The Effects of Sweet Potato Greens on Breast Cancer

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Breast Cancer

What is Breast Cancer (BC)?
The uncontrolled growth of breast cells

• Men and women can get BC.

• 2nd leading cause of death for women in the U.S.

Breast Profile:
A-Ducts
B-Lobules
C-Dilated section of duct to hold milk
D-Nipple
E-Fat
F-Pectoralis major muscle
G-Chest wall/rib cage

Cross-Section of Individual Duct:
A-Normal duct cells
B-Basement membrane
C-Lumen (center of duct)
Different Types of Breast Cancer

- Invasive Ductal Carcinoma
- Invasive Lobular Carcinoma in situ
- Vascular (blood vessels) & Lymphatic (immune system) Invasion

Different phases in the progression of breast cancer
Breast Cancer and the Cell Cycle

How does BC occur?
The genes are damaged at some point in the cell cycle resulting in the division of damaged/unstable chromosomes.
Mechanisms Involved in the Progression of Breast Cancer

- Uncontrolled cell proliferation (growth/division)
- Alteration in DNA
  - Telomere elongation & telomerase activity
- Degradation (break down) of extracellular matrix
  - Matrix Metalloproteinases
- Invasion & Metastasis
Sweet Potato Greens *(Ipomoea batatas)*

- Members of the morning glory family
- Loaded nutrients
- Not commercially sold, but used as feed for livestock
- Previous studies indicate that SPGs:
  - May provide potential protection from lung cancer
  - Shown to control immune response and antioxidative state in basketball players during training
  - Posses anti-diabetic effects in Caiapo mice
  - Certain polyphenols in SPGs decrease proliferation in colon, stomach and leukemic cells
Purpose of Study

• To determine if sweet potato greens have any effect(s) on the proliferation, telomerase activity, invasion and extracellular matrix breakdown in breast cancer cells.
Results: Proliferation

Cell Viability
Results: MMP and Invasion

Enzyme Activity

Invasion study

Control

50µg/ml

150µg/ml

450µg/ml

MMP-9 (82kD)
Pro-MMP-2 (72kD)
Results: Telomerase

Telomerase Activity

Telomere Elongation
Cell Cycle Activity #1

Determining Time Spent in Different Phases of the Cell Cycle
“The Assignment”

In this activity, you will be presented with cells from the tip of an onion root. You will classify each cell based on what phase it is in. At the end you will count up the cells found in each phase and use those numbers to predict how much time a dividing cell spends in each phase. You can base your calculation on a total cell cycle of **24 hours**.

Enter data in this table as you go along, or at the end of the activity.

<table>
<thead>
<tr>
<th></th>
<th>A-Interphase</th>
<th>B-Prophase</th>
<th>C-Metaphase</th>
<th>D-Anaphase</th>
<th>E-Telophase</th>
<th>Total</th>
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<td>36</td>
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<td>Percent of cells</td>
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</table>

Examples of Onion Root Tips
QUESTIONS???