



COLLEGE OF PHARMACY
PHARMACEUTICAL SCIENCES
UNIVERSITY OF MICHIGAN

Pharmaceutical Sciences Seminar

Wednesday, March 17, 2021

Join Zoom Meeting

<https://umich.zoom.us/j/94901493113>

4:00-5:00 pm

“Cancer Stem Cell Antigen Cocktail Nanodiscs Induce Strong Anti-tumor Immunity in a Melanoma Model”

Presented by:

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Ph.D. Candidate

Abstract: Cancer is one of the most prevalent causes of death worldwide. Both conventional and immunotherapy cancer treatments, including surgical resection, chemotherapy, radiation therapy, and immune checkpoint inhibitors, have limited efficacy as indicated by tumor recurrence and metastasis. One of the reasons for this recurrence is hypothesized to be due to cancer stem cells (CSCs), which are a subpopulation of cancer cells able to self-renew and sustain tumor growth after completion of conventional therapy. While cancer immunotherapies that can target and eliminate CSCs would be advantageous, identification of CSC antigens and efficient delivery of said antigens to immune activation sites remains a major challenge. To address these issues, we have identified immunogenic sequences from stemness factors (ALDH, SOX2, NANOG) shown to be overexpressed in CSCs and associated with poor prognosis. Using our previously developed synthetic high-density lipoprotein (sHDL) nanodisc platform, we have co-loaded CSC antigens and Toll-like receptor 9 agonist CpG for immune activation in CSC-containing cancers. The nanodisc's small size (< 15 nm), high biocompatibility, and established manufacturing procedure make it an ideal, clinically translatable candidate for delivery of CSC antigens. Overall, we show that vaccinating tumor-bearing mice using sHDL nanodiscs co-loaded with ALDH, SOX2, and NANOG immunogenic peptides and CpG elicits robust antigen-specific T cell responses and delays tumor growth in a melanoma model.

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