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MSEC SEMINAR AND COMMERCIALIZATION FORUM



INVITED SPEAKER:

**DR. CAROL ELLIS-TERRELL**

“RESEARCH AT A NON-PROFIT R&D ORGANIZATION AND LIFE AFTER TEXAS STATE”

**To attend contact MSEC Staff for Zoom link/passcode**

**November 13<sup>th</sup>, 2020**  
**1:30 – 3:00 PM**

**Abstract:**

This presentation will discuss Southwest Research Institute's (SwRI<sup>®</sup>) position in the independent non-profit research and development realm and highlight some of the latest technology that is being developed at SwRI. During Dr. Ellis-Terrell's tenure at SwRI, she successfully developed a superhydrophobic coating to reduce drag on the leading edge of legacy aircraft for the Air Force. She transitioned the basis of the coating technology to the energy sector designing robust omniphobic coatings to generate high-quality catalysts. Lastly, Dr. Ellis-Terrell will discuss the changes in her career since obtaining her Ph.D.

**Biography:**

Dr. Carol A. Ellis-Terrell received her Bachelor's degree in Chemistry Pre-Med from Xavier University in Louisiana. While she enjoyed her time in New Orleans, Louisiana, Hurricane Katrina's harsh winds blew her back to San Antonio. After finishing her Bachelor's degree a few months early, her focus progressed into the field of pharmaceutical research, and she joined Dr. Edward Tienkink's Research Group at the University of Texas at San Antonio (UTSA). She spent her years at UTSA studying the co-crystallization of thioamides, also known as active pharmaceutical ingredients (API), with bipyridine-type molecules. An essential technique used to confirm these molecules' crystalline purity was powder X-ray diffraction (PXRD). She teamed up with Southwest Research Institute (SwRI<sup>®</sup>) to perform PXRD analysis. Her collaboration

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with SwRI led to a graduate internship, where she played a critical role in measuring the hydrogen uptake in potential storage materials for the Department of Energy (DOE).

Dr. Ellis-Terrell's critical thinking skills, attention to detail, and desire to learn garnered her a full-time position in the Surface Engineering and Materials Chemistry group at SwRI. Over the next couple of years at SwRI, she gained experience in synthesizing and testing new materials using both wet and plasma chemistry for a wide range of applications, from battery technology to offshore drilling. Her involvement with developing a superhydrophobic coating to keep offshore drilling pipes from being clogged guided her back to the medical field. She postulated if this coating can descale large drilling pipes, why couldn't it work for tiny tubular stents. Thus, her doctoral research began.

While working toward her degree, Dr. Ellis-Terrell maintained her position at SwRI. She continued to build her expertise, engineering, and testing robust superhydrophobic, superoleophobic, and iceophobic surfaces for the aerospace, food, oil & gas, and energy industries. In May 2020, She earned her PhD at Texas State University in the Material Science Engineering and Commercialization Program, where she worked under the supervision of Dr. Tania Betancourt. Her research focused on using plasma chemistry to modulate cell-interaction on stainless steel surfaces. She is now looking to transfer the plasma technology to other biomedical applications.

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