



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

Name(s) Azaam M. Samad	Project Number S1009
Project Title Tea Extracts Inhibit the Proliferation and Differentiation of Adipocytes	
Abstract Objectives/Goals Obesity is a major public health problem and in the U.S. alone more than 65% of the adult population is overweight or obese. The result of this epidemic is an increase in obesity-related diseases such as cardiovascular disease, diabetes and cancer. Since several studies have documented the health benefits of tea, in this study, the hypothesis that black and green tea extracts may inhibit the proliferation and differentiation of adipocytes was evaluated in vitro using the murine 3T3-L1 pre-adipocyte cell line. Methods/Materials Cells were grown in 6-well tissue culture plates in Dulbecco's Modified Eagle's Medium (DMEM) containing 10% fetal bovine serum, 1% Penicillin-Streptomycin, and 1% HEPES buffer. Confluent pre-adipocytes were differentiated into adipocytes in the above cell culture medium supplemented with 10micrograms/ml bovine insulin. Various concentrations (1%, 0.5% and 0.1%) of black and green tea extracts were added either to: a) pre-confluent 3T3-L1 adipocytes; or b) to confluent 3T3-L1 pre-adipocytes during the time of induction of differentiation into adipocytes with insulin. Results Green and black tea extracts inhibited the proliferation of pre-confluent pre-adipocytes in a time and dose-dependent manner as determined by cell counts using a hemacytometer. Black and Green tea extracts also dose dependently inhibited the differentiation of confluent pre-adipocytes to mature adipocytes. In this instance the tea extracts inhibited lipid (triglyceride) accumulation in cells as determined visually through microscopic examination and also by Oil-Red-O staining for lipids. Conclusions/Discussion These data demonstrate that constituents in black and green tea extracts are effective in inhibiting the growth and differentiation of adipocytes in vitro.	
Summary Statement My project determined whether black and greens tea extracts inhibited the growth and differentiation (i.e. lipid accumulation) of adipocytes.	
Help Received This project was carried out at the Scripps Research Institute, La jolla, CA, under the supervision of Dr. Fahumiya Samad.	