Vaccine Research

Dan Barouch, MD, PhD, Chief

Eug-Jun Im, PhD, Postdoctoral Fellow

The Division of Vaccine Research aims to promote research and education activities related to vaccine-related sciences, including basic, translational and clinical vaccine research. The Division consists of primary and affiliate faculty and focuses on the development of vaccines against infectious, oncologic, degenerative and other diseases.

Joseph Nkolola, PhD, Postdoctoral Fellow

2009–2010 HIGHLIGHTS

A seminar is held every other week to highlight research advances of Division faculty as well as guest speakers. The Division also holds weekly laboratory meetings and journal clubs for graduate students, postdoctoral fellows, clinical fellows and junior faculty. The Division has close affiliations with the Divisions of Hematology/Oncology, Infectious Diseases and Viral Pathogenesis at BIDMC as well as with the graduate programs in Virology and Immunology at Harvard Medical School. The Division is a key part of the Bill & Melinda Gates Foundation Collaboration for AIDS Vaccine Discovery (CAVD), the NIH Center for HIV/AIDS Vaccine Immunology (CHAVI) and the Ragon Institute of MGH, MIT and Harvard.

Dr. Dan Barouch's laboratory focuses on the immunology and virology of HIV-1 infection and the development of novel vaccine strategies. Drs. Ray Dolin, Lindsey Baden and Michael Seaman lead a clinical vaccine trials unit, a specimen

processing laboratory, and a neutralizing antibody laboratory to evaluate and to develop vaccines against HIV-1, poxviruses and other pathogens.
Dr. David Kaufman is investigating the molecular and cellular mechanisms associated with T lymphocyte trafficking and mucosal immunity. Drs. David Avigan and Jacalyn Rosenblatt lead a cancer immunology and tumor vaccine program focusing on examining the nature of immune function in patients with malignancy and how this impacts responses to cancer vaccines.

Dan Barouch, MD, PhD

Drs. Dan Barouch, Ray Dolin, Lindsey Baden and Michael Seaman have recently developed a series of novel HIV-1 vaccine vectors based on alternative adenovirus serotypes. These vaccine candidates are currently being evaluated in both preclinical studies and clinical trials as part of two NIH/NIAID U19 Integrated Preclinical/Clinical AIDS Vaccine Development (IPCAVD) programs. Clinical vaccine trials in East Africa and South Africa are scheduled to begin in 2011, and a multivalent vaccine expressing mosaic HIV-1 Gag/Pol/Env antigens is planned for clinical testing in 2012.

SELECTED PUBLICATIONS

Barouch DH, Korber B. HIV-1 vaccine development after STEP. *Annu Rev Med* 2010; 61:153-167.

Nkolola JP, Peng H, Settembre EC, Freeman M, Grandpre LE, Devoy C, Lynch DM, La Porte A, Simmons NL, Bradley R, Montefiori DC, Seaman MS, Chen B, Barouch DH. Breadth of neutralizing antibodies elicited by stable, homogeneous clade A and clade C HIV-1 gp140 envelope trimers in guinea pigs. *J Virol* 2010; 84:3270-3279.

Barouch DH, O'Brien KL, Simmons NL, King SL, Abbink P, Maxfield LF, Sun YH, La Porte A, Riggs AM, Lynch DM, Clark SL, Backus K, Perry JR, Seaman MS, Carville A, Mansfield KG, Szinger JJ, Fischer W, Muldoon M, Korber B. Mosaic HIV-1 vaccines expand the breadth and depth of cellular immune responses in rhesus monkeys. *Nat Med* 2010; 16:319-323.

Kaufman DR, Bivas-Benita M, Simmons NL, Miller D, Barouch DH. Route of adenovirus-based HIV-1 vaccine delivery impacts the phenotype and trafficking of vaccine-elicited CD8+ T lymphocytes. *J Virol* 2010; 84:5986-5996.

Liu J, Keele BF, Li H, Keating S, Norris PJ, Carville A, Mansfield KG, Tomaras GD, Haynes BF, Kolodkin-Gal D, Letvin NL, Hahn BH, Shaw GM, Barouch DH. Low-dose mucosal simian immunodeficiency virus infection restricts early replication kinetics and transmitted virus variants in rhesus monkeys. *J Virol* 2010; 84:10406-10412.

Wilck MB, Seaman MS, Baden LR, Walsh SR, Grandpre LE, Devoy C, Giri A, Kleinjan JA, Noble LC, Stevenson KE, Kim HT, Dolin R. Safety and immunogenicity of modified vaccinia Ankara (ACAM3000): effect of dose and route of administration. *J Infect Dis* 2010; 201:1361-1370.

Seaman MS, Wilck MB, Baden LR, Walsh SR, Grandpre LE, Devoy C, Giri A, Noble LC, Kleinjan JA, Stevenson KE, Kim HT, Dolin R. Effect of vaccination with modified vaccinia Ankara (ACAM3000) on subsequent challenge with Dryvax. *J Infect Dis* 2010; 201:1353-1360.

Rosenblatt J, Wu Z, Vasir B, Zarwan C, Stone R, Mills H, Friedman T, Konstantinopoulos PA, Spentzos D, Ghebremichael M, Stevenson K, Neuberg D, Levine JD, Joyce R, Tzachanis D, Boussiotis V, Kufe D, Avigan D. Generation of tumor-specific T lymphocytes using dendritic cell/tumor fusions and anti-CD3/CD28. *J Immunother* 2010; 33:155-166.

HONORS AND AWARDS

Dan Barouch, PhD, was elected to the American Society for Clinical Investigation in 2009. He was also elected as a Fellow of the American College of Physicians and a Fellow of the Infectious Diseases Society of America in 2009. He received the Sir William Osler Young Investigator Award from the Interurban Clinical Club in 2010.

FACULTY

David Avigan, MD

Lindsey Baden, MD

Dan Barouch, MD, PhD

Raphael Dolin, MD

David Kaufman, MD, PhD

Jacalyn Rosenblatt, MD

Michael Seaman, PhD

RESEARCH FUNDING

	Direct	Indirect
Federal	**14,581,207**	**2,431,240**
Non Federal	**3,063,726**	**317,159**