



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

Name(s) Samuel L. Chen	Project Number S0404
Project Title The Effect of the PI3 Kinase/AKT/GSK3 Pathway on the Regulation of GSK3beta Activity	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The objective is to establish positive localization of phosphorylated GSK3beta (inactivated) and phosphorylated AKT1 (activated) in the mouse testes tubule, therefore accepting or rejecting the role of the PI3 Kinase/AKT/GSK3 growth signaling pathway on the regulation of GSK3beta, which is hypothesized to have a regulating effect on the initiation of meiosis.</p> <p>Methods/Materials Mouse testes tissue extracted from previously euthanized adult mouse organisms was obtained and fixed by paraffinization onto blocks. Sections were sliced and mounted onto slides, where immunohistochemical cell staining procedures were used, identifying the presence of total GSK3beta, phosphorylated (Serine-9) GSK3beta and phosphorylated (Serine-473) AKT1 through their incubation in their respective specific antibodies. Conventional immunohistochemistry and immunofluorescent immunohistochemistry was used in localization of expression of the proteins of interest.</p> <p>Results It turned out that total GSK3beta antibodies yielded expression of the protein in both Sertoli cells and germ cells, phosphorylated GSK3beta antibody immunohistochemistry had localization in Sertoli cells, but phosphorylated AKT1 antibodies only showed expression in germ cells.</p> <p>Conclusions/Discussion This information leads one to believe that the specific PI3 Kinase/pAKT1/pGSK3beta pathway is not a major pathway having relations to the initiation of meiosis, although other isoforms (AKT2,3) or other pathways entirely, may be the inhibitor of meiosis, among other possibilities. AKT1 was only chosen first because of its reputation of rapid degeneration of the testes, in AKT1-knockout mice. Understanding GSK-3b regulation might prove clinically useful, for instance a specific inhibitor for GSK-3b action can be used as a male contraceptive, or as an agent to preserve fertility by inhibiting germ-cell proliferation during cancer therapy.</p>	
Summary Statement This project is an investigation to determine the biological and physiological pathway, by which GSK3beta is regulated, in its role in the initiation of the entry of meiosis.	
Help Received Used lab equipment at Harbor-UCLA Medical Center Research Facility under the supervision of Dr. Wael Salameh	