Evaluation of Exosomal Influence on Proliferation, Migration, and Invasion in MDA-MB-231 TNBC Cells

Perkins, Kaitlyn (School: New Orleans Charter Science and Mathematics High School)

The purpose of this project was to see what specific influence exosomes have on MDA-MB-231 triple negative breast cancer cell characteristics of proliferation, migration and invasion. Exosomes from PDx, or Patient-derived xenograft models were then isolated, purified, and characterized from each sample, resulting in 14 PDx exosomal medias. Three assays were run to evaluate proliferation, migration and invasion behavior of TNBC cells after incubation with PDx media. In the proliferation assay, I exposed the exosomes to MDA-MB-231s and used Alamar Blue to measure the rate of which the exosomes were causing the 231s to proliferate. In the transwell migration assay, filters inside of inserts were stained to get a count of cells that migrate towards exosomes. Lastly, in the Matrigel invasion assay inserts were coated with a matrigel solution and also stained to get a count of cells that penetrate through the matrigel and move more towards the exosomes. With respect to the control, incubating the cells with exosomes resulted in the following: Tu-Bcx-4M4-Tb3 exosomes increased proliferation, Tu-Bcx-41CP13 exosomes increased migration, and Tu-Bcx-4M4-Tb3 increased invasion. The miRNA in exosomes may cause the movement of cancerous cells but not cell division (proliferation) because all exosomal media surpassed the control in the Transwell Migration assay. Based on my findings, exosomes play a role in making triple negative breast cancer metastasize. It also means that exosomes could be a potential therapeutic target for this aggressive form of breast cancer.