

CARNEGIE MELLON UNIVERSITY

BME 2024 SPRING SEMINAR SERIES

Biomaterials for delivering on the promise of immunotherapy



PRESENTED BY

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SCHEDULE

Doherty Hall (DH) 2315

**Thursday,
February 1, 2024
(11:00-12:00PM)**

Immunomodulatory therapies have advanced to clinical trials over the past decade for the treatment of a range of diseases and disorders, from cancer to diabetes to transplant rejection. However, the efficacy of these therapies remains limited, as challenges associated with off-target drug toxicity, poorly controlled drug pharmacokinetics, and an incomplete understanding of real-time therapy responses prevent effective therapeutic windows from being realized. Here, we highlight some of our work on the design, fabrication, and characterization of biomaterial-based delivery technologies for the controlled delivery of immunotherapies and for the non-invasive monitoring of their associated immune responses for the treatment of cancer and autoimmune disease. We show that the design of materials and their delivery context can influence therapeutic outcomes and alter the spatiotemporal characteristics of the incited immunomodulatory responses. By adroitly designing and utilizing our material delivery platforms, we can deliver immunotherapies with tailorable pharmacokinetics and enhanced efficiency to improve long-term therapeutic outcomes and tolerability, and enable studying basic questions in immunobiology as we seek to generate a 'living' therapeutics.

