COLLEGE OF PHARMACY
PHARMACEUTICAL SCIENCES
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Pharmaceutical Sciences Seminar Series

Wednesday, March 29, 2023
4:00pm
NCRC Building 10 Research Auditorium
Zoom

"Remote Loading of MOG 38-50 in PLGA Nanoparticles for the Treatment of Multiple Sclerosis"

Presented by:

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Abstract: Slow release of autoantigens from biodegradable and biocompatible polymer nanoparticles(NPs) is a promising approach to treat autoimmune diseases such as multiple sclerosis. We sought to apply a novel aqueous absorption remote loading method to encapsulate peptide autoantigen in poly(D,L-lactic-co-glycolic acid) (PLGA) NPs and test their in vitro release before evaluating in a rodent model for experimental autoimmune encephalomyelitis (EAE). Remote loading of MOG peptide in PLGA NPs was highly efficient with 9.5 ± 0.3% loading and >90%EE, with 750 ± 200 nm size and -16.7 ± 0.4 mV zeta potential. MOG-PLGA NPs exhibited slow and continuous release of 81.6 ± 4% over the course of 49 days with a low 24-h burst release of <10%. All mice within the prophylactic and therapeutic test groups did not exhibit clinical scores greater than 2 through 35 days. All mice that received remote loaded NPs regardless of administration type showed reduced scores under 1.5 through>60 days of observation. Cationic MOG peptide was remote loaded at high loading and EE in NPs with desirable release characteristics for the first time. Clinical score reduction of the resulting peptide/PLGA NPs show a promising strategy for inducing tolerance from the desirable SC injection route without the need for high particle surface charge. The novel remote loading paradigm could strongly improve the scalability, stability, and cost of goods of the final product.

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