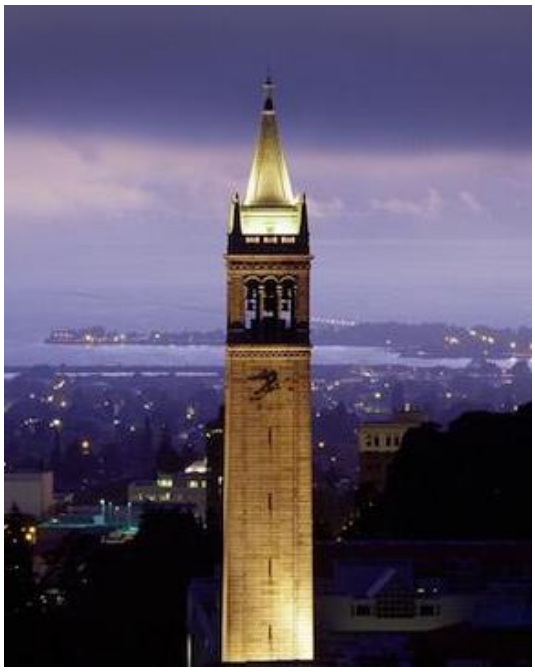
UNIVERSITY of CALIFORNIA, BERKELEY

SCHOOL of PUBLIC HEALTH



DIVISION of

INFECTIOUS DISEASES and VACCINOLOGY

ORIENTATION BOOKLET

2018 - 2019

Berkeley School of Public Health

Dear Infectious Diseases and Vaccinology Incoming Class 2018,

On behalf of the faculty, students and staff of the Division of Infectious Diseases & Vaccinology (IDV) at UC Berkeley, we would like to welcome you **enthusiastically** to our program at UC Berkeley. This handbook is assembled as a resource guide for new students. Please read this in conjunction with the School of Public Health Student Handbook (available in the SPH website at sph.berkeley.edu/Student Resources) and the Resources and Services for Graduate Students at Graduate Division website at http://grad.berkeley.edu/students/

Much of the information in this guide can also be found in the Division website at http://microbe.berkeley.edu and the Infectious Diseases and Immunity (IDI) PhD program website at http://microbe.berkeley.edu/idgroup/index.html

Our faculty and staff are here to support you and take pride in your academic success. Please feel free to contact us for assistance. Wishing you a very prosperous and rewarding year ahead!

Sincerely,

Lee Riley, MD

Professor of Epidemiology and Infectious Diseases

Chair, Division of Infectious Diseases and Vaccinology

School of Public Health

Table of Contents

IDV MPH Program Core Competencies

Students completing the MPH curriculum with a concentration in Infectious Diseases should be able to:

- Describe the viral, bacterial, fungal, and parasitological agents of infectious diseases of humans;
- Explain the manifestations of infectious diseases and the biological, molecular, cellular, and immunological mechanisms of infectious disease;
- Identify the local, state, federal, and international agencies responsible for infectious disease surveillance and control and explain their roles and missions;
- Conduct classical and molecular analyses for the detection and characterization of infectious disease agents;
- Implement advanced diagnostic and surveillance techniques used in clinical and public health laboratories;
- Identify current public health problems in communicable diseases and describe how the social, behavioral, environmental, and administrative/policy components of public health affect infectious disease distributions;
- Demonstrate use of biostatistics and epidemiology in infectious disease surveillance;
- Critically evaluate biological and experimental designs for infectious disease research;
- Organize, analyze, and present scientific data in a lucid manner through oral and written communication.

IDI PhD Program Core Competencies

Students completing the Infectious Diseases and Immunity PhD curriculum should be able to:

- Describe the viral, bacterial, fungal, and parasitological agents of infectious diseases of humans;
- Explain the manifestations of infectious diseases and the biological, molecular, cellular and immunological mechanisms of infection and disease
- Demonstrate advanced knowledge of molecular biology, microbiology, immunology, biochemistry and cell biology
- Identify the local, state, federal and international agencies responsible for infectious disease surveillance and control and explain their roles and missions
- Conduct classical and molecular laboratory methods
- Identify current public health problems in communicable diseases and describe how the social, behavioral, environmental and administrative/policy components of public health affect infectious disease distributions
- Demonstrate use of biostatistics and epidemiology in infectious disease
- Critically evaluate biological and experimental designs for infectious disease
- Organize, analyze and present scientific data in a lucid manner through oral and written communications
- Teach coursework in an area relating to infectious diseases
- Plan, conduct, and publish original research in the area of infectious diseases and immunity

Overview

The study of infectious diseases focuses on the interactions between infectious agents, their hosts, and the environment that may lead to disease in humans. Infectious Diseases and Vaccinology (IDV) is a multidisciplinary program. The curriculum is designed to emphasize the biology and molecular biology of host-pathogen interactions; host immune response to infection associated with protection or pathology; the ecology, evolution, and transmission of infectious agents, methods of laboratory-based surveillance and the epidemiology of infectious diseases.

The mission of the Infectious Diseases and Vaccinology Program is to create opportunities for students to gain new and advanced knowledge about infectious disease agents and how they interact with host cells, human populations, and the environment. Students learn how to design and implement independent investigations using interdisciplinary approaches. The goal is to promote public health through better understanding of infectious diseases and human immunology based on interaction of basic and translational research that contributes to the development of new diagnostics, treatment, prevention, and control of human infectious diseases.

The Division of Infectious Diseases & Vaccinology offers:

- The professional two-year MPH degree in Infectious Diseases & Vaccinology; and
- The five year academic degree of the Infectious Diseases and Immunity PhD program (wet lab research).

IDV Office Address:

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Faculty & Staff

Faculty

Gertrude C. Buehring, Ph.D., Professor of Graduate School, Emeritus, 61A Koshland Hall

Peter Dailey, Ph.D., Adjunct Professor
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Eva Harris, Ph.D., Professor of Infectious Diseases and Molecular Biology,
IDI PhD program Head, 500B Li Ka Shing Center

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326 Barker Hall

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5321-14 Berkeley Way West (By appointment)
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500D Li Ka Shing Center

George F. Sensabaugh, Professor of Graduate School, Emeritus
319 Mulford Hall

Sarah Stanley, Assistant Professor, School of Public Health
500C Li Ka Shing Center

Richard S. Stephens, Ph.D., Professor Emeritus
51A Koshland Hall

John E.Swartzberg, M.D., Clinical Professor of Medical Virology and Microbiology, Emeritus
570 University Hall

Staff

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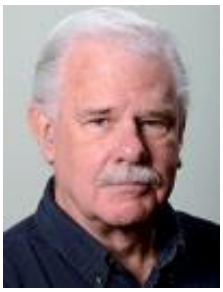

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Sarah Stanley, PhD

Richard S. Stephens, PhD, MSPH

John E. Swartzberg, M.D.

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Research Interests:

- Viral etiology of human breast cancer
- Bovine leukemia virus and its possible role in causing human breast cancer
- Development of early diagnostic tests for breast cancer

Current Projects:

The following projects relate to our overall hypothesis that bovine leukemia virus (BLV) infects humans and could potentially cause cancer:

1. How do humans become infected with BLV? Is it from cattle via bovine food products?
2. Can women infected with BLV pass the virus to their children transplacentally or through breast milk?
3. Are other human organs besides breasts infected by BLV and could the virus be associated with cancer in these organs?
4. Does infection of normal human breast cells with BLV in culture cause them to acquire characteristics of a malignant cell?

Other interests:

- Member, Graduate group in Infectious Diseases and Immunology, UC Berkeley
- Member, Graduate group in Endocrinology, UC Berkeley
- Member, Avon Foundation Virus and Breast Cancer Research Consortium
- Member, International Expert Panel on Misidentification and Cross-Contamination of Cell Lines

Selected Publications:

Buehring GC, Shen HM, Schwartz DA, Lawson, JS. Bovine leukemia virus linked to breast cancer in Australian women. *Emerging Infectious Diseases* (submitted)

Buehring GC, Shen HM, Jensen HM, Jin DL, Hudes M, Block G. Exposure to bovine leukemia virus is associated with breast cancer: A case-control study. *PLoS One,* Sept. 2, 2015, DOI:10.1371/journal.pone.0134304.

Buehring GC, Shen HM, Jensen HM, Choi KY, Sun D: Bovine leukemia virus DNA in human breast tissue. *Emerging Infectious Diseases* 20 (5): 772-782, 2014.

Hsieh K, Kimsey P, **Buehring GC**: Using inter-organizational partnerships to strengthen public health laboratory systems. *Public Health Reports 128, Supplement 2* (Public Health Laboratory Systems): 63-69, 2013.

Joshi D, **Buehring GC**: Are viruses associated with human breast cancer? Scrutinizing the molecular evidence. *Breast Cancer Research and Treatment* 135 (1): 1-15, 2012.

Baltzell K, **Buehring GC,** Krishnamurthy S, Kuerer H, Shen HM, Sison J: Limited evidence of human papillomavirus in breast tissue using in situ molecular methods. *Cancer* 118(5): 1212-1220, 2012

Baltzell K, **Buehring GC,** Krishnamurthy S, Kuerer H, Shen HM, Sison J: Epstein-Barr virus seldom found in mammary epithelium of breast cancer tissue using in situ molecular methods. *Breast Cancer Res Treat*132(1):267-274, 2012.

Zhao X, Jimenez-Sanchez C, Sentsui H, **Buehring GC**: Sequence polymorphisms in the long terminal repeat of bovine leukemia virus: Evidence for selection pressure in regulatory sequences. *Virus Res* 124: 113-124, 2007.

Zhao X, **Buehring GC**: Natural genetic variations in bovine leukemia virus envelope gene: Possible effects of selection and escape. *Virology*366(1):150-165, 2007.

McGirr KM, **Buehring GC**: Variation in the tax/rex region of the human T cell leukemia/bovine leukemia virus group: Evolutionary consequences in this overlapping reading frame. *Virus Genes* 32(1):229-239, 2006.

Buehring GC, Letscher A, McGirr K, Khandar S, Che L, Nguyen C, Hackett A: Presence of epithelial cells in nipple aspirate fluid is associated with subsequent breast cancer: A 25-year prospective study.*Breast Cancer Research and Treatment* 98(1): 63-70, 2006.

Buehring GC, Philpott SM, Choi KY: Humans have antibodies reactive with bovine leukemia virus. *AIDS Research and Human Retroviruses*19(12):1105-1113, 2003.

Phillpott SM, **Buehring GC**: Defective DNA repair in cells infected with human T-cell leukemia / bovine leukemia virus group. *Journal of the National Cancer Institute* 91(11):933-942, 1999.

Peter J. Dailey, Ph.D., MPH
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(by appointments)
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Courses:

- PH 266B Zoonotic Diseases (Spring)

Research Interests:

- Development, evaluation, and implementation of assays for the estimation of HIV incidence
- Development, evaluation, and enabling access of infectious disease diagnostics in low-resource settings

Current/Recent Projects:

- Senior Technical Officer for the Foundation for Innovative New Diagnostics (FIND). FIND is a non-profit organization headquartered in Geneva, Switzerland whose mission is to drive the development and early implementation of innovative diagnostic tests that have a high impact on patient care, disease control, and public health in low-resource settings.

- "HIV Incidence Assay Development Partner", grant funded through FIND. Coordination of multiple projects related to the development, evaluation and implementation of HIV Incidence Assays.

    - FIND: Measuring HIV Incidence http://www.finddx.org/hiv/hiv-projects/

- **"PanDx: A Low-cost Diagnostics Platform for Health Centers in the Developing World":** discover and develop a prototype affordable, easy-to-use system for health workers to rapidly diagnose diseases in resource limited settings. Prototype assays for tuberculosis (nucleic acid assay) and HIV (immunoassay) will be developed. This project is part of the Grand Challenges in Global Health Diagnostics initiative funded by the Bill & Melinda Gates Foundation to Stratos Product Development.

Other interests:

- Member, Committee for Laboratory and Environmental Biosafety (UC Berkeley's Institutional Biosafety Committee (IBC))
- Associate Editor, Diagnostic Microbiology and Infectious Diseases
- Point of Care Diagnostics Idea Lab (http://www.pocdx.org/)
- UC Berkeley One Health Student Initiative (faculty advisor)

Selected Publications:

Holger Becker, Richard Klemm, William Dietze, Wallace White, Nadine Hlawatsch, Susanne Freyberg, Christian Moche, Peter Dailey, and Claudia Gärtner. Modular microfluidic cartridge-based universal diagnostic system for global health applications. 2016. ***Proc. SPIE* 9705, Microfluidics, BioMEMS, and Medical Microsystems XIV**, 970514 (March 18, 2016)

Helb D, Jones M, Story E, Boehme C, Wallace E, Ho K, Kop J, Owens MR, Rodgers R, Banada P, Safi H, Blakemore R, Lan NT, Jones-López EC, Levi M, Burday M, Ayakaka I, Mugerwa RD, McMillan B, Winn-Deen E, Christel L, Dailey P, Perkins MD, Persing DH, Alland D. Rapid detection of *Mycobacterium tuberculosis* and rifampin resistance by use of on-demand, near-patient technology. 2010**. J Clin Microbiol**. 48(1):229-37.

Patel SR, Weir F, Dailey P, Persing DH. Democratizing molecular diagnostics: the GeneXpert enterovirus assay. 2009. **Expert Opin. Med. Diagn.** 3(1): 91-7.

Nolte, F.S., Arbique, J.C., Cockerill, F.R., Dailey, P.J., Hillyard, D., McDonough, S., Meyer, R.F., and Shively, R.G. Molecular Diagnostic Methods for Infectious Diseases; Approved Guideline—Second Edition (MM3-A2), 2005. **Clinical Laboratory Standards Institute** 26 (8).

Van Rompay, K.K.A., P. J. Dailey, D. R. Canfield, R. P. Tarara, N. L. Aguirre, N. Bischofberger, N. C. Pedersen, and M. L. Marthas. Early short-term 9-[2-(Phosphonomethoxy)-propyl]adenine (PMPA) treatment reduces viremia, enhances immune responses, and prolongs survival for simian immunodeficiency virus-infected newborn rhesus macaques. 1999. **J. Virology** 73: 2947-2955.

Baba, T.W., V. Liska, A. H. Khimani, N.B. Ray, P.J. Dailey, D. Penninck, R. Bronson, M.F. Greene, H.M. McClure, L.N. Martin, and R.M. Ruprecht. Live-attenuated, multiply deleted simian immunodeficiency virus causes AIDS in infant and adult macaques. 1999. **Nature Medicine** 5:194-203.

Connor, R. I., D. C. Montefiori, J. M. Binley, J. P. Moore, S. Bonhoeffer, A. Gettie, K. E. Sheridan, D. D. Ho, P. J. Dailey, and P. A. Marx. Temporal analyses of virus replication, immune responses and efficacy in rhesus macaques immunized with a live, attenuated simian immunodeficiency virus vaccine. 1998. **J. Virology** 72: 7501-7509.

Harris, M., P. Patenaude, P. Cooperberg, D. Filipenko, A. Thorne, J. Raboud, S. Rae, P. Dailey, D. Chernoff, J. Todd, B. Conway, J. S. G. Montaner, and the INCAS Study Group. 1997. Correlation of viral load in plasma and lymph node tissue in HIV infection. **J. Infec. Dis.** 176: 1388-92.

Terrault, N. A., P. J. Dailey, L. Ferrell, M. L. Collins, J. C. Wilber, M. S. Urdea, B. N. Bhandari, and T. L. Wright. 1997. Hepatitis C Virus: Quantitation and Distribution in Liver. **J. Med. Virol**. 51: 217-224.

Marx, P. A., A. I. Spira, A. Gettie, P. J. Dailey, R. S. Veazey, A. A. Lackner, C. James Mahoney, C. J. Miller, L. E. Claypool, D. D. Ho, and N. J. Alexander. 1996. Progesterone implants enhance SIV vaginal transmission and early virus load. **Nature Medicine** 2:1084-1089.

