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EMPLOYMENT

Lucent Technologies: Principal Investigator since November 1998.

My current work is related to the reliability physics and chemistry of photonic and electronic components and assemblies. A specific goal is the identification and procurement of advanced devices/assemblies that are capable of long-term reliable operation, particularly in harsher environments, e.g., high relative humidity, airborne particulate contamination, corrosive gases, and fluctuating temperatures, at a competitive cost. My responsibilities include travelling to developing countries (mostly in Asia) to assess the effects of the local environments on Lucent's equipment. I work with designers on specifications for components for our systems and on solving field-related reliability problems. I also meet and interact with our suppliers and customers concerning reliability issues. Most of this work is confidential and cannot be published. One of my current activities is to be the Chairman of the Lucent Task Force on Corrosion. With the help of this team, we have developed a Corrosion Model that allows the prediction of the lifetime of any of our equipment in a corrosive environment. It also allow us to take any preventive and corrective actions depending whether the equipment is in the field or if it has been deployed for several years. We just got a Bell Labs Team Award for this job in June 2003.

I have managed interdisciplinary teams that work together around the clock to solve critical problems with customers. I also have designed tests for qualification of new devices, and created accelerated test protocols that are used to predict lifetime in a specific environment. I have a very strong background on microscopy and corrosion and therefore I am always involved in the failure mode analysis of our products and the devices from our suppliers

I also utilize my knowledge and experience to develop and study new materials for biomedical applications and to develop and apply new methodologies for corrosion research. My work at Bell Laboratories and at the University of Minnesota has given me a wide spectrum of experience in which I have solved many problems and developed new techniques for evaluation of new materials, products, and devices. I have studied biomedical, metallic and electronic materials. My research has utilized and I am experienced in electrochemistry, surface analysis, and materials science. I have built computerized measurement systems that have been important tools in my research.

ADDITIONAL QUALIFICATIONS

- To continue my scientific career and to enhance my research experience, I do collaborative studies with research groups outside of Bell Laboratories, applying the novel imaging technique, near-field scanning optical microscopy (which I developed with Prof. William H. Smyrl at the University of Minnesota), to biomedical applications.

One of the projects (with Prof. Kathryn Uhrich at Rutgers University) is to stimulate and direct the *in-situ* growth of neurons (near-term) and then to accurately control neuronal outgrowth (long-term). The main objective of this ongoing research project is the development of a methodology to grow neurons on implantable substrates in a controlled environment. My main contribution is to perform a direct, non-destructive evaluation of neuron growth with my modified Near-Field Scanning Optical Microscope (NSOM). At the present time we are studying the performance of proteins that enable us to pattern neurons and control and direct their growth. The first part of our recent studies has been published in the Journal Langmuir.

The second project (with Dr. Juan Cauich at CICY, Mexico) is related to the investigation of biocompatibility on polymers that are used for hip replacements. We have been using *in-situ* NSOM to study calcium deposition on these new materials when they are exposed to Simulated Body Fluid (SBF). In the same project, we are currently studying the corrosion properties of commercial alloys (stainless steels and Ti) coated with some of these materials (using different techniques).

- I routinely attend and present papers at national and international conferences (ECS, NACE and ICC), collaborate with local universities and research institutes, and publish scientific papers. I also have served as a referee for international journals such as Journal of the Electrochemical Society, Corrosion Science, Journal of the American Chemical Society, and Journal of Materials Science.

PROFESSIONAL SKILLS

- Surface analysis using SEM, AES and XPS.
- *In-situ* scanning probe techniques using AFM, STM, CLSM, SECM, PEM, MFM and NSOM.
- Experience working with biomedical materials and living cells.
- Application of novel imaging techniques to the characterization of surfaces under liquids in different environments.
- Experience working in controlled environments: inert, dry and clean rooms.
- Experience with fiber optic, piezoelectric, thin films, vacuum systems, and laser technology.
- Strong mechanical, computer, mathematical and organizational skills.
- Interfacing and adapting available equipment to computers and controllers.
- Ability to work as either a team leader or member.