

JANUARY 22, 2021

# BME ANNOUNCEMENTS

Newsletter to the Undergraduate Students

## IMPORTANT DATES:

Final Day to Drop a  
Winter Course

**FEB. 19TH**

Spring Courses Viewable  
in CAESAR

**FEB. 24TH**

Registration for Spring  
Opens

**MARCH 8TH**

Winter Courses End

**MARCH 13TH**



*"Would you worry less about your relationship if I told you we're  
about to get hit by a giant asteroid?"*

## Contents:

BME Weekly Seminar Series.....[Page 2](#)

Northwestern STEM Career Fair 2021.....[Page 3](#)

Apply to be a Peer Advisor.....[Page 4](#)

Brazen Quick Guide for Students.....[Pages 5-6](#)

Rising Stars of SQL Lecture.....[Pages 7-8](#)

List of Career Development Virtual Events.....[Page 8](#)



# Matthew G. Perich, PhD

Postdoctoral Fellow |  
Dept of Neuroscience,  
Icahn School of Medicine  
at Mount Sinai

Behaviors such as navigation, running, and manipulating objects rely on continuous influx of sensory information about the body and the environment. Integrating behavior signals and sensory feedback requires the coordinated activity of numerous anatomically and functionally distinct brain regions. In my talk, I will explore how interactions between brain regions shape the activity of cortical populations. I will first present a series of experiments studying populations of neurons in two interacting brain regions - primary motor (M1) and somatosensory (S1) cortex - of macaque monkeys. While M1 is known to utilize somatic feedback from sensory regions such as S1 to accurately reach and manipulate objects, existing models of cortical dynamics have largely treated M1 activity as a feedforward generator of movement. I will present a new model of M1 dynamics where activity is shaped both by motor commands and sensory feedback. I will provide evidence that a “communication subspace” linking M1 and S1 enables sensory feedback to coexist with ongoing M1 dynamics to enable correction of behavioral errors. Next, I will expand beyond the interactions between two brain regions and introduce Current-Based Decomposition (CURBD), a new approach to infer brain-wide interactions by leveraging data-constrained recurrent neural network models. While many existing methods model the outputs of neurons (e.g., action potentials), CURBD provides an unprecedented view into brain-wide interactions by reconceptualizing population activity in terms of the inputs driving each neuron. Using large-scale calcium imaging of four regions of mouse cortex, I will demonstrate how CURBD can untangle movement-related information from strongly sensory regions like primary visual cortex. Together, these two studies emphasize how models of multi-region interactions can yield new insights into how the brain generates behavior.

## BME Weekly Seminar Series:

Thursday, Jan. 28th  
4:15-5:15 PM

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## "Interactions between distinct brain regions shape cortical population dynamics"

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Zoom Meeting ID:  
944 7858 9441

Password:  
422515

# NORTHWESTERN STEM CAREER FAIR 2021

*The career fair is for science, technology, engineering, and math students (undergrads and graduate) who are looking for internships, co-op, or full-time opportunities.*

**JANUARY 28, 2021  
12:30 PM - 4:00 PM, CST  
HOSTED ON BRAZEN**

**REGISTER HERE:  
[HTTPS://BIT.LY/NORTHWESTERNSTEM](https://bit.ly/northwesternstem)**

## Companies Attending Include:

ARCO | Asahi Kasei Bioprocess | Cardinal Intellectual Property, Inc. | Cboe  
Global Markets | Deloitte | Design Science Consulting, Inc. | Epic | Esri |  
Guidewire Software | Hanley, Flight & Zimmerman LLC | Institute for  
Defense Analyses | J.B. Hunt Transport Services | Johnson & Johnson |  
Optiver | SMS Assist | Soar Technology | SpiderRock Platform | The  
Chamberlain Group | TIBCO | U.S. Navy | Webb deVlam/Marks



## Apply to be a McCormick Peer Adviser!

Calling McCormick students — the application for 2021 Peer Advisers is now open! This is a phenomenal chance to grow as a leader and person, join a community, and, most importantly, support new students. We have an opportunity to welcome the next MEAS class with open arms and introduce them to this school and the wider NU community with care, empathy, and support.

