Selective Inhibition of Metastatic Cancer Cell Migration

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Chemotherapy, although it remains the best treatment option for metastatic cancer patients, it is still plagued with many side effects. Herein I tested if folate-conjugated nanoparticles containing chemotherapy drugs could specifically target the neuroblastoma cancer cells SH-SY5Y and prostate cancer cells DU-145, as the folate receptor is overexpressed in these cancer cells. Migration assays and soft agar colonies were conducted to evaluate tumor growth and metastasis. Each cell line was treated with the desired concentrations of nanoparticles for 24-hours in an incubator before the start of experimentation. Cell migration assays for SH-SY5Y and DU-145 cells showed a significant decrease in the number of cells migrated, which showed a dose-dependent relationship as compared to the untreated control. Importantly, a substantial decrease in SH-SY5Y migration was observed when compared with DU-145 cells, suggesting that these therapies need to be tailored for individual cancers. Soft agar colony experiments also showed a decrease in the number and size of tumor cell growth at similar nanoparticle concentrations for both SH-SY5Y and DU-145 cells. Overall, these results indicate that nanoparticles inhibit the ability for cancer cells to metastasize and survive in vitro.

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