

## CURRICULUM VITAE

### Jonathan Andrew Runstadler

Division of Comparative Medicine  
Department of Biological Engineering  
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### Education

Ph.D., Genetics, University of California, Davis, 2003; Advisor: Dr. Michael Seldin  
**Thesis title:** Immunogenetics of juvenile idiopathic arthritis: genetic susceptibility of the MHC and SLC11A1 chromosomal regions  
D.V.M., University of California, Davis, 1999  
Swedish University of Agricultural Science Animal Health Externship, Skara, Sweden, 1999  
Utrecht University Lab Animal Medicine Externship, Utrecht, Netherlands, 1999  
John G. Shedd Aquarium Externship, Chicago, IL, 1999  
Stanford University Lab Animal Medicine Externship, Stanford, CA, 1998  
Aquavet Program, Woods Hole, MA, 1996  
M.S., Zoology, University of New Hampshire, 1992; Advisor: Dr. Tom Kocher  
**Thesis title:** The evolution of zebrafish homeotic gene arrays  
B.S., Biological Sciences, Stanford University, 1989  
Stanford-in-Oxford, Oxford, England, 1989  
Williams-Mystic Maritime Studies Program, Mystic, CT, 1987

### Professional Experience

2011-present Assistant Professor, Massachusetts Institute of Technology  
2013-present Associate Faculty, Broad Institute, Cambridge, MA  
2011-present Faculty, MIT Center for Environmental Health Sciences  
2010-2011 Director, Alaska Zoonotic Disease Center, University of Alaska Fairbanks  
2010-2011 Associate Professor with Tenure, University of Alaska Fairbanks  
2006-present Affiliate Faculty, Department of Comparative Medicine, University of Washington  
2004-2010 Assistant Professor, Institute of Arctic Biology and Department of Biology, University of Alaska Fairbanks  
2003-2004 Post-doctoral Research Associate, Veterinary Genetics Laboratory, University of California, Davis  
1999-2001 Resident (auxiliary status), Laboratory Animal Medicine, University of California, Davis

### Research Interests

- Virology, emerging infectious disease, and disease ecology
- Comparative genetics, immunogenetics, and genetic mechanisms of infectious disease and health
- Comparative medicine, evolution of immune function, and host/pathogen interaction
- Veterinary and human public health
- Veterinary immunology and virology
- Genetic diversity

## Research Funding

- NIH/NIAID (Co-PI) for “Centers of Excellence in Influenza Research and Surveillance” 2014-2021
- Kuwait-MIT Center for Natural Resources and the Environment (CNRE) – The Underworlds Project: A Smart Sewage Infrastructure for Kuwait (Co-I), 2015-2018
- North Atlantic Research Board (PI) - Influenza in synanthropic gulls: are congregation sites hotspots for viral evolution, 2015-2017
- MISTI MIT-Mexico Zapopan Seed Fund (PI) 2013-2015
- Doherty Professorship in Ocean Engineering, MIT (PI) 2013-14
- MISTI MIT Global Seed Fund (PI) 2012-14
- MISTI MIT Russian Seed Fund (PI) 2012-14
- MIT Center for Environmental Health Science (PI) Pilot Project Grant 2013-14
- NIH/NIAID (Co-PI) for “Centers of Excellence in Influenza Research and Surveillance” 2007-2014
- MIT Center for Environmental Health Science (PI) Pilot Project Grant 2012-13
- U.S. Civilian Research & Development Foundation (US PI with Alexander Shestopalov, Russian PI), CGP-RFBR Climate Change & Energy (CGP-RFBR IV) competition, “Measuring, monitoring, modeling and predicting avian influenza in the Pacific Rim” 2010-2012
- NIH/NIAID subcontract (PI) “Influenza Genome Sequencing Project” 2008-2012
- NIH/NCRR (Supported faculty) “Alaska IDeA Networks for Biomedical Research Excellence (Alaska INBRE)” 2004-2011
- Center for Companion Animal Health, UC Davis (Co-PI) “Is Subacute Necrotizing Encephalopathy in Alaskan Huskies a Mitochondrial Encephalopathy?” 2008-2009
- USDA (UAF Co-PI) “Control and Prevention of Avian Influenza in the U.S. (AICAP)” 2006-2007

