

Mei Wu, MD, PhD recently received a [NIH, RO1 grant](#)

Project Title: “Boosting Flu Vaccine without Adjuvant Injection”

Project Overview:

The overall objective of this proposal is to provide proof of concept evidence that a newly-developed prototype laser system can result in dose-sparing of existing influenza (flu) vaccines without any additives. Our study showed that laser-based vaccine adjuvant could enhance immune responses against protein-based vaccines including season flu vaccine with few side effects. We will investigate whether immune protection elicited by a low dosage of season flu vaccine intradermally injected into a site of laser exposure is equal to or greater than that induced by a higher dosage of the vaccine injected similarly in Balb/c and C57BL/6 (B6) mice and in minipigs to verify the feasibility of this technology in different animal species with varying skins. A similar study will be also conducted in young and immune-compromised mice corroborating that the laser vaccine adjuvant can reduce vaccination doses from two to one in naive young mice and significantly enhance a respondent rate of flu vaccination in immune-compromised mice. Finally, we will extend the investigation to H5N1 pandemic flu vaccine, protecting mice and ferrets from a lethal challenge of a highly pathogenic avian H5N1 flu virus after one dose of the stockpiled H5N1 vaccine delivered via a combination of laser and MPL adjuvants. The laser “adjuvant” does not need cold chain storage or any modification of the existing vaccines, and it can be used immediately and repeatedly without a limit. These unique characters make this technology ideal for coping with flu vaccine shortages.