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Vitamin E: A Possible Preventative Measure for CTE

Dylan Roth
*Marian University - Indianapolis, droth201@marian.edu*

Cameron Dargis
*Marian University - Indianapolis, cdargis072@marian.edu*

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**ABSTRACT**

Vitamin E Oxidation

**INTRODUCTION**

- This experiment is aimed to aide all future athletes.
- The brain injury known as CTE can only be diagnosed after death and upon autopsy.
- Upon research, what causes this is non-heme iron deposits in the brain cause radical oxygen species that damage the nerve cells.
- Causes many different mental and physical problems.
- Research on Vitamin E showed that it can accept radical oxygen species and increase neurological health.
- We will be testing these affects on yeast samples

**HYPOTHESIS**

- If yeast is treated with Vitamin E before being exposed to radical oxygen species via non-heme iron, then it will have a higher survivability than the non-treated yeast samples.

**MATERIALS AND METHODS**

**Prep Yeast Samples**

- Treat with Vitamin E and Iron

**Turbidity Assay**

- Treated yeast samples with vitamin E and iron
- Turbidity assay was used to give us a visual on how well the yeast could survive in the iron dense environments
- Good first method to evaluate the yeasts viability

<table>
<thead>
<tr>
<th>Tube</th>
<th>Viability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>283.7</td>
</tr>
<tr>
<td>2</td>
<td>437.2</td>
</tr>
<tr>
<td>3</td>
<td>422.8</td>
</tr>
<tr>
<td>4</td>
<td>216.4</td>
</tr>
<tr>
<td>5</td>
<td>195.3</td>
</tr>
</tbody>
</table>

**HEMOCYTOMETER**

- Same solutions used for this as in the turbidity assay
- When counting dead and alive cells we were surprised it affected the reproductive abilities more than the viability of the cells
- This helped prove that the vitamin E was helping decrease the amounts of dead cells, but did not give us enough evidence

<table>
<thead>
<tr>
<th>Tube</th>
<th>Alive</th>
<th>Dead</th>
<th>Trypan Blue (ml)</th>
<th>PBS (ml)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>332</td>
<td>3</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>47</td>
<td>1</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>85</td>
<td>1</td>
<td>40</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>100</td>
<td>2</td>
<td>40</td>
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</tr>
<tr>
<td>5</td>
<td>68</td>
<td>0</td>
<td>40</td>
<td>10</td>
</tr>
</tbody>
</table>

**GFP**

- Shows yeasts natural and treated ability to fight off radical oxygens
- Slight increase when no radical oxygens present due to lack of them
- Dramatic increase in ability when non-heme iron was introduced

**CONCLUSIONS**

- First two methods were not successful, but the GFP gave us the results we needed
- Results show that Vitamin E inhibits the radical oxygens reacting with non-heme iron
- This experiment can a pivotal one in the future mental states of all contact sport athletes.
- The applications of this experiment can lead to many new and pivotal information on CTE.
- The next step for this experiment would to try different time intervals and introduce it to human trials
- Bringing more awareness to this subject may be vital to preventing thousands of mental issues for all athletes.

**LITERATURE CITED**


**ACKNOWLEDGMENTS**

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