Haase, A. T., K. Henry, M. Zupancic, G. Sedgewick, R. A. Faust, H. Melroe, W. Cavert, K. Gebhard, K. Staskus, Z. Zhang, P. J. Dailey, H. H. Balfour, Jr., A. Erice, and A. S. Perelson. 1996. Quantitative Image Analysis of HIV-1 Infection in Lymphoid Tissue. **Science** 274: 985-989.

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Courses Taught:

- PH 162A: Public Health Microbiology (Fall, Team-Taught)
- PH 265: Molecular Parasitology (Fall, odd-numbered years)
- PH 260F: Infectious Disease Research in Developing Countries (Spring, odd-numbered years)
- PH 293: IDI PhD Doctoral Seminars

Research Interests:

- Molecular virology, pathogenesis, immunology, epidemiology, clinical aspects, and control of dengue, Zika, and chikungunya
- Epidemiology of influenza in tropical countries
- Scientific capacity building in developing countries

Research Description:

Dr. Harris has developed a multidisciplinary approach to study the molecular virology, pathogenesis, immunology, epidemiology, clinical aspects, and control of dengue, Zika, and chikungunya – the most prevalent mosquito-borne diseases in humans. Her work investigates viral and host factors that modulate disease severity and immune correlates of protection and pathogenesis, using in vitro approaches, animal models, and research involving human populations. One major focus is on studies of arboviral diesase in humans, including antibody and B cell responses and correlates of protection, systems immunology profiling of the innate response, and viral evolution, fitness, and intrahost diversity. Another focus is viral pathogenesis, specifically the role of NS1 protein in vascular leak and ZIKV infection of the human placenta. Her international work focuses on laboratory-based and epidemiological studies of dengue, Zika, chikungunya, and influenza in endemic Latin American countries, particularly in Nicaragua, where she has been working closely with the Ministry of Health for over 30 years. Long-term collaborations include clinical, biological, and immunological studies of severe disease through a 20-year pediatric hospital-based study; a 15-year ongoing pediatric cohort study of dengue, Zika, chikungunya, and influenza transmission in Managua; and a cluster randomized controlled trial of evidence-based community-derived interventions to prevent and control arboviral diseases.

Selected Publications:

Zambrana, J.V., Bustos, F., Burger-Calderon, R., Collado, D., Jairo, Sanchez, N., Ojeda, S., Plazaola, M., Lopez, B., Arguello, S., Elizondo, D., Aviles, W., Kuan, G., Balmaseda, A., Gordon, A., **Harris, E**. (2018) Seroprevalence, risk factor, and spatial analysis of Zika virus infection after the 2016 epidemic in Managua, Nicaragua. *Proc. Natl. Acad. Sci. USA.* In press.

Gordon, A., Gresh, L., Ojeda, S., Chowell-Puente, G., Gonzalez, K., Sanchez, N., Saborio, S., Mercado, J.C., Kuan, G., Balmaseda, A., and **Harris, E**. (2018) Differences in transmission and disease severity between two successive waves of chikungunya. *Clin. Infect. Dis*. 2018 Apr 25. doi: 10.1093/cid/ciy356. [Epub ahead of print].

Katzelnick., L. Gresh, L, Halloran, M.E., Mercado, J.C., Kuan, G., Gordon, A., Balmaseda, A., and **Harris, E**. (2017) Antibody-dependent enhancement of severe dengue disease in humans. *Science*. 358(6365):929-932.

Montoya, M., Collins, M., Dejnirattisai, W., Katzelnick, L.C., Puerta-Guardo, H., Jadi, R., Schildhauer, S., Supasa, P., Vasanawathana, S., Malasit, P., Mongkolsapaya, J., de Silva, A.D., Tissera, H., Balmaseda, A., Screaton, G., de Silva, A.M., **Harris, E**. (2018) Longitudinal analysis of antibody cross-neutralization following Zika and dengue virus infection in Asia and the Americas. *J. Infect. Dis.* 218(4):536-545

Michlmayr, D., Andrade, P., Gonzalez, K., Balmaseda, A., and **Harris E**. (2017) CD14+ CD16+ monocytes are the main targets of Zika virus infection in peripheral blood mononuclear cells in a paediatric study in Nicaragua. *Nat Microbiol*. 2(11):1462-1470.

Glasner, D.R., Ratnasiri, K., Puerta-Guardo, H., Beatty, P.R., and **Harris, E.** (2017) Dengue virus NS1 cytokine-independent vascular leak is dependent on endothelial glycocalyx integrity. *PLoS Pathog.* 13(11):e1006673.

Andrade, D.V., Katzelnick, L.C., Widman, D.G., Balmaseda, A., de Silva A.M., Baric, R.S., and **Harris, E**. (2017) Analysis of individuals from a dengue-endemic region helps define the footprint and repertoire of antibodies targeting dengue virus 3 type-specific epitopes. *mBio*. 8(5):e01205-17

Parameswaran, P., Wang, C., Trivedi, S.B., Eswarappa, M., Montoya, M., Balmaseda, A., and **Harris, E**. (2017) Intrahost selection pressures drive rapid dengue virus microevolution in acute human infections. *Cell Host Microbe*. 22(3):400-410.e5.

Tabata, T., Petitt, M., Puerta-Guardo, H., Michlmayr, D., Wang, C., Fang-Hoover, J., **Harris, E.*** and Pereira, L*. (2016) Zika virus targets different primary human placental cells, suggesting two routes for vertical transmission. *Cell Host Microbe*. 20(2):155-66.

Puerta-Guardo, H., Glasner, D.R., and **Harris, E.** (2016) Dengue virus NS1 disrupts the endothelial glycocalyx, leading to hyperpermeability. *PLoS Pathog.* 12(7):e1005738.

Beatty, P.R., Puerta Guardo, H., Killingbeck, S., Glasner, D., Hopkins, K., and **Harris, E.** (2015) Dengue virus non-structural protein 1 (NS1) triggers vascular leak that can be inhibited by anti-NS1 antibodies. *Sci Transl Med.* 7:304ra141.

Andersson, N., Nava-Aguilera, E., Arosteguí, J., Morales-Perez, A., Suazo-Laguna, H., Legorreta-Soberanis, J., Hernandez-Alvarez, C., Fernandez-Salas, I., Balmaseda, A., Cortés-Guzmán, A.J., Coloma, J., Ledogar, R.J., and **Harris, E.** (2015) Camino Verde (Green Way) to Dengue Prevention: a pragmatic cluster-randomised controlled trial of evidence-based community mobilisation in Nicaragua and Mexico. *BMJ.* 351:h3267.

Other interests:

- President, Sustainable Sciences Institute
- Director, Center for Global Public Health
- Infectious Diseases and Immunity Graduate Group (Chair)
- Microbial Biology Graduate Group

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Courses Taught:

- PH 162A: Public Health Microbiology (Fall, Team-Taught)
- PH 264: Current Issues in Infectious Diseases (Fall)
- PH 295: Seminar in Public Health

Research Interests:

- Biology of human viruses (e.g. herpes, cytomegalovirus)
- Development of novel antiviral agents
- Biochemistry of nucleic acids and RNA enzymes

Selected Publications:

To, A., Bai, Y., Shen, A., Gong, H., Umamoto, S., and **Liu, F.** (2011). Yeast two hybrid analyses reveal novel binary interactions between human cytomegalovirus-encoded virion proteins. *PLoS ONE*. 6, e17796.

Bai, Y., Gong, H., Li, H.,Vu, G., Lu, S., and **Liu, F.** (2011). Oral delivery of RNase P ribozymes by Salmonella effectively inhibits viral infection in mice. *Proc. Natl. Acad. Sci.* USA. 108(8):3222-27.

Jiang, X., Bai, Y., Rider, P., Kim, K., Zhang, C., Lu, S., and **Liu, F.** (2011). Engineered external guide sequences effectively block viral gene expression and replication in cultured cells. *J. Biol. Chem.* 286(1):322-30.

Liu, F., and Altman, S. (2010) *Ribonuclease P*. Springer, New York.

Bai, Y., Li, H., Gong, H., Vu, G., Umamoto, S., Zhou, T., Lu, S., **Liu, F.**(2010) Salmonella-mediated delivery of RNase P ribozymes for inhibition of viral gene expression and replication in human cells. *Proc. Natl. Acad. Sci.* U.S.A. 107, 7269-7274.

Rider, P. J., Dunn, W., Yang, E., and **Liu, F.** (2009). Human cytomegalovirus microRNAs. *Curr Top Microbiol Immunol*, 325, 21-39.

Bai, Y., Trang, P., Li, H., Kim, K., Zhou, T., and **Liu, F.** (2008). Effective inhibition in animals of viral gene expression and pathogenesis by an engineered ribozyme derived from RNase P catalytic RNA. *Proc. Natl. Acad. Sci.* USA. 105, 10919-24.

Kim, K. and **Liu, F.** (2007). (Invited review) Inhibition of gene expression in human cells using RNase P-derived ribozymes and external guide sequences. *Biochimica et Biophysica Acta*. 1769, 603-612.

Hai, R., Chu, A., Li, H., Umamoto, S., Rider, P., **Liu, F.** (2006). Infection of human cytomegalovirus in cultured human gingival tissue. *Virology J*. 3:84.

Yu, X., Trang, P., Shah, S., Atanasov, I., Bai, Y., Zhou, Z. H. and **Liu, F.**(2005). Dissecting human cytomegalovirus gene function and capsid maturation by ribozyme targeting and electron cryomicroscopy. *Proc. Natl. Acad. Sci.* USA, 102, 7103-7108.

Lodoen, M., Abenes, G., Umamoto, U., Houchins, J. P., **Liu, F.**, and Lanier, L. L. (2004). The Cytomegalovirus m155 Gene Product Subverts NK cell Antiviral Protection by Disruption of H60-NKG2D Interactions. *J. Exp. Med.* 200, 1075-1081.

Dunn, W., Chou, C., Li, H., Hai, R., Patterson, D., Stolc, V., Zhu, H., and**Liu, F.** (2003). Functional profiling of human cytomegalovirus genome.*Proc. Natl. Acad. Sci.* USA. 100, 14223-14228.

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Courses Taught:

- PH 266A: Food-borne Diseases (Spring, odd numbered years)

Research Interests:

- Pathogenesis and transmission of Salmonella
- Foodborne pathogens
- Foodborne diseases – detection and prevention

Selected Publications:

Mempin, R., Tran, H., Chen, C., Gong, H., Ho, K. K, and **Lu, S.** (2013) Release of extracellular ATP by bacteria during growth. *BMC Microbiol*. 13, 301. Pubmed

Liu, Y., Ho, K. K., Su, J., Gong, H., Chang, A. C., and **Lu, S.** (2013) Potassium transport of *Salmonella* is important for type III secretion and pathogenesis. *Microbiology* 159, 1705-19. Pubmed

Jiang, X., Gong, H., Chen, Y. C., Vu, G. P., Trang, P., Zhang, C. Y., **Lu, S.**, and Liu F. (2012) Effective inhibition of cytomegalovirus infection by external guide sequences in mice. *Proc. Natl. Acad. Sci.* USA. 109, 13070-5. Pubmed

Bai, Y., Gong, H., Li, H., Vu, G., **Lu, S.**, and Liu, F. (2011). Oral delivery of RNase P ribozymes by Salmonella effectively inhibits viral infection in mice. *Proc. Natl. Acad. Sci.* USA. 108, 3222-3227. Pubmed

Bai, Y., Li, H., Vu, G., Gong, H., Umamoto, S., Zhou, T., **Lu, S.** and Liu, F (2010) Salmonella-mediated delivery of RNase P-based ribozymes for inhibition of viral gene expression and replication in human cells. *Proc. Natl. Acad. Sci.* U. S. A. 107, 7269-7274. Pubmed

Loui, C., Chang, A. C. and **Lu, S.** (2009) Role of the ArcAB Two-Component System in the Resistance of Escherichia coli to Reactive Oxygen Stress. *BMC Microbiology* 9, 183. Pubmed

Gong, H., Su, J., Bai, Y., Miao, L., Kim, K., Yang, Y., Liu, F., and **Lu, S.** (2009) Characterization of the expression of Salmonella Type III secretion system factor PrgI, SipA, SipB, SopE2, SpaO, and SptP in cultures and in mice. *BMC Microbiology*. 9, 73. Pubmed

Su. J., Gong, H., Lai, J. T., Main, A. J. and **Lu, S.** (2009) Potassium transporter Trk and external potassium modulate Salmonella protein secretion and virulence. *Infection and Immunity* 77, 667-75. Pubmed

Loui, C., Grigoryan, G., Huang, H., Riley, L. W. and **Lu, S.** (2008) Bacterial communities associated with retail alfalfa sprouts. *Journal of Food Protection* 71, 200-204. Pubmed

Kang, H., Loui, C. S., Clavijo, R. I., Riley, L. W. and **Lu, S** (2006)**.** Survival characteristics of *Salmonella enterica* serotype Enteritidis in chicken egg albumen. *Epidemiology and Infection* **134**, 967-976. Pubmed

Clavijo, R. I., Loui, C. S., Andersen, G. L., Riley, L. W. and **Lu, S.** (2006) Identification of genes associated with the survival of *Salmonella enterica* serovar Enteritidis in chicken egg albumen. *Appl Environ Microbiol.*72, 1055-1064. Pubmed

Lu, S., Killoran, P. B., and Riley, L. W. (2003) Association of *Salmonella enterica* serovar Enteritidis YafD with chicken egg albumen resistance. *Infection and Immunity* **71**, 6734-6741. Pubmed

Lu, S., Killoran, P. B., Fang, F. C. and Riley, L. W. (2002) The global regulator ArcA controls resistance to reactive nitrogen and oxygen intermediates in *Salmonella enteritidis. Infection and Immunity* **70**, 451-461. Pubmed

Veronica Miller, Ph.D.

Adjunct Professor
Executive Director, Forum for
Collaborative HIV Research
(202) 974-6290, Fax: (202) 872-4316
E-mail: veronicam@berkeley.edu

Courses Taught:

- PH 236: U.S. Food and Drug Administration, Drug Development, and Public Health (Spring)

Research Interests:

- Advancing regulatory science for unmet medical/public health needs
- Collaborative frameworks for drug development
- Translating biomedical innovation to global access
- Disease areas: HIV, HCV, HBV, CMV, liver diseases

Research Description:

In 2001, Miller joined the Forum for Collaborative Research—a public/private partnership addressing cutting-edge science and policy issues through a process of stakeholder engagement and deliberation—as executive director. The Forum brings together researchers and advocates, national and international regulatory agencies, pharmaceutical and diagnostic companies, health care providers, and private foundations to compare data and debate consequences. The Forum also identifies gaps and impediments, frames issues, and helps set research strategy.

Under her leadership, the Forum for Collaborative Research extended its deliberative process to advance regulatory science (applied successfully to HIV) to drug development for hepatitis C infection, the treatment of liver diseases (NASH and fibrosis), and human cytomegalovirus disease in solid organ and stem cell transplant patients.

Prior to 2001, Miller's own research focused on randomized clinical trials and observational cohorts to determine factors associated with HIV treatment outcomes, including the impact of drug resistance, documented in more than 50 peer-reviewed articles. Her original research work contributed to FDA and EMA guidelines on assessment and reporting of drug resistance and the generation of international guidelines for drug resistance testing.

Current Projects:

- HIV Cure Project
- Overcoming Health Disparities in the Bay Area Using HIV/AIDS and HCV as Models
- HCV Drug Development Advisory Group
- Facilitating Drug Development for the Treatment of Liver Disease
- Facilitating Drug Development for the Prevention and Treatment of CMV Disease in Transplantation Settings
- Pre-Exposure Prophylaxis and Microbicide Research
- HBV Therapeutic and Curative Interventions
- Pediatric HIV Clinical Trials
- Addressing the Regulatory Challenges of Primary Sclerosing Cholangitis (PSC) to Advance Therapeutic Interventions

Selected Publications:

Natori Y, Algahamdi A, Tazari Mahmood, **Miller V**, Husain S, Komatsu T, Griffiths P, Ljungman P, Orchanian-Cheff A, Kumar D, Humar A. *Can Viral Load be used as a Surrogate Marker in Clinical Studies of Cytomegalovirus in Solid Organ Transplantation: A Systematic Review and Meta-analysis.*CMV. CID 2017. In press. DOI 10.1093/cid/cix793

Patel YA, Imperial JC, Muir A, Quentin M, Debrota DJ, Dimick-Santos L, Filozof C, Metha R, Sanyal AS, Schabel E, Neuschwander-Tetri BA, **Miller V.***Baseline parameters in clinical trials for nonalcoholic steatohepatitis: Recommendations from the Liver Forum*. Gastroenterology 2017; In press. DOI 10.1053/j.gastro.2017.07.024

Bartlett SR, Grebely J, Eltahla AA, Reeves JD, Howe AYM, **Miller V**, Ceccherini-Silberstein F, Bull RA, Douglas MW, Dore DJ, Harrington P, Lloyd AR, Jacka B, Matthews GV, Wang GP, Pawlotsky J-M, Feld JJ, Schinkel J, Garcia F, Lennerstarnd J, Applegate TL. *Sequencing of hepatitis C virus for detection of resistance to direct-acting antiviral therapy: A systematic review*. Hepatology Communications 2017; in press. DOI 10.1002/hep4.1050

Liu J, Goicochea P, Block T, Brosgart CL, Donaldson EF, Lenz O, Lim SG, Marins EG, Mishra P, Peters MG, **Miller V.** *Advancing the regulatory path on hepatitis B virus treatment and curative research: A stakeholders' consultation.* Journal of Virus Eradication 2017; 3:1-6.

Ljungman P, Boeckh M, Hirsch HH, Josephson F, Lundgren J, Nichols G, Pikis A, Razonable RR, **Miller V**, Griffiths PD. *Definitions of Cytomegalovirus Infection and Disease in Transplant Patients for Use in Clinical Trials*. CID 2017; 64(1):87-91. DOI 10.1093/cid/ciw668

Lee W. Riley, M.D.

Professor and Head, Division of Infectious Diseases and Vaccinology
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Lab: 530E Li Ka Shing Center
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E-mail: lwriley@berkeley.edu
Lab Website:
https://sites.google.com/site/rileylabucberkeley/home

Courses Taught:

- PH 260A: Principles of Infectious Diseases, Part I (Fall) with Dr. Swartzberg
- PH 260E: Molecular Epidemiology of Infectious Diseases (Fall, even-numbered years)

Research Interests:

- Mechanisms of drug resistance in Gram-negative bacteria
- Molecular epidemiology of tuberculosis and drug-resistant Gram-negative bacterial infections
- Rapid diagnostic test development for drug-resistant Gram-negative bacterial infections
- Tuberculosis biomarker test development and validation
- Field epidemiology and global health research focused on diseases of urban slums

Current Projects:

- Global Health Equity Scholars Fellowship Program: A NIH/Fogarty International Center-funded project to train US postdoctoral fellows and advanced PhD students to go abroad do research related to slum health.
- NIH-funded project on new diagnostic test development for drug-resistant Gram negative bacterial infections.
- CDC-funded project on molecular epidemiology of community-acquired urinary tract infections.

Selected Publications:

Queiroz A, Medina-Cleghorn D, Marjanovic O, Nomura DK, **Riley LW**. *Comparative metabolic profiling of mce1 operon mutant vs wild-type Mycobacterium tuberculosis strains*. Pathog Dis. 2015; 73(8):ftv066.

Marlow MA, Maciel EL, Sales CM, Gomes T, Snyder RE, Daumas RP, **Riley LW**. *Tuberculosis DALY-Gap: Spatial and Quantitative Comparison of Disease Burden Across Urban Slum and Non-slum Census Tracts*. J Urban Health. 2015;92(4):622-34.

Adams-Sapper S, Nolen S, Donzelli GF, Lal M, Chen K, Justo da Silva LH, Moreira BM, **Riley LW**. *Rapid induction of high-level carbapenem resistance in heteroresistant KPC-producing Klebsiella* pneumoniae. Antimicrob Agents Chemother. 2015;59(6):3281-9.

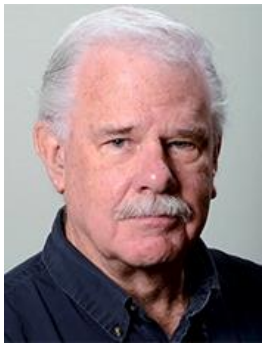
Francis SS, Plucinski MM, Wallace AD, **Riley LW**. *Genotyping Oral Commensal Bacteria to Predict Social Contact and Structure*. PLoS One. 2016;11(9):e0160201.

Schump MD, Fox DM, Bertozzi CR, **Riley LW**. *Subcellular Partitioning and Intramacrophage Selectivity of Antimicrobial Compounds against Mycobacterium tuberculosis*. Antimicrob Agents Chemother. 2017;61(3). pii: e01639-16.

Stephens CM, Adams-Sapper S, Sekhon M, Johnson JR, **Riley LW**. *Genomic Analysis of Factors Associated with Low Prevalence of Antibiotic Resistance in Extraintestinal Pathogenic Escherichia coli Sequence Type 95 Strains*. mSphere. 2017;2(2). pii: e00390-16.

Snyder RE, Boone CE, Cardoso CA, Aguiar-Alves F, Neves FP, **Riley LW**. *Zika: A scourge in urban slums*. PLoS Negl Trop Dis. 2017;11(3):e0005287.

Book: Corburn, J and **Riley LW**. *Slum health: from the cell to the street*. University of California Press, 2016: 315p.



George F. Sensabaugh Jr. D Crim

Professor of Biomedical and Forensic Sciences
Professor of Graduate School
Professor Emeritus
Office: 319 Mulford Hall
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Research Interests:

- Microbial population genetics and evolution - molecular epidemiology
- Genetic variation in human populations - biological significance and evolutionary origins
- Forensic science - forensic genetics, science-law interactions, concepts of identification

Research Description:

Microbial Population Genetics and Epidemiology

We are interested in the genetic structure of populations of species in the genus staphylococcus and in the role of mobile elements in shaping variation within and between species.

Forensic Science

Our research interests focus on the analysis and interpretation of biological evidence, with a current emphasis on the utilization of biological evidence in the investigation and prosecution of sexual assault.

Current Projects:

- Genomic characterization, population structure, and evolution of Staphylococcus saprophyticus
- Review of evidence collection and DNA profile outcomes in sexual assault cases

Selected Publications:

Target capture enrichment of nuclear SNP markers for massively parallel sequencing of degraded and mixed samples. (2018) Bose N, Carlberg K, **Sensabaugh G**, Erlich H, Calloway C. Forensic Sci Int Genet. 34:186-196.

Forensic bitemark identification: weak foundations, exaggerated claims. (2016) Saks MJ, Albright T, Bohan TL, and 36 others. J Law Biosci. 3(3):538-575.

Staphylococcus saprophyticus Recovered from Humans, Food, and Recreational Waters in Rio de Janeiro, Brazil. (2017) de Sousa VS, da-Silva APS, Sorenson L, and 12 others. Int J Microbiol. 2017;2017:4287547.

S. Cavness, A. Choudhury, and **G.F. Sensabaugh**. (2014) Hospital wet mount examination for the presence of sperm in sexual assault cases is of questionable value. *J. Forensic Sciences* 59(3): 729-734

B.W. Brunelle and **G.F. Sensabaugh**. (2012) Nucleotide and phylogenetic analyses of the chlamydia trachomatis ompa gene indicates it is a hotspot for mutation. *BMC Research Notes* 5:53

Kaye DH and **Sensabaugh GF**. Reference guide on DNA identification evidence. In: *Reference Manual on Scientific Evidence*, 3rd Ed., pp.129-210. Federal Judicial Center (National Academy Press, 2011)

Miragaia M, de Lencastre H, Perdreau-Remington F, Chambers HF, Higashi J, Sullam PM, Lin J, Wong KI, King KA, Otto M, **Sensabaugh GF**, Diep BA. (2009) Genetic diversity of arginine catabolic mobile element in staphylococcus epidermidis. *PLoS ONE* 4: e7722,.

Other interests:

- Affiliated Faculty - Graduate Group in Forensic Science, UC Davis

Sarah Stanley, Ph.D.

The King Sweesy and Robert Womack Endowed Chair in Medical Research and Public Health
Assistant Professor, Infectious Diseases and Vaccinology
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E-mail: sastanley@berkeley.edu

Courses Taught:

- PH 162A: Public Health Microbiology (Fall, Team-Taught)
- PH 263: Public Health Immunology (Fall)
- PH 293: IDI Doctoral Seminars

Research Interests:

- Tuberculosis mechanisms of pathogenesis and immune subversion
- Lipid metabolism
- Innate Immunity
- Novel approaches to antibiotic development

Selected Publications:

Braverman, J, Sogi KM, Benjamin D, Nomura DK, **Stanley SA**. HIF-1α Is an Essential Mediator of IFN-γ–Dependent Immunity to *Mycobacterium tuberculosis*. *Journal of Immunology* 2016 July, 1600266.

Stanley, SA, Barczak AK, Silvis, MR, Luo, SS, Sogi, K, Vokes, M, Bray, M, Carpenter, AE, Siddiqi, N, Rubin EJ, Hung, DTH. A chemical screen to identify host-targeted small molecules that restrict intracellular*Mycobacterium tuberculosis* growth. *PLoS Pathog* 2014 Feb; 10(2): e1003946. doi:10.1371/journal.ppat.1003946.

Stanley, S.A., Kawate, T., Iwase, N., Shimuzu, M., Clatworthy, A., Kazyanskaya, E., Siddiqi, N., Sac-chettini J.C., Ioerger T.R., Aquadro, J.A., Rubin, E.J., Hung, Diarylcoumarins inhibit mycolic acid biosynthesis and kill M. tuberculosis by targeting FadD32. *Proc Natl Acad Sci.* 2013 Jul 9;110(28):11565-70.

Stanley, SA, Cox, JS. Host-pathogen interactions during *Mycobacterium tuberculosis* infections. *Current topics in Microbiology and Immunology*, 2013 July 24.

Stanley, S.A., Kazyanskaya, E., Aquadro, J.A., Silvis, M., Gomez, J., Hung, D.T. Identification of novel inhibitors of *M. tuberculosis* growth using whole cell based high-throughput screening. *ACS Chemical Biology*, 2012 May 21.

Barczak, A.K., Gomez, J.E., Kaufmann, B.B., Hinson, E.R., Cosimi, L., Borowsky, M.L., Onderdonk, A.B., **Stanley, S.A.**, Kaur, D., Bryant, K.F., Knipe, D.M., Sloutsky, A., Hung, D.T. RNA signatures allow rapid identification of pathogens and antibiotic susceptibilities. *Proc Natl Acad Sci* USA, 2012 April 17; 109(16):6217-22.

Chindelevitch, L., **Stanley, S.**, Hung, D., Regev, A., Berger, B. MetaMerge: scaling up genome-scale metabolic reconstructions with application to*Mycobacterium tuberculosis*. *Genome Biol*. 2012 Jan 31; 13(1):R6.

Stanley S.A., Johndrow, J.E., Cox, J.S. The type I IFN response to infection with *M. tuberculosis* requires ESX-1 mediated secretion and contributes to pathogenicity. *J. Immunol*. 2007 Mar 1;178(5):3143-52.

Champion P.A., **Stanley S.A.**, Champion M.M., Brown E.J., Cox J.S. C-terminal signal sequence promotes virulence factor secretion in*Mycobacterium tuberculosis*. *Science*. 2006 Sep 15;313(5793):1632-6.

MacGurn, J.A., Raghavan, S., **Stanley, S.A.**, Cox, J.S. A non-RD1 gene cluster is required for Snm secretion in *M. tuberculosis*. *Mol. Micro.*2005 Sep;57(6):1653-63.

Stanley S.A., Raghavan S., Hwang W.W., Cox J.S. Acute infection and macrophage subversion by *Mycobacterium tuberculosis* require a specialized secretion system. *Proc Natl Acad Sci* USA. 2003 Oct 28;100(22):13001-6.

Richard S. Stephens, Ph.D., MSPH

Professor Emeritus
Office: 51A Koshland Hall
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Email: rss@berkeley.edu

Research Interests:

- Molecular interactions of Chlamydia and the host in the context of specific microbe-cell interaction
- The genetic basis of chlamydial developmental regulation at the level of macromolecular chromosomal
- Molecular epidemiology of chlamydial infections

John E. Swartzberg, MD, FACP

Clinical Professor,
Emeritus
Chair, Editorial Board, *UC Berkeley Wellness Letter*
Office: 570 University Hall
(510) 643-0499, Fax: (510) 643-8771
E-mail: jes@berkeley.edu

Courses Taught:

- HMS 202 D/E: Clinical Skills
- PH 260A: Principles of Infectious Diseases (co-teach with Riley)
- PH 260B: Principles of Infectious Diseases (Spring)
- PHW 260: Principles of Infectious Diseases
- PH 266C: Hospital Associated Infections (Fall)

Research Interests:

- Healthcare Associated Infections
- Infectious Diseases
- Journalism and Public Health

Selected Publications:

UC Berkeley Wellness Reports:

- Dietary Supplements, 2017
- Eating for Optimal Health, 2017
- Women's Health, 2017
- Men's Health, 2017
- Controlling Your Cholesterol, 2017

"The Physician as a 21st Century Public Health Professional," *JAMA*, December 24/31, 2009.

Other interests:

- Chair, Editorial Board - *UC Berkeley Wellness Letter*

MPH Program Career Opportunities

I. Research/Education -Related

1. Research analyst , research associate, research scientist, research analyst in a:
   - biotechnology, state (CDHS) or federal (CDC, LBL, FDA, NIH, etc.) unit/laboratory;
   - county health department laboratory or division (e.g., communicable diseases, STD, TB, bioterrorism);
   - hospital-based or academic research groups/institutions;
   - forensics laboratory;
   - city sanitation department.
2. As a stepping stone for a higher degree: Dr PH, PhD, DVM, MD. Some IDV MPH graduates continue on for more education immediately after graduation such as MD, DrPH, PhD degrees.
3. Licensed clinical laboratory scientist in a hospital or private laboratory at a supervisory level (must complete 12-15 month training program and licensure).

II. Public health microbiologist in a state or county public laboratory at a supervisory level (must complete 6-month training program and licensure).

III. Teaching

1. Clinical laboratory scientist or public health microbiologist training programs (with appropriate licenses).
2. Instructor or faculty in a junior college.
3. Academic coordinator for microbiology lab courses, internships, etc. in a college or university.
4. Field program supervisor, public health practice.

IV. Epidemiology-Public Health Epidemiologist in private or public sector

1. Infection control officer in a hospital or other institution.
2. Surveillance assistant in a public health department.
3. Epidemiology analyst.

V. Program Administrator

1. Biohazard inspector for a university, institute, or biotech company.
2. Environmental microbiologist.
3. Industrial hygienist specializing in infectious diseases.
4. Health facility evaluator.
5. Health program director
6. Program Coordinator/Program Analyst

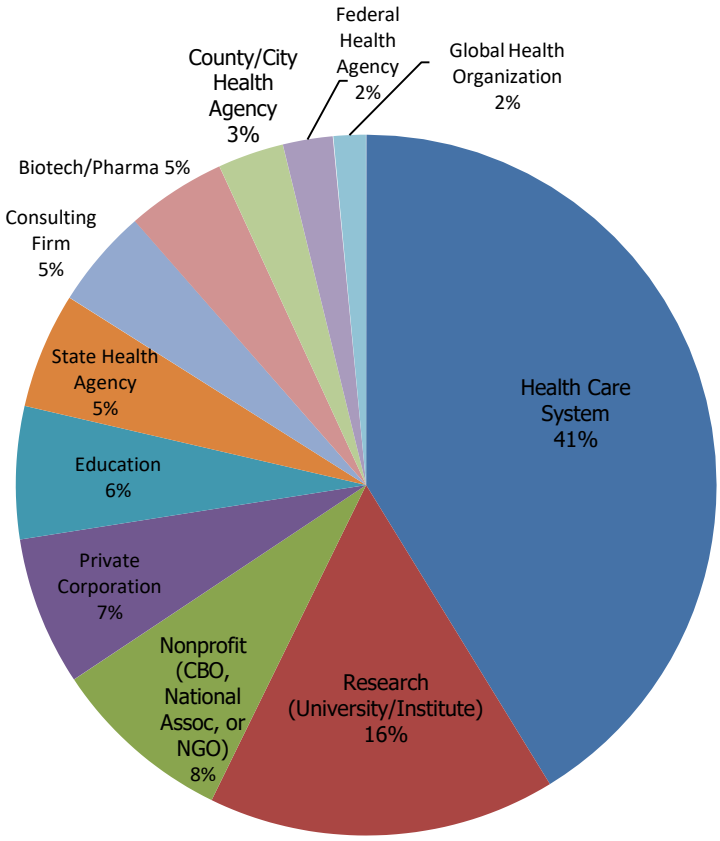
VI. Journalism

1. Science writer
2. Producer/director of science programs

VII. Consulting

VIII. Supplement (public health perspective) to an already earned doctoral degree

Recent SPH MPH Job Placement Statistics



Where IDV Grads from the past three years have been employed:

UCSF University of California San Francisco
Berkeley School of Public Health
KAISER PERMANENTE
Pangaea Global AIDS Foundation
California Department of Public Health CDPH
C·H·O·R·I Children's Hospital Oakland Research Institute
CLINTON HEALTH ACCESS INITIATIVE
LifeLong Medical Care Health Services For All Ages
COUNTY OF SAN MATEO HEALTH SYSTEM
San Francisco Immunization Coalition
California Emerging Infections Program
Alameda County
GLADSTONE INSTITUTES
sfgh
hip HEALTH IMPROVEMENT PARTNERSHIP of Santa Cruz County
GLOBAL HEALTH CORPS
happy family
CEDARS-SINAI
THE UNIVERSITY OF ILLINOIS AT CHICAGO
Healthy+Active Before 5
STANFORD BUSINESS
UCSF GLOBAL HEALTH SCIENCES THE GLOBAL HEALTH GROUP From evidence to action
BBC Berkeley Builds Capacity
San Francisco Multi•Specialty Medical Group
CDC Centers for Disease Control and Prevention
BERKELEY FREE CLINIC HEALTHCARE FOR PEOPLE NOT PROFIT
Deloitte.
Forum for Collaborative HIV Research
UNIVERSITY of CALIFORNIA OFFICE OF THE PRESIDENT
ASCENDIAN HEALTHCARE CONSULTING
SAN FRANCISCO STATE UNIVERSITY
PaxVax
MEDICAL COLLEGE OF WISCONSIN
VDH VIRGINIA DEPARTMENT OF HEALTH Protecting You and Your Environment
TOWERS WATSON
RTI INTERNATIONAL
APHL ASSOCIATION OF PUBLIC HEALTH LABORATORIES

MPH Program Curriculum Requirements

This MPH program provides a basic course of study in public health microbiology and infectious diseases. Persons with a firm background in biology but with no prior experience in infectious diseases, can gain the basic education necessary to pursue careers in the public health, industrial, and clinical fields of infectious diseases. Persons with prior backgrounds in the infectious diseases (i.e. medical technologists, clinical and public health microbiologists, nurses, physicians, etc.) can update and broaden their public health base. **Forty-eight (48) graduate units** are required for graduation. All Breadth and Division core courses must be taken in letter grades, with a minimal of a **B-** grade for graduation. Students must maintain an overall grade-point average of **at least 3.0** on the basis of all upper division and graduate courses (100- and 200-level, please note 300-level courses will not count for graduation) taken in graduate standing. No more than one third of the classes for graduation can be taken in Satisfactory or Unsatisfactory (S/U) grade. A Satisfactory grade implies work of B minus (B-) quality or better. The time required to complete the MPH degree is two years. Twelve units is full time. Graduate students in the MPH program usually take 16 units per semester and the maximum units they can take each semester is no more than 20.5 units.

As part of general School of Public Health Breadth requirements, the following courses or accepted substitutes must be taken (pl refer to MPH Breadth Course Requirement), or an exemption examination passed. More advanced level substitutes are recommended when possible.

MPH Breadth Requirement:

PH 200J, K, & L	Public Health Core Breadth Course (PH 200J- 2 units, 200L-2 units, (4 units total) (Fall 2018) (PH 200K 2 units)(Sp 2019)
PH 142	Probability and Statistics in Public Health and Biology (4 units) (F)
PH 250A	Epidemiologic Methods (3 units) (Su) (F)
PH 297	Public Health Field Study (3 units) (Do the Placement in Summer 19), Register the class PH 297 in Fall 2018 in S/SU grade for 3 units

Effective Fall 2014, MPH students are required to attain a B- or better in Breadth Course Requirements (Epidemiology PH 250A; Biostatistics PH 142; Health Policy & Management PH 200J; Environmental Health PH 200K; Health and Social Behavior PH 200L). This rule also applies to alternative courses. Please refer to the School-wide Student Handbook 2018-19 for details. **Students attaining less than a B- will be required to retake the course in order to receive a MPH degree**. Students must also meet the "Good Academic Standing Rule" (i.e. student must maintain overall GPA of a B, which is a 3.0) to participate in the PH 297 Field Study and to graduate.

Special curricular requirements for the IDV MPH Program are as follows:

IDV Core Requirements:

PH 260A	Principles of Infectious Disease, Part I (4 units) (F)
PH 260B	Principles of Infectious Disease, Part II (4 units) (Sp)
PH 264	Current Issues in Infectious Diseases (2 units) **(F, 2nd yr IDV MPH students only)**
PH 263	Public Health Immunology (3 units) (F)

PH 260A and PH 260B must be taken in the first year. PH 264 must be taken in the fall of the 2nd year.

Advanced Courses:

At least two advanced courses are required for all MPH students for graduation. Courses offered in alternate years are **in bold**.

PH 260E	Molecular Epidemiology of Infectious Diseases (2 units) (Fall 2018)
PH 260F	Infectious Disease Research in Developing Countries (2 units) (Sp 2019)
PH 262	Molecular Basis of Bacterial Pathogenesis (3 units) (Sp)
PH 265	Molecular Parasitology (3 units) (Fall 2019)
PH 266A	Food-borne Diseases (2 units) (Spring 2019)
PH 266B	Zoonotic Diseases (2 units) (Sp)
PH 236	US Food & Drug Admin, Drug Development, and Public Health (2 units) (Sp)

IDV Division Seminar:

All IDV MPH students are required to register for **PH 266C**: Hospital Associated Infections, the IDV Division Seminar, and will be offered in every Fall. Only one seminar is needed, and a substitution by another School of Public Health seminar **related to Infectious Diseases** may be acceptable as IDV Division Seminar. Please contact IDV Division Manager for questions. Please note it is established that PH 290 Infectious Diseases Modeling Seminar I or II by Professor John Marshall is acceptable to count as the IDV Division Seminar.

IDI PhD students should enroll in PH 293: IDI Monday Doctoral Seminar (1 unit) every semester till graduation and PH 293: IDI Wednesday Doctoral Seminar (2 unit) (is for pre-QE IDI PhD students to enroll, advanced IDI PhD students are welcome).

MPH Program
Sample of Two Year Course of Study

COURSE #	COURSE TITLE	UNITS
Year 1: Fall 2018 Semester		
*PH 260A	Principles of Infectious Diseases Part I	4
PH 250A	Epidemiologic Methods I	3
*PH 200J & L	Public Health Core Breadth Course	4
PH 142 or	Intro. Probability and Statistics	4
PH 263	Public Health Immunology	3
Year 1: Spring 2019 Semester		
*PH 260B	Principles of Infectious Diseases, Part II	4
PH 250B	Epidemiologic Methods II	4
PH 257	Outbreak Investigation	2
PH 200K	Public Health Core Breadth Course	2
PH 2XX	Required IDV Advanced Courses or electives	2-4
Year 1: Summer 2019		
*PH 297	Public Health Practice – Field Study Placement	
Year 2: Fall 2019 Semester		
*PH 264	Current issues in Infectious Diseases	2
PH 266C	Hospital Associated Infections (IDV Div Seminar)	2
PH 253B	Epidemiology and Control of Infectious Diseases	3
PH 263	Public Health Immunology	3
PH 2XX	Required IDV Advanced Course and/or elective	2, 4
*PH 297	Public Health Practice – Field Study	3
Year 2: Spring 2020 Semester		
PH 227A	Healthcare Finance	3
PH 2XX	Required IDV course and/or electives	8
PH 299	Work on Comprehensive Exam (Comp Paper mentorship), register for 2 units of PH 299 section of your assigned Comp Paper mentor faculty	2

Students must register for a minimum of 12 units each semester.
* Required course that must be taken during the semester where indicated on this document.
PH 142 and PH 263 can be taken in the first year or second year.

Additional courses offered by the School of Public Health and by other departments on the Berkeley campus may be taken to supplement the above curriculum and to satisfy particular student educational objectives. Such courses should include epidemiology, biostatistics, molecular biology, immunology, Public Health policy, MBA and behavioral science.

Recommended Alternatives to MPH Breadth Required Courses

Course	Acceptable Substitutions
PH 142	PH 141, 241, 245, or *exemption exam
PH 250A	PH 250B or *exemption exam

*Exemption exam will be held during Orientation

Advanced Courses in Infectious Diseases and Vaccinology

(Courses offered in alternate years are **bolded**)

PH 260E	**Molecular Epidemiology of Infectious Diseases**	**2**	**Fall 2018**
PH 260F	**Infectious Diseases Research in Developing Countries**	**2**	**Spring 2019**
PH 262	Molecular Basis of Bacterial Pathogenesis	3	Spring 2019
PH 265	**Molecular Parasitology**	**3**	**Fall 2019**
PH 266A	**Foodborne Diseases**	**2**	**Spring 2019**
PH 236	US Food & Drug Admin, Drug Dev, and Public Health	2	Spring
PH 266C	Hospital Associated Infections (counts as IDV Div seminar)	2	Fall
PH 266B	Zoonotic Diseases	2	Spring

Recommended Electives:

Students may take courses as electives from other concentrations such as Biostat, Epi, EHS, Global Health, HSB, HPM, etc. The list below represents recommended electives relevant to the IDV curriculum that IDV MPH students have taken before and have found useful and relevant.

Class Number	Class Title	Semester	Units
Biostatistics			
PH 290 Section 5 (Previously PH144A/B)	Introduction to SAS Programming	Spring	2
PH 241	Statistical Analysis of Categorical Data	Spring	2
PH 245	Introduction to Multivariate Statistics	Fall	4
PH 251C	Causal Inference and Meta-Analysis in Epidemiology	Fall	2
PH 251D	Applied Epidemiology Using R	Fall	2
PH 252C	Intervention Trial Design	Fall	3
Epidemiology			
*PH 250B	Epidemiologic Methods II	Fall	4
PH 253B	Epidemiology and Control of Infectious Diseases	Spring	3
PH 253D	Behavioral & Policy Science in HIV Treatment & Prevention	Fall	3
PH 253G	Sexual Health Promotion and Sexually Transmitted Diseases	Spring	2
PH 256	Molecular and Genetic Epidemiology and Human Health in the 21st Century	Spring	4
PH 257	Outbreak Investigation	Fall/Spring	2
Environmental Health Sciences			
PH 269E	Environmental Medicine	Fall	2
PH 271D	Global Burden of Disease and Comparative Risk Assessment	Spring	3
PH 272A	Geographic Information Science for Public and Environmental Health	Spring	4
PH 273**	Environmental Determinants of Infectious Disease (Seminar)	Fall	3
Health & Social Behavior			
PH 219D	Social and Behavioral Health Research	Fall	3
PH 204F	Culture, Public Health Practice, and Eliminating Health Disparities: From Ideas to Action in the 21st Century	Spring	3
Health Policy and Management			
PH 220D	Health Policy Advocacy	Fall	3
PH 227A	Healthcare Finance	Spring	3
Molecular & Cell Biology			
MCB 110	General Biochemistry and Molecular Biology	Fall/Spring	4
MCB 210	Macromolecular Reaction and the Cell	Spring	4
MCB 250	Advanced Immunology	Spring	4

*****Highly recommended

** Will meet IDV Division seminar requirement

Note: Course offerings based on past years; please check the latest course offerings in Calcentral.

MPH Field Study Practice Requirement

All MPH students in the School are expected to complete a field training or project-based public health practice activity following the first year of academic study in public health. This entails a 12- week, full-time work experience during the summer between the 1st and 2nd year. Unit credit is received by registering for 3 units of Public Health Practice Field Study (PH297) in the fall semester of the 2nd year.

The Center for Public Health Practice and Leadership (CPHPL) provides the academic and administrative structure for meeting this practice requirement for the MPH degree. To receive academic credit, students need to complete requirements such as: Placement Confirmation Form, Learning Agreement, Site Visit, and Final Project. Visit http://sph.berkeley.edu/careers/internships to learn more.

Infectious Disease students can fulfill the public health practice requirement by active participation in a research or field project within the School or by working in a public health agency at the local, state, national, or international level. Examples of previous internship placements are listed below. Students are encouraged to explore internship options throughout their first Fall semester of the program and into January/February 2019. CPHPL staff will work closely with IDV Field Consultant (Peter Dailey) to provide support throughout the internship placement process and the duration of the summer internship.

Agencies where students were placed during the last few years include:

University Mayores de San Andres, La Paz, Bolivia
California Dept. of Public Health (CDPH), Richmond
- TB Control Branch
- HIV Prevention Training Center
- Alcohol Research Group: Bar Study

UCSF-GI Division
- SF General Hospital/Division of Internal Medicine
- Grant Laboratory Gladstone Institute of Virology & Immunology
- UCB Global Framework
- Global Health Group-Zanzibar Malaria Control Program
- Parnassus - Pediatric Immunology
- Blood Systems Research Institute

University of Zimbabwe
NIH Malaria Training Program, Mali
ID Branch, Ministry of Health, Nicaragua
UCOP CA Breast Cancer Research Program
SFDPH STD Prevention and Control Services
NIH, Bethesda
California Emerging Infections Program
Les Cantres GHESKIO, Haiti
Thailand Ministry of Public Health
City of Berkeley Bioterrorism Preparedness
Alta Bates Medical Center, Berkeley
Contra Costa County, Alameda County and San Francisco, Dept of Public Health
Ctr for Infectious Disease & Emergency Readiness CDC, Washington D.C.
Emerging Drug Resistance -Malaria, Uganda National Institute of Infectious Diseases-Japan
Meheba Refugee Settlement-Zambia
Providence Cancer Center-Portland, Oregon
WHO-Geneva, Switzerland
Fundacao Oswaldo Cruz- Centro de Pesquisa Gonçalo Moniz – FIOCRUZ
Zambia-Meheba Refugee Settlement-
UN Internship Program (NY)
Pan Am Health Organization, Washington DC Family AIDS care & Education Services, Kenya Prevention International, Kenya
Project AIDS East Bay, Oakland
HEAL Africa, Democratic Republic of Congo & Berkeley

IDV MPH Summer 2018 Field Study Placements

Student Name	Field Study	Location
Leah Rosenbaum	ScienceNews	
Laura Deneckere	Professor David Collier, in the UCB Political Science Department to focus in part on the role of the influenza virus in creating pandemics	**Berkeley**
Di Niu	Dr. Stanley Lab	
Carrie Whitaker	National Nurses United	**Oakland**
Melody Yu	CA Emerging Infections Program	
Cory Yun	Alameda County Public Health Dept	
Kirsten Hogstad	CDPH Disease Investigation Section	**Richmond**
Zahra Samiezade-Yazd	CDPH STD Control Branch	
Rocky Kee Li	Kaiser Permanente Napa-Solano Family Medicine Residency Program	**Vallejo**
Chandra Greenberg	PaxVax	**Redwood City**
Alejandro Vega	San Diego State University Dept of Biology/Computer Science	**San Diego**
Raj Topiwala	Anne Arundel Health System Research Institute	**Annapolis, MD**
Zaq Tman	Yap Memorial Hospital	**Yap/Federated State of Micronesia**
John Auld	American University of Science & Technology	**Beirut, Lebanon**
Katherine Chen	UCSF Dept of Pulmonary & Critical Care Medicine	**Uganda**
Alexandra Jones	Federal University of Rio de Janeiro	**Rio de Janeiro, Brazil**
Huong Nguyen	USAID PREDICT Project	**Vietnam**
Aster Workineh	Public Health Research Institute of India	**Mysore, India**

IDV MPH Summer 2017 Field Study Placements

Student Name	Field Study	Location
Gerardo Cruz	CDPH Infectious Diseases Branch (Disease Investigations Section)	**Richmond**
Kan Tong	Dr. Buehring lab	**Berkeley**
Jeremy Roland	CEIP Enteric Pathogen Food Surveillance	**Oakland**
Nadine Peinovich	Children's Hospital Oakland Research Institute (CHORI)	
Emma Gierman	PaxVax	**Redwood City**
Laura Rust	PaxVax	
Jessica Bivian Hernandez	Santa Rosa Memorial Hospital, Infection Control	**Santa Rosa**
Madeleine Smith	Roche Molecular Diagnostics	**Pleasanton**
Sylvia Jebiwott	UCSF Center for AIDS Prevention Studies	**San Francisco**
Michelle Ha	UCSF Infection Control Unit	
Emily Schneider	University of Washington Department of Microbiology and Epidemiology	**Seattle**
Melissa Hermerding	Forum for Collaborative HIV Research	**Washington, D.C.**
Namrata Mohanty	Forum for Collaborative HIV Research	
Royce Tsukayama	CGPH Fellow	**Thailand**
Joanna Vinden	CGPH Fellow, Infectious Disease Research Collaboration	**Uganda**

Comprehensive Examination

Students graduating from the MPH Program in Infectious Diseases are expected to possess both core knowledge and critical thinking skills in the area of infectious diseases and a basic understanding of the scope of public health. Students are evaluated for competency in these areas through a comprehensive examination which consist of two components:

1. Preparation of an analytical, comprehensive paper on a topic involving infectious diseases in the public health context, and;
2. An oral examination (conducted in April of their last semester).

The preparation of the analytical paper is initiated during the Fall Term of the 2nd year in the course "Current Issues in Infectious Diseases" (PH 264). Students are to identify their paper topic early in the Fall semester. The topic may build upon the student's own experience, e.g., a research project, the field study or a community intervention project. Alternatively, the student may develop a novel topic of his/her own interest, e.g. a policy proposal on a public health issue or a research proposal. Second year IDV MPH students present their Field Study projects in the Annual IDV MPH symposium (this will serve as the final report/assignment of their Field Study and complete the final academic requirement of the Field Study.)

Students should start working on the Comp Paper topics early in Fall

Once the topics are decided and approved, students will be assigned to faculty mentors who will help them with the development of the paper as early as in Oct. During the Fall semester PH 264 course, students will give presentations reviewing progress on their papers for peer and faculty mentor critique as applicable. The paper is completed in the Spring semester under the mentorship of a faculty member in the program assigned to the student under the PH 299 Independent Research (2 units) course number.

Students should start early to meet with their faculty mentors in late Oct/Nov to discuss their proposed paper topics and set a schedule and adhere to it for the work to be done. Students should update/meet with their mentors **regularly** on their progress and made revisions to the paper per feedbacks given. A **highly** complete draft is due to the faculty mentor in mid-February. The final written paper is due in mid-March to the Division prior to Spring Break and is typically 10-15 pages, single spaced, in length. **Deadlines must be strictly adhered to**. No late submission will be accepted.

Students submitting acceptable comprehensive papers are then qualified to take the oral examination. They will be given the Oral Exam questions to study when they submit the final written paper to the Division in mid-March of their final semester. Students must follow the Comp Paper guidelines and meet the time lines. Detailed information will be given out by the instructor of PH 264.

The oral exams are administered during the two-week period immediately following Spring Break starting in April. Each student will be examined by two members of the faculty; exams are one hour in length. A portion of the exam tests the student's knowledge of infectious diseases in the public health context. The exam may also include questions and discussion concerning the analytical paper and general public health issues

Financial Aid

There are several sources of financial support available for MPH students in IDV Division:

Graduate Division Fellowships:

Block Grant (BG) for Academic Excellence. For new students BG, usually about 1 to 2 awards for IDV which is processed through SPH fellowship competition process per nominated by Division during admission process. In addition, about 10 Block Grants awards for continuing students for the entire School. SPH Student Services will administer and call for applications for BG award for continuing students. Please watch out for emails from Student Services

Graduate Opportunity Fellowships: usually 1 per year for IDV

Community Health Fellowships-Kaiser Community Scholars: 2 to 3 awards per year for IDV

Graduate Student Instructors (GSI): about 9 per year for courses in our Division. GSI appointment is similar to Teaching Assistants in other universities, appointment 25% or more come with partial fee remission in addition to salary income. Current salary rate is $1032.5 for 25% appt (about 10 hrs work) and $2065 for 50% (about 20 hrs wk) for **5** months. First time GSI required to complete the new GSI requirements as a condition for employment.
Many for science courses offered by department s such as Molecular and Cell Biology Dept and Integrative Biology hire a lot of GSI each semester. These courses include BIO 1A and 1B courses. Please visit the respective department website for details. Application for GSI positions usually made at least one semester in advance. Contact the respective Student Affairs Officers and their website for details and pay attention to email announcements at SPH weekly student digest. Please note last minute GSI job openings may be available prior to semester starts. Students interested to apply for GSI should always highlight your academic qualifications and credentials and your teaching assistant/tutoring experience in your application.

Graduate Student Researchers (GSR): GSRs positions are usually hired by faculty and sometimes by research centers for administrating projects or programs. For appointment 25%-44% GSR appointments, it comes with partial fee remission as benefits. For 45% or above GSR appointments, students will get full fee remission. GSRs are subject to availability of funds and research needs. Please contact individual professors to see if they have any positions available. Moreover, faculty usually will give preference to PhD students for GSR appointments.

Financial Aid

Work Study Job or Other Job Opportunities will be announced in Student Services students weekly digest among other announcements as well as SPH Career Center job site.

Please note that you can convert some of your loan amount to work study (if you do not offer any) this will make you more competitive in the process as under the Workstudy program, the employer only needs to pay half of your salary, the other half will come from the Government. Unlike loans, which is guaranteed funding, Workstudy award is only an amount of how much you can earn within the Workstudy program, you still have to land on the job and earn the income. Please visit workstudy program website at http://financialaid.berkeley.edu/work-study and contact Financial Aid Office for questions.

Useful website for jobs:

Work Study: http://workstudy.berkeley.edu/JobSearch.aspx

Campus Career Center: https://career.berkeley.edu/Callisto/CalJobs.stm

School of Public Health Career Center: https://ucalhealth-csm.symplicity.com/

Association for Schools and Programs for Public Health (ASPPH) link
for students to find outside scholarship and external financial aid
http://www.aspph.org/study/financing-your-degree/

Courses

From the Berkeley General Catalog

PH C102: Bacterial Pathogenesis (3 units)

Course Format: Three hours of lecture per week.
Prerequisites: Molecular and Cell Biology C100A/Chemistry C130 or Molecular and Cell Biology 102 or consent of instructor.
Description: This course for upper division and graduate students will explore the molecular and cellular basis of microbial pathogenesis. The course will focus on model microbial systems which illustrate mechanisms of pathogenesis. Most of the emphasis will be on bacterial pathogens of mammals, but there will be some discussion of viral and protozoan pathogens. There will be an emphasis on experimental approaches. The course will also include some aspects of bacterial genetics and physiology, immune response to infection, and the cell biology of host-parasite interactions. Also listed as Molecular and Cell Biology C103 and Plant and Microbial Biology C103.
(Sp) Portnoy

PH 162A: Public Health Microbiology (3 units) (Fall)

Course Format: Two 1½-hour lectures per week.
Prerequisites: One year each of college-level biology and chemistry.
Description: Introduction to properties of microorganisms; their relationships with humans in causing infectious diseases and in maintaining health. May be taken without 162L.
(F) Buehring; (Su) Dailey/Elbeik

PH 162L: Public Health Microbiology Laboratory (1 unit) (Fall)

Course Format: One 2-hour laboratory per week.
Prerequisites: One year each of college-level biology and chemistry.
Description: Laboratory to accompany 162A.
(F) Liu

PH 236: US Food & Drug Admin, Drug Development, and Public Health

Course Format: Two hour lectures per week.
Prerequisites: None
Description: The process and principles of drug development will be discussed in the context of the FDA's mandate and reach (basic science, pre-clinical and clinical research, policy law, and public health), emphasizing the impact of public health emergencies such as HIV on evolution of regulatory policies.
(Sp) Miller

PH 260A-260B: Principles of Infectious Diseases (4;4 units) (260A Fall; 260B Spring)

Course Format: 4 hours of lecture per week.
Prerequisites: Upper division course preparation in biology
Description: This course presents general principles of microbial interactions with humans that result in infection and disease. Common themes are developed using examples of viral, bacterial, and parasitological pathogens that exemplify mechanisms of infectious disease. The epidemiology, pathogenesis, host immune response, diagnosis, treatment, and control will be presented for each infectious disease discussed.
PH 260A: (F) Riley & Swartzberg.; PH 260B: (Sp) Swartzberg

PH 260E: Molecular Epidemiology of Infectious Diseases (2-3 units) (Fall of even-numbered years)

Course Format: Three hours of lecture and ½ hour of discussion per week.
Prerequisites: PH 250A, PH 260A or equivalent course.
Description: The course will cover general principles and practical approaches in the use of molecular laboratory techniques to address infectious disease epidemiologic problems. It is designed for students with experience in the laboratory or in epidemiology, but not both. The principles to be discussed will include the use of molecular techniques in outbreak investigations, characterizations of dynamics of disease transmission, identifying vehicles, and quantifying attributable risks in sporadic infections, refining data stratification to assist case-control studies, distinguishing pathovars from non-pathogenic variants of organisms, doing surveillance, and identifying genetic determinants of disease transmissions.
(Fall 2018) Riley

PH 260F: Infectious Disease Research in Developing Countries (2 units) (Spring of odd-numbered years)

Course Format: Two hours of lecture per week.
Description: The objective of this course is to provide M.P.H. and Ph.D. students with an appreciation and understanding of the complex issues involved in conducting scientific, laboratory-based investigation in developing countries. We will discuss the many obstacles to establishing and sustaining research projects, such as poor infrastructure, insufficient financial and material resources, and lack of scientific information and interaction. More importantly, we will identify innovative solutions to overcoming these obstacles. The first half of the course will consist of presentations by investigators in the U.S. and developing countries that have long-term research experience in Latin America, Asia, and Africa. We will also discuss related issues such as ethical considerations, equitable collaborations, and research capacity strengthening. During the second half of the course, students will give presentations on topics of their choice.
Offered in odd-numbered year.
(Sp 2019) Harris

PH 262: Molecular and Cellular Basis of Bacterial Pathogenesis (3 units) (Spring)

Course Format: Three hours of lecture and 1 hour of literature review per week.
Prerequisites: PH 260A, PH 260B, or consent of instructor.
Description: This course for graduate students will explore the molecular and cellular basis of bacterial pathogenesis. The emphasis will be on model bacterial pathogens of mammals. The course also will include some aspects of bacterial genetics and physiology, immune response to infection, and the cell biology of host-parasite interactions. Public health courses 102 and 262 are taught concurrently. Students enrolled in PH 262 also will be required to attend a weekly discussion of the primary literature, both current and classic. Each student will be required to present one paper.
(Sp) Portnoy

PH 263: Public Health Immunology (Fall)

Course Format: *Three hours of lecture and 1 hour of literature review per week*
Description: This course will be the principal immunology course for graduate students in the field of public health. It is designed to teach both the basic biology of the human immune system and its response in health and disease, especially the specific response of the human immune system to major human pathogens. Four areas will be explored: 1) components of the immune system (spectrum of cell types and cell products); 2) different arms of the immune system including humoral, cell-mediated, innate and mucosal immunity; 3) specific immune response to infection caused by viral, bacterial, fungal, and parasitic pathogens; and 4) disorders of the immune system unrelated to infectious disease.
(F) Stanley

PH 264: Current Issues in Infectious Diseases (2 units) (Fall)

Course Format: *One 2-hour lecture and presentation per week.*
Prerequisites: ***2nd year Infectious Diseases M.P.H. students only.***
Description: Formerly PH 264A-264B. Examination of scientific, social, and policy dimensions of issues involving infectious diseases. Students select one topic for in-depth analysis and present findings in class. Topics vary from year to year.
(F) Liu

PH 265: Molecular Parasitology (3 units) (Fall of odd-numbered years)

Course Format: ***Two 1½-hour lectures and 2 hours of discussion per week for 11 weeks.***
Prerequisites: *Upper division courses in molecular biology, parasitology, biochemistry, immunology, microbiology, or consent of instructor. Familiarity with reading primary research is recommended.*
Credit Option: *Course may be repeated for credit.*
Description: This is an advanced course in the molecular aspects of parasite immunology, molecular biology, genetics, biochemistry, and genomics. For each parasite, the following areas will be covered: biology (history, classification/taxonomy, life cycle), disease spectrum/clinical manifestations, epidemiology (distribution, impact), pathogenesis, immunology (host immune response, immunopathology), vaccine development, and genomics. The lectures will focus on "state-of-the-art" research and knowledge in these areas in relation to molecular mechanisms of pathogenesis, parasite adaptions for survival within the host, and strategies for drug and vaccine development. Course content will rely heavily on current literature. Readings are required and consist of one review article about each parasite and several primary research articles on selected topics that will be focused upon in the lectures.
(Fall 2019) Harris

PH 266A: Foodborne Diseases (2 units) (Spring of odd-numbered years)

Course Format: 1½ hours of lecture per week.
Prerequisites: Basic knowledge of microbiology.
Description: This course will cover public health, microbiological, social, and economical issues related to foodborne diseases. Three areas will be explored: 1) categories, clinical manifestations, and disease processes of foodborne illness; 2) etiological agents causing foodborne illness; 3) investigation and prevention of foodborne illness. The course will discuss different types of foodborne diseases, clinical manifestations, and the interactions between etiological agents (pathogens and non-pathogens) and human hosts. We will cover pathogens that are the most frequently associated with foodborne illness, including bacterial and viral pathogens such as Salmonella, E. coli, hepatitis viruses and Norwalk-like gastroenteritis viruses. We will also study non-pathogen agents such as heavy metal, pesticide, and toxic chemicals. Furthermore, the course will discuss how to identify the etiological agents in outbreaks and possible measures that can be taken to minimize the risk to the public, including vaccines and education. Finally, we will explore the social and economic issues involved in the food production, distribution, and consumption that contribute to foodborne diseases.
(Spring 2019) Lu

PH 266B: Zoonotic Diseases (Spring)

Course Format: One 2-hour lecture per week.
Prerequisites: ***Principles of Infectious Disease (PH 260A) or equivalent Infectious Diseases course (may be taken concurrently)***
Description: This is a graduate (Ph.D. and MPH) level course designed to describe the major zoonoses and their life cycle, disease manifestations, epidemiology, and methods for prevention and control. Available treatments, diagnostics, and public health and agriculture surveillance and "forecasting" programs will also be discussed. The most recent research on the molecular and cellular basis of the mechanisms and consequences of the "species" jump from other animals to humans will be reviewed. The global nature of zoonotic diseases and the integration of multiple disciplines (molecular biology, immunology, epidemiology, evolutionary biology, ecology, animal science, veterinary medicine, etc.) will be emphasized.
(Sp) Dailey

PH 266C: Hospital Associated Infections (2 units) (Fall)

Course Format: 1 hour lecture and 1 hour discussion per week.
Description: This course will examine and evaluate the principles underlying the control of infections in healthcare settings, the causes of these infections, current important topics in this field and future trends. Students will gain an appreciation of the national and local programs involved in preventing HAI's, their major causes, antimicrobial control, and specific agents and procedures causing HAI's. The class instructors have spent many decades in infection control in healthcare settings. Additional, there will be an invited guest for each class who has extensive knowledge of the topic to be discussed. (Count to meet IDV Division Seminar requirement)
(F) Swartzberg

