

**IMI201a: ECOLOGY, EPIDEMIOLOGY, and CONTROL of IMPORTANT
PARASITIC DISEASES of DEVELOPING COUNTRIES**

Harvard School of Public Health

Department of Immunology and Infectious Diseases

General Information

1. Classes will be held Monday, Wednesday, and Friday from 2:00-3:30 PM in room G10 of the Francois-Xavier Bagnoud Building (FXB-G10).
2. A set of required readings for each class, including a background paper that covers general information for each topic and a recent scientific article, will be available on the course website. Material for each session should be read before class.
3. Students are expected to be familiar with the life cycle and general biology of each parasite before class. Persons who do not have a background in Medical Parasitology or wish a review may consult one of several textbooks that are on course reserve at Countway Library (marked * on the following booklist). Other useful sources of background information on Parasitology include the Centers for Disease Control Parasitology website (www.dpd.cdc.gov/dpdx) and WHO's tropical diseases information pages (www.who.int/ctd/).
4. Evaluation will be based on performance on two take-home examinations (45%), a case study and group project (45%), and participation in the classroom (10%).
5. Course co-directors:
Dyann Wirth, Department of Immunology and Infectious Diseases, HSPH Building 1, Room 703, Tel: 617-432-1563, Email: dfwirth@hsph.harvard.edu
Manoj Duraisingh, Department of Immunology and Infectious Disease, HSPH Building 1, Room 715, Tel: 617-432-2675, Email: mduraisi@hsph.harvard.edu
Jeffrey Dvorin, Division of Infectious Diseases, Boston Children's Hospital, Enders 878.2, Tel: 617-919-1236, Email: Jeffrey.Dvorin@childrens.harvard.edu
6. Course Administrator: Andi Sabaroff, Department of Immunology and Infectious Diseases, HSPH FXB Building, Room 301, telephone 617-432-1023, email: asabarof@hsph.harvard.edu. The TFs for the course are **Rebecca Mandt** (rebeccamandt@g.harvard.edu) and Madalyn McFarland (mcfarland@g.harvard.edu).
7. Students are encouraged to attend seminars in the Department of Immunology and Infectious Diseases (usually Wednesdays at noon and posted on bulletin boards throughout the Department). The main office of the Department of Immunology and Infectious Diseases is on the 3rd floor of the Francois-Xavier Bagnoud Building (FXB-301), telephone 617-432-1023.

ECO, EPI, and CONTR of IMPORTANT PARASITIC DISEASES of DEVELOPING COUNTRIES

*Mondays, Wednesdays, Fridays at 2:00-3:30 P.M. HSPH FXB Building, Room G10
(Preliminary Schedule)*

| Date | Title | Presenter |
|--------------|--|----------------------------|
| Sep 5, 2018 | Course Introduction | DFW |
| Sep 7, 2018 | Malaria: Infection and Control | MD |
| Sep 10, 2018 | Malaria: Evaluation of elimination programs | Marcia Castro, HSPH |
| Sep 12, 2018 | Modeling infectious diseases and rebounds | Caroline Buckee, HSPH |
| Sep 14, 2018 | Malaria: Clinical Disease and Treatment | JDD |
| Sep 17, 2018 | Malaria: Parasite diversity/vaccines | DFW |
| Sep 19, 2018 | Malaria: transmission and vectors | Flaminia Catteruccia, HSPH |
| Sep 21, 2018 | Class presentations/malaria control | |
| Sep 24, 2018 | Onchocerciasis Case Study Group | Ed Ryan, MGH |
| Sep 26, 2018 | ***Midterm Exam Due** | |
| Sep 28, 2018 | The economic burden of infectious diseases | Rifat Atun, HSPH |
| Oct 1, 2018 | Ecology and control of Filariasis | Peter Weller, BIDMC |
| Oct 3, 2018 | Geohelminth Infection | Jamie Maguire, BWH |
| Oct 5, 2018 | Dracunculiasis: Epidemiology and Eradication | Don Hopkins, Carter Center |
| Oct 8, 2018 | Indigenous Peoples' Day | |
| Oct 10, 2018 | Leishmaniasis | Jamie Maguire, BWH |
| Oct 12, 2018 | African Trypanosomiasis | MD |
| Oct 15, 2018 | Chagas's Disease: Epidemiology & Control | Barbara Burleigh, HSPH |
| Oct 17, 2018 | Cysticercosis/Echinococcosis | Ryan Carrol, MGH |
| Oct 19, 2018 | Schistosomiasis | Don Harn, UGA |
| Oct 22, 2018 | Global Health Program Development | Regina Rabinovich, HSPH |
| Oct 24, 2018 | Intestinal Protozoa: Pathology and Control | JDD |
| Oct 26, 2018 | Final Exam Due | |

