Jonathan Abraham, M.D., Ph.D., Associate Professor of Microbiology, Harvard Medical School.
Molecular virology, structural biology: A former trainee on this T32, Dr. Abraham uses methods in molecular biology, immunology, and structural biology (including X-ray crystallography and cryo-EM) to investigate mechanisms of viral pathogenesis and the relationship between virus receptor binding and antibody neutralization, with the goal of informing strategies aimed at preventing or treating infection by emerging pathogens. His laboratory primarily focuses on emerging viruses with outbreak potential, including alphaviruses, arenaviruses, filoviruses, and coronaviruses. Of note, his work does not involve select agents. Dr. Abraham has mentored 8 predoctoral and 11 postdoctoral trainees, has co-authored papers with Dr. Charles, and is also collaborating with Drs. Léger-Abraham, Gewurz, and Mansour.

Amy Barczak, M.D., Assistant Professor of Medicine, Harvard Medical School.
Tuberculosis pathogenesis: A former trainee on this T32, Dr. Barczak's independent research program focuses on the molecular mechanisms that enable *M. tuberculosis* survival in human macrophages and which drive pathology in infected lung tissue. She recently leveraged her expertise with BSL-3 pathogens to investigate the persistence of viral infection in COVID-19, now an ongoing additional area of interest in her group. Dr. Barczak has mentored 1 predoctoral and 2 postdoctoral trainees, has co-authored papers with Drs. Bhattacharyya, Goldberg, and Lemieux, and is also collaborating with Dr. Charles. Dr. Barczak is a new mentor on this T32, bringing expertise in human macrophage biology in tuberculosis and COVID-19 persistence.

Roby P. Bhattacharyya, M.D., Ph.D., is Assistant Professor of Medicine, Harvard Medical School.
Antibiotic resistance, sepsis, transcriptomics, molecular diagnostics: A former trainee on this T32, Dr. Bhattacharyya's independent research program focuses on (i) the development of rapid transcription-based methods of identification of infectious disease pathogens and determination of their antimicrobial susceptibility profile and (ii) the analysis of immune cells from patients bacterial sepsis using single-cell RNA-seq with the goals of improving clinical diagnostics and advancing the mechanistic understanding of sepsis. He has mentored 1 predoctoral and 3 postdoctoral trainees, has co-authored papers with Drs. Barczak, Goldberg, Hacohen, Hung, Lemieux, and Sabeti, and is also collaborating with Dr. Mansour. Dr. Bhattacharyya is a new mentor on this T32, bringing expertise in transcriptional profiling for pathogen identification, determination of antimicrobial susceptibility, and analysis of immune responses to infection.

Richelle C. Charles, M.D., is Associate Professor of Medicine, Harvard Medical School.
Antibody-mediated immunity: Dr. Charles' group investigates multiple aspects of antibody responses to pathogens: (i) identification of immunogenic antigens for vaccine and diagnostic development using high-throughput proteomic and genomic approaches, (ii) development of rapid diagnostics and seroepidemiological tools for *Salmonella* Typhi and Paratyphi A infection, (iii) characterization of immune responses during human infection and vaccination with enteric infections, particularly cholera and *Salmonella*, and (iv) antibodies that mediated immunity to SARS-CoV-2 and monkeypox. She has mentored 1 predoctoral and 6 postdoctoral trainees, has co-authored papers with Drs. Abraham, Lemieux, Sabeti, and Waldor, and is also collaborating with Dr. Barczak.

Kizzmekia Corbett, Ph.D., Assistant Professor of Immunology and Infectious Diseases, Harvard T.H. Chan School of Public Health.
Viral immunology for vaccine development: Dr. Corbett, a major leader in the development of mRNA vaccine technology for COVID-19, was recruited to the Harvard T.H. Chan School of Public Health in 2021. Her focus is on the immune landscape of viral surface proteins and the influence of immune responses on clinical outcomes following natural viral infection and the

translation of those findings to rationally design and evaluate novel vaccine concepts for emerging and re-emerging zoonotic viruses. She has recruited to her new group 2 postdoctoral trainees and is collaborating with Dr. Sabeti. Dr. Corbett is a new mentor on this T32, bringing expertise in development of viral vaccines and mRNA vaccine technology.

Benjamin E. Gewurz, M.D., Ph.D., Associate Professor of Medicine, Harvard Medical School.
Epstein-Barr virus pathogenesis, SARS-CoV-2 metabolic pathways: Dr. Gewurz's laboratory investigates the mechanisms by which Epstein-Barr virus subverts B-cell biology to establish persistent infection and how it contributes to lymphomas, gastric and nasopharyngeal carcinomas, and how Epstein-Barr virus and SARS-CoV-2 alter mitochondrial one-carbon metabolism in infected cells. Dr. Gewurz has mentored 10 predoctoral and 14 postdoctoral trainees and has co-authored papers with Dr. Mansour. Dr. Gewurz is a new mentor on this T32, bringing expertise in mechanisms of persistent viral infection.

