



Society for Analytical Chemists of Pittsburgh  
Spectroscopy Society of Pittsburgh



April Meeting  
Former SACP/SSP Chair Night  
Wednesday, April 10, 2019



DUQUESNE  
UNIVERSITY



in Pittsburgh

5:30 PM Social Hour — Power Center Ballroom  
5:30 PM SSP Technology Forum – Power Center Ballroom  
6:30 PM Dinner – Power Center Ballroom  
Post Dinner Student Affiliate Meeting – Shepperson Suite  
7:45 PM Business Meeting – Power Center Ballroom  
8:00 PM Technical Program – Power Center Ballroom

Deadline for Dinner Reservations: **Thursday, April 4, 2019 by NOON**

**SACP TECHNICAL PROGRAM**

Robbyn Anand,

“Direct Detection of Inflammatory Markers in Tear Fluid in a Paper Strip by Electrochemical ELISA Following Electrokinetic Pre-Enrichment”



Sjögren's syndrome (SS) is a connective tissue disease that primarily impacts the exocrine glands (esp. lacrimal (tear) and salivary glands). This autoimmune disease may also have extraglandular involvement that leads to excessive fatigue and carries the potential for organ damage. Dryness resulting from damage to moisture producing glands can be quantified in the clinic via the assessment of the production rate of tears or saliva. However, diagnosis depends on the positive identification of an underlying inflammatory cause indicated by the presence of autoantibodies in the blood or foci of leukocyte infiltrates in biopsied salivary tissue. Due to a high false negative rate for these tests and a lack of physician awareness of this condition, the average time to diagnosis is 6 years. The concentration of inflammatory proteins in tear fluid may provide an independent indication of autoimmune etiology, and therefore, the analysis of this fluid has the potential to decrease the difficulty of diagnosis. Our research seeks to integrate electrochemical ELISA with an additional electrokinetic pre-enrichment in a paper strip to provide sufficient signal enhancement to reach a relevant limit of quantitation for the assessment of inflammatory proteins in tears. Enrichment will be

achieved by ion concentration polarization, with an expected 10- to 100-fold enhancement. We present initial progress towards this goal - namely, the electrochemical detection of an enriched analyte in a paper-based device.

**BIOGRAPHY:**

Robbyn K. Anand is an Assistant Professor in the Department of Chemistry at Iowa State University. She earned her Ph.D. in 2010 from the University of Texas at Austin under the guidance of Prof. Richard M. Crooks with the support of an NSF Graduate Research Fellowship. She developed microfluidic devices employing bipolar electrodes for electrokinetic focusing of charged species and membrane-free seawater desalination. Then, as an NIH Postdoctoral Fellow, she worked with Prof. Daniel T. Chiu at the University of Washington on the capture and analysis of circulating tumor cells. During that time, she also pioneered a technique for dielectrophoretic manipulation of biological cells using electric field gradients extended by the manipulation of local ionic strength. Research in the Anand group is focused on the development of electrokinetic, microfluidic, and electrochemical approaches to address critical needs in human health. Robbyn has also founded the Midwest Women Chemists Retreat, an annual event aimed at the retention and advancement of women in the chemical enterprise. Robbyn is the recipient of the Society of Analytical Chemists of Pittsburgh Starter Grant, a National Science Foundation CAREER Award, and a Cottrell Scholars Award.

## SSP TECHNOLOGY FORUM

### Paul Glass, PhD VP Engineering nanoGripteck, Inc. “Gecko-inspired Adhesives”

Geckos' ability to climb up walls and across ceilings is due to their millions of micro/nano foot-hairs, which interact through intermolecular attractions at the interface between these hairs and an underlying substrate, and not through tacky or oily secretions. Culminating in ten years of research, nanoGripteck has developed proprietary methods to produce glue-free, reusable, synthetic gecko-inspired microfiber adhesives for a wide range of applications. These materials can be integrated into products with excellent adhesive, fastening, or gripping properties due to their ability to repeatedly and reversibly attach to a wide range of surfaces with high and controllable strength while leaving no residue. In this lecture, the principals of adhesion of different biological systems will be described, as well as methods of manufacture of synthetic biomaterials and pathways toward commercialization of these systems.



**BIOGRAPHY:** Paul Glass is the Vice President of Engineering at nanoGripteck, Inc., a Pittsburgh-based company which is the global leader in the commercialization of gecko-inspired materials. He has a Bachelor's degree in Mechanical Engineering from McGill University in Montreal, and a PhD in Biomedical Engineering from Carnegie Mellon University. Dr. Glass leads nanoGripteck's manufacturing and R&D teams; in this capacity he has led state and federally-funded initiatives from the Department of Defense, National Science Foundation, NASA, and the Pennsylvania

NanoMaterials Commercialization Center, and has developed and patented several innovative methods to mass-produce novel micro-structured surfaces for a range of commercial products including for the semiconductor, automotive, apparel, and medical industries. His research has been published in a number of academic journals and he holds several patents in this field. Dr. Glass has lectured on entrepreneurship at Carnegie Mellon University and the University of Pittsburgh and is a strong advocate for developing the regional economy through innovation.

**DINNER RESERVATIONS:** Please complete the **Online Dinner Reservation Form** **NO LATER THAN Thursday, April 4, 2019 at NOON**. The form is also located under the Meeting Notice on website [www.sacp.org](http://www.sacp.org). & [www.ssp-pgh.org](http://www.ssp-pgh.org). Should you not be able to access the form, please call 412-825-3220, ext 208 the SACP & SSP Administrative Assistant to make your dinner reservation.

The entrée choices for April: **Lobster Romano OR Stuffed Zucchini with Artichokes, Red Pepper & Goat Cheese.**

Please let us know if you have any dietary restrictions. Dinner will cost \$10 (\$5 for undergraduate students). Checks can be made payable to the SACP.

**PARKING:** Duquesne University Parking Garage entrance is on Forbes Avenue. Upon entering the garage, you will need to get a parking ticket and drive to upper floors. Bring your parking ticket to the dinner or meeting for a validation ticket. Should any difficulties arise, please contact Duquesne University.