

Center for Research and Training in the Sciences (UTSA) ,  
Institute for Integration of Medicine & Science (UTHSA) ,  
Translational Science Graduate Program , &  
UTSA-UTHSA Joint Graduate Program in Biomedical Engineering  
invite you to attend

# STRECH



Seminars in Translational Research

## Presents

### *Supramolecular Biomaterials Enabling Innovations in Cell and Drug Delivery*

Supramolecular biomaterials exhibit highly useful properties that are impossible with traditional materials but crucial for a wide variety of emerging applications in industry or biomedicine. These materials typically employ enthalpy-dominated crosslinking interactions that become more dynamic at elevated temperatures, leading to significant softening. Herein, we all will discuss the development of a supramolecular hydrogel platform exploiting dynamic and multivalent interactions between biopolymers and nanoparticles that are strongly entropically driven, providing alternative temperature dependencies than typical for materials of this type. We will discuss the implications of these crosslinking thermodynamics and kinetics of these crosslinking interactions enable broad modulation of the mechanical properties of these materials, including their shear-dependent viscosities, temperature responsiveness, self-healing, and cargo encapsulation and controlled release. These materials exhibit viscous flow under sheer stress (sheer-thinning) and rapid recovery of mechanical properties when the applied stress is relaxed (self-healing), affording facile processing though direct injection or spraying approaches, making them well served for applications in industry and biomedicine. This talk will illustrate our recent efforts exploiting dynamic and multivalent interactions between polymers and nanoparticles to generate hydrogel materials exhibiting properties not previously observed in biomaterials and affording unique opportunities in industry and biomedicine.



**Eric A. Appel**

*Associate Professor,  
Materials Science & Engineering  
Stanford University California*



**Friday, January 24, 2025**

**Virtually from 9:00 AM - 10:00 AM**

For information on participating in the current monthly seminar. Please head to <https://klesse.utsa.edu/bmce/strech/> or scan the QR code below.



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