# CALIFORNIA STATE SCIENCE FAIR
## 2002 PROJECT SUMMARY

**Name(s)**

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**Project Number**

**S0413**

**Project Title**

# A Cellular and Molecular Investigation of the Downregulation of Wild-Type p53 by a Dominant-Negative Mutant p53 Allele

**Abstract**

**Objectives/Goals**

The purpose of this study was to investigate the effects a dominant-negative p53 protein has on the cellular and molecular response of prostate cancer cells to radiation. The hypothesis of this experiment is that cell cycle arrest after radiation is decreased by the downregulation of wild-type p53 by a dominant-negative mutant p53 allele in prostate cancer cells.

**Methods/Materials**

This experiment used vector/parental and R273H mutant cells of the CWR22R cell line to address whether ionizing radiation of prostate cancer is a good form of treatment by analyzing the status of p53 using Western blotting and flow cytometry methods to observe the gene on a molecular and cellular level. A method called mitotic trapping was also used with the CWR22R cells to differentiate between cells in G2 and M phases of mitosis.

**Results**

Although the Western blots and flow cytometry did not present sound evidence of the mutant R273H dominant-negative effect, there was some evidence that introduction of the mutant R273H p53 allele had the expected effect of reducing p53 function following radiation in the mitotic trapping data.

**Conclusions/Discussion**

The research emphasizes the importance of predicting the different cell cycle responses to cancer treatment, such as irradiation of cells, and how genetics can play an important part on the effectiveness of such treatment.

**Summary Statement**

This project looks at the impact of a genetic mutation on cell destruction after exposure to radiation.

**Help Received**

Used lab equipment at the University of California, Davis Med Center under the supervision of Ms. Nancy Nesslinger and Ms. Susan Scott.