The University of Utah
Department of Pharmaceutics and Pharmaceutical Chemistry

Spring 2016
Seminar Series

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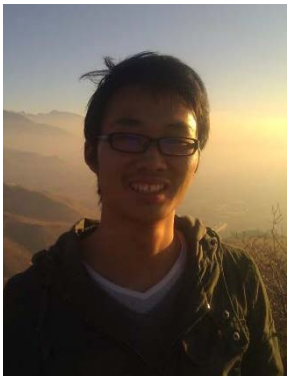

"Multifunctional vaccine carrier enhancing immune response"

Vaccine treatment is always a useful therapeutic method for many diseases, including infectious diseases and cancer. In the modern era, many efforts have been made to develop subunit vaccines, because they have advantages in defined structures, stability, and safety, compared with the live-attenuated vaccines. However, subunit vaccines are poorly immunogenic and induce a weak adaptive immune response. As vaccines must reach the lymphoid organs to prime immune responses, we hypothesized that increased accumulation of vaccines in lymph nodes will induce stronger immune responses. To deliver vaccines to lymph nodes, the vaccine carrier is designed to non-covalently associate with endogenous serum protein that has intrinsically efficient lymphatic uptake. Upon injection, the carrier binding with serum protein in the interstitial fluid can efficiently traffic to lymphatics. After vaccines reaching lymph nodes, antigen-presenting cells (APCs) will endocytose vaccines and present the antigens on MHC class I molecules, by a mechanism known as cross-presentation. Because cross-presentation is essential for the initiation of CD8+ T cell responses that kill infected cells and cancer cells, we included another functional moiety in the carrier that could increase the cross-presentation. In all, the vaccine carrier is designed to increase the immune response, and hopefully could be applied to treat melanoma in the future.

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4:00 PM
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