

The Job of a Department of Defense Scientist

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Research Scientists at Department of Defense laboratories find themselves with several different responsibilities. While part of their duties includes solving short-term problems that arise in the fleet, they are also required to act as entrepreneurs, writing proposals to a wide variety of agencies to fund their research. Additionally, Research Scientists often find themselves working with defense contractors, evaluating program performance as well as proposals for future research. This presentation will give insights into the proposal evaluation process as well as the other roles of research scientists in Department of Defense laboratories.

Tailoring Chemical Structure and Morphology of Electroactive Polymers

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Electroactive polymers change their properties in the presence of an electric field. The changes are typically reversible, making these polymers potentially useful in a wide range of applications, including alternative energy, actuators, electrochromics, sensors, and biomedical therapeutic agents. Enhancement of performance and long term stability can be achieved by modifying the chemical structure of the polymer, modifying polymer porosity, or modifying the electrolyte used in the electrochemical cell. Our efforts to improve performance will be discussed.

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Dr. Jennifer Irvin is an Associate Professor in the Department of Chemistry & Biochemistry at Texas State University. Her research focuses on electroactive polymers, that is, polymers that change their properties in the presence of an electric field. Projects include synthesis of novel n-doping polymers with enhanced stability, using electroactive polymers to develop energy storage devices as alternatives to traditional batteries and capacitors, using electroactive polymers to detect and treat cancer, using templating approaches to enhance electroactivity, and preparing, modifying, and characterizing metal nanoparticles. Funding sources have included the National Science Foundation, the US Army, the US Air Force, the US Navy, the Department of Energy, NASA, the Research Corporation for Scientific Advancement, the Petroleum Research Fund, and the Norman Hackerman Advanced Research Program. Dr. Irvin received a Ph.D. in Organic Chemistry from the University of Florida under the guidance of John R. Reynolds prior to spending two years as a post-doctoral fellow at Sandia National Laboratories. Dr. Irvin then spent eight years as a Research Chemist and Head of Analytical Chemistry in the Chemistry and Materials Division of the Naval Air Warfare Center Weapons Division (NAWCWD) in China Lake, CA. In 2008 Dr. Irvin joined the faculty at Texas State University as an Assistant Professor; she was promoted to Associate Professor in 2014. Dr. Irvin has more than 30 publications, 16 patents issued, and over 70 technical presentations. She is a member of the American Chemical Society.