Role of Quaternary Ammonium Compounds on Inducing Cancer Progression Using a Melanoma Cell-line

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Quaternary Ammonium Compounds (QAC) are antimicrobial agents that are used to eliminate bacteria and are found in products that advertise antimicrobial activity. During the ongoing pandemic, disinfectant agents are being used more frequently to remove unwanted bacteria. QAC have been linked to multiple health effects such as mild skin irritations, gastrointestinal issues, asthma, eye and mucous membrane issues upon mists, and are also linked to reproductive issues. Mild skin irritations and contact dermatitis have been linked to the potential for skin cancer in recent years (Demetri et al, 2014). To assess the effects of QAC on inducing skin cancer, 2 QAC (Benzalkonium Chloride (BAC) & Didecyl Dimethyl Ammonium Chloride (DDAC)) were exposed at 0.00075% to melanoma skin cancer cells. The dosage concentration was at the lowest possible in order to avoid killing the skin cancer cells on contact, as QACs are known for their toxicity. The alternate hypothesis was increased exposure to DDAC will result in a higher development of cancer compared to BAC and the control because of the increased toxicity of DDAC. This experiment measured the growth of melanoma skin cancer cells over a 48-hour incubation period and recorded the change in cell count. The results under 0.00075% concentration revealed no significant effect on the proliferation of skin cancer cells compared to no treatment, indicating that at the raw level, QAC do not pose a potential for the rise of skin cancer. This signifies that QAC do not allow for the proliferation of skin cancer when exposed to previously cancerous cells, which is important to know with our abundant usage of these compounds.

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