

UCSD NANOENGINEERING/CHEMICAL ENGINEERING  
**SEMINAR SERIES**

Wednesday, November 20, 2019

Seminar Presentation: 11:00am - 12:00pm

**SME room 248***“Nanoscale glycomaterials for tailoring glycan interactions at the cell-matrix interface”***Kamil Godula Ph.D.**

*Associate Professor Chemistry, Vice Chair of the Synthesis, Materials and Chemical Biology Section of the Department of Chemistry and Biochemistry and the Associate Director of the Glycobiology Research and Training Center at UC San Diego*

**Abstract:** Glycans (also known as carbohydrates, saccharides or, simply, sugars) are among the most intriguing carriers of biological information in living systems.

The structures of glycans not only convey the cells' physiological state, but also regulate cellular communication and responses by engaging receptors on neighboring cells and in the extracellular matrix. Despite their structural complexity, individual glycans rarely engage their protein partners with high affinity. Yet, glycans modulate biological processes with exquisite selectivity and specificity. To correctly evaluate glycan interactions and their biological consequences, one needs to look beyond individual glycan structures and consider the entirety of the cell-surface landscape and nanoscale organization. There, glycans are presented on protein scaffolds, or are linked directly to membrane lipids, forming a complex, hierarchically organized network with specialized functions, called the glycocalyx. Our research program focuses on the development of nanoscale glycomaterials, which can mimic the various components of the glycocalyx, together with chemical methods for cell surface engineering to reveal how the presentation of glycans within the glycocalyx can influence their biological functions. In my presentation, I will describe our recent efforts in this area, placing emphasis on the applications of glycomaterials to provide new insights into the mechanisms through which glycans mediate cellular differentiation and host-pathogen interactions.

**Biosketch:** Kamil Godula is an Associate Professor Chemistry, Vice Chair of the Synthesis, Materials and Chemical Biology Section of the Department of Chemistry and Biochemistry and the Associate Director of the Glycobiology Research and Training Center at UC San Diego. Born and raised in the Czech Republic, he earned his MSc in organic chemistry with William A. Donaldson at Marquette University and his PhD with Dalibor Sames at Columbia University in the area of C-H bond activation. He trained as a postdoctoral fellow with Carolyn Bertozzi at UC Berkeley in chemical glycobiology and nanomaterials. Since 2013, he has led his own research lab at UC San Diego focused on developing carbohydrate-based nanomaterials for glycomics platforms and chemical approaches for tailoring glycan interactions at cellular boundaries. Prof. Godula is actively engaged in the development of educational programs in glycoscience at the Glycobiology Research and Training Center at UC San Diego, 16 and is a National Coordinator for the newly established NIH National Consortium for Career Development in Glycoscience. He is the recipient of the 2011 NIH Pathway to Independence Award and the 2015 NIH Director's New Innovator Award. He has been named the Alfred P. Sloan Fellow, Cottrell Scholar, New Investigator by the ACS Division of Polymeric Materials: Science and Engineering and the ACS Division of Organic Chemistry, and 2018 Scialog Fellow, and the Gordon and Betty Moore Foundation grantee.