## Publications

1. Estrin M, Puryear W, Hussein I, Kuan A, **Runstadler J**. Host-directed Combinatorial RNAi Prevents the Growth of Diverse Strains of Influenza A Virus in Human Respiratory Epithelial Cells. In review.
2. Sultan S, Nghia Bui V, Hill NJ, Hussein ITM, Trinh DQ, Hashizume KT, **Runstadler JA**, Ogawa H, Imai K. Genetic characterization of H5N2 influenza viruses isolated from wild birds in Japan suggests multiple reassortment. In review.
3. Puryear W, Keogh M, Hill NJ, Moxley J, Josephson E, Davis KR, Bandoro C, Lidgard D, Bogolmolni A, Levin M, Lang S, Hammill M, Bowen D, Johnston D, Romano T, Waring G, **Runstadler J**. Grey seals are an underappreciated mammalian reservoir for potential pandemic influenza. *Emerging Microbes and Infections*. In press.
4. Hill N, Ma E, **Runstadler J**. Transmission of influenza reflects seasonality of wild birds across the annual cycle. *Ecol Lett*. 2016 Jun 21.
5. Hill NJ and **Runstadler JA**. A bird's eye view of influenza A virus transmission: challenges with characterizing both sides of a co-evolutionary dynamic. *Integr Comp Biol*. 2016 Jun 1.
6. Hussein ITM, Ma EJ, Hill NJ, Meixell BW, Lindberg M, Albrecht RA, Bahl J, **Runstadler JA**. A point mutation in the polymerase protein PB2 allows a reassortant H9N2 influenza isolate of wild-bird origin to replicate in human cells. *Infect Genet Evol*. 2016 Jul;41:279-88.
7. Bahl J, Pham TT, Hill NJ, Hussein ITM, Ma EJ, Easterday BC, Halpin RA, Stockwell TB, Wentworth DE, Kayali G, Krauss S, Schultz-Cherry S, Webster RG, Webby RJ, Swartz M, Smith GJD, **Runstadler JA**. Ecosystem interactions and reassortment dynamics underlie the emergence of influenza A viruses with pandemic potential. *PLoS Pathog*. 2016 May 11;12(5):e1005620.
8. Ma EJ, Hill NJ, Zabilansky J, Yuan K, **Runstadler JA**. Reticulate evolution is favored in influenza niche switching. *Proc Natl Acad Sci U S A*. 2016 May 10;113(19):5335-9.
9. Tang S, Puryear WB, Seifried BM, Dong X, **Runstadler JA**, Ribbeck K, and Olsen BD. Antiviral Agents from Multivalent Presentation of Sialyl Oligosaccharides on Brush Polymers. *ACS Macro Lett* 2016 5 (3), pp 413–418.

