Holothuria cinerascnes and Holothuria impatiens' Cuvierian Tubules Extracts Decrease HCT-116 Colon Cancer Cells' Viability

Kekumano, Kaeo (School: Kamehameha Schools Kapalama Campus)

Colon cancer is a leading cause of death worldwide. Sea cucumbers are a potential source of medicinal compounds and have been consumed in traditional Chinese medicine. Thus, it was hypothesized that extracts of Holothuria cinerascens and Holothuria impatiens' cuvierian tubules would be effective in treating HCT-116 colon cancer cells. These two species have not been investigated in cancer research before. It was discovered that the H. cinerascens body wall must be cryogenically homogenized before being extracted in a MeOH solvent to induce significant viability reduction in HCT-116 cells ($p<0.05$). H. impateins' cuvierian tubules MeOH extract consistently showed significant HCT-116 cell viability reduction, despite not being cryogenically homogenized. Liquid Chromatography–Mass Spectrometry (LC-MS) identified several triterpene glycosides in both the H. cinerascens and cuvierian tubule MeOH extracts. Using SRB and XTT assays, dilutions from both extracts showed significant HCT-116 cell viability reduction ($p<0.05$); however, at lower dilutions, no significant effect on HEK293 cell viability (a non-cancerous cell line) were shown. Additionally, at serial dilutions of 10% and 1%, the H. cinerascens extracts have shown to significantly inhibit the migration of HCT-116 cells across a scratch. At 10% and 1% dilutions, both extracts have also shown to significantly suppress HCT-116 colony formation, which implies that the extracts may reduce HCT-116 cells' reproductive viability and survival rate. This study demonstrates that MeOH extracts of H. cinerascens body walls and H. impatiens' cuverian tubules inhibit cell proliferation and colony formation, suppress cell migration, and reduce cell viability and adhesion of HCT-116 colon cancer cells.

Awards Won: