CMCC Mechanochemistry Discussions

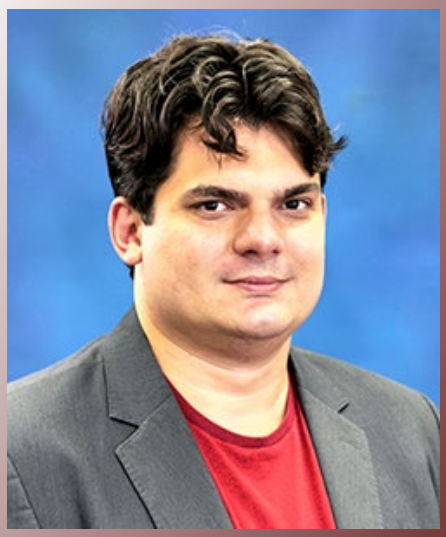
Online Seminar Series

Unbreakable Bonds: The Role of Catch-Bonds in Pathogenic Bacterial Infections

Livestreaming at 10:00 AM (CT)

THURS., January 18, 2024

on the CMCC YouTube Channel:
https://www.youtube.com/channel/UC7eCYPKbGTKpgO7W2bNABxg



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ABSTRACT:

Exploring the resilience of bacterial adhesins, our research reveals how Staphylococcus epidermidis utilizes catch-bonds to withstand extreme forces. Using molecular dynamics simulations combined with single-molecule experiments, we demonstrate that the adhesin/peptide complex, a key factor in bacterial infections, exhibits force resilience rivaling covalent bonds. Our findings show that under mechanical stress, these complexes dissociate through a unique pathway, distinct from thermal dissociation. This discovery, pivotal in understanding bacterial adherence, suggests new antimicrobial strategies targeting these adhesins. Our work not only advances biomechanics, but also contributes to the fight against rising antibiotic resistance.

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