10. Hussein IT, Krammer F, Ma E, Estrin M, Viswanathan K, Stebbins NW, Quinlan DS, Sasisekharan R, **Runstadler J**. New England harbor seal H3N8 influenza virus retains avian-like receptor specificity. *Sci Rep* 2016 Feb 18;6:21428. PMID: 26888262.
11. Ramos I, Mansour M, Wohlbold TJ, Ermler ME, Hirsh A, **Runstadler JA**, Fernandez-Sesma A, Krammer F. Hemagglutinin Receptor Binding of a Human Isolate of Influenza A(H10N8) Virus. *Emerg Infect Dis* 2015 Jul;21(7):1197-201. PMID: 26079843.
12. Bui VN, Ogawa H, Hussein IT, Hill NJ, Trinh DQ, AboElkhair M, Sultan S, Ma E, Saito K, Watanabe Y, **Runstadler JA**, Imai K. Genetic characterization of a rare H12N3 avian influenza virus isolated from a green-winged teal in Japan. *Virus Genes* 2015 Apr;50(2):316-20. PMID: 25557930.
13. Bui VN, Mizutani T, Nguyen TH, Trinh DQ, Awad SS, Minoungou GL, Yamamoto Y, Nakamura K, Saito K, Watanabe Y, **Runstadler J**, Huettmann F, Ogawa H, Imai K. Characterization of a genetic and antigenic variant of avian paramyxovirus 6 isolated from a migratory wild bird, the red-necked stint (*Calidris ruficollis*). *Arch Virol* 2014 Nov;159(11):3101-5. PMID: 25000900.
14. Bui VN, Ogawa H, Trinh DQ, Nguyen TH, Pham NT, Truong DA, Bui AN, **Runstadler J**, Imai K, Nguyen KV. Genetic characterization of an H5N1 avian influenza virus from a vaccinated duck flock in Vietnam. *Virus Genes* 2014 Oct;49(2):278-85. PMID: 24880916.
15. Krammer F, Albrecht RA, Tan GS, Margine I, Hai R, Schmolke M, **Runstadler J**, Andrews SF, Wilson PC, Cox RJ, Treanor JJ, Garcia-Sastre A, Palese P. Divergent H7 immunogens offer protection from H7N9 virus challenge. *J Virol* 2014 Apr;88(8):3976-85. PMID: 24453375.
16. Wille M, Huang Y, Robertson GJ, Ryan P, Wilhelm SI, Fifield D, Bond AL, Granter A, Munro H, Buxton R, Jones IL, Fitzsimmons MG, Burke C, Tranquilla LM, Rector M, Takahashi L, Kouwenberg AL, Storey A, Walsh C, Hedd A, Montevecchi WA, **Runstadler JA**, Ojkic D, Whitney H, Lang AS. Evaluation of seabirds in Newfoundland and Labrador, Canada, as hosts of influenza A viruses. *J Wildl Dis* 2014 Jan;50(1):98-103. PMID: 24171570.
17. Bui VN, Dao TD, Nguyen TT, Nguyen LT, Bui AN, Trinh DQ, Pham NT, Inui K, **Runstadler J**, Ogawa H, Nguyen KV, Imai K. Pathogenicity of an H5N1 avian influenza virus isolated in Vietnam in 2012 and reliability of conjunctival samples for diagnosis of infection. *Virus Research* 2014 179:125-32. PMID:24211664.
18. Arai Y, Bui VN, Takeda Y, Trinh DQ, Nibuno S, **Runstadler J**, Ogawa H, Imai K. Lung Cytokine Gene Expression is Correlated with Increased Severity of Disease in a Novel H4N8 Influenza Virus Isolated from Shorebirds. *Journal of Veterinary Medical Science*. 2013 75(10):1341-7. PMID:23759687.
19. Margine I, Krammer F, Hai R, Heaton NS, Tan GS, Andrews SA, **Runstadler JA**, Wilson PC, Albrecht RA, Garcia-Sastre A, Palese P. Hemagglutinin Stalk-Based Universal Vaccine Constructs Protect against Group 2 Influenza A Viruses. *J. Virol*. 2013 87(19):10435-46 PMID:23903831.
20. **Runstadler J**, Hill N, Hussein IT, Puryear W, Keogh M. Connecting the study of wild influenza with the potential for pandemic disease. *Infect Genet Evol* 2013 Jul;17:162-87. PMID: 23541413.
21. Abao LN, Jamsransuren D, Bui VN, Ngo LH, Trinh DQ, Yamaguchi E, Vijaykrishna D, **Runstadler J**, Ogawa H, Imai K. Bui. Surveillance and characterization of avian influenza viruses from migratory water birds in eastern Hokkaido, the northern part of Japan, 2009–2010. *Virus Genes* 2013 46(2):323-9. PMID:23264106.
22. Vernau KM, **Runstadler JA**, Brown EA, Cameron JM, Huson HJ, Higgins RJ, Ackerley C, Sturges BK, Dickinson PJ, Puschner B, Giulivi C, Shelton GD, Robinson BH, DiMauro S, Bollen AW, Bannasch DL. Genome-wide association analysis identifies a mutation in the thiamine transporter 2 (SLC19A3) gene associated with Alaskan Husky encephalopathy. *PLoS One*. 2013 8(3):e57195. PMID:23469184.
23. Bui VN, Ogawa H, Ngo LH, Baatartsogt T, Abao LN, Tamaki S, Saito K, Watanabe Y, **Runstadler J**, Imai K. H5N1 highly pathogenic avian influenza virus isolated from conjunctiva of a whooper swan with neurological signs. *Arch Virol*. 2013 158(2):451-5.PMID: 23053526.
24. Hill NJ, Takekawa JY, Ackerman JT, Hobson KA, Herring G, Cardona CJ, **Runstadler JA**, Boyce WM. Migration strategy affects avian influenza dynamics in mallards (*Anas platyrhynchos*). *Mol Ecol*. 2012. 21(24):5986-99. PMID: 22971007.
25. Girard YA, **Runstadler JA**, Aldehoff F, Boyce W. Genetic structure of Pacific Flyway avian influenza viruses is shaped by geographic location, host species, and sampling period. *Virus Genes* 2012 44(3):415-28. PMID:22222690.

