



**CALIFORNIA STATE SCIENCE FAIR
2005 PROJECT SUMMARY**

| | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| Name(s) Andy Lucas; Riley McCluskey | Project Number J1422 |
| Project Title The Effect of Growth Hormones on Irradiated Lima Beans | |
| Abstract Objectives/Goals Our objective was to determine what effect growth hormone supplementation had on irradiated lima beans. Methods/Materials Forty-eight lima beans were irradiated with high-energy X-rays at Providence St. Joseph's hospital. Sixteen beans were irradiated at 10,000 rads, sixteen beans at 30,000 rads, and sixteen beans at 60,000 rads. In addition, sixteen beans were not irradiated and served as controls. Following irradiation, the lima beans were placed in a hydroponic germination station, where they were exposed to artificial light 16 hours of every 24-hour period, for nine consecutive days. Half of the beans were given growth hormone supplementation (Hormex Growth Hormone) and half were hydrated with clean water only. After nine days, the plants were uprooted and the stem and root lengths were measured. Results Lima bean growth was severely stunted at radiation levels of 30,000 and 60,000 rads, since the beans that were irradiated at these levels germinated and then stopped growing altogether. When we compared the data taken from the plants supplemented with growth hormone, the hormone-treated plants generally had longer roots, yet shorted stems. Strangely, at 60,000 rads, there were a few centimeters of stem growth on most plants, yet no visible root growth. Conclusions/Discussion Although the growth hormone did not repair stem length damage in the irradiated plants, it did slightly increase root length. The increase of root length in Hormex-watered plants suggests that the growth hormone may be able to make up for the damage inflicted by the radiation. When we began, we had little knowledge of radiation and how it works. This study helped us to learn about radiation and its impact on plant growth. We will continue our studies of Hormex's potentially beneficial effects on radiation damage over the summer using considerably larger control and variable groups to achieve more valid results. | |
| Summary Statement We examined the effects of growth hormone supplementation on lima beans that were exposed to high levels of radiation. | |
| Help Received Mothers provided transportation and supplies; Used linear accelerator at Providence St. Joseph's Hospital | |