COURSE OBJECTIVES

- Understand epidemiology and current worldwide burden of disease
- Understand parasite biology and transmission as relevant to elimination/eradication (limited focus on clinical)
- Understand natural infection and protection (especially in context of malaria) as different from sterilizing immunity
- Learn to think more critically about effectiveness of control programs and elimination/eradication campaigns
- Understand common principles for successful elimination/eradication (including importance of integrated approaches-vector control, drugs, etc.) and current challenges of specific diseases in relation to successes of previous campaigns (guinea worm, polio, etc.)
- Discuss the current situation in terms of interventions (including drugs/vaccines currently available or in the pipeline), challenges in developing/implementing these interventions, and particularly tools with population-level effects (MDA, vaccines)

BOOK LIST

Parasitology and tropical medicine texts (* on reserve at Countway library):

1. * Basic Clinical Parasitology. Neva FA, Brown HW. 6th edition New York Appleton-Century-Crofts, 1994.
2. * Hunter's Tropical Medicine. Strickland GT. 8th Edition. Philadelphia: WB Saunders, 2000. (\$195.00)
3. * Manson's Tropical Diseases. Cook GC. 20th Edition London: WB Saunders, 2003.
4. * Markell and Voge's Medical Parasitology. Markell EK, Voge M, John DT, Krotoski WA. 8th edition Philadelphia WB Saunders, 1999 (\$49.00).
5. * Parasitic Diseases 3rd edition Despommier DD, Gwadz RW, Hotez PJ., New York: Springer Verlag, 1995.
6. Clinical Parasitology. Beaver PC, Jung RC, Cupp EW. 9th edition. Philadelphia: Lea & Febiger, 1984. (the classic text on medical parasitology- unique and invaluable reference, but out of print)
7. Tropical Infectious Diseases. Principles, Pathogens, and practice. Guerrant RL, Walker DH, Weller PF. Philadelphia: Churchill Livingstone, 1999 (\$295; \$236 from Amazon.com)

Suggested Reading- (General background)

1. Pathology of Infectious Diseases. Connor,DH, et al. Stamford, Connecticut: Appleton and Lange, 1997.
2. Infectious Disease Epidemiology: Theory and Practice. Graham, NM, Masters CF, Nelson KE. Aspen Publishers, 2000.
3. International Health: beyond the year 2000. Velji AM (ed). Infectious Disease Clinics of North America, volume 9, number 2, 1995.
4. Chemotherapy of Parasitic Diseases. Campbell WC, Rew RS. New York: Plenum Press, 1986.
5. WHO Model Prescribing Information: Drug Used in Parasitic Diseases. Geneva: World Health Organization, 1990
6. Pathology of Tropical and Extraordinary Diseases. Binford CH, Connor DH. Vols I and II. Washington, DC: Armed Forces Institute of Pathology, 1978.
7. Atlas of Human Parasitology. Ash LR, Orihel TC. 4th ed. Chicago: American Society of Clinical Pathologists, 1997.
8. Parasites in Human Tissues. Orihel TC Ash LR. Chicago ASCP Press, 1995
9. A Colour Atlas of Arthropods in Clinical Medicine. Peters W. London: Wolfe Publishing, 1992.
10. Arthropods of Medical Importance. 2nd ed. Goddard J. Boca Raton: CRC Press, 1996
11. Illustrated History of Tropical Diseases. Cox FEG (ed) London: The Wellcome Trust, 1996
12. Infection and Environment. Kaplan C. Woburn, MA: Butterworth-Heinemann, 1997.
13. Parasitic Diseases. Maguire JH, Keystone (eds). Infectious Disease Clinics of North America, volume 7, number 3, 1993.

