COLLEGE OF SCIENCE
THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

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Treating Human Breast Cancer Cell Lines with the Use of Plants

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Introduction

According to the Center for Disease Control, breast cancer is the most common cancer found in women with 236,968 women being diagnosed with breast cancer in 2014 alone. Some plants have cytotoxic effects on breast cancer cells. These plants can then in turn be studied further, and broken down into smaller components to find exactly what compound of the plant is toxic to the breast cancer cells. This will then lead to the possible use of the plant compound in breast cancer treatments.

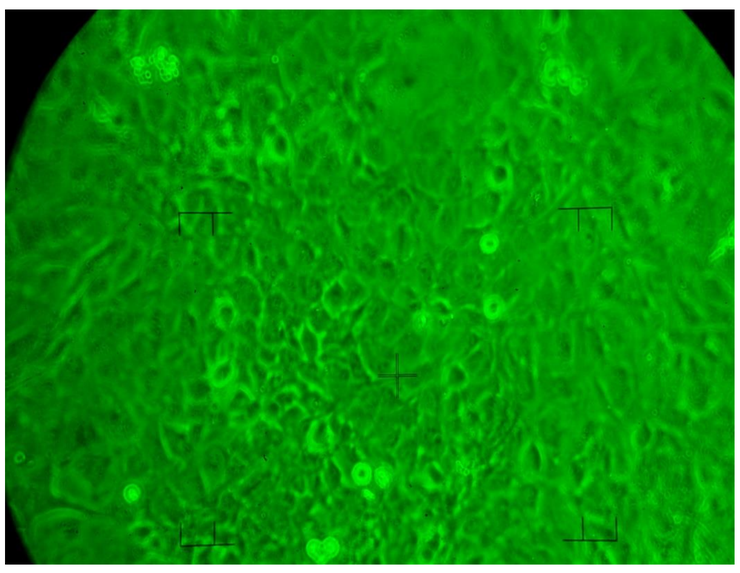

Figure 1
Live *in vitro* HS578T human breast cancer cells; Estrogen Receptor negative cells.

Materials and Methods

- Remove stored HS578-T cells from liquid nitrogen and quickly defrost them
- Grow cells to 90-100 percent confluence in RPMI 1640 media with 10% fetal bovine serum
- Trypsinize cells and plate into two new T25 flasks at a concentration of $1.75*10^5$ cells/flask to maintain cells
- Plate cells in a 96 well plate at a concentration of $1.5*10^4$ cells/well to perform cytotoxicity assay
- Grow cells in 96 well plate for 48 hours at 37°C
- Add appropriate concentration of plant extracts to 96 well plate in growth media and incubate for another 48 hours
- Remove media from wells, add 100 µl MTT solution to each well
- Remove MTT solution from wells after 3 hours and solubilize crystals in iso-PBS.
- Use spectrophotometer to read color change in 96 well plate at 570nm
- Calculate percent of cells killed compared to controls

Key Findings/Results

Essential Oil Extract Tested	Percent Killed (%)	Standard Deviation
SASCEO 0.01%	37.38	13.24
HEITEO 0.01%	68.77	49.40
JUCOEO 0.01%	79.20	16.72
COMYEO 0.01%	137.07	11.97
CIBEEO 0.01%	82.02	8.29
PECREO 0.01%	15.98	20.07
ALVIEO 0.01%	101.54	14.02
PIMAEO 0.01%	94.43	16.00
PEGREO 0.01%	31.77	72.51
PECRCEO 0.01%	4.18	21.75
SAOFEO 0.01%	18.21	49.27

Impact/Conclusions

As shown in the table above, I had positive hits for cytotoxicity on HS578-T breast cancer cells with three different plant extracts. COMYEO, ALVIEO, PIMAEO are abbreviations for plants whose common names are myrrh, wild garlic, and spruce leaf essential oils in that order. These three essential oil extracts will now be further purified by Dr. Setzer's lab in the Chemistry Department to find the component(s) of each plant that is cytotoxic to the HS578-T breast cancer cells.

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