

## Vaccines Against Bacterial and Viral Infections

July 9-14, 2023 | Course No: 0158.1270

**Course Instructors:** Dani Cohen (Tel Aviv University), Khitam Muhsen (Tel Aviv University), Ron Ellis (Human Vaccines & Immunotherapy Journal), Elizabeth Miller (London School of Hygiene & Tropical Medicine; Tel Aviv University), Myron M. Levine (University of Maryland Baltimore), Jonathan Zenilman (Johns Hopkins University), Michal Mandelboim (Tel Aviv University), Orna Mor (Tel Aviv University)

**Date & Time:** July 9-13, 2023 | M, W, Th 14:00-18:30 / S, T 14:00-19:00

**Final Exam:** July 14, 2023 | 09:00-11:00

**Location:** Room 927 | Faculty of Medicine

**Teaching Assistant:** Anne Marie Novak ([annemarie@mail.tau.ac.il](mailto:annemarie@mail.tau.ac.il))

**Course Documents:** <https://bit.ly/Vaccines2023>

### Pre-requisites & Intended Audience

The course is intended for Master's and PhD level students or above. There are no prerequisites.

### Academic Credit & Course Requirements

2 Academic Credits (4 ECTS). Participants must pass the final exam with a grade of 60 (D). Noncredit participants will receive a certificate of participation and are not required to take the final exam but are still expected to participate in exercises and presentations.

### Grade Breakdown:

Exercise- 20% | Final Exam- 80%

### Course Description

This course will cover key concepts in vaccinology in general, integrating references to vaccine development, evaluation and current immunization strategies against COVID-19 and other emerging diseases such as Ebola-Sudan and monkeypox. The course will review the evolution of vaccine development approaches and present the characteristics of currently licensed vaccines and those authorized for emergency use. The process from conception to R&D, and to first-in-man studies and further evaluation of safety, immunogenicity and efficacy of candidate vaccines through clinical development phases will be presented and analyzed. Methods to quantify the induced immune response and the protective efficacy conferred by vaccine candidates will be reviewed, and the notion of correlates of protection will be elaborated upon. Post-licensure approaches in the evaluation of vaccines for effectiveness, impact and signal of detection of adverse events will be presented and discussed. Highlights and challenges of the present immunization programs worldwide will be described vis-à-vis the burden of corresponding vaccine-preventable diseases. Special attention will be given to the analysis of psychosocial factors associated with hesitancy to vaccination in various populations. Lecturers will present accomplishments and challenges with selected licensed and investigational vaccines. Throughout, the course will emphasize the importance of the use of advanced epidemiological tools to prioritize the development of new vaccines and assess existing immunization programs.

Course Timetable

Sunday, July 9 (Day 1)	
14:00-15:00	Course Introduction Vaccine and vaccination in a historical perspective <b>Lecturer: Prof. Dani Cohen</b>
15:00-15:15	Break
15:15-16:45	Clinical development of vaccines (phase 1, 2 and 3 studies); Safety, immunogenicity and protective efficacy evaluation; correlates of protection <b>Lecturer: Prof. Dani Cohen</b>
16:45-17:15	Break
17:15-19:00	Post-licensure evaluation of vaccines, signal detection of adverse events, effectiveness and impact <b>Lecturer: Prof. Elizabeth Miller</b>
Monday, July 10 (Day 2)	
14:00-15:30	The role of the Data and Safety Monitoring Board (DSMB) in vaccine trials monitoring safety and efficacy. Dilemmas and ethical issues that a DSMB may face. <b>Lecturer: Prof. Jonathan Zenilman</b>
15:30-16:00	Break
16:00-16:45	Methods to quantify and characterize vaccine-induced immune response <b>Lecturer: Prof. Dani Cohen</b>
16:45-17:00	Break
17:00-17:45	The role of experimental challenge of humans with pathogens (aka Controlled Human Infection Models [CHIM]) in vaccine development <b>Lecturer: Prof. Myron (Mike) Levine</b>
17:45-18:00	Break
18:00-18:45	How does the WHO Technical Working Group for Candidate Vaccine Prioritization operate? Vaccines against COVID-19, filoviruses, and other emerging diseases <b>Lecturer: Prof. Myron (Mike) Levine</b>
Tuesday, July 11 (Day 3)	
14:00-15:30	From concept to R&D to first-in-man studies – vaccines as pharmaceutical products <b>Lecturer: Dr. Ron Ellis</b>
15:30-16:00	Break

16:00-17:30	Understanding and addressing the impact of trust and risk perception on vaccine acceptance <b>Lecturer: Prof. Khitam Muhsen</b>
17:30-17:45	Break
17:45-19:00	Exercise <b>All Faculty</b>
<b>Wednesday, July 12 (Day 4)</b>	
14:00-15:30	Novel strategies of immunization against vaccine-preventable diseases: Immunization of pregnant women and impact morbidity in children <b>Lecturer: Prof. Elizabeth Miller</b>
15:30-16:00	Break
16:00-17:15	HIV / AIDS vaccine development–state of the art <b>Lecturer: Prof. Orna Mor</b>
17:15-17:30	Break
17:30-18:30	Contemporary and innovative approaches to influenza vaccine development and vaccination policies <b>Lecturer: Prof. Michal Mandelboim</b>
<b>Thursday, July 13 (Day 5)</b>	
14:00-15:30	Immunization programs in high and low- and- middle-income countries. Which vaccines should be added? <b>Lecturer: Prof. Myron (Mike) Levine</b>
15:30-16:00	Break
16:00-16:45	Use of epidemiological tools to prioritize the development of new vaccines and assess existent immunization programs. <b>Lecturer: Prof. Khitam Muhsen</b>
16:45-17:00	Break
17:00-18:00	Exercise and course summary <b>All Faculty</b>
18:00-18:30	Conclusions, certificate ceremony and class photo
<b>Friday, July 14 (Final Exam)</b>	
09:00-11:00	Sackler Faculty of Medicine, Room 935