14. Infectious Diseases of Humans: Dynamic and control. Anderson RM, May RM. Oxford: Oxford University Press, 1991.
15. Parasitic and Infectious Diseases: Epidemiology and Ecology. Scott ME, Smith G. San Diego: Academic Press, 1992.
16. Emerging Infections. Krause RM, ed. San Diego: Academic Press, 1998
17. Parasitic disease in Water Resources development. The need for Intersectoral Negotiation. Geneva: World Health Organization, 1993.
18. Methods for field Trials of Interventions against Tropical Diseases. A toolbox. Smith PG, Morrow RH. Oxford: Oxford University Press, 1991.
19. Immunity to Parasites: How Parasitic Infections are Controlled. Cambridge: Cambridge University Press, 1996.
20. Tropical Medicine and Parasitology: Classic Investigations. Kean BH, Mott KE, Russell AJ. Vols I and II. Ithaca, NY: Cornell University Press, 1978.
21. Medical and Veterinary Entomology. 2nd ed. Kettle, DS. Wallingford, UK: CAB International, 1995.
22. Tropical Neurology. Shakir RA, Newman PK, Poser CM (eds). London: WB Saunders, 1996
23. Molecular Approaches to Parasitology. Boothroyd JC, Komuniecki R (eds). New York: Wiley-Liss, 1995.
24. Emerging Infections. Microbial threats in the United States. Lederberg J, Shope RE, Oaks Sc, Jr.(eds). Washington, D.C. National Academy Press, 1992.

Epidemiology of Infectious Diseases: (Partial) List of Courses**Infectious Disease related courses****Harvard School of Public Health**

- IID201 Ecological and Epidemiological Control of Parasitic Diseases
- IID202 Tuberculosis
- IID206 Biology and Control of Insect Vectors of Human Health
- IID216 Molecular and Cell Biology of Parasites
- IID 208 Immunology of Infectious Diseases
- IID 232 Vector-borne and zoonotic infections
- IID 233 Infections transmitted through food and water
- EPI 255a Epidemiology of HIV infection I: Etiology, Natural History, and Transmission
- EPI 256 Epidemiology of HIV infection II: Design and Conduct of Therapeutic and Prevention Interventions
- EPI 260d Mathematical Modeling of Infectious Diseases
- EPI 501 Dynamics of Infectious Diseases
- EPI 519 Evolutionary Epidemiology of Infectious Disease
- BIO 508 Genomic Data Manipulation
- GHP 539 The Social, Economic, and Political Dimensions of Infectious Disease in Developing Countries

Harvard Medical School

- Microbiology 201. Molecular Biology of the Bacterial Cell
- Microbiology 202. Molecular Basis of Bacterial Pathogenesis and Host Response
- Microbiology 300qc. Advanced Topics in Microbiology and Molecular Genetics
- *Microbiology 205. Mechanisms of Microbial Pathogenesis
- Microbiology 210. Microbial Sciences: Chemistry, Ecology, and Evolution
- Microbiology 301qc. Molecular Mechanisms of Microbial Pathogenesis
- Microbiology 302qc. Introduction to Infectious Disease Research: Infectious Diseases Consortium Boot Camp
- Microbiology 213. Social Issues in Biology
- *Virology 200. Introduction to Virology
- Virology 201. Virology
- Virology 330. Critical Readings in Virology
- Virology 300qc. Advanced Topics in Virology
- Virology 301qc. Advanced Topics in Virology - Viral Oncology
- Immunology 201. Principles of Immunology
- Immunology 202. Advanced Principles of Immunology
- Immunology 204. Critical Readings for Immunology
- Immunology 303qc. The Warring Genomes: Innate Immunity and Host Defense
- Immunology 304qc. Current Concepts in Mucosal Immunology
- Immunology 306qc. Systems Immunology

Harvard University

- MCB 121. The Microbes
- MCB 169. Molecular and Cellular Immunology
- OEB 192. Microbial Evolution
- OEB 221. Microbial Diversity
- [OEB 279. Microbial Metabolic Systems] (2014-2015)
- [OEB 282. Genomics and Evolution of Infectious Disease] (2014-2015)

MIT

Fall 2018

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| 7.493J | Microbial Genetics and Evolution |
| 7.62 | Microbial Physiology |
| 7.63 | Immunology |
| 7.66 | Molecular Basis of Infectious Disease |
| 20.106J | Systems Microbiology |

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