26. Hill NJ, Takekawa JY, Cardona CJ, Meixell BW, Acherman JT, **Runstadler** JA, Boyce WM. Cross-seasonal patterns of avian influenza virus in breeding and wintering migratory birds: a flyway perspective. *Vector Borne Zoonotic Dis.* 2012 12(3):243-53. PMID:21995264.
27. Huson HJ, vonHoldt BM, Rimbault M, Byers AM, **Runstadler** JA, Parker HG, Ostrander EA. Breed-specific ancestry studies and genome-wide association analysis highlight an association between the MYH9 gene and heat tolerance in Alaskan sprint racing sled dogs. *Mamm Genome.* 2012 23(1-2):178-94. PMID: 22105876.
28. Sivay MV, Sayfutdinova SG, Sharshov KA, Alekseev AY, Yurlov AK, **Runstadler** J, Shestopalov AM. Surveillance of influenza A virus in wild birds in the Asian portion of Russia in 2008. *Avian Dis.* 2012 56(3):456-63. PMID: 23050460.
29. Bui VN, Ogawa H, Xininigen, Karibe K, Matsuo K, Awad SSA, Minoungou GL, Yoden S, Haneda H, Ngo LH, Tamaki S, Yamamoto Y, Nakamura K, Saito K, Watanabe Y, **Runstadler** JA, Huettman F, Happ GM, Imai K. H4N8 subtype avian influenza virus isolated from shorebirds contains a unique PB1 gene and causes severe respiratory disease in mice. *Virology* 2011 423(1):77-88. PMID: 22192630.
30. Reeves AB, Pearce JM, Ramey AM, Meixell BW, **Runstadler** JA. Interspecies transmission and limited persistence of low pathogenic avian influenza genomes among Alaska dabbling ducks. *Infect Genet Evol.* 2011 11(8):2004-10. PMID: 21964597.
31. Wille M, Robertson GJ, Whitney H, Bishop MA, **Runstadler** JA, Lang AS. Extensive Geographic Mosaicism in Avian Influenza Viruses from Gulls in the Northern Hemisphere. *PLoS ONE* 2011 6(6): e20664. PMID:21697989.
32. Pearce JM, Reeves AB, Ramey AM, Hupp JW, Ip HS, Bertram M, Petrula MJ, Scotton BD, Wege ML, Trust KA, Meixell BW, **Runstadler** JA. 2010. Interspecific exchange of avian influenza virus genes in Alaska: the influence of trans-hemispheric migratory tendency and breeding ground sympatry. *Mol Ecol.* 2011 20(5):1015-25. PMID: 21073586.
33. Bui VN, Ogawa H, Karibe K, Matsuo K, Nguyen TH, Awad SSA, Minoungou GL, Xininigen, Saito K, Watanabe Y, **Runstadler** JA, Happ GM, Imai K. 2010. Surveillance of Avian Influenza Virus in Migratory Water Birds in Eastern Hokkaido, Japan. *J Vet Med Sci.* 2011 73(2):209-15. PMID: 20948168.
34. Huson HJ, Byers AM, **Runstadler** J, Ostrander EA. A SNP within the angiotensin-converting enzyme distinguishes between sprint and distance performing Alaskan sled dogs in a candidate gene analysis. *J Hered.* 2011 102 Suppl 1:S19-27. PMID: 21846742.
35. Hill NJ, Takekawa JY, Cardona CJ, Meixell BW, Ackerman JT, **Runstadler** JA, Boyce WM. Cross-Seasonal Patterns of Avian Influenza Virus in Breeding and Wintering Migratory Birds: A Flyway Perspective. *Vector Borne Zoonotic Dis.* 2011 12(3):243-53. Epub 2011 Oct 13. PMID: 21995264.
36. Herrick KA, Huettmann FH, **Runstadler** JA, Chernetsov N, Antonov A, Valchuk O, Gerasimov Y, Matsina E, Matsina S, Markovets M, Drouzhiaka A, Saito K. 2010. Predictive RISK Modeling of Avian Influenza in the Pacific Rim and Beyond. In "Lecture Notes in Information Sciences; Risk Models and Applications, 2010". CODATA Germany, pp. 135-148.
37. Sayfutdinova S, **Runstadler** J, Kulak M, Sivay M. Monitoring for avian influenza in wild birds on the Far East in 2008. *International Journal of Infectious Diseases* 14. 2010 e322.
38. Huson HJ, Parker HG, **Runstadler** JA, Ostrander EA. A Genetic Dissection of Breed Composition and Performance Enhancement in the Alaskan Sled Dog. *BMC Genet.* 2010 11:71. PMID: 20649949.
39. Dillon D, **Runstadler** JA. Mx gene diversity and influenza association among five wild dabbling duck species (*Anas* spp.) in Alaska. *Infect Genet Evol.* 2010 10(7): 1085-93. PMID: 20621205.
40. Dugan VG, Chen R, Spiro DJ, Sengamalay N, Zaborsky J, Ghedin E, Nolting J, Swayne DE, **Runstadler** JA, Happ GM, Senne DA, Wang R, Slemons RD, Holmes EC, Taubenberger JK. The evolutionary genetics and emergence of avian influenza viruses in wild birds. *PLoS Pathogens* 2008 4(5):e1000076. PMID: 18516303.
41. Lang AS, Kelly AM, **Runstadler** JA. Prevalence and diversity of avian influenza viruses in environmental reservoirs. *J Gen Virol* 2008 89(Pt 2):509-519. PMID: 18198382.
42. Wang R, Soll L, Dugan V, **Runstadler** JA, Happ GM, Slemons RD, Taubenberger JK. Examining the hemagglutinin subtype diversity among wild duck-origin influenza A viruses using ethanol-fixed cloacal swabs and a novel RT-PCR method. *Virology* 2008 375(1):182-9. PMID: 18308356.