**Applications are due Monday, January 25**, and applicants must have attended one info session.

[Click here for the application link and more information about the role.](#)



Info sessions are great spaces to learn about what we have planned and what the role might look like for 2021 if you're on the fence. A panel is also included for some Q&A with those who have served as a PA in the past. Here are the remaining dates (with Zoom links)!

- [Wednesday, January 20 @ 7 p.m.](#)
- [Friday, January 22 @ 5 p.m.](#)
- [Sunday, January 24 @ 7 p.m.](#)

If you have any questions or concerns, don't hesitate to contact the Wildcat Welcome Board Director for McCormick: alexandragomez2022@u.northwestern.edu



# **Brazen Quick Guide for Students**

Northwestern STEM Career Fair 2021

Thursday, January 28 ~ 12:30 pm - 4:00 pm CST

## **Get Started:**

### **1) Test Accessibility of Your Device with Brazen**

- Please [test your video/audio before the event](#).
- Google Chrome is Brazen's preferred browser because it updates automatically. Have a backup browser ready to go and make sure you are running the most up to date version.
- Ensure your camera is enabled on your browser so that you can video chat with employers.
- Disable your pop-up blocker so that the video is not blocked.
- Close all other apps: You should not have other streaming services connected (music, other video apps such as Zoom, Microsoft Teams, Google Hangouts, etc.)
- Minimal, if any, other tabs open to reserve your internet bandwidth and computer capabilities for this event.
- Utilize headphones if you have them.

### **2) Before Attending the Event**

- Take a virtual tour of [what to expect inside a Brazen event](#) and [joining video/audio chats](#) to be prepared. Chats will be timed at 10 minute intervals, so conversations will go by quickly.
- Prepare your physical space. Ensure your location is well-lit and free of distractions. Putting a lamp in front of you will brighten your face.
- Note that Brazen does not support virtual backgrounds.
- Research participating employers you are interested in speaking to and create a target list. When you visit each booth, make sure you check each tab for additional information.

### 3). Managing Your Chats

When you enter the event, your chat availability is automatically set to “available” when the event begins. However, in order to accept chats, you must still get in line in a specific booth of your choice. You may toggle your status to “Away” at any time during the event to stop receiving chats from any booths you may be in line for.

- You will hear an audible “ping” notification when it is your turn to chat with a representative and will be automatically taken to the chat screen. Note: Please make sure to respond to the chat invitation promptly, as the chat will time out if the invitation is not accepted in a timely manner.
- You will chat directly with a representative while on this page. You may be asked to enable video/audio, so please be ready to be on video.
- The chat time limit is 10 minutes, and a timer will count down on the screen. Once the 10 minutes are over, the chat will automatically end unless the employer extends the conversation time. Note: It is important to keep an eye on your chat connectivity and the time left in your conversation. Bad connectivity could affect your ability to chat.
- If you need to step away, change your status to away so you do not miss any chat invitations.
- If a booth has multiple reps, you will not be able to choose a rep to talk to because you are automatically assigned to the rep who is available next. You can drop a note in the booth if you would like to reach out to a specific rep.
- You will be taken to a chat conclusion page when your conversation has ended. This is optional. Click the “Finish” button to return to the Event Lobby.