PH 291: Public Health Professional Development Series (1 unit) Spring

Course Format: Two hours of workshop every week.
Description: A series of skills-based workshops designed to introduce the student to specialized skills needed in the public health workplace. These workshops are designed to complement the core curriculum of the School of Public Health and are selected based on regular feedback from faculty, public health practitioners, and students. Workshop facilitators include consultants, CPHP field supervisors, and public health practitioners with expertise in the subject. This course or series of workshops is open to all M.P.H. and Dr.PH. students. Students select from a list of 2-hour workshops to total 1 unit equal to 15 hours of class time, plus readings that are assigned for many of the workshops. Workshop topics have included writing for publication, moderating focus groups, human resources management, legislative policy and advocacy, negotiation, evaluation, tools for financial planning, scientific grant writing, leadership, oral presentations, strategic planning, cultural competency, time management, and budgeting.
(Sp) CPHP staff

PH 293: Doctoral Seminar (1-2 units)

Course Format: One to four hours of seminar per week.
IDI Monday Doctoral Seminars PH 293 section 7(1 unit, letter grade) Instructor: (Fall 2018) Stanley
IDI Wednesday Doctoral Seminar PH 293 section 8 (2 units, letter grade) Instructor: (Fall 2018) Stanley
Credit Option: Course may be repeated for credit.
Description: Discussion and analysis of dissertation research projects, as well as of conceptual and methodological problems in planning and conducting health research.
(F, Sp) Faculty

PH 295: Seminars (1-4 units)

Course Format: One to four hours of seminar per week.
Credit Option: Course may be repeated for credit.
(F, Sp) Staff

PH 291: Public Health Professional Development Series (1 unit)

Course Format: Two hours of workshop every week.
Description: A series of skills-based workshops designed to introduce the student to specialized skills needed in the public health workplace. These workshops are designed to complement the core curriculum of the School of Public Health and are selected based on regular feedback from faculty, public health practitioners, and students. Workshop facilitators include consultants, CPHP field supervisors, and public health practitioners with expertise in the subject. This course or series of workshops is open to all M.P.H. and Dr.PH. students. Students select from a list of 2-hour workshops to total 1 unit equal to 15 hours of class time, plus readings that are assigned for many of the workshops. Workshop topics have included writing for publication, moderating focus groups, human resources management, legislative policy and advocacy, negotiation, evaluation, tools for financial planning, scientific grant writing, leadership, oral presentations, strategic planning, cultural competency, time management, and budgeting.
(Sp) CPHP staff

PH 297: Field Study in Public Health (3 units) S/SU grade only

Course Format: Field Study.
Grading Option: Must be taken on a satisfactory/unsatisfactory (S/U) grade..
Description: Supervised experience relevant to specific aspects of public health in off-campus organizations for graduate students. Regular individual meetings with faculty sponsor and written reports required. IDV students should sign up for 3 units.
(Field Study will be completed in the summer after the first year; student should register the class in their second year fall semester) Staff

PH 298: Group Study (1-8 units)

Course Format: Independent study.
Credit Option: Course may be repeated for credit.
(F, Sp, Su) Faculty

PH 299: Independent Research (1-12 units)

Credit Option: Course may be repeated for credit.
Description: Independent study.
(F, Sp, Su) Faculty

Seminar Offerings

Fall 2018 & Spring 2019:

IDI Doctoral Seminar series:

PH 293 Sec. 7 — IDI Monday Doctoral Seminar (1 unit, letter grade) (Fall and Spring)
Class # 16658 — Instructor: Dr. S. Stanley, Fall 2018
Mondays, 10 a.m. to 11 a.m. Berkeley Way West 1208
All IDI PhD students must register and participate in this class for 1 unit and for letter grade

Dr. Harris is teaching this class Spring 2019; course # will change.

PH 293 Sec. 8 — Wednesdays Doctoral Seminar (2 units, letter grade) (Fall and Spring)
Class # 16659 — Instructor: Dr. S. Stanley, Fall 2018
Wednesdays 10:00 to noon, Berkeley Way West 1206
Discussion and analysis of dissertation research projects, as well as conceptual and methodological problems in planning and conducting health research. IDI PhD students who have not passed the QE must enroll in this course every semester. Other IDI PhD students are welcome to take the seminar if interested.

Dr. Harris is teaching this class Spring 2019; course # will change

IDV Division Seminar series:

Fall 2018:

PH 266C — Hospital Associated Infections (2 units)
Class # 28981 — Instructor: Dr. Swartzberg
Tues, 12 p.m. to 4 p.m. Berkeley Way West 1104

Course Description:
This course will look at and evaluate the principles underlying the control of infections in hospitals, the causes of these infections, current important topics in this field and future trends. Students will gain an appreciation of the national and local programs involved in HAI's, their major causes, antimicrobial control, and specific agents and procedures causing HAI's.

Ph.D. Program Introduction

The study of infectious disease and immunity focuses on those interactions between infectious agents, their human and other hosts, and their relationship to the environment that may lead to disease in humans. Infectious disease agents include primarily pathogenic bacteria, fungi, helminthes, protozoa, and viruses that continue to be leading causes of morbidity and mortality in human populations throughout the world. The treatment, control, and prevention of infectious diseases depend upon an in-depth knowledge of the biology and genetics of the pathogen; the factors that allow pathogens to infect, persist in the host and produce disease; and the host's defense mechanisms that bring about recovery. This requires an integration of the disciplines of molecular and cellular biology, genetics, immunology, microbiology (which include virology, bacteriology, mycology as well as parasitology) and epidemiology.

The Graduate Group in Infectious Diseases and Immunity is an interdepartmental graduate program that provides graduate students an opportunity to obtain a Ph.D. degree that is unique in emphasizing integrated, multidisciplinary training of host-pathogen-environmental interactions. Important areas of inquiry include the molecular biology of host-pathogen interactions where the molecular and cellular biology of pathogenesis will be investigated; the ecology, evolution, and transmission of infectious agents where the mechanisms of infectious disease acquisition through environmental factors, intermediate hosts and vectors are integrated with biology, surveillance and epidemiological analysis; and prevention and control where the relationship between host immunity and preventive public health practices are integrated with molecular approaches for detection and vaccine and drug development.

The objective of this program is to provide students with research-oriented pursuits that will train them to design and implement independent investigations and advance the fundamental knowledge of infectious disease agents and their interactions with the human host and the environment. The goal is to promote health by integration of basic research and applied technologies for the development of new approaches for the diagnosis, treatment, prevention, and control of infectious disease in humans. This program crosses traditional departmental boundaries to combine clinical, epidemiological, and basic laboratory research strategies in modern biology and apply these to specific infectious disease problems affecting human populations. Thus, students that matriculate from this program will acquire expertise in fundamental infectious disease research for which there is demand from academic institutions, local and national government agencies, and biotechnology companies.

Ph.D. Program Admission and Curriculum

I. Undergraduate Preparation for Admission

Applicants with a B.A. or B.S. degree, typically in the biological sciences, from accredited institutions must meet the following minimal qualifications for admission:

a) satisfactory record of scholarship (minimum GPA of 3.0),
b) evidence of significant intellectual potential (GRE scores), and
c) demonstrated competence in English.

Admission Criteria: Final selection for admission follows the ranking of all applicants on the basis of academic record, intellectual potential, preparation, letters of recommendation, research interests, and overall promise, as well as availability of enrollment allocation (determined by the Campus) for the program. Admissions are limited to the top 10% of the applicants depending on available allotment. Because a major part of the program is laboratory research training, each admitted student must be acceptable to at least three faculty members who would commit to providing research training in their laboratory.

The following subjects are normally required as undergraduate preparation for all candidates. Deficiencies must be made up early during the graduate program.

a) Mathematics: calculus; one course in probability or statistics.
b) Physics: general physics.
c) Chemistry and biochemistry: inorganic chemistry; organic chemistry; biochemistry and associated laboratories.
d) Biology: general biology lecture and laboratory; genetics, and a basic course in molecular biology.

Applicants are reviewed by the Group Admissions Committee appointed by the Group Chair and are considered for entry in the fall semester only. Admission recommendations are forwarded to the Dean of the Graduate Division for final approval.

II. Foreign Language

There is no requirement for a foreign language.

III. Program of Study

1. Program

In addition to the minimal core course requirements (listed below – see Section II, Part 3), each student shall take additional courses selected in consultation with the major professor and/or Graduate Advisor and approved by the Group Executive Faculty Committee. The specific courses will not be listed here since this part of the student's curriculum will be tailored to meet identified professional career goals. In addition, laboratory rotations, teaching, Candidacy examination, research resulting in a dissertation and a culminating seminar are required for completion of the Ph.D. degree.

2. Unit Requirements

Doctor of Philosophy:

Students should take a minimum of twelve units each semester to qualify for full time students, and are advised not to take more than 16 to avoid academic overload. Any class load exceeding 20.5 units will need the Head Graduate Advisor's approval. The minimum requirements include a) general training in molecular biology, epidemiology, statistics, and research ethics; and b) specific training in infectious disease related to their major interest to obtain more specialized preparation. It is expected that students will complete a minimum of 30 units of predominantly graduate-level courses, in addition to 4 units of graduate seminar. All IDI PhD students must enroll and participate in PH 293 the IDI Seminar Series: Monday Doctoral Seminar. In addition, IDI PhD students who have not passed their qualifying examinations must enroll and participate in Wednesday Doctoral Seminar PH 293.

During the first three to four semesters of the program, doctoral students complete all or most of the course work required for the degree and rotate through the research laboratories of one to three faculty members, who evaluate the student's ability to conduct laboratory research. This allows the student to determine what research opportunities are available to them, to learn new research methods that will be of value in their subsequent dissertation research, and to decide on a suitable research project for their dissertation.

The Candidacy examination is taken no later than the 4th semester. Within three months of passing the examination, the student is required to apply for Advancement to Candidacy for the Ph.D. degree, and then complete the requirements for the degree under Plan B of the Graduate Division, by submitting an acceptable dissertation on a suitable research question in a timely fashion.

3. Required and Recommended Courses, including teaching requirement

The following minimum core graduate courses, or their equivalent, are required of all students in the Graduate Group. These courses should be taken before the Qualifying Examination Committee is appointed, and the student must receive a "B" or higher grade average in these courses, except seminars that may be taken on a S/U basis.

Group I: Infectious Diseases (2 courses)

PH 260A	Principles of Infectious Disease, Part I (4 units); Riley & Swartzberg
	and one of the following:
PH 260B	Principles of Infectious Disease, Part II (4 units); Swartzberg & Riley
PH 262	Molecular Basis of Bacterial Pathogenesis (3 units); Portnoy
PH 265	Molecular Parasitology (3 units); Harris

Group II: Immunology (1 course)

PH 263	Public Health Immunology (3 units) Stanley
or:	
MCB 250	Advanced Immunology (4 units); Raulet/Robey/Shastri

Group III: Epidemiology and Biostatistics (2 courses)

PH 145 Statistical Analysis of Continuous-Outcome Data (4 units)
or:
PH 245 Introduction to Multivariate Statistics (4 units)

PH 253B* Epidemiology and Control of Infectious Diseases (3 units); Reingold
or:
PH 260E Molecular Epidemiology (3 units); Riley

***Note: IDI PhD students without an epidemiology background are strongly encouraged to read more about Epidemiology and/or take 250A prior to taking PH 253B**

Group IV: Research (2 courses)

PH 293 IDI Monday Doctoral Seminar (1 unit), required every semester
& IDI Wed Doctoral Seminar (2 units) for pre-QE students, others are welcome.

In addition to the required courses listed above per Group I to Group IV, students will elect at least a few additional course work appropriate to the student's area of research interest with the guidance of the Graduate Advisor and other faculty.

Examples for electives:

PH 250A Epidemiologic Methods I (4 units)

MCB 210 Molecular and Cell Biology (4 units) Rio

PH 266A Foodborne Diseases (2 units); Lu

PH 260F Infectious Disease Research in Developing countries (3 units); Harris

PH 266B Zoonotic Diseases (2 units); Dailey
PMB 200B Genomics and Computational Biology (1.5 units) Brenner

MCB 230 Advanced Cell Biology (4 units); Bilder

MCB 259J Immune Evasion by Viruses (2 units); Coscoy

4. Lab Rotations

Rotations in lab provide an opportunity for students to experience different research areas and environments. Lab rotation should be arranged by mutual agreement with the faculty and the student in consultation with the IDI Head Graduate Advisor. Each lab rotation may last 9 weeks and should begin as early as desired**, but** no later than the mid of the first semester. Students are suggested to do at least one or two lab rotations before deciding on the lab for their research. IDI PhD first year students must decide on their lab at the end of April 2019 or early May 2019, the latest. They should inform the Head Graduate Advisor and the IDV Division on their lab decision once the information is available for the continuality of student funding support by the PI of the lab they joined.

5. Teaching Requirements

Teaching is an important part of training for a scientist and an educator. Doctoral students are required to work as GSIs for at least two semesters 50% GSI is preferable) to fulfill the teaching requirements for the program.

6. Qualifying Examination

The Qualifying Examination (QE) is usually taken late in the second year of graduate study (in the fourth semester), after all course requirements have been completed with a grade-point average of at least 3.0, excluding lower-division courses, seminars, and research. Each student will choose a four-member faculty committee. The committee membership must be approved by the Program Chair of the IDI Graduate Group and IDV Division before the student can submit the eform officially in calcentral for program and the Grad Division approval. Both the QE Chair and Academic Senate Representative must be members of the Berkeley academic senate. The latter must be non- IDI Graduate Group faculty. The QE Chair **cannot** also serve as the Chair of the student's Dissertation committee. The fourth member can be from the IDI department or other departments with expertise on the subject matter. The Ph.D. Qualifying Examination consists of an oral defense of two written research proposals (10-15 pages each). The application for Qualifying Exam via eform calcentral must be submitted at least three weeks prior to the proposed exam date. No students can take the QE Exam without the Grad Division's approval.

One proposal represents the student's proposed dissertation research, but the other must be on an unrelated topic pertaining to infectious diseases. The Chair of the Ph.D. Qualifying Examination Committee must approve both proposals. During the examination, questions by the committee focus on the background and theory of the proposed research, the rationale for the presented methods of data analysis, the experimental approach, etc., and not on the actual research results. The latter is a function of the dissertation committee. The purpose of the examination is to test your ability to recognize research problems of fundamental importance, to propose experimental approaches to address problems, and to demonstrate comprehensive knowledge of your disciplinary area and related subjects to test the student's mastery of a broad area of knowledge reflecting the interdisciplinary preparation of an approved course of study. **Please visit IDI website for IDI Guidelines for QE at http://microbe.berkeley.edu/idgroup/currents.html**

7. Advancement to Candidacy

Within the same semester, or the latest, by the following semester, of passing the qualifying examination, students must apply for advancement to candidacy for the Ph.D. degree. IDV Division still require student to copy the hard copy of the form with required signatures before student can submit the eform in calcentral.berkeley.edu to the GSAO for review and routing to the Grad Division for approval. Information required on the form is as follows:

1) Their dissertation committee and Dissertation title;

2) Whether human subjects or animal research will be involved in the dissertation research. A human subjects protocol must be procured from the Committee for the Protection of Human Subjects before any dissertation research is conducted. Please visit CPHS Web Page at http://cphs.berkeley.edu for requirements and contact ophs@berkeley.edu for questions.

The dissertation committee chair is the student's research mentor. Both the Dissertation Chair and the Academic Senate Representative of the Dissertation Committee must be members of the Berkeley academic senate. In addition, student must choose another committee member from the Graduate Group in Infectious Disease & Immunity. PhD students with advanced candidacy status are required to meet with their dissertation committee **at least once a year** and complete an academic progress report in the student information portal with input from both the student and the Dissertation Chair.

8. Research and Dissertation

After obtaining research experience through laboratory rotations, the student should be acquainted with the research opportunities available in several laboratories and can evaluate these opportunities in the context of their personal interests. Students with interests that are clearly defined and are not identified among the Graduate Group faculty, but can be identified among faculty at Berkeley or UCSF outside of the Graduate Group, may elect through direct mentorship of a Graduate Group member to conduct their research in a laboratory other than one represented in the Graduate Group.

