May 17th, 9:00 AM - 12:00 PM

Norms of reaction for pheromone response in Saccharomyces cerevisiae isolates

Shelby Duffy
Western Washington University

Follow this and additional works at: https://cedar.wwu.edu/scholwk

Part of the Higher Education Commons

https://cedar.wwu.edu/scholwk/2017/Day_one/3
Abstract

• Traits are commonly influenced by environmental and genetic factors. An important life history trait in baker’s yeast (Saccharomyces cerevisiae) is the rate at which cells prepare for mating in response to environmentally released pheromones.
• It is known that pheromone response depends on pheromone concentration, but the effects of environmental factors are largely unknown.
• We are investigating the norms of reaction to environmental factors for pheromone response in genetically distinct yeast isolates. Initial results suggest isolates follow unique norms of reaction.

Data

Figure 4: Time course for both strains showing the percent of shmooing cells versus time after pheromone was added. Cultures were incubated at 30°C with a pheromone concentration of 50 nM.

Figure 5: The number of minutes between adding pheromone and the first shmooing cell for each strain.

Comparison of Yeast Isolates Used:

<table>
<thead>
<tr>
<th>Yeast Strain</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S288c</td>
<td>A common haploid laboratory strain originally obtained from a fig.</td>
</tr>
<tr>
<td>YJM145</td>
<td>A homozygous diploid strain derived from the long of an AIDS patient.</td>
</tr>
</tbody>
</table>

Figure 6: Table describing and comparing the two strains of yeast we are studying.

Conclusion

• Results after three experiments suggest the response delay for each strain is significantly different. In general, the first shmooring cell appears in strain YJM145 before strain S288c. While the response rates for each strain are not significantly different, the response rate for S288c appears to be faster than that of YJM145.
• The magnitudes of the differences observed between response rate and delay for each strain are small. Further trials will help solidify these differences and develop a deeper understanding of pheromone response for these strains under controlled conditions.

Future Directions

• The next steps are to study potential variation in response rate and delay for S288c and YJM145 due to the manipulation of temperature and pheromone concentration.
• Understanding norms of reaction for pheromone response will facilitate future analysis of genetic mechanisms and help the larger community of researchers studying this model environmental response network.