Past Topics for the Ph.D. Preliminary Qualifying Examination

2001: Intradiscal Electrothermal Annuloplasty (IDET)

A medical interventions company has asked you to develop a research plan to evaluate a newly developed technique to treat degenerative disc disease of the lumbar spine. The technique, intradiscal electrothermal annuloplasty (IDET), involves the use of a flexible catheter attached to a thermal probe. The probe is inserted into the degenerated disc and the tissue is heated with the intention of destroying painful nerve endings and shrinking loose ligaments to reseal the disc. Clinical trials are currently underway with some publications resulting. The company has asked you to determine the validity of the technique at the basic science level. Specifically you have been asked to address changes in material properties of the disc as a result of this technique as well as its effect on structure and function of nerves in the disc. You have elected to use an animal model to address these basic science issues. Develop a research plan to address the above issues that includes the following:

1. Background and significance of disc degeneration of the lumbar spine.
2. Progress report: Clinical outcomes to date using this technique.
3. Specific aims of this proposal.
4. Methodology.
5. Assessment of outcomes.
6. Possible future work.