Ph.D. candidates who are advanced to candidacy must meet with their dissertation committee periodically at least once a year to complete the Annual Report on Candidacy Program in Doctoral Program to the Division for onward submission to the Graduate Division.

The purpose of the committee meeting is to assess student's progress and provide guidance to the student's research. It is expected that the student's research will be of sufficient quality to be accepted for publications in peer-reviewed journals. A goal of three first-author publications is typically considered to write the dissertation. The emphasis on publication of student research, rather than merely completing a dissertation is an intrinsic component of the Program's training experience and one of its unique strengths.

9. Time to Degree

Most Infectious Disease & Immunity Ph.D. students take 5 years to complete the program. By UC Berkeley policy, IDI students must complete the program in 10 semesters following advancement to candidacy (normative time). Graduates from this program have gone on to academic, government, and industry positions.

10. Culminating Seminar

Within three months prior of filing the student's dissertation, the student will give an oral seminar to the members of the Graduate Group describing the dissertation research conducted at the IDI Monday Doctoral Seminar.

Ph.D. Program
Sample Curriculum (Minimum Course load)

COURSE #		UNITS
Year 1 – Fall Semester		
Lab rotation		
PH 260A	Principles of Infectious Disease, Part 1	4
PH 263	Public Health Immunology	3
PH 265	Molecular Parasitology	3
PH 293	IDI Monday and Wed Doctoral Seminar	1; 2 units respectively
Year 1 – Spring Semester		
PH 260B	Principles of Infectious Disease, Part II	4
Electives MCB 210	Molecular and Cell Biology	4
PH 145	Statistical Analysis of Continuous Outcome Data	4
PH 293	IDI Monday and Wednesday Doctoral Seminar	1; 2
PH 253B	Epidemiology and Control of Infectious Diseases	3
Year 2 – Summer		
Year 2 – Fall Semester		
PH 299	Research or Teaching	3
PH 293	IDI Monday and Wednesday Doctoral Seminar	1;2
PMB 200B	Genomics and Computational Biology	1.5
PH 260E	Molecular Epidemiology of Infectious Diseases	2
Electives PH 2XX	Advanced courses as Electives	6
Year 2 – Spring Semester		
	Qualifying Examination (If passed, submit the Advancement to Candidacy application in the same semester when passed the QE or the latest by the following semester)	
PH 299	Research	12
PH 293	IDI Monday and Wednesday Doctoral Seminar	1; 2
Year 3+ until Graduation		
PH 299	Research	12
PH 293	IDI Monday Doctoral Seminar	1

Note: IDI PhD students <u>without</u> an epidemiology background are strongly encouraged to read more about Epidemiology and/or take 250A prior to taking PH 253B. In addition to the required coursework (Group I to IV), students should take <u>a few</u> advanced courses as electives to strengthen the knowledge in the areas of their interest. Please consult the IDI Head Graduate Advisor or faculty advisor for academic advising and/or IDV Division manager for questions.

Ph.D. Program Financial Support

Financial Aid and Fellowships

The Division offers full funding to doctoral students for the first year of study from a combination of state and Division funds. Funding support will include fees and tuition as well as a monthly stipend. Graduate Student Instructorship (GSIship) can also be used to supplement funding support, independent of the required two semesters of GSIship. Effecdtive Fall 2018, the current minimum annual stipend for IDI students are $34,000.

After the students have decided on the laboratory for research after a series of lab rotations, usually before the fall semester of their second year, the faculty as their mentor and PI, will be responsible for continuing funding the students as Graduate Student Researcher (GSR) until graduation.

United States citizens and permanent residents who are not California residents must establish residency after one year and will no longer be subject to non-resident tuition.

Extramural sources of pre-doctoral fellowships are available to apply from the National Institute of Allergy and Infectious Diseases, National Science Foundation, and some private sources such as Founder Region Fellowship for women in doctoral program.

Graduate students are strongly encouraged to apply for these and other extramural fellowships

Intramural sources include Graduate Fellowships are awarded and administered through the Graduate Division. All prospective applicants who wish to be considered for graduate fellowships beginning in the fall semester must apply by December 1st of the preceding year. The number of Graduate Fellowships awarded each year is limited, and the competition for them is highly competitive. Teaching and research assistantships are awarded and administered by the IDV Division of the School of Public Health or the PI's and the PI's home department respectively.

Graduate Division Conference Travel Grant for PhD and Master Student in Academic Degrees

PhD and Master's students in academic degree programs can apply for the Conference Travel Grant If you're going to present a research paper or poster at a professional conference. Please see the link for details: http://grad.berkeley.edu/news/announcements/travel-grant/

Infectious Diseases & Immunity Ph.D. Program Graduate Group Faculty

IDI Graduate Group Faculty and IDV SPH Faculty 2018

Buerhing, Gertrude, Professor Emertius
Harris, Eva, IDI PhD Program Head
Liu, Fenyong
Lu, Sangwei, Adjunct Professor
Veronica Miller, Adjunct Professor
Riley, Lee, IDV Division Chair
Sensabaugh, George, Professor Emertius
Stanley, Sarah
Stephens, Richard, Professor Emertius

IDI Graduate Group Faculty from Other Units

Barton, Gregory	MCB
Brenner, Steven	PMB/BIOE
Coscoy, Laurent	MCB
Cox, Jeffery	MCB
Fleiszig, Suzanne M.J.	OPT
Getz, Wayne	ESPM
Glaunsinger, Britt A.	PMB
Gronert, Karsten	OPT
Herr, Amy	BIOE
Lee, Luke	BIOE
Machen, Terry	MCB
Nelson, Kara	CEE
Portnoy, Daniel	MCB/PMB
Reingold, Arthur	SPH
Resh, Vincent	ESPM
Robey, Ellen A.	MCB
Seed, Kimberley	PMB
Shastri, Nilabh	MCB
Sjolander, Kimmen	PMB/BIOE
Taylor, John W.	PMB
Vance, Rusell E.	MCB
Welch, Matthew D.	MCB
Zhou, Qiang	MCB

Fall 2018 - Course Weekly Grid

Division of Infectious Diseases & Vaccinology (IDV and MPH Breadth Courses)

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
8 A.M.				
8 to 9 A.M. PH 142: Intro to Probability and Stats in Bio and PH **CN:** 28928 **INSTRUCTOR:** Hubbard **LOCATION:** LKS 245	**8-9:30 A.M** PH 162A: Public Health Microbiology **CN:** 28952 **INSTRUCTOR:** Harris, Liu, Stanley **LOCATION:** 100 GPB	**8 to 9 A.M.** PH 142: Intro to Probability and Stats in Bio and PH **CN:** 28928 **INSTRUCTOR:** Hubbard **LOCATION:** LKS 245	**8-9:30 A.M** PH 162A: Public Health Microbiology **CN:** 28952 **INSTRUCTOR:** Harris, Liu, Stanley **LOCATION:** 100 GPB	**8 to 9 A.M.** PH 142: Intro to Probability and Stats in Bio and PH **CN:** 28928 **INSTRUCTOR:** Hubbard **LOCATION:** LKS 245
9 A.M.				
9 to 10 A.M. PH 250A: Epidemiologic Methods I **CN:** 28924 **INSTRUCTOR:** McCoy **LOCATION:** GPB 100	**9:30 to 11 A.M.** PH 263: Public Health Immunology **CN:** 28922 **INSTRUCTOR:** Stanley **LOCATION:** Wheeler 106	**9 to 10 A.M.** PH 250A: Epidemiologic Methods I **CN:** 28924 **INSTRUCTOR:** McCoy **LOCATION:** GPB 100	**9:30 to 11 A.M.** PH 263: Public Health Immunology **CN:** 28922 **INSTRUCTOR:** Stanley **LOCATION:** Wheeler 106	**9 to 10 A.M.** PH 250A: Epidemiologic Methods I **CN:** 28924 **INSTRUCTOR:** McCoy **LOCATION:** GPB 100
10 A.M.				
10 to 11 A.M PH 293 Sec. 7: IDI Mon. Doctoral Seminar **CN:** 16658 **INSTRUCTOR:** Stanley **LOCATION:** Berkeley Way West 1208 **10:00 to 12 PM** PH 200J Health Policy and Management Breadth Course **CCN**: 28977 **INSTRUCTOR:** Robinson **LOCATION:** LeConte 4	**10 to 12 PM** PH 162L 001 Lab: Public Health Microbiology Lab **CN:** 29053 **INSTRUCTOR:** Liu **LOCATION:** 201 GPB	**10:00 to 12 P.M.** PH 293 Sec. 8: IDI Wed. Doctoral seminar **CN:** 16659 **INSTRUCTOR:** Stanley **LOCATION: :** Berkeley Way West 1206 **10:00 to 12PM** PH 200L Health and Social Behavior Breadth **CCN**: 29058 **INSTRUCTOR:** Ozer **LOCATION:** LeConte 4	**10 to 12 PM** PH 162L 003 Lab: Public Health Microbiology Lab **CN:** 29055 **INSTRUCTOR:** Liu **LOCATION:** 201 GPB	
11 A. M				
12 P.M.				
12 to 2 P.M. PH 250B: Epidemiologic Methods II **CCN:** 28896 **INSTRUCTOR:** Colford **LOCATION:** LeConte 3	**12 to 2 PM** PH 162L 002 Lab: Public Health Microbiology Lab **CN:** 29054 **INSTRUCTOR:** Liu **LOCATION:** 201 GPB **12 to 2 P.M** PH 266C: Hospital Associated Infections **CN:** 28981 **INSTRUCTOR:** Swartzberg **LOCATION:** Berkeley Way West	**12 to 2 P.M.** PH 250B: Epidemiologic Methods II **CCN:** 28896 **INSTRUCTOR:** Colford **LOCATION:** LeConte 3	**12 to 2 PM** PH 162L 004 Lab: Public Health Microbiology Lab **CN:** 29056 **INSTRUCTOR:** Liu **LOCATION:** 201 GPB	
1 P.M.				
2 P.M.				
2 to 4 P.M. PH 260A: Princ. of Infectious Diseases **CN:** 29824 **INSTRUCTOR:** Riley & Swartzberg **LOCATION:** GPB 107	**2P.M. to 5P.M.** PH 260E:Molecular Epidemiology of Infectious Diseases **CN:** 31456 **INSTRUCTOR**: Riley **LOCATION**: VLSB 2011	**2 to 4 P.M.** PH 260A: Princ. of Infectious Diseases **CN:** 29824 **INSTRUCTOR:** Riley & Swartzberg **LOCATION:** GPG 107		
4 P.M				
	4 to 6 P.M PH 264: Current Issues in Infectious Diseases (2nd yr IDV/MPH students) **CN:** 28936 **INSTRUCTOR:** Liu **LOCATION:** Dwinelle 106			

Green –MPH Breadth Course Yellow –IDV Course Blue–PhD Seminar Purple – Undergraduate Course

Tips for Newcomers

Library Resources

The School of Public Health Library is located on the ground floor of University Hall in Room 1. Your registration card entitles you to borrow books from the main University library and any of its branches. For more information, call the Doe Library Privileges Desk at (510) 642-3403 or visit the UC Berkeley Library homepage at http://www.lib.berkeley.edu.

Computing Resources

A shared computer lab for School of Public Health students is located in 340A Haviland Hall. Students may use the lab when classes are not scheduled. The drop-in facility for School of Public Health students is at 340B Haviland. Doctoral students will find computers for drop-in use in 585 University Hall; a pass code is needed. For more information about Instructional Computing resources in the School of Public Health, go to http://microbe.berkeley.edu. Students can also contact David Lein, Coordinator of Academic Computing, for assistance: dlein@berkeley.edu; (510) 642-6011.

Email Accounts:

UCB Campus email account should be set up once your student identification number (SID) is available at CalMail Website at https://calmail.berkeley.edu. Your Berkeley email account is the official email we will use to communicate with students. Students are responsible for the contents of the emails sent to them regarding policies and deadlines.

Useful Websites:

Please refer to IDV website at http://microbe. berkeley.edu on useful links. To name a few:
UC Berkeley homepage*:* http://www.berkeley.edu,
(Students can use the search engine in the Berkeley home page to look for Online General Catalog, current Schedule of Classes and links to all campus departments and resources.)
Graduate Division homepage: http://www.grad.berkeley.edu
(Important information on the Guide to Graduate Studies, Information for holding GSI/GSR appointments, various academic forms, and fellowship information can be found in this site)
School of Public Health homepage: http://sph.berkeley.edu
SPH Career Center: http://sph.berkeley.edu/cphp/career_services/index.php

The Role of a Faculty Advisor

It is the responsibility of the academic faculty advisor to assist the student in developing an optimal academic plan that meets the basic curriculum requirements for the degree being pursued and insures sufficient flexibility to meet individual goals. The academic faculty advisor is prepared to discuss the requirements of the specific degree program and the individual area of concentration in which the student is enrolled. **It is the student's responsibility to keep his/her faculty advisor of apprised of their academic progress and seek academic advice as needed**. IDV MPH students are required to meet with their faculty advisor at least once a year, preferably every semester. General program information can be addressed to IDV Division Manager.

All faculty advisors will make available a sufficient number of office hours to advise students during Orientation Week, the first week of the semester, and throughout the semester. Advisors are encouraged to post a sign-up sheet outside their door indicating office hours available for advising purposes. Students can then sign-up for the amount of time they believe they need to have all their questions answered.

A list of some possible questions students might want to ask their faculty advisor during an initial meeting is listed below. The purpose of a meeting with a faculty advisor early in a student's first semester is to give the student a chance to get to know their advisor and vice versa, give the faculty advisor a chance to learn about the student's academic and career goals and provide the student with specific information about what he/she can expect from the relationship with a faculty advisor. During the first meeting, students need to be prepared to ask the questions for which they want answers and to talk about themselves and their academic goals.

Suggested questions for the initial meeting with your faculty advisor include:

1. Let your advisor know whether you have a specific career goal in mind or if you are uncertain and are "exploring different possibilities".
2. Tell him/her what you would like to focus on while a student here; ask "What courses do you suggest I take?"
3. "Here are the courses I am thinking about taking; what do you think of this plan?"
4. "How often should I plan to meet with you?"
5. "What is the best way to communicate with you if I have questions, a problem, or need to make an appointment?

Steps for resolving an unsatisfactory advising situation

The faculty advisor's responsibilities are limited to advising the student about coursework and other aspects of the curriculum. He/she is not necessarily the same person who will be the student's mentor for the MPH Comp paper. Summer Field Study placement should be arranged early through the Center for Public Health Practice; students should start the process early by working with the Field Study Placement supervisor and participating in the IDV Field Study Placement information session and speaking with peer students of their experience. IDV faculty advisor can give general research advice to students but are not expected to be involved in the actual placement process.

1. If a student feels that their faculty advisor is not fulfilling their responsibilities, the student should talk first with the advisor regarding that perception, and they should try to work together to take steps toward improving the situation. 2. If the situation is not resolved after talking about it with the faculty advisor, the student is encouraged to talk with the Division Head, Dr. Lee Riley and/or the Associate Dean of Services. It is the responsibility of the Division Head or the Associate Dean to discuss the situation with the faculty advisor to insure resolution of any advising difficulties.

Student Groups

Infectious Disease and Immunity PhD Student Group

The mission of the ID & I student group is to facilitate social interactions within the student body and allow informal discussion addressing concerns central to the improvement of the program. The student-led group meets monthly to discuss and plan social events, student recruitment, the annual PhD retreat and general program concerns.

2018-19-Co-Presidents: Derek Bangs; Kristina Geiger

Association of Public Health Infectious Diseases Students (APHIDS)

The Association of Public Health Infectious Diseases Students at Berkeley (APHIDS) is a graduate student group serving the School of Public Health (SPH) graduate students. Its goals include creating a strong sense of community and cohesiveness, and providing a welcoming and warm environment for new and prospective students. It is also dedicated to working within both the UC Berkeley student population and the city of Berkeley to reduce disease burden among at-risk populations. APHIDS has been engaged in community work with the Suitcase Clinic to provide Berkeley's homeless population with flu vaccinations and to expand its disease surveillance services.

