The Effect of Hyperthermia on Liver Cell Viability

BY: JADA GRANT
What is hyperthermia?
A treatment for Liver Cancer where the tumor is exposed to higher amounts of heat than normal body temp.

The Liver
An organ that detoxifies chemicals in the body
The Question

- How is hyperthermia treatment affecting the noncancerous cells in the Liver?
  - The noncancerous cells have to be exposed to heat too

- Liver Damage can cause:
  - Bleeding Easily
  - Swollen Abdomen
  - Jaundice
    - Yellow eyes and skin
Research Design

The Effect of Hyperthermia on Liver Cell Viability

Hypothesis: If hyperthermia kills the cancerous cells then there will be negative long-term effects on the noncancerous cells surrounding the tumor.

Null hypothesis: There will be no effect on the noncancerous cells.

<table>
<thead>
<tr>
<th>IV: The amount of time the organisms were exposed to heat</th>
<th>Concentration</th>
<th>Control</th>
<th>30 minutes</th>
<th>1 hour</th>
<th>2 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kidney Cells</td>
<td>4 wells</td>
<td>4 wells</td>
<td>4 wells</td>
<td>4 wells</td>
<td>4 wells</td>
</tr>
<tr>
<td>Zebrafish</td>
<td>No specific trials were conducted due to limits on the number of zebrafish</td>
<td></td>
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</tr>
</tbody>
</table>

DV: Cell health and number of dead cells/ Zebrafish

Constants: Growth conditions of the cells/Zebrafish, Temperature the organisms are exposed to.
Procedures: Cells

1. The cells were plated
2. The cells incubated
3. The cells were heated
4. The cells incubated
5. MTT Assay/ Cell Count
Procedure: Zebrafish

The zebrafish were transferred to petri dishes

The zebrafish were heated for 30 minutes and 1 hour

The zebrafish were examined to determine if they survived experimentation
Results: Cell Count

Average Number of Dead Cells

<table>
<thead>
<tr>
<th>Amount of time the Cells were Heated</th>
<th>Average Number of Dead Cells</th>
</tr>
</thead>
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<tr>
<td>Control</td>
<td></td>
</tr>
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</tbody>
</table>
Results: MTT Assay
## Results: Zebrafish

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Control</th>
<th>30 min</th>
<th>1 hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dead/Alive</td>
<td>Alive</td>
<td>Dead</td>
<td>Dead</td>
</tr>
<tr>
<td>How Many</td>
<td>All</td>
<td>12 Dead/1 Alive</td>
<td>All Dead</td>
</tr>
</tbody>
</table>
Discussion/Conclusion

- **Zebrafish:**
  - Hyperthermia has negative effects on the noncancerous cells

- **Cells:**
  - Very few cells were killed
  - All of the cells were healthy

- **Overall:**
  - Hyperthermia is not damaging to noncancerous cells
Any Questions about the Hyperthermia on Liver Cells Viability?