SUMMARY OF PROPOSED RESEARCH
(Do not exceed the space provided)

Describe clearly and concisely, in language readily understandable to a biomedical scientist who may not be a specialist in the research project's field, the broad objectives, specific aims, general procedures, and the potential significance of the research.

Project Summary

Oxidative stress is the excessive production of reactive oxygen species (ROS). This may be responsible for slow embryo development and reproductive failure in IVF patients due to its embryotoxic effects. The harmful effects of ROS have been implicated in the pathology of male infertility. Women with endometriosis who are infertile may have increased production of ROS in their peritoneal fluid (PF), however this may not affect fertility directly. Lipid peroxidation (LPO) is the end result of ROS production. Antioxidants help in reducing both the productions of excessive ROS and LPO levels. Our central hypothesis proposes that both ROS and the amount of LPO produced as a result of oxidative stress may have a role in the PF of infertile endometriosis women. This may be deleterious to the subsequent development of human embryos. As a first step to validate our hypothesis, we will determine the effect of reactive oxygen species and the end product of lipid peroxidation on mouse embryo toxicity before actually using the peritoneal fluid from endometriosis women for studying the toxic effects on mouse embryo development.

The aim of our study is to use a mouse embryo model and generate dose response curves for ROS by either activating the leukocytes or using hydrogen peroxide, one of the main components of ROS. Similarly, we will generate dose response curves using malondialdehyde the main product of lipid peroxidation. We will also study the effect of LPO present in the PF from infertile women with endometriosis on mouse embryo development. Once the effect of ROS and LPO on embryotoxicity is established, we will examine if the addition of antioxidant to the culture medium with high ROS or LPO is beneficial in reducing the embryo toxicity. The proposed study will allow us to determine the embryotoxic effects of the ROS and LPO and validate if the addition of antioxidants will be effective in reducing the deleterious effects of ROS on mouse embryo development. Our results may help increase the short survival rates of embryos thereby increasing the prevailing low success rate of IVF.

Please provide five Key Words that best describe your project:

(1) reactive oxygen species (2) lipid peroxidation (3) peritoneal fluid

(4) endometriosis (5) mouse embryo