**Project outline**

**Introduction**

Obesity is a rising concern in the United States. In fact, about 65% of world’s population lives in countries where obesity is a bigger concern for morbidity than malnutrition. Obesity causes adverse effects on reproduction including reduced conception and implantation, impaired fecundity and infertility. Previous studies from our labs have shown that ovaries from obese females have a greater level of DNA damage (Ganesan, et.al ‘Enhanced susceptibility of ovaries from obese mice to 7,12-dimethylbenz [a] anthracene-induced DNA damage.’20214). Environmental factors contribute to female infertility too. Polycyclic aromatic hydrocarbons are produced by burning organic matter and are present ubiquitously. PAH’s were also recently listed in the top 10 priority concern chemicals by the Agency for Toxic Substances and Disease registry. DMBA, Dimethylbenz[a]anthracene, produced by burning organic matter, through wildfires, waste incineration , during coal tar and coke production, smoking etc. is one such polycyclic aromatic hydrocarbon that causes ovarian toxicity DMBA. Ovotoxicants can cause depletion in oocytes and DNA damage. DNA damage repair involves histone

modifications and modifications in DNA damage repair due to ovotoxicity and is under-

explored. My project, under the guidance of Dr. Aileen Keating focuses on exploring how obesity potentiates ovotoxicity under the influence of an ovotoxicant and how that causes ineffective DNA damage repair. 20, lean or obese, mice were dosed with either corn oil(control) or DMBA for 7 days at 1mg/Kg. Post euthanasia, the ovaries were collected, one frozen for molecular analyses and one fixed for histology from each animal. Brca1 is a member of the DNA damage repair pathway and is one of the proteins that I am interested in learning more about. Since I work with mice, I want to look at evolution patterns of the gene that encodes for Brca1 and compare how similar it is in mice and humans and if there are other organisms that have a more similar version of Brca1 with human Brca1.

**Methods**

I am working on quantifying Brca1 abundance in my samples (mouse ovaries) in lab through various methods including western blotting, LC-MS and immunofluorescence. I will collect the mRNA sequences of BRCA1 of various organisms (most common model organisms) from NCBI database and construct the best phylogenetic tree using maximum likelihood and determine whether my conclusions from lab about mouse BRCA1 are applicable to human BRCA1