CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY

Name(s)

Connie Lu

Project Number

S0412

Project Title

Somatic Mutations in P85 Regulatory Subunit in Phosphoinositide-3 Kinase Pathway in Human Cancer Cells

Abstract

Objectives/Goals

Cancer is one of the main diseases in our society today. With much ongoing research, there are still many unfamiliar areas to study to find a cure. Mutations play a big part in cancer development. The purpose of my project is to find somatic mutations in the regulatory subunit P85 of the Phosphoinositide-3 Kinase Pathway # an important pathway to understand because it sends survival signals for cellular functions. It is predicted that due to mutations, P85 is bound to P110 # another subunit of the PI3 Kinase Pathway # indefinitely, which causes the PI3K Pathway to be over expressed. If somatic mutations can be found in P85 within its 15 exons, it could probably explain its overexpression. If we can target this mutation and allow the PI3K Pathway to function normally again, cells can perhaps return to their regular function.

The main methods used for this project were PCR, agarose gels and electrophoresis, and sequencing. PCR was done for all 15 exons, forward and reverse ends using fourteen cell lines which consisted of breast, ovarian, and endometrial cell lines. Agarose gels of 1.5% concentration were used during electrophoresis. Sequencing was done by the ABI Company at the Norris Cancer Center CORE Facility. After receiving sequencing results, my analysis was done by using FinchTV to view sequencing results; and I used the SDSC Biology Workbench 3.2 using the tools BLAST and CLUSTALW to compare DNA sequences with my results.

Although there seemed to be a few potential areas for mutations in Exon 1 Forward, they are not significant enough to alter the role of P85. However, more analysis will be done on the other exons with hopes of finding more mutations.

Summary Statement

The purpose of my project is to find somatic mutations in P85, which may be a potential reason why cells mutate into cancer cells.

Help Received

Used lab equipment at USC Norris Cancer Center under the supervision of Dr. Melinda Epstein