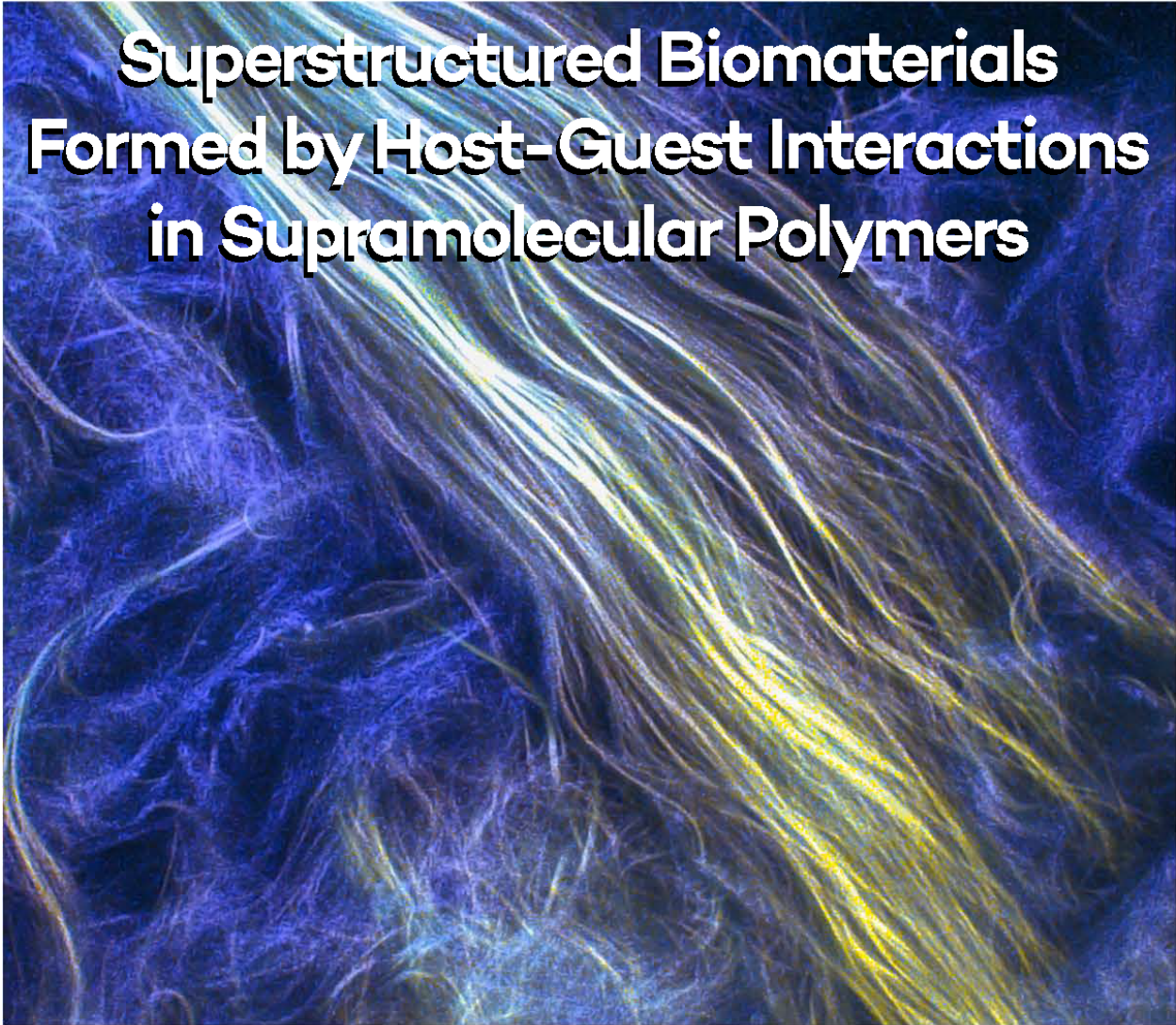
If you have any questions or concerns about the event, please contact Northwestern Engineering Career Development at [ecd@northwestern.edu](mailto:ecd@northwestern.edu).

# Rising Stars of SQL

Lecture Sponsored by the Peptide Synthesis Core & ANTEC

**Tristan Clemons, PhD**

Samuel Stupp Laboratory

A microscopic image showing a dense network of fine, fibrous structures. The fibers are primarily blue and purple, with some bright yellow and green highlights, suggesting a complex, interconnected network of biomaterials.

