

**EXECUTIVE SUMMARY:** (State in layman's terms the application's broad, long-term objectives and specific aims, making reference to the potential public benefits of the project for California.)

Obesity is an ongoing epidemic in the US and it increases the risk of many diseases including coronary heart disease, high blood pressure and diabetes. Recent animal cell studies suggest that exposure to a widely used environmental chemical bisphenol A, which is used in dental procedure, food storage and polycarbonate plastic, may contribute to obesity by increasing the number of fat cells formed (adipogenesis) as well as the size of fat cells. We would like to further test this hypothesis on human cells by using human mesenchymal stem cells (hMSCs) as our *in vitro* cell model.

hMSCs are a type of adult stem cells that exist in fetal liver, umbilical cord blood and adult bone marrow. They are important players for maintaining the homeostasis of the musculoskeletal, blood and adipose tissues. Upon receiving appropriate external stimuli, these cells will differentiate into mature adipocytes (fat cells). As these cells serve as excellent *in vitro* model for human adipogenesis, we propose to use this model to assess the effect of bisphenol A on adipogenesis. We will evaluate the potential harm of these chemicals on human adipogenesis at levels of human exposure. This project will be of important significance for evaluating the potential health harm of BPA and help policy makers determine the safety levels of human exposure. We also believe this study provides an excellent example of directly linking chemical toxicity studies with human adult stem cells, as this application field of stem cell research is just beginning to emerge.