

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

Varicocele is one of the most common conditions associated with male infertility. It occurs in 10-20% of the general male population, and in 30 - 40% of men presenting to infertility clinics. Men with varicocele exhibit impaired semen quality, in terms of the total number of sperm, as well as sperm quality. Sperm have high levels of polyunsaturated fatty acids in their plasma membranes, and are therefore susceptible to lipid peroxidation (LPO) induced damage caused by imbalances between reactive oxygen species (ROS) production and ROS scavenging

The goals of this study are to examine the mechanisms of poor sperm quality in men with varicocele due to sperm membrane damage and dysfunction caused by high levels of reactive oxygen species (ROS), and consequent lipid peroxidation (LPO), and to assess whether exogenous ROS scavengers may enhance sperm function. Sperm from men with varicocele will be evaluated for motion parameters, as well as functional characteristics, with tests including viability and hypoosmotic swelling, bovine cervical mucus penetration, capacitation, and acrosome reaction. The lipid peroxidation potential will be measured, as will the levels of endogenous ROS scavengers including catalase and glutathione peroxidase. Exogenous antioxidant supplementation with glutathione will be assessed for its relative enhancement of sperm quality in fresh semen samples.

The objectives outlined in this proposal will assist the clinician in further assessing men with varicocele. This may eventually translate into an effective medical therapy for varicocele patients, and possibly obviate the need for invasive treatment.

Please provide five Key Words that best describe your project:

- (1) Varicocele (2) Reactive Oxygen Species (3) Antioxidants
(4) Sperm Function (5) Lipid peroxidation