Michael S. Gilmore, Ph.D., Sir William Osler Professor of Ophthalmology and of Microbiology, Harvard Medical School.
Molecular basis of antibiotic resistance in gram-positive bacteria: Research in Dr. Gilmore's laboratory focuses on determining the genetic and molecular events that led to the emergence of highly hospital-adapted, multidrug resistant, readily transmitted strains of enterococci, staphylococci, and streptococci. He has mentored 20 predoctoral and 34 postdoctoral trainees, and has co-authored papers with Drs. Abraham, Hung, and Waldor. Dr. Gilmore is a new mentor on this T32, bringing expertise in genetics of antibiotic resistance.

Marcia B. Goldberg, M.D., Program Director, Professor of Medicine and of Microbiology at Harvard Medical School.
Molecular mechanisms of infection and host response: Dr. Goldberg's laboratory investigates the molecular mechanisms by which microbial pathogens both alter host signaling pathways to promote disease and are recognized by human cells. Dr. Goldberg has mentored 12 predoctoral and 27 postdoctoral trainees. She has co-authored papers with Drs. Barczak, Bhattacharyya, Hacohen, Hochschild, Lemieux, Lesser, and Sabeti, is collaborating with Drs. Bhattacharyya, Hacohen, Higgins, Hung, Kagan, and Mansour.

Nir Hacohen, Ph.D., David P. Ryan, MD Professor of Medicine, Harvard Medical School, Institute Member, Broad Institute of MIT and Harvard.
Systems immunology, innate and autoimmunity: Dr. Hacohen's laboratory combines systems-level and mechanistic approaches to investigate principles and mechanisms of immunity, with a focus on the initiation of immune responses in infections, cancer, and autoimmunity. He has mentored 17 predoctoral and 29 postdoctoral trainees and has co-authored papers with Drs. Bhattacharyya, Goldberg, Hung, Kagan, Mansour, and Sabeti. Dr. Hacohen is a new mentor on this T32, bringing expertise in systems immunology in human infection.

Sophie Helaine, Ph.D., Associate Professor of Microbiology, Harvard Medical School.
Molecular mechanisms of bacterial persistence: Dr. Helaine's laboratory investigates the mechanisms of intracellular persistence of *Salmonella* Typhimurium and *S.* Typhimurium toxin-antitoxin systems, which contribute to persister formation. She has mentored 9 predoctoral and 12 postdoctoral trainees and has co-authored papers with Dr. Waldor. Dr. Helaine is a new mentor on this T32, bringing expertise in persistence mechanisms and toxin-antitoxin systems of bacterial pathogens.

Darren Higgins, Ph.D., Professor of Microbiology, Harvard Medical School.
Intracellular bacterial pathogenesis of *Listeria monocytogenes*: Dr. Higgins' laboratory investigates the molecular mechanisms of pathogenesis and cellular immune responses to the intracellular pathogen *L. monocytogenes*. He has mentored 27 predoctoral and postdoctoral

trainees, has co-authored a paper with Dr. Waldor, and is collaborating with Drs. Goldberg and Kagan.

Deborah T. Hung, M.D., Ph.D., Professor of Genetics and of Medicine, Harvard Medical School, and Core Faculty Member, Broad Institute of MIT & Harvard.
Infectious diseases and chemical biology: Dr. Hung uses chemical biological and genetic/genomic approaches to investigate infection by *Vibrio cholerae*, *Pseudomonas aeruginosa*, and *M. tuberculosis,* focusing on underlying mechanisms of pathogenesis, thereby identifying chemically validated targets for intervention. She has mentored 11 predoctoral and 30 postdoctoral trainees and has co-authored papers with Drs. Bhattacharyya, Gewurz, Goldberg, Hacohen, Kirby, Lemieux, and Sabeti.

Jonathan C. Kagan, Ph.D., Marian R. Neutra, PhD Professor of Pediatrics, Harvard Medical School.
Innate immunity to infection: The focus of research in Dr. Kagan's laboratory is the earliest molecular events that stimulate innate immune responses and inflammation during bacterial or viral infections. He has mentored 11 predoctoral and 30 postdoctoral trainees and is collaborating with Drs. Goldberg, Hacohen, Higgins, Mansour, and Waldor.

