Fighting Cancer with Herbs and Spices

Pham, Khanh

Duong, Kevin

Nearly 1,620 Americans die from cancer each day and it is important that new drugs are discovered to treat this serious disease. Eastern medicine has used herbs and spices to treat diseases for thousands of years. The goal of this project was to determine whether components extracted from herbs and spices could be used to kill or slow the growth of cancer cells. Rosemary, garlic, basil, caraway, cardamom, and allspice were chosen for the initial experiments. Extractions were performed with six organic solvents: methanol, ethanol, isopropanol, acetonitrile, heptane, and ethyl acetate. The extracted components were dried and resuspended in water. The resuspended extracts were tested on a lung cancer cell line, a breast cancer cell line, a brain cancer cell line, and two normal lung cell lines. The cancer drugs Doxorubicin and Vincristine were used as positive controls and water was used as the negative control. Three days after treatment, the number of living cells in each sample was counted. The resulting data showed that the garlic acetonitrile and heptane extracts showed fractional viability approaching zero, indicating that there is a component in garlic that is able to kill cancer cells. There was not a significant effect on cell growth or cell death for any of the other extracts tested. Next, an attempt was made to identify components in the garlic extract using a gradient from 100% methanol to 100% water in both basic and acidic conditions. The chromatography fractions were then tested using mass spectrometry and repeating the cell assay in an attempt to identify the active component of garlic.

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