43. **Runstadler** JA, Happ GM, Slemons RD, Sheng ZM, Gundlach N, Petrula M, Senne D, Nolting J, Evers DL, Modrell A, Huson H, Hills S, Rothe T, Marr T, Taubenberger JK. Using RRT-PCR analysis and viral isolation to determine the prevalence of avian influenza virus infections in ducks at Minto Flats state game refuge, Alaska, during August 2005. *Arch Virol.* 2007 152(10):1901-10. PMID: 17541700.
44. **Runstadler** JA, Angles JA, Pedersen NC. Dog leukocyte antigen class II diversity and relationships among indigenous dogs of the island nations of Indonesia (Bali), Australia and New Guinea. *Tissue Antigens* 2006 68(5):418-426. PMID: 17092255.
45. **Runstadler** JA, Säilä H, Savolainen A, Leirisalo-Repo M, Aho K, Tuomilehto-Wolf E, Tuomilehto J, Seldin MF. Association of SLC11A1 (NRAMP1) with persistent oligoarticular and polyarticular rheumatoid factor-negative juvenile idiopathic arthritis in Finnish patients: haplotype analysis in Finnish families. *Arthritis Rheum.* 2005 52(1):247-56. PMID: 15641099.
46. **Runstadler** JA, Säilä H, Savolainen A, Leirisalo-Repo M, Aho K, Tuomilehto-Wolf E, Tuomilehto J, Seldin MF. HLA-DRB1, TAP2/TAP1, and HLA-DPB1 haplotypes in Finnish juvenile idiopathic arthritis: more complexity within the MHC. *Genes Immun.* 2004 5(7):562-571. PMID: 15343265.
47. Tolwani RJ, Hagan CE, **Runstadler** JA, Lyons H, Green SL, Bouley DM, Rodriquez LF, Schendel SA, Moseley ME, Daunt DA, Otto G, Cork LC. Development of an animal model for cleft palate: magnetic resonance imaging and surgical repair of a four week old brittany spaniel. *Contemp Top Lab Anim Sci.* 2004 43(6):17-21. PMID: 15636550.
48. **Runstadler** JA, Säilä H, Savolainen A, Leirisalo-Repo M, Aho K, Tuomilehto-Wolf E, Tuomilehto J, Seldin MF. Analysis of MHC region genetics in Finnish juvenile idiopathic arthritis: evidence for different locus specific effects in polyarticular vs. pauciarticular subsets and a shared DRB1 epitope. *Genes Immun.* 2003 4(5):326-335. PMID: 12847547.
49. Oberbauer AM, **Runstadler** JA, Murray JD, Havel P. Obesity and elevated plasma leptin concentrations in oMT1a-o growth hormone transgenic mice. *Obes Res.* 2001 9(1):51-58. PMID: 11346667.
50. Detrich HW III, Kieran MW, Chan FY, Barone LM, Yee K, **Runstadler** JA, Pratt S, Ransom D, Zon LI. Intra-embryonic hematopoietic cell migration during vertebrate development. *Proc Natl Acad Sci U S A.* 1995 92(23):10713-10717. PMID: 7479870.
51. **Runstadler** JA, Kocher TD. A new antennapedia-class gene from the zebrafish. *Nucleic Acids Res.* 1991 19(19):5434. PMID: 1681510.
52. Olson RR, **Runstadler** JA, Kocher TD. Whose larvae? *Nature* 1991 351(6325):357-358. PMID: 2034285.

