CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY

Name(s)
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Project Number
J0403

Project Title
mRNA and Cell Division: Is There a Connection?

Abstract

Objectives/Goals
I decided to find out if actively dividing cells would have more messenger RNA (mRNA) than cells that are not actively dividing. Messenger RNA is one of the most important parts of the cell because without it, none of the other parts could do their jobs. The mRNA takes the cell's DNA instructions from the nucleus to the cytoplasm, where proteins are made. Proteins made from these instructions can then carry out the jobs of the cell.

Methods/Materials
In my project, I cultured two different kinds of cells in flasks with growth media, kept in a 37°C incubator. The cultures were started at high density (less actively dividing) and low density (more actively dividing) cell concentrations. I counted the cells each day and then purified and measured the amount of mRNA in the two different kinds of actively and non-actively dividing cells.

Results
I found that there was less than a two-fold difference in the amount of mRNA/cell I purified from the inactively and actively dividing cells. In one of the kinds of cells I studied, there was more mRNA in the actively dividing cells than the inactively dividing cells. However, in the other cell type, I purified more mRNA/cell from the inactively dividing cells than the actively dividing cells.

Conclusions/Discussion
From my results, I concluded that you can not tell if a cell is actively dividing or not by the amount of mRNA in the cell.

Summary Statement
I wanted to figure out whether you can tell if a cell is actively or non-actively dividing by the amount of mRNA per cell.

Help Received
My father showed me how to culture and count cells, and how to purify and measure mRNA. My project was done using reagents and equipment provided by Genentech, Inc. My father also showed me how to graph my data.