Phase IV: The Effects of Epigallocatechin-3-Gallate on Breast and Cervical Carcinomas

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The goal of this research is to find a cure for cancer. Breast and Cervical cancers are very aggressive forms of cancer. Polyphenols, in green tea, have an anti-cancer effect. Phase I research proved that a polyphenol in green tea, epigallocatechin-3-gallate (EGCG) inhibits planarian regeneration by 157.54% after injury. Phase II research proved that EGCG inhibits planarian tumorigenesis. Phase III proved that EGCG eliminates preexisting tumors. Phase III also proved that EGCG can be used as a way to detect active cancer since EGCG has specific fluorescence properties. For the current phase of research, Phase IV, the goal was to experiment with human cancer cells. MCF7 (breast) and SiHa (cervical) cancer cell lines were used to determine if EGCG induces cell apoptosis in both cancerous cell lines. At a 100micromolar concentration of EGCG, the CytoTox96 assay showed that the breast cancer cells experienced 86% and 100% apoptosis at 48 and 72 hours respectively. The cervical cancer cells experienced 95% and 99% apoptosis at 48 and 72 hours respectively. HMEC (normal breast epithelial cells) were used to determine if EGCG effects non-cancerous cells. The HMEC cells were unaffected by the EGCG treatment. Also, all cell colonies were imaged microscopically before treatment and then after EGCG treatment at 24, 48, and 72 hours. Fluorescence microscopy confirmed that EGCG entered the MCF7 cell nuclei, paralleling Phase III results. Conclusions: EGCG induces cell apoptosis in breast and cervical cancer cells. EGCG does not negatively affect normal breast epithelial cells.

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