School of Public Health
Sackler Faculty of Medicine
Tel Aviv University

Course Syllabus

Vaccines Against Bacterial and Viral Infections Including COVID-19

(DRAFT- Feb 12, 2021)

1. Course Details

Title: Vaccines Against Bacterial and Viral Infections Including COVID-19

Number: 0158.1120

Format: Lectures and class exercises (online)

Language of Instruction: English

Course Duration: One semester (13 classes)

Hours per week: 2

Number of Academic Credits: 2

Course level: Masters, MD, PhD students, Post-Doctoral Fellows

Dates and Times: Wednesdays, 12:15-14:00, Online

2. Course Teaching Staff

Course Coordinators:	Prof. Daniel Cohen (dancohen@tauex.tau.ac.il) Prof. Khitam Muhsen (kmuhsen@tauex.tau.ac.il)
Lecturers TAU SPH:	Prof. Daniel Cohen, Prof. Khitam Muhsen, Dr. Michal Mandelboim, Dr. Orna Mor
Guest lecturers:	Dr. Ronald Ellis (Editor-in-Chief, Human Vaccines & Immunotherapeutics Journal), Prof. Myron M. Levine (University of Maryland), Prof. Elizabeth Miller (Public Health England & London School of Tropical Medicine & Hygiene), Prof. Jonathan Zenilman (Johns Hopkins University)
Teaching Assistants:	Ms. Saritte Perlman (perlmans@tauex.tau.ac.il) Mr. Jonathan Amir (yonatanamir@tauex.tau.ac.il)

3. Course Description

This course will cover key concepts in vaccinology in general, integrating references to the vaccine development and current immunization strategies against COVID-19 for each topic. 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 quantifying 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 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 development of new vaccines and assess existent immunization programs.

Course Specific Topics and Tentative Dates

Date	Topic	Lecturer
3/3/2021	Course Introduction Vaccine and vaccination in historical perspective Characteristics of the current licensed vaccines (live-attenuated, killed whole cell and subunit, recombinant)	Prof. D. Cohen
10/3/2021	From concept to R&D to first-in-man studies – vaccines as pharmaceutical products? The path of COVID-19 vaccines development	Dr. R. Ellis
17/3/2021	Methods to quantify and characterize vaccine-induced immune response. Routes of vaccine delivery	Prof. D. Cohen
7/4/2021 21/4/2021	Clinical development of vaccines (Phase 1, 2 and 3 studies); Safety, immunogenicity and protective efficacy evaluation; Direct and indirect protection; Correlates of protection	Prof. D. Cohen
21/4/2021	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.	Prof. J. Zenilman
28/4/2021	Vaccine hesitancy and confidence: Contemporary experience with COVID-19 vaccination in diverse populations Understanding and addressing the impact of trust and risk perception on vaccine acceptance	Dr. R. Ellis Prof. K. Muhsen
5/5/2021	What would an “ideal” COVID-19 vaccine look like?	Prof. M. Levine
12/5/2021	Post-licensure evaluation of vaccines, signal detection of adverse events, effectiveness and impact	Prof. E. Miller

19/5/2021	Immunization programs in high and low and middle income countries. Status of the COVID-19 vaccines introduction Use of epidemiological tools to prioritize development of new vaccines and assess existent immunization programs.	Prof. K. Muhsen
26/5/2021	Novel strategies of immunization against vaccine-preventable diseases: immunization of pregnant women and impact on morbidity in infants	Prof. E. Miller
2/6/2021	HIV / AIDS vaccine development–state of the art	Dr. O. Mor
9/6/2021	Contemporary and innovative approaches to influenza vaccine development and vaccination policies	Dr. M. Mandelboim
16/6/2021	Course summary and recap before final exam	Prof. D. Cohen and Prof. K. Muhsen
30/6/2021 (Moed A) 29/7/2021 (Moed B)	Final exam	

5. Recommended Reading

- "New Generation Vaccines", Fourth Edition 2010, Editors: M.M. Levine, G. Dougan, M. F. Good, M. A. Liu, G. J. Nabel, J. P. Nataro and R. Rappuoli, Informa Healthcare
- "Plotkin's Vaccines", Seventh Edition 2018, Editors: S.A. Plotkin, W. A. Orenstein and P. A. Offit, Kathryn M. Edwards, Saunders Elsevier
- Published academic papers distributed by course lecturers

6. Course Prerequisites

- Introductory courses in microbiology, immunology and basic knowledge in epidemiology

7. Course Requirements*

- Attendance and participation in at least 75% of the course lectures
- Completion of online exercise based on selected articles

8. Grading Policy

Final grades are based on the following:

- Final exam-80%
- Submitted exercise – 20%

*Only students who have fulfilled all the course requirements will be eligible to take the exam