### Other Publications

1. **Runstadler**, J.A. Immunogenetics of juvenile idiopathic arthritis: genetic susceptibility of the MHC and SLC11A1 chromosomal regions. 2003. Doctoral dissertation. Genetics Graduate Group, University of California, Davis.
2. **Runstadler**, J.A. The evolution of zebrafish homeotic gene arrays. 1992. Masters Thesis. Department of Zoology, University of New Hampshire.

### Professional Activities and Special Appointments

- Invited speaker, International Association of Aquatic Animal Medicine Conference, "Northwest Atlantic Grey Seals are a Reservoir Host for Influenza", May 2016
- Participant, NIH Centers for Excellence in Influenza Research and Surveillance, Working group on viral genome sequencing, 2016-present
- Participant, NIH Centers for Excellence in Influenza Research and Surveillance, Working group on Host-Pathogen Interaction, 2015-present
- Executive committee member, Center for Research on Influenza Pathogenesis (CRIP), NIH Center for Excellence in Influenza Research and Surveillance, April 2014-present
- Participant, NIH Centers for Excellence in Influenza Research and Surveillance, Working Group on Surveillance Research, 2009-present

- Invited speaker, MIT Microbiome Club Lunch, April 2016
- Invited speaker, MIT Center for Environmental Health Science Friday Forum Seminar, “Evaluating the role of contaminants in viral infection and evolution – What cause for further study?”, February 2016
- Convener, co-organizing chair, host and invited speaker, NIH CEIRS Annual Surveillance Meeting, “Influenza surveillance needs and priorities”, October 2015
- Invited proposal reviewer, University of Alaska Fairbanks NIH INBRE Program, June 2015
- Invited speaker, 3rd International Symposium on Neglected Influenza Viruses, Athens, GA, “North Atlantic grey seals (*Halichoerus grypus*) may be an underappreciated reservoir host for Influenza A Virus”, April 2015
- Invited participant, OFFLU OIE/FAO network of expertise on influenza, Workshop meeting, April 2015
- Invited speaker, University of Connecticut, Department of Pathobiology and Veterinary Science Seminar, “Are seals/seabirds and pigs/poultry two sides of the same coin?”, April 2015
- Convener, organizing chair, host and invited speaker, NIH CEIRS Annual Surveillance Meeting, “The state of influenza surveillance”, October 2014
- Invited speaker, MIT Sea Grant Seminar, "Tracking influenza from sea to shining sea", May 2014
- Invited participant and speaker, Protein folding and virus evolution and adaptation workshop, MIT, "Tracking the ecology and evolution of avian influenza in animal reservoirs to understand the generation of pandemic strains", May 2014
- Invited speaker, Broad Institute, Infectious Disease Initiative, “Deciphering the influenza code”, March 2014
- Guest Instructor, Tufts University Program in Conservation Medicine, "The microbiome - host-associated microbial communities and the host-microbiome interaction", November 2013
- Convener, co-organizer and moderator, Discussion panel on professions in Veterinary Medicine to students from Boston area, MIT, November 2013
- Invited speaker, MIT Pre-medicine Club, October 2013
- Invited speaker, Mystic Aquarium Ridgway Research Seminar Series, "Tracking influenza from sea to shining sea", April 2013
- Invited speaker, Tufts University Veterinary Pathology and Wildlife Disease Club Lunch Seminar, "Ground truthing viral flights of fancy", November 2012
- Invited speaker, MIT Center for Environmental Health Science Friday Forum Seminar, “Tracking a killer?: Dispatches from the world of influenza”, February 2016
- Committee Chair, University of Alaska Fairbanks, Faculty Search Committees - Immunologist and Infectious Disease Positions, September 2010-September 2011
- Founding organizing committee member, Veterinary Medicine Planning Task Force, University of Alaska Fairbanks, March 2010-August 2011
- Board member, Friends of Creamer's Field Migratory Waterfowl Refuge, Board of Directors, March 2006-July 2011
- Invited speaker, NIH CEIRS Annual Network Meeting, "Perspectives on influenza disease ecology from the Alaska subarctic", July 2011
- Invited speaker, Massachusetts Institute of Technology, Division of Comparative Medicine, “The evolution and ecology of influenza virus in natural reservoir hosts”, February 2011
- Invited speaker, MEEGIDX: 10th International Conference on Molecular Epidemiology and Evolutionary Genetics of Infectious Disease, "Age and species-specific variation of influenza seroprevalence among migratory waterfowl in Alaska", November 2010
- Invited speaker, Zoonotic and Parasitic Infections in Alaska (Z-PAK) meeting, “Influenza in Alaska”, August 2010
- Invited speaker, International Conference on Diseases in Nature Communicable to Man (INCDNCM), “Influenza in the Pacific Rim”, August 2010
- Science symposium judge, Alaska Statewide Science Symposium, 2008-2010
- Invited speaker, Whalefest Symposium, Sitka, AK, “Influenza in the marine environment”, November 2009

