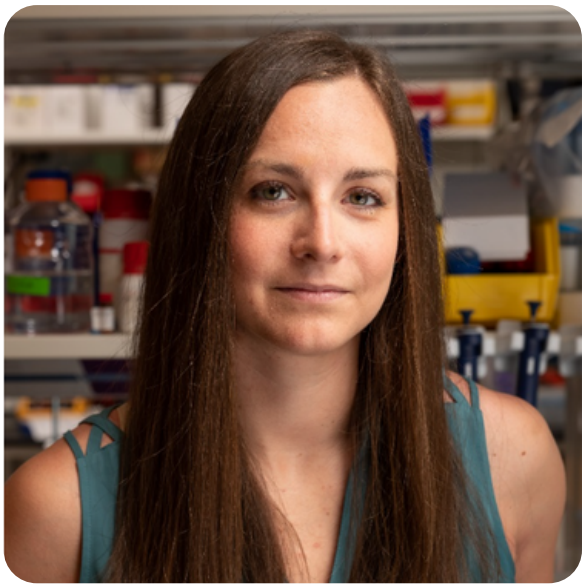
Penn Engineering
University of Pennsylvania
Chemical and Biomolecular Engineering

Spring 2023 Seminar Series

LISA VOLPATTI

"Engineering Drug Delivery Platforms to Modulate Immunity"

Wednesday
February 1, 2023
3:30 PM
Wu and Chen Auditorium
Levine Hall



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ABSTRACT

The immune system is crucial to our ability to fight disease such as viruses and cancer. However, its overactivation can also drive certain pathologies, for example as a result of chronic inflammation. Therefore, modulating immunity in specific contexts is critical to improving human health, and directing the immune response against a specific protein, cell type, or tissue may reduce off-target side effects associated with systemic immune modulation. In this seminar, I will discuss the application of molecular engineering approaches to the development of novel vaccines, cancer immunotherapies, and anti-inflammatory therapies. First, I will discuss how engineering nanoparticle vaccines to mimic the physical characteristics of virus particles enhances immunity against SARS-CoV-2. Second, I will discuss how inducing mutations in cancer cells on the level of RNA improves the responsiveness of tumors to immune checkpoint inhibitors. Third, I will discuss how targeting anti-inflammatory cytokines to specific sites of vascular inflammation results in local immunosuppression in the context of atherosclerosis. These examples highlight the need for applying chemical engineering principles to the development of safe and effective immunotherapies.

BIO

Lisa Volpatti is an American Heart Association Postdoctoral Fellow in the Hubbell Lab at the University of Chicago, where she engineers proteins to modulate the immune system. Her future lab will focus on engineering cytokines to treat metabolic diseases. She completed her PhD in Chemical Engineering at MIT in the laboratories of Bob Langer and Dan Anderson on an NSF Graduate Research Fellowship, where her thesis focused on developing glucose-responsive insulin delivery systems. Prior to MIT, she earned a research-based master's degree (MPhil) in Chemistry at the University of Cambridge, UK which was fully funded by a Whitaker International Fellowship.