

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

Despite significant developments in assisted reproductive technologies (ART), the *in vitro* fertilization (IVF) success rate is not very high (26.1% with delivery rate of 20.9%, Hum Reprod 2001; 16: 384-391). This is partly due to the effects of various components such as temperature, embryotoxic factors and oxidative stress involved during the *in vitro* culture of embryos. Oxidative stress caused by reactive oxygen and nitrogen intermediates may be one of the reasons for low success rate. Reactive nitrogen species and in particular nitric oxide (NO) is produced in large amounts following infections in the female reproductive system and may cause some deleterious effects on embryo development and implantation. The effects of NO on developing embryos are controversial, and several studies have documented that high amounts of NO induces apoptosis and arrest of pre-implantation embryo development (Joo et al., 1999, Barroso et al., 1998). One of the defense mechanisms of embryos against environmental stress is the production of heat shock proteins (HSP). However, studies documenting the efficacy of HSP in improving the quality of embryos and IVF success rate are lacking. The objectives of our study are to identify the effect of NO on *in vitro* embryo development. We will examine the effect of NO in presence and absence of heat shock proteins to confirm their protective effect on embryo development and study if NO can induce apoptosis in embryos. The outcome of our study may help in an improvement of embryo quality during *in vitro* culture and may increase the pregnancy rates in IVF program

Please provide five Key Words that best describe your project:

(1) *in vitro* fertilization (2) nitric oxide (3) heat shock protein (4) apoptosis (5) blastocyst culture