2018-19- Office Bearers: Chandra Greenberg; Zahra Samiezade-Yazd; Zaq Tman

2018 -2019 Academic Calendar

Fall Semester 2018

Event	Date
Fall Semester Begins	Wednesday, August 15, 2018
Instruction Begins	Wednesday, August 22, 2018
Academic & Administrative Holiday (Labor Day)	Monday, September 3, 2018
Academic & Administrative Holiday (Veterans Day)	Friday, November 12, 2018
Non-Instructional Day	Wednesday, November 21, 2018
Academic & Administrative Holiday (Thanksgiving)	Thursday, November 22 & Friday, November 23, 2018
Formal Classes End	Friday, November 30, 2018
Reading/Review/Recitation Week	Monday, December 3 – Friday, December 7, 2018
Last Day of Instruction	Friday, December 7, 2018
Final Examinations	Monday, December 10 – Friday, December 14, 2018
Fall Semester Ends	Friday, December 14, 2018
Academic & Administrative Holidays (Winter Holidays)	Monday, December 24 & Tuesday, December 25, 2018
Academic & Administrative Holiday (New Year's)	Monday, December 31, 2018 & Tuesday, January 1, 2019

2018 -2019 Academic Calendar

Spring Semester 2019

Event	Date
Spring Semester Begins	Tuesday, January 15, 2019
Academic & Administrative Holiday (Martin Luther King, Jr. Day)	Monday, January 21, 2019
Instruction Begins	Tuesday, January 22, 2019
Academic & Administrative Holiday (Presidents' Day)	Monday, February 18, 2019
Spring Recess	Monday, March 25 – Friday, March 29, 2019
Academic & Administrative Holiday (Cesar Chavez Day)	Friday, March 29, 2019
Classes End	Friday, May 3, 2019
Reading/Review/Recitation Week	Monday, May 6 – Friday, May 10, 2019
Last Day of Instruction	Friday, May 10, 2019
Final Examinations	Monday, May 13 – Friday, May 17, 2019
Spring Semester Ends	Friday, May 17, 2019
Academic & Administrative Holiday (Memorial Day)	Monday, May 27, 2019

General Information

California Residency

Every entering student is classified as a Resident or Non-resident of California for tuition purposes. Fees and tuition will vary depending upon the student's residency status. To establish California residence for tuition purpose, it is important for non-California residents to begin collecting documentation. For more information, please visit the Registrar's website at **http://registrar.berkeley.edu/Residency/legalinfo.html** and California residency information for non-citizens is at **http://registrar.berkeley.edu/?PageID=non-citizen.html**. For inquiries regarding residence requirements, determination, and exemptions, please contact the Residence Affairs Unit of the Registrar's Office, email: orres@berkeley.edu, phone: (510) 642-5990, office located at 120 Sproul Hall.

Registration and Enrollment

Incoming IDV MPH and IDI PhD graduate students are asked to register for classes they must take by reviewing the program curriculum requirement in **Calcentral** student portal and confirming their class schedule after meeting with their faculty advisors during Orientation. Make any changes if necessary during the Adjustment Period.

To be officially registered at Berkeley, you must enrolled in at least 12 units; your registration fees must have been paid, either in full or by payment plan, by the published deadlines and you must have no registration/financial blocks. After adjustment period ended by the end of the 3rd week of instruction, students must fill out the Petition to Change Class Schedule for Graduate Students (forms available online) to make course schedule change. The form should be submitted to the Student Services at 417 U Hall and a small fee charged for adding/dropping classes. No change of class schedule will be entertained by Student Services after the SPH internal add/drop deadline for graduate students, it is usually earlier a week prior to the published deadline. Please always check your enrollment status in Calcentral on a regular basis to make sure your enrollment information is correct.

Note: Please check financial aid website for satisfactory academic progress requirement for student receiving federal loans and work study. http://financialaid.berkeley.edu/satisfactory-academic-progress

Campus Resources for students with disabilities

The campus offers many different resources for graduate students with disabilities. The purpose of an academic accommodation is to offer the graduate student an equal opportunity to meet with the department's academic standards and requirements. The Disabled Students Program http://dsp.berkeley.edu at (510) 642- 0518 serves graduate students with disabilities (who complete the process of establishing eligibility) by authorizing academic accommodations. To get more information on the Disabled Access Services, please visit http://access.berkeley.edu or contact (510) 643-6473 or (510) 643-6456. It can usually assist with accommodations to extra-curricular events. Most physical access issues are addressed in the Campus Access Guide http://acads.chance.berkeley.edu/GAG/. Finally, problems with accommodations may be reported to the campus Disability Resolution Officer Derek Coates http://acads.chance.berkeley.edu/ada.shtml at (510) 642- 2795

University Health Services (UHS)

University Health Services (UHS) provides comprehensive medical, mental health and health promotion services to all Cal students and a variety of occupational health services to faculty and staff.
http://www.uhs.berkeley.edu/

GSI/GSR Position

If you are interested in finding GSI (Graduate Student Instructor) and/or GSR (Graduate Student Researcher). The best way is to contact the Student Affairs Officers and the faculty concerned of individual hiring departments and the faculty concerned, check the department's website and pay attention to email announcements. Most departments hire their GSI at least a semester or even an academic year ahead of time (such as MCB), please apply early. The SPH GSI job openings are also posted in the SPH Career Center at https://ucalhealth-csm.symplicity.com/students/

Complete academic departments and programs list (search by alphabet) can be found at
www.berkeley.edu/academics/dept/a.shtml

Useful Resources

Useful SPH resources for students:

- http://sph.berkeley.edu/current-students/student-resources

Useful campus resources:

- CalCentral is UC Berkeley's **online** one-stop service center that allows students to manage class enrollment, billing, financial aid, and student records.. This website combines multiple campus systems into one easy-to-use mobile friendly place. Check campus email, calendar, academic progress, financial aid, enrollment information, and more.
  https://calcentral.berkeley.edu
- **Cal Student Central** is the physical one-stop student services center located in 120 Sproul Hall where students can find answers to questions regarding financial aid, fees and billing, payments, disbursements, registration and enrollment in one convenient location. Visit studentcentral.berkeley.edu for quick answers to top questions. If you need further assistance, stop by 120 Sproul Hall, Monday - Friday, 9 a.m. - 4 p.m.http://studentcentral.berkeley.edu/
- www.berkeley.edu/visitors/contacts.html

Center for Public Health Practice & Leadership:

- http://sph.berkeley.edu/careers/center-public-health-practice-leadership
- http://sph.berkeley.edu/careers/internships

Registrar's Office (Academic & student calendars, fees, establishing legal residency):
http://registrar.berkeley.edu/

Graduate Division: www.grad.berkeley.edu

- Guide to Graduate Policy: www.grad.berkeley.edu/policies/guide.shtml
- What do you Need to know about being a GSI, GSR, Reader or Tutor http://www.grad.berkeley.edu/policies/pdf/apptknow.pdf
- Degrees FAQ: www.grad.berkeley.edu/policies/faq.shtml
- Fees: www.grad.berkeley.edu/admissions/cost_fees.shtml
- Fellowship Office: www.grad.berkeley.edu/financial/fellowships_office.shtml
- Information on GSI/GSR/Reader/Tutor appointments:
  www.grad.berkeley.edu/policies/pdf/apptknow.pdf
- Graduate Diversity Program: http://www.grad.berkeley.edu/diversity/diversity.shtml
- Financial Aid Office: http://students.berkeley.edu/finaid/
- Disabilities Service: http://dsp.berkeley.edu
- University Health Services at UCTang Center: http://uhs.berkeley.edu/
- GSI Teaching and Resource Center: http://gsi.berkeley.edu/
- Housing: www.housing.berkeley.edu/livingatcal/graduatestudents.html

Faculty Advisor List
2018 – 2019 IDI PhD Program

Student Name	Email	Faculty, Lab
IDI 1st Year Student		
Cuong Tran	cuongt3@berkeley.edu	Dr. Harris
Joanna Vinden	joanna_vinden@berkeley.edu	Dr. Harris
Marcus Wong	mpwong@berkeley.edu	Dr. Harris
IDI 2nd Year Students		
Nicholas Lo	nicholas.lo@berkeley.edu	
IDI 3rd Year Students		
Perri Callaway	perricallaway@berkeley.edu	Dr. Harris at UCB, Feeney Lab UCSF
Marissa Foster	mrisajne@berkeley.edu	Dr. Riley, Riley Lab
IDI 4th Year Students		
Derek Bangs	djbangs@berkeley.edu	Dr. Robey, Robey Lab
Gina Borgo	gborgo@berkeley.edu	Dr. Welch, Welch Lab
Milena Dimitrova	mdimitrova@berkeley.edu	Dr. Harris, Harris Lab
Kristina Geiger	kgeiger@berkeley.edu	Dr. Coscoy, Coscoy Lab
IDI 5th Year Students		
Paulina Andrade	paulinaandradeproano@berkeley.edu	Dr. Harris, Harris Lab
Eric Lee	eric.lee.822@berkeley.edu	Dr. Portnoy, Portnoy Lab
Alexandra Tsitsiklis	alexandra.tsitsiklis@berkeley.edu	Dr. Robey, Robey Lab
IDI 6th Year Students		
Daniela Andrade (on filing fee Fall 2018)	danilymphb13@berkeley.edu	Dr. Harris, Harris Lab

Faculty Advisor List
2018 – 2019 IDV MPH Program

1st Year IDV MPH Students

Student Name	Email	Faculty	Office
Junlin Chen	junlinc12@berkeley.edu	George Sensabaugh	319 Mulford Hall
Jan Bing Del Rosario	jbadelro@berkeley.edu	Fenyong Liu	326 Barker Hall
Kelli Hager	kelli_hager@berkeley.edu	Peter Dailey	By appointment
Robin Hauschner	robin_hauschner@berkeley.edu	Eva Harris	500B Li Ka Shing
Christopher Hernandez	chrishernandezb@berkeley.edu	Peter Dailey	By appointment
Diana Holden	dianazyh@berkeley.edu	John Swartzberg	570 University Hall
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Kathleen (Katie) Kurowski	kathleen_kurowski@berkeley.edu	Sarah Stanley	500C Li Ka Shing
Phoebe Lu	phoebelu@berkeley.edu	Peter Dailey	By appointment
Clarissa Martinez	cimartinez@berkeley.edu	Eva Harris	500B Li Ka Shing
Rachel Marusinec	rachel_marusinec@berkeley.edu	Fenyong Liu	326 Barker Hall
Angela Monahan	angela_monahan@berkeley.edu	Sarah Stanley	500C Li Ka Shing
Jennifer Nguyen	jennifer_nguyen@berkeley.edu	Sarah Stanley	500C Li Ka Shing
Gathenji Njoroge	gathenji_njoroge@berkeley.edu	John Swartzberg	570 University Hall
Kaley Parchinski	kaley_parchinski@berkeley.edu	Sangwei Lu	57B Koshland Hall
Nathaniel (Nate) Sands	nathaniel_sands@berkeley.edu	John Swartzberg	570 University Hall
Peter White	pfwhitemd@berkeley.edu	Lee Riley	500D Li Ka Shing

Faculty Advisor List
2018 – 2019 IDV MPH Program

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Chandra Greenberg	chandra_greenberg@berkeley.edu	Dr. Dailey	By appointment
Kirsten Hogstad	kirsten_hogstad@berkeley.edu	Dr. Riley	500D Li Ka Shing
Alexandra Jones	jones_alexandra@berkeley.edu	Dr. Harris	500B Li Ka Shing
Rocky Kee Li	rkli@berkeley.edu	Dr. Stanley	500C Li Ka Shing
Huong Nguyen	sungsim27@berkeley.edu	Dr. Dailey	By appointment
Di Niu	di_niu@berkeley.edu	Dr. Lu	57B Koshland Hall
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Raj Topiwala	rajtopiwala@berkeley.edu	Dr. Dailey	By appointment
Alejandro Vega	avega619@berkeley.edu	Dr. Lu	57B Koshland Hall
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Infectious Diseases and Immunity (IDI) PhD Students 2018 - 2019

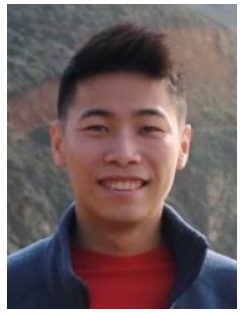
1st Year

Joanna Vinden

Cuong Tran

Marcus Wong

2nd Year



Nicholas Lo

3rd Year

Perri Callaway

Marissa Foster

4th Year

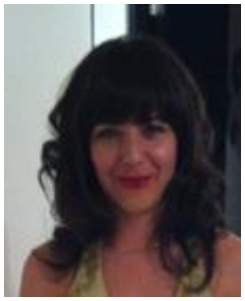
Derek Bangs

Gina Borgo

Milena Dimitrova

Kristina Geiger

5th Year



Paulina Andrade

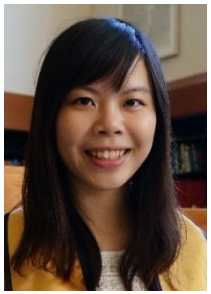
Eric Lee

Alexandra Tsitsiklis

6th Year

Daniela Andrade

First Year Infectious Disease and Vaccinology (IDV) MPH Students 2018-2019

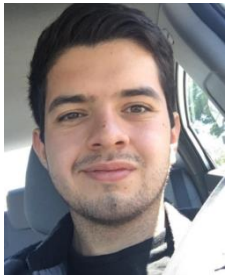


Junlin Chen

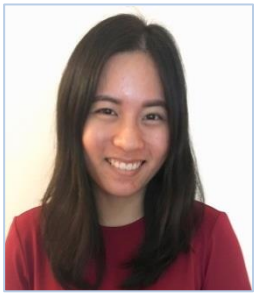
Jan Bing Del Rosario

Kelli Hager

Robin Hauschner



Chris Hernandez

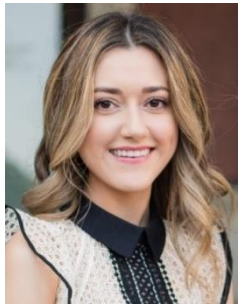


Diana Holden

Benjamin Iwaszewicz

Kathleen Kurowski

Phoebe Lu



Clarissa Martinez

Rachel Marusinec

Angela Monahan

Jennifer Nguyen

Gathenji Njoroge

Kaley Parchinski

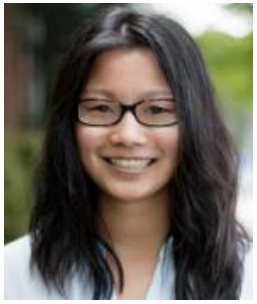
Nathaniel Sands

Peter White

Second Year Infectious Disease and Vaccinology (IDV) MPH Students 2018-2019


John Auld

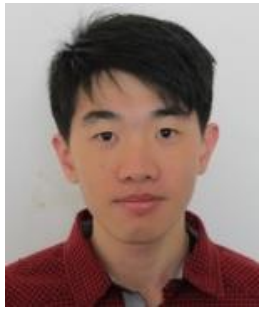

Katherine Chen


Laura Deneckere


Chandra Greenberg


Kirsten Hogstad


Alexandra Jones


Rocky Li


Huong Nguyen


Di Niu


Zahra Samiezade-Yazd


Zaq Tman


Raj Topiwala


Alejandro Vega


Carrie Whitaker


Aster Workineh


Melody Yu

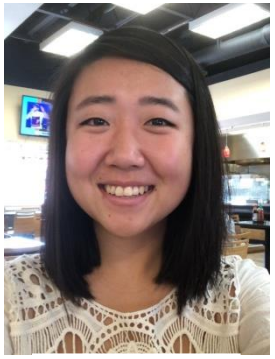

Cory Yun


MJ/MPH Student
Leah Rosenbaum

First Year Infectious Disease and Vaccinology (IDV) 4+1 Students 2018-2019

Kerri Chen

Jessica Le



Jane Lee

Hannah Sans