CCBM
NSF-CREST
CENTER FOR CELLULAR AND BIOMOLECULAR MACHINES

The NSF-CREST Center for Cellular and Biomolecular Machines (CCBM) was established with a $5 million Centers of Research Excellence in Science and Technology (CREST) grant in 2016 from the National Science Foundation (NSF). The CCBM brings together more than 30 faculty members from multiple units across campus, including bioengineering, physics, chemistry and chemical biology, biomaterials science and engineering, cell and molecular biology, and applied mathematics. The center received an additional $5 million in 2021 for another 5 years of funding. Researchers are studying how biological matter like proteins or cells come together to perform specific tasks, in hopes of eventually being able to engineer and develop innovations ranging from designer cells and tissue to novel diagnostic and therapeutic devices. The CCBM also hosts an integrated, interdisciplinary training program for graduate students that emphasizes physical and biological components, research and training experiences for undergraduate and high school students to enhance the recruitment of underrepresented groups into STEM research, and outreach experiences for the local community and beyond.

Hosted by the NSF-CREST Center for Cellular and Biomolecular Machines
and the Bioengineering Department at the University of California, Merced

"Dynamic Autoinhibition as a Mechanism for Proteins to Rapidly Locate Targets"

Friday, May 13, 2022
1:00-2:00 pm
GRAN 135

Prof. Junji Iwahara
Department of Biochemistry & Molecular Biology
University of Texas Medical Branch

Abstract:
The molecular switch involving autoinhibition is crucial for some proteins that must become active only when the cells receive particular stimuli. However, the role of autoinhibition is unclear for many other proteins whose autoinhibition appears constitutive. Based on our biophysical data, we propose that autoinhibition may help proteins accelerate association with relatively scarce targets, avoiding distractions of numerous nonfunctional target-analogues (i.e., 'decoys'). We show this effect for the HMGB1 protein, which undergoes dynamic autoinhibition via intrinsically disordered regions. We also demonstrate that the autoinhibition-assisted acceleration of protein-target association can be artificially implemented in other systems through protein engineering.

Bio:
Junji Iwahara is a Professor of Department of Biochemistry & Molecular Biology at the University of Texas Medical Branch. He received his Ph.D. degree in Biochemistry and Biophysics from the University of Tokyo in 1998. He conducted postdoctoral research at the University of California, Los Angeles (1998-2002) and at the National Institutes of Health (2002-2006). He started his laboratory at the University of Texas Medical Branch in 2007. His research area is biophysical chemistry of protein-DNA interactions.

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