- Invited participant, Novosibirsk Workshop on Disease Ecology for Young Investigators, "Avian influenza disease ecology", October 2009
- Invited speaker, Lovelace Respiratory Research Institute, Albuquerque, NM, "Rethinking zoonotic disease at the intersection of disease ecology, virology, and genetics", October 2009
- Invited speaker, University of Wisconsin, Madison, School of Medicine and Public Health, Department of Medical Microbiology and Immunology, "Getting knee deep in the ecology of avian influenza – from chasing birds to mucking around in the mud", June 2007
- Invited participant, National Institutes of Health - National Institute of General Medical Sciences, NIH-NIGMS MIDAS Consultation Workshop: "Avian Influenza: Potential Contributions of Computational Modeling to Prevention and Control – What are the Important Questions?", June 2006
- Keynote speaker, Alaska ASM Branch Annual Meeting, Fairbanks, AK, "Avian influenza – the bugs, the birds, and the buzz", May 2006
- Invited speaker, AK Bird Observatory, "The current state of avian influenza in Alaska", February 2006

### Academic Service

- MIT President's Committee on Prehealth Advising (COPA), 2013-present
- MIT Freshman Advising, 2012-present
- MIT Biological Engineering Undergraduate Advisor, 2011-present
- Ad hoc reviewer, multiple journals, 2003-present
- MIT Microbiology Graduate Admissions Committee, 2012-2016
- MIT Biological Engineering Graduate Committee, 2012-2015
- MIT Committee on Animal Care (IACUC), 2012-2015
- University of Alaska Fairbanks, Department of Biology and Wildlife, Teaching Assistant Award Committee, 2009-2011
- University of Alaska Fairbanks, College of Natural Sciences and Mathematics Accreditation Committee, 2009-2011
- University of Alaska Fairbanks, Department of Biology and Wildlife, Teaching Advisory Committee, 2007-2009
- University of Alaska Fairbanks, Department of Biology and Wildlife, Graduate Student Comprehensive Exam Committee, 2005-2007
- University of Alaska Fairbanks, Faculty Search Committee - Microbiologist and Infectious Disease Microbiologist, 2004-2006

### Honors and Awards

- Most Innovative MIT Freshman Seminar, 2014
- Doherty Professorship in Ocean Utilization, MIT, 2013-15
- National Academies Education Fellow in the Life Sciences, 2007-2008
- National Academies Summer Institute - Undergraduate Education in Biology, 2007
- NIH Postdoctoral Fellowship in Comparative Medicine, University of California, Davis, 2000-2003
- Certificate for course in Laboratory Animal Science, Utrecht University, Netherlands, May 1999
- Certificate in Microsurgery, Utrecht University, Netherlands, April 1999
- Wilds Award for academic excellence and demonstrated research ability, UC Davis, May 1999
- SCAVMA/Hill's Pet Food Program Lab Animal Medicine Scholarship, UC Davis, May 1999
- Theodora Peigh Dual Degree Scholarship, UC Davis, 1996, 1997, 1998
- ARCS Foundation Research Fellowship, UC Davis, June 1997
- Theodora Peigh Externship Scholarship, UC Davis, May 1996
- Graduate Student Fellowship, Department of Genetics, UC Davis, 1994
- NSF Predoctoral Fellowship Competition, Honorable Mention, 1991
- Howard Hughes Predoctoral Fellowship Competition, Honorable Mention, 1991

### Current License To Practice

- California Veterinary Medical License #13839 (1999-present)

### Current Professional Affiliations

- American Association for the Advancement of Science (AAAS)
- American Society of Microbiology (ASM)
- American Society for Virology (ASV)
- International Society for Influenza and other Respiratory Viral Diseases (ISIRV)
- International Society for Evolutionary Medicine and Public Health (ISEMPH)

