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Restoration of microRNA-200c: Effect on HEY Cancer Cell Behavior

MicroRNAs (miRNAs), previously thought to be “junk-DNA”, are now known to play a large role in gene regulation. In particular, miR-200c is highly expressed in normal cells but not in very aggressive breast, uterine, and ovarian cancer cells. To determine the effects of miRNA on cancer cells, miR-200c was added to aggressive ovarian cancer cells (HEY) to target specific messenger RNAs in the cell and alter its characteristics. Two controls, negative (HEY cells with a miRNA with a scrambled code) and mock (HEY cells with no added nucleic acids), were used. Two assays assessed the effect of miR-200c on HEY cells. The wound healing assay determined how quickly HEY cells would migrate when a “wound” was created in plates of monolayer cells. The clonogenic assay determined how well HEY cells would respond to paclitaxel, a chemotherapeutic drug, by quantifying the surviving colonies. The cells transfected with miR-200c were hypothesized to migrate slower and respond better to the drug due to miR-200c’s presence in normal cells, and the results support the hypothesis. The “wound” for the pre-200c cells closed slower than the control cells, and 64% of pre-200c cells died when treated with 10 nM of paclitaxel, compared to 43.4% and 24% of negative and mock, respectively. However, with only four successful assay trials, definitive conclusions cannot be drawn. It is hoped that with more trials and a larger variety of assays, the miR-200c will be shown to cause HEY cells to behave more like normal cells.