RUTGERS
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The effects of stress and alcohol on triple negative breast cancer cells

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INTRODUCTION

- There are multiple types of common breast cancers diagnosed, including estrogen receptor positive (ER-positive) cancers, progesterone receptor (PR-positive), and triple negative breast cancers
- Triple negative breast cancer cell strains do not express estrogen receptors, progesterone receptors or make HER2 proteins, meaning the cancer is not fueled by these hormones or proteins
- Everyday life events such as experiencing stress or drinking alcohol can affect breast cancer
- The body's reaction to stress may be linked to the incidence of cancer through neurochemical and hormonal pathways, and these manipulations influence the carcinogenic process
- This project will examine the effects of epinephrine and ethanol on triple negative breast cancer cells when they are directly exposed to these treatments at varying concentrations, as well as a double treatment
- It was investigated if the cells proliferate more when incubated with the treatments compared to the controls, and this will yield information about the relationship between breast cancer/stress and breast cancer/alcohol when the cells are directly exposed to the treatment of interest, as well as the effects of stress combined with alcohol consumption

MATERIALS AND METHODS

- MDA-MB-231 ER-/PR-/HER2- breast cancer cells, Gibco® Dulbecco's Modified Eagle Medium (DMEM) with 10% Gibco® Fetal Bovine Serum (FBS) and 1% Gibco® penicillin/streptomycin antibiotics, Gibco® trypsin media, Sigma-Aldrich® epinephrine in 20% acetic acid solution, MTT colorimetric assay, isopropanol
- For proliferation assay, the cells were plated on 96 well plates at 15,000 cells/well and incubated with varying concentrations of epinephrine, ethanol, and double treatments
- For 2-week colony assay, cells were plated 2000 cells/well on 6 well plates to assess tumor progression over a two week period with 2mL of culture media and varying concentrations of epinephrine. A colony assay for ethanol/double treatment was unable to be completed
- Proliferation assays were assessed via a 3 hour MTT assay, and the 2-week colony assay was stained with crystal violet and left to dry overnight

ACKNOWLEDGEMENTS

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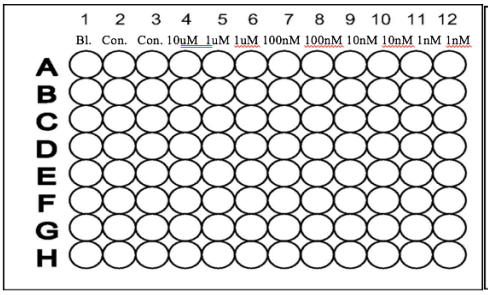
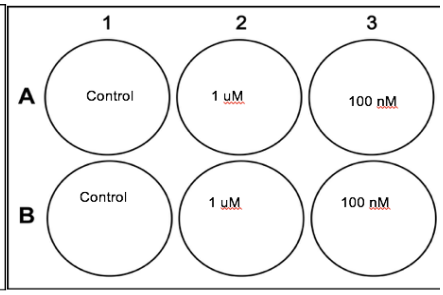
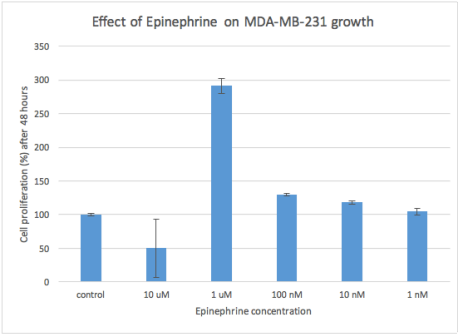


96-well proliferation assay

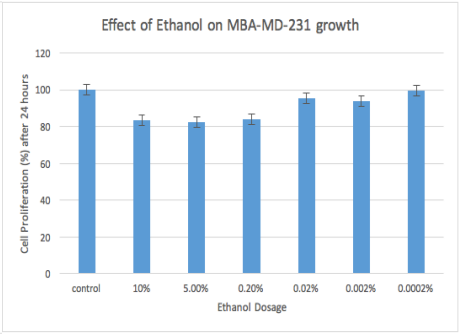


6-well 2 week colony assay

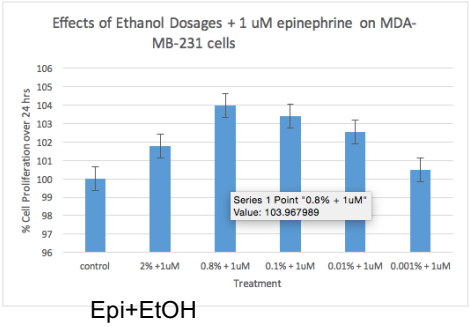
RESULTS



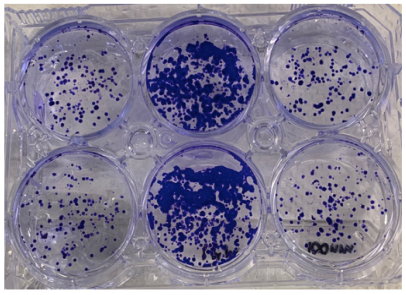
Epinephrine assay



Ethanol assay



Epi+EtOH



2-week epi colony assay

CONCLUSIONS

- Epinephrine was seen to have a significant impact on the cancer cells
- Cell proliferation decreased consistently as epinephrine concentrations decreased
- For ethanol, control wells showed the most proliferation and growth increased with decreasing ethanol concentrations, very low ethanol concentrations close to 0% yielded proliferation similar to the controls. Inconsistent findings
- Double treated groups have higher proliferation compared to controls, these findings are most likely attributed to epi