



## Research Assignment - 2007

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Title of research assignment

### Toxicity Evaluation of Novel Neural Implant Coatings

Research abstract

A major focus area of our research is the study of cell behavior on different types of surfaces. This project will investigate the toxicity of novel protective coatings that are being developed for neurological implants. These implants are a special class of prosthetic devices that are under development for the treatment of various neurological disorders (such as stroke, paralysis, and Parkinson's disease). These prostheses are small, silicon-based integrated circuit devices that can send and receive electrical signals to and from neurons in the central nervous system. An important challenge in the design of these implants is the protection of the electronic circuitry from the ambient body environment. Another important design consideration is the response of the human body to these coatings. Materials that are known to be biocompatible in one form may be toxic in another form, so just considering molecular structure is not sufficient; a rigorous method of testing toxicity at the cellular level is required. An additional advantage of such a method is that material samples can be tested quickly and with small numbers of cells before implantation in animals, a process which is considerably more complex and expensive. In a collaborative effort with a local company that is manufacturing the protective coatings, we will design methods to determine how nerve cells respond to these coatings. This work will involve designing appropriate test methodologies and performing the toxicity tests over the duration of the project period.



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