### Mentoring and Teaching

#### MS Students Supervised:

Lisa Smith	S12	University of Alaska Fairbanks (UAF) Biology, member
Lori Gildehaus	F10	UAF Biology, main advisor
Danielle Mondloch	S10	UAF Biology, main advisor
Theresa Woldstad	S09	UAF Biology, member
Alison Triebenbach	S09	UAF Biology, member
Trista Welsh	S08	UAF Biology, main advisor

#### PhD Students Supervised:

Eric Ma	current	MIT Biological Engineering, main advisor
Marcus Parrish	current	MIT Biological Engineering, member
Kimberly Davis	current	MIT Microbiology, main advisor
Christopher Bandoro	current	MIT Microbiology, main advisor
Jason Nguyen	current	MIT Microbiology, member
Truc Pham	current	University of Texas, School of Public Health, member
Dave VanInsberghe	current	MIT Biology, member
Mariana Matus	current	MIT Computational and Systems Biology, member
Keiko Herrick	S12	UAF Biology, member
Mandy Keogh	S11	UAF Marine Biology & Biological Oceanography, member (Wildlife Physiologist III, Alaska Department of Fish & Game)
Heather Huson	S11	UAF Biology & Wildlife, main advisor (Assistant Professor, Cornell University)
Cord Brundage	S10	UAF Biochemistry, member (Visiting Professor of Veterinary Physiology at St. Matthew's University)

#### Postdoctoral Scholars Supervised:

Dr. Nichola Hill	2012-present
Dr. Islam Hussein	2012-present
Dr. Jassia Pang	2013-2015 (Research Veterinarian and Veterinary Surgeon, National University of Singapore and Biological Resource Center)
Dr. Michael Estrin	2012-2014 (Small Animal Internist, Westford Veterinary Emergency and Referral Center)
Dr. Sara Turner	2009-2010 (Assistant Professor, Mercyhurst College)
Dr. Andrew Lang	2006-2007 (Associate Professor, Memorial University, Canada)

21 undergraduate and 2 high school students supervised between 2005-2016



**MIT**

- Biological Engineering (BE) – 20.106 Systems Microbiology, Co-developed undergraduate BE course synthesizing systems level concepts in microbiology (Fall '13, '15).
- Biological Engineering – 20.109 Laboratory Fundamentals of Biological Engineering, Developed module for undergraduate BE core laboratory course (Spring '13, '14, '15).
- Biological Engineering – 20.450 Molecular and Cellular Pathophysiology of Disease, Graduate core course for applied biology track (Fall '12, '14).
- Freshman Seminar – 20.A03 “Kissing Dogs and Running Barefoot in the Grass – Why Worry? Exploring the microbial world around us” (Fall '12, '13, '14, '15). Developed seminar for incoming freshmen to explore infectious disease in the world around them.

**University of Alaska Fairbanks**

- Department of Biology & Wildlife – BIOL 393 Concepts in Animal Development, Developed upper level course in developmental biology (Spring '09).
- Department of Biology & Wildlife – BIOL 465 Immunology, Re-developed upper level course in innate and adaptive mechanisms in immunology (Spring '06, '07, '10, '11).
- Department of Biology & Wildlife – BIOL 106 Fundamentals of Biology, Freshman/sophomore core series for undergraduate biology majors. Course coordinator. 33% responsibility plus lead instructor (Spring '07).
- Department of Biology & Wildlife – BIOL 362 Principles of Genetics, Junior/Senior core course for undergraduate biology majors (Spring '08).
- Department of Biology & Wildlife – BIOL 692 Mentoring Seminar, Developed graduate student/postdoc seminar in effective mentoring (Spring '08, '10).
- UAF Graduate and Undergraduate Seminar Courses:
  - Alaska Zoonotic Disease Center Seminar, Organizer and Leader (Spring '09, '10, '11)
  - Ecology of Infectious Disease, Developed (Fall '06, Spring '07)
  - Current Topics in Immunology and Infectious Disease (Fall '07, '08, '09; Spring '08, '09, '10)
  - Molecular Evolution, Developed (Fall '07, Spring '08)

**Prior Teaching Experience**

- UC Davis Spring Teaching Forum: “The ins and outs of producing and reviewing a college course”, 2002
- Teaching Assistant, Program in Genetics, UC Davis, 1999
- Graduate level core course in Transmission Genetics
- Teaching Assistant, Department of Pathology, Microbiology, and Immunology, UC Davis, 1996
- Professional level Veterinary Bacteriology and Mycology laboratory course
- Teaching Assistant, Department of Zoology, University of New Hampshire, 1990-91
- Upper level undergraduate Animal Physiology and Introductory Human Physiology course laboratories