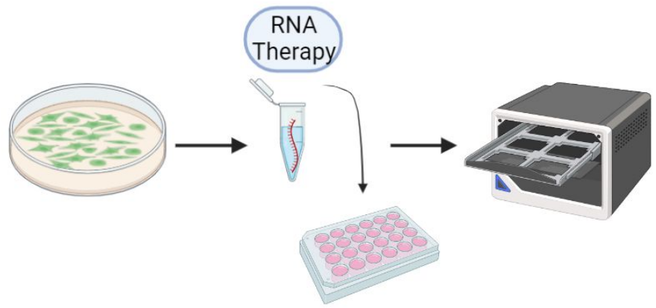
So what does RNA have to do with Cancer?

- Some Breast Cancers have high amounts of detrimental RNA
- HOTAIR, one of these RNAs, can turn important genes off that normally help slow cancer
- Using RNA therapy, we want to stop HOTAIR in its tracks!



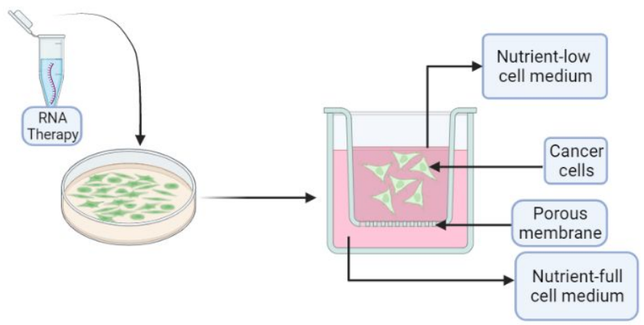
Goals and methods

- Goal 1: Does our RNA therapy slow cell growth?



We grow the breast cancer cells and add the RNA therapy. We then load the plate onto a machine, that takes pictures every two hours and analyzes how fast they grow.

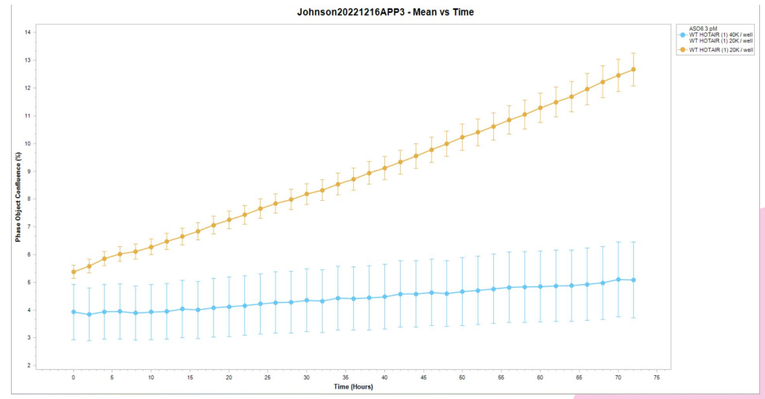
- Goal 2: Does our RNA therapy slow cell invasion?



We add the therapy to our breast cancer cells, let them grow and then transfer them to a receptacle with low-nutrients and a porous membrane at the bottom. Underneath there is a container with nutrients, which attracts the cells. We then count the cells that moved towards the nutrients.

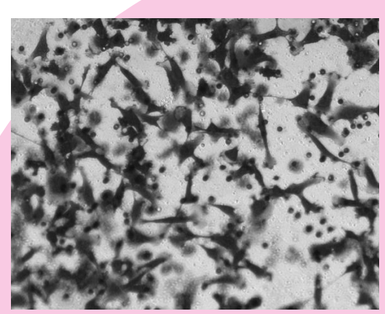
What we have learned

- Goal 1:

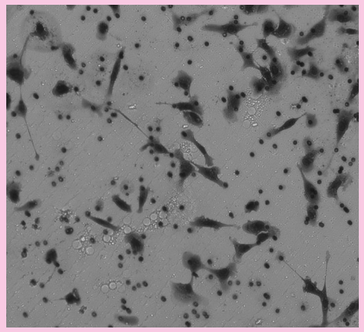


Our cells that were not treated with the RNA therapy grew quickly. The cells that had the targeting therapy added grew slower (the blue line is the growth of RNA treated cells).

- Goal 2:



Control cells



Treated cells

In this preliminary test, the cells that were treated with the RNA therapy were less invasive (fewer cells moved through the pores), than the control cells.