

**Abstract:** Project Optimus from FDA aims to shift the paradigm of oncology dose selection by emphasizing the importance of finding an optimal dose with desirable efficacy and safety. Traditionally, the optimal dose in oncology is equivalent to the maximum tolerated dose (MTD) since most oncology drugs have been cytotoxic, making the highest tolerable dose also the most efficacious dose. Due to the development of targeted and immune oncology therapeutics, MTD is no longer the default optimal dose. Statistical designs solely aimed at finding the MTD therefore cannot fulfill the requirement of Project Optimus. In this short course, I will provide a comprehensive review and introduction of practical statistical designs for dose optimization. Through the learning provided by this short course, attendees will be exposed to the main ideas and motivations for key innovative statistical designs and strategies. The short course is constructed not long to teach “hows” but “whys”, so that attendees will develop ability to assess the pros and cons of different designs for their individual needs in practice. The following topics will be covered with three sessions:

Session 1: Brief review of Bayesian statistics and modeling. This session will expose attendees to some basic concept and techniques of Bayesian statistics as many designs for early-phase oncology trials are Bayesian.

Session 2 Review of key dose-finding Designs, including but not restricted to 3+3, CRM, mTPI, mTPI-2 (keyboard), BOIN, and i3+3. This session will review a set of major dose-finding designs aiming to identify the MTD, which sets the stage for innovative dose-optimization strategies and designs.

Session 3: Introduce strategies and designs for oncology dose optimization. This session will introduce a few key designs and strategies for dose optimization like eff-tox dose-finding designs, expansion cohort trials, backfill designs, seamless phase 1-2 designs, PK-empowered dose finding, and randomized dose comparison, etc.

Session 4: Q&A

Throughout the short course, available software and tools will be illustrated for the course attendees. The short course is expected to run for 4 hours with two breaks.