Chemical & Biomolecular Seminar Series

Chase Beisel

Assistant Professor

Chemical & Biomolecular Engineering

North Carolina State University

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10:00—11:00 a.m.

102 Colburn Lab

Chase Beisel is an Assistant Professor in the Department of Chemical and Biomolecular Engineering at North Carolina State University. He received his Ph.D. in Chemical Engineering from the California Institute of Technology and he completed a Postdoctoral Fellowship at the National Institutes of Health. Beisel's independent research program at North Carolina State University has focused on understanding CRISPR-Cas immune systems and exploiting these systems as versatile tools for genome engineering and programmable antimicrobials. His research accomplishments have garnered multiple awards, including the NIH Maximizing Investigator's Research Award, the NSF CAREER Award, the Camille Dreyfus Teacher-Scholar Award, and the Bay Area Lyme Foundation Emerging Leader Award.

The CRISPR Revolution

CRISPR has become synonymous with disruptive genome-editing technologies that are revolutionizing basic research, biotechnology, medicine, and agriculture. One critical aspect of CRISPR often overlooked in this fanfare is that it was not invented; instead, CRISPR is naturally part of adaptive immune systems in bacteria and archaea called CRISPR-Cas systems. These systems have proven remarkably diverse and stand in stark contrast to small handful of proteins currently used as technologies. In this talk, I will describe the unique properties of CRISPR-Cas systems and how these properties directly lend to genome editing and many other uses. I will also describe my group's ongoing efforts to explore the functional diversity of these systems and how they can be harnessed for applications in bacterial strain engineering and programmable-spectrum antimicrobials. Through these advances, we aim to understand the functional diversity of these versatile immune systems and further advance the reach and impact of the ensuing revolutionary technologies.