## Superstructured Biomaterials Formed by Host-Guest Interactions in Supramolecular Polymers

**Thursday, February 4, 2021**

**2-3 p.m. CST**

**Register here for Zoom Webinar link:**

[https://northwestern.zoom.us/webinar/register/9616101285198/WN\\_riVQ0jvTSFWbFCnzb7y-w](https://northwestern.zoom.us/webinar/register/9616101285198/WN_riVQ0jvTSFWbFCnzb7y-w)



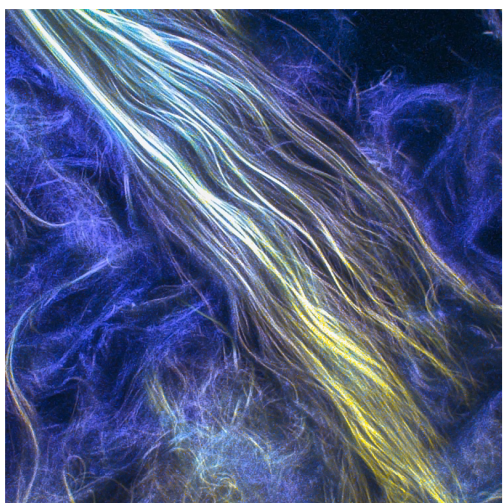
# Superstructured Biomaterials Formed by Host-Guest Interactions in Supramolecular Polymers

Tristan Clemons, PhD

Simpson Querrey Institute, Northwestern University, Evanston, Illinois 60208, USA

## Abstract

Reversible hierarchical self-assembly of molecules has been harnessed by living systems to control the formation of structures such as protein assemblies, cellular membranes, and cytoskeletal filaments, along with many others. By controlling multiple orthogonal interactions between molecules, we design supramolecular systems that mimic these reversible hierarchical processes. I will present on a supramolecular system in which exchange dynamics and host-guest interactions between  $\beta$ -cyclodextrin- and adamantane-functionalized peptide amphiphiles led to reversible superstructure formation. The host-guest interaction between the  $\beta$ -cyclodextrin and adamantane



resulted in the generation of bundled nanoribbons to create a mechanically robust hydrogel with a highly porous architecture suitable for 3D printing. Functionalization of the porous superstructured material with a biological signal results in a matrix with enhanced neuronal infiltration and significant *in vitro* bioactivity. These reversible, hierarchical, and bioactive superstructures overcome the challenges of printing sensitive cell types while allowing the fabrication of complex brain tissue-like architectures. The combined benefits of bioactive chemical signaling and hierarchical superstructure formation, coupled with the ability to print self-supporting cell-laden hydrogels, make this an exciting biomaterial for tissue regeneration applications.

## Biography

Dr. Tristan Clemons completed his PhD studies in 2014 at the University of Western Australia. He



then received a Peter Doherty Australian Biomedical Research Fellowship from the National Health and Medical Research Council of Australia to investigate nanomaterials for wound healing and scar treatments following burn injuries. Tristan relocated in 2018 to join the laboratory of Prof. Samuel Stupp at Northwestern University as a postdoctoral research fellow. Tristan has won a number of awards including the Exxon Mobil Western Australia Student Scientist of the Year for his PhD work and a Western Australia Young Tall Poppy Science Award from the Australian Institute of Policy and Science. He was also acknowledged in 2018 as a CAS SciFinder Future Leader of Chemistry.





Northwestern | McCormick School of  
ENGINEERING  
Career Development

# Engineering Career Development Winter Virtual Events

January 15th (3:00pm - 3:30pm)

Hot Topic Friday: Job Search Strategies and Tips

January 20th (4:00pm - 5:00pm)

Virtual Industry Panel: Successful Virtual Interview Tips

January 25th (4:00pm - 5:00pm)

Career Fair Prep Workshop

January 28th (12:30pm - 4:00pm)

Northwestern STEM Career Fair 2021 (formerly Tech Expo)

February 5th (3:00pm - 3:30pm)

Hot Topic Friday: Insights to Coding  
Assessments/Interviews

February 10th (4:00pm - 5:00pm)

Virtual Industry Panel (VIP): What to Know About Job  
Offers and Negotiating

February 13th (10:00am - 1:00pm)

Civil and Environmental Engineering Career Fair 2021

## Virtual Walk-In Hours

Start the week of  
Jan. 20th  
on Wednesdays &  
Thursdays from  
1:00-4:00 pm

Our office is located in the Ford Design Building  
on the 1st floor, suite 1-200  
Questions? Call 847- 491-3366 or email  
[ecd@northwestern.edu](mailto:ecd@northwestern.edu)