Compounds from fermented noni exudates (fNE) selectively kill human cancer cells

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After adjusting for the dilution factor.

Noni (Morinda citrifolia) is small tree originating in Southern Asia and Polynesia. Parts of this tree, including the fruit, have been used in folk medicine for close to 3000 years (1). It is said to have a broad range of therapeutic effects, proliferation of NK and T cells, as well as stimulation of dendritic cells (4, 5).

Conclusions & Future Directions

This research shows that there is significant evidence that select extracts from Noni is great for the ability to selectively kill cancerous cells while increasing or maintaining the stability of non cancerous cells. Certain extracts have proven effects in DU-145/293 and NG-4620 human cell lines. We found that the most potent samples can exhibit significant results in as little as 24 hours, while other compounds took as long as 72 hours to demonstrate desired trends. These early results are promising in the hopes of fighting cancer.

Materials & Methods

In each trial, the AS49 human lung carcinoma and NL-20 non-tumor lung cells were plated on to separate 96 well plates with 500 cells/well. The non samples, extracted from collaborators in Hawaii, were diluted to concentrations of 20μg/μl, 40μg/μl, and 200μg/μl of each diluted Noni sample was added in each well. These plates were incubated for 48 hours at 37°C. The plates were then read at 490nm. The data from the plate reader was then analyzed using a two-way ANOVA in order to determine the statistical significance of our samples in selectively killing tumor cells.

To further investigate antioxidant activity in our noni samples, we used a working protocol developed from the Sigma-Aldrich Antioxidant Assay Kit. To start, we diluted all of our Noni samples to a concentration of 20μg/μl, and 100% DMSO controls. We also diluted the 10X Assay buffer to a 1X Assay working protocol developed from the Sigma-Aldrich Antioxidant Assay Kit. To start, according to protocol. Six Trolox standard working solutions were also created of ultrapure water. The absorbance 4000g for one minute to secure cells to the bottom of the well. The media was then removed and 20μl of an MTS/PHM solution was added. In some trials, an additional wash step of 10μl of DPBS solution was utilized. After an additional four hours of incubation at 37°C, the plates were read at 490nm. The data from the plate reader was then analyzed using a two-way ANOVA in order to determine whether the test sample or control, 20μg of each diluted Trolox standard was added. In control cells, 20μl of the sample was added followed by 270μl of ultrapure water. The absorbance was then read at 490nm using a plate reader.

The analysis was based on the average of triplicate samples from the Sigma-Aldrich Antioxidant Assay Kit. To start, according to protocol. Six Trolox standard working solutions were also created of ultrapure water. The absorbance 4000g for one minute to secure cells to the bottom of the well. The media was then removed and 20μl of an MTS/PHM solution was added. In some trials, an additional wash step of 10μl of DPBS solution was utilized. After an additional four hours of incubation at 37°C, the plates were read at 490nm. The data from the plate reader was then analyzed using a two-way ANOVA in order to determine whether the test sample or control, 20μg of each diluted Trolox standard was added. In control cells, 20μl of the sample was added followed by 270μl of ultrapure water. The absorbance was then read at 490nm using a plate reader. To analyze the data, a standard curve was created using the data from the Trolox standards. The equation generated from the line of best fit was then utilized to obtain the antioxidant activity for each sample after adjusting for the dilution factor.

Results

Noni and Tea Leaf Extract Effects on AS49 tumor cells

After looking at which samples were statistically significant in their killing of AS49 cancerous cells, we found that noni inhibited the trend, which was tested in samples 1A, 7A, 20, and 7A were most successful in promoting NL-20 cell growth while having a significant decrease in AS49 cells.

Conclusions & Future Directions

This research shows that there is significant evidence that select extracts from Noni is great for the ability to selectively kill cancerous cells while increasing or maintaining the stability of non cancerous cells. Certain extracts have proven effects in DU-145/293 and NG-4620 human cell lines. We found that the most potent samples can exhibit significant results in as little as 24 hours, while other compounds took as long as 72 hours to demonstrate desired trends. These early results are promising in the hopes of fighting cancer.

References