



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 ~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 recruitment into STEM research, and outreach experiences for the local community and beyond.

Science for Humanity Series / COSMOS Distinguished Speaker Series

Beyond the Protein Shake: The Tiny Machines That Run Your Body

*Meet the molecular workforce
behind every heartbeat, thought, and breath*

Victor Muñoz, Ph.D.

University of California, Merced

Wednesday, July 15, 2026 | 2:00-3:30 pm

UC Merced Conference Center



When you hear the word “protein,” you probably picture a tub of powder on a gym shelf. But that’s a little like calling the internet “a thing that sends emails.” The truth is far more intriguing and wondrous: inside every cell of your body are millions of machines too small to see even with a microscope, working without rest to keep you alive. These are proteins—and they are nature’s masterful workforce. They defend you from invaders, ferry oxygen through your blood, fire the signals behind every thought, and run the chemistry of life millions of times faster than it could happen on its own. What makes them work is a beautiful secret of the very small: at their scale, everything jiggles and shakes, and proteins don’t fight that chaos—they harness it, flexing, grabbing, and assembling themselves into tiny engines powered by chemical fuel. Join us for a journey into the hidden machinery of being alive. No need to be a science jock—just curious. By the end, you’ll never look at a protein shake the same way again.

About the speaker

Victor Muñoz has spent his career getting to know proteins up close—how they fold, how they grab their partners, and how they pull off the astonishing jobs that keep us alive. Today he is a Professor of Bioengineering at the University of California, Merced, and Co-Director of the NSF Center for Cellular and Biomolecular Machines, where he and his team don’t just study nature’s tiny machines; they learn to build new ones, designing proteins into biosensors and smart therapies that could one day help detect and treat infectious and neurodegenerative diseases. His path to Merced crossed three countries: a Ph.D. at Europe’s renowned EMBL in Heidelberg, postdoctoral training at the U.S. National Institutes of Health, and faculty posts at the University of Maryland and Spain’s National Research Council (CSIC). Along the way he was named a Packard Fellow and a Searle Scholar and elected to the European Molecular Biology Organization—distinctions reserved for scientists helping shape their fields.

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