James E. Kirby, M.D., Professor of Pathology, Harvard Medical School.
Antimicrobial resistance, antimicrobial development, novel microbial diagnostics: Dr. Kirby's research focuses on structure-activity relationships studies on aminoglycoside, apramycin, streptothricin, and fusidic acid scaffolds using *de novo* and semi-synthetic approaches and on diagnostic development for SARS-CoV-2 and other emerging pathogens. He has mentored 4 predoctoral and 10 postdoctoral trainees and is collaborating with Dr. Hung.

Michael Klompas, M.D., M.P.H., Professor of Population Medicine, Harvard Medical School.
Sepsis, pneumonia, public health surveillance: Dr. Klompas' research focuses on the population level analysis, risk factors, prevention, treatment strategies, and public policy ramifications of sepsis, hospital-acquired pneumonia, and ventilator-associated pneumonia. He has mentored 5 predoctoral and 20 postdoctoral trainees. Dr. Klompas is a new mentor on this T32, bringing expertise in population level assessment of sepsis, hospital-acquired pneumonia, and ventilator-associated pneumonia.

Sophia Koo, M.D., Assistant Professor of Medicine, Harvard Medical School.
Novel pneumonia biomarkers, invasive mycoses: Dr. Koo identified unique volatile secondary sesquiterpene metabolite breath signatures in invasive mycoses and is now focused on identifying breath volatile metabolite features that differentiate bacterial and viral pneumonia and that distinguish different bacterial pathogens in pneumonia from each other. She has mentored 2 predoctoral and 12 postdoctoral trainees. Dr. Koo is a new mentor on this T32, bringing expertise in volatile metabolites and pneumonia diagnostics.

Melissa Léger-Abraham, Ph.D., Assistant Professor of Microbiology and Pediatrics, Harvard Medical School.
Structural analysis of specialized translation mechanisms of neglected tropical diseases: Dr. Léger-Abraham's research focuses on using structural biology to understand specialized translation mechanisms in neglected tropical diseases, including babesiosis, leishmaniasis, and malaria. She has mentored 7 postdoctoral trainees, and is collaborating with Dr. Abraham. Dr. Léger-Abraham is a new mentor on this T32, bringing expertise in the biology of parasites and structural approaches for studying of microbial translation.

Jacob E. Lemieux, M.D., D.Phil., Assistant Professor of Medicine and Microbiology, Harvard Medical School.

Pathogenesis of spirochetes: Dr. Lemieux's research integrates computational and molecular approaches to dissect the mechanisms of pathogenesis of spirochetes that cause human disease, with a major focus on the causative agents of Lyme disease (*Borrelia burgdorferi*) and relapsing fever (*B. miyamotoi*). He has also contributed substantially to the study of SARS-CoV-2 genomic evolution. He has mentored 4 postdoctoral trainees, has co-authored papers with Drs. Barczak, Bhattacharyya, Charles, Goldberg, Hung, and Sabeti. He is a new mentor on this T32, bringing expertise in spirochete biology.

Michael K. Mansour, M.D., Ph.D., is Associate Professor, Harvard Medical School.
Human immune response to fungal and other pathogens: Dr. Mansour's group focuses on immune responses to fungal pathogens, including emerging fungi, and to SARS-CoV-2. Several of the projects in which his group participates are translational with direct implications for patient care. He has mentored 18 predoctoral and postdoctoral trainees, has co-authored a paper with Dr. Hacohen, and is also collaborating with Drs. Bhattacharyya, Goldberg, and Koo.

Pardis C. Sabeti, M.D., D.Phil., Professor of Organismal and Evolutionary Biology, Harvard University, of Immunology and Infectious Diseases, Harvard T.H. Chan School of Public Health, Institute Member, Broad Institute of MIT and Harvard.
Evolutionary adaptation in humans and pathogens: Dr. Sabeti's group applies genomic approaches to understand the evolution of human infectious disease pathogens, to develop rapid diagnostics for these pathogens, and to reveal biology of infection. She has mentored 29 predoctoral and 24 postdoctoral trainees, and has co-authored papers with Drs. Bhattacharyya, Charles, Goldberg, Hacohen, Hung, and Lemieux, and is also collaborating with Dr. Corbett.

Matthew K. Waldor, M.D., Ph.D., Edward H. Kass Professor of Medicine and Microbiology and Immunobiology, Harvard Medical School, Professor of Immunology and Infectious Diseases, Harvard T.H. Chan School of Public Health, and Investigator, Howard Hughes Medical Institute.
Pathogen-host interactions of enteric bacteria in animal models: Dr. Waldor's group employs genome-wide analyses and high-throughput technologies, particularly in animal models of infection, to study host-pathogen interactions and develop vaccines for human enteric bacterial pathogens. He has mentored 20 predoctoral and 52 postdoctoral trainees, has co-authored papers with Drs. Charles, Gewurz, and Higgins, and is also collaborating with Drs. Helaine and Kagan.