CALIFORNIA STATE SCIENCE FAIR
2002 PROJECT SUMMARY

Name(s)
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Project Number
22169

Project Title
An Important New Strain of Sacchcromyces cerevisiae Created using Biotechnology

Abstract

Objectives/Goals

Since the entire genome of the yeast, Sacchcromyces Cerevisiae, has been sequenced, the next task is to determine the roles of particular genes. Yeast use at least two different methods for pumping out sodium. ENA genes are known to encode sodium pumps that use ATP. The other method uses proton pumps, encoded by the PMA1 gene to create a proton gradient. Proton gradients are then used to pump out sodium through a sodium/proton antiporter. In this project the ENA genes were removed from the yeast Yak2, which already contained a deletion of the PMA1 proton pumps. Eliminating these genes permits the study of new ways in which sodium can be exported. The purpose of this project was to create a strain of Sacchcromyces Cerevisiae where the ENA genes were removed through homologous recombination and replaced with the Kanamycin resistance gene.

Using this method I found deletions of the ENA genes. The new strain was named LAL after myself, Citlali Villalobos. Successful recombination is confirmed when LAL is shown to be resistant to G418, a Kanamycin analog. In total, I found four different deletions of the ENA regions resulting from homologous recombination.

Summary Statement

In this project the ENA genes were removed from the Yak2 strain by homologous recombination in order to creat a brand new strain, LAL, to be used in future studies that will analyze methods by which cells export sodium.

Help Received

The Scripps Research Institute's Harper Lab; I used lab equipment and materials for my project.