

PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF INTERNAL MEDICINE
DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY
COLLEGE OF LITERATURE, SCIENCE, AND THE ARTS
DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY

Adam S. Lauring, M.D., Ph.D., associate professor of internal medicine, with tenure, Department of Internal Medicine, associate professor of microbiology and immunology, without tenure, Department of Microbiology and Immunology, Medical School, and associate professor of ecology and evolutionary biology, without tenure, Department of Ecology and Evolutionary Biology, College of Literature, Science, and the Arts, is recommended for promotion to professor of internal medicine, with tenure, Department of Internal Medicine, professor of microbiology and immunology, without tenure, Department of Microbiology and Immunology, Medical School, and professor of ecology and evolutionary biology, without tenure, Department of Ecology and Evolutionary Biology, College of Literature, Science, and the Arts.

Academic Degrees:

M.D.	2002	University of Washington
Ph.D.	2000	University of Washington
B.S.	1994	Yale University

Professional Record:

2018 - present	Associate Professor of Internal Medicine, with tenure, University of Michigan
2018 - present	Associate Professor of Microbiology and Immunology, without tenure, University of Michigan
2018 - present	Associate Professor of Ecology and Evolutionary biology, without tenure, University of Michigan
2017 - 2018	Assistant Professor of Ecology and Evolutionary Biology, University of Michigan
2012 - 2018	Assistant Professor of Internal Medicine, University of Michigan
2012 - 2018	Assistant Professor of Microbiology and Immunology, University of Michigan
2009 - 2012	Assistant Adjunct Professor of Internal Medicine, University of California, San Francisco
2008 - 2009	Clinical Instructor, Department of Internal Medicine, University of California, San Francisco

Summary of Evaluation:

Teaching: Dr. Lauring's teaching runs concurrently with both his clinical duties as an attending on the infectious diseases consult service and with his laboratory-based instruction in research. While serving as an attending, he supervises medical students, internal medicine residents and infectious diseases fellows. His teaching is case-based at the patient's bedside. Dr. Lauring also participates in classroom teaching. He is the course director for Science in the Clinics; a course that is a requirement for both graduate students and post-doctoral fellows in the T32 supported Molecular Mechanisms of Microbial Pathogenesis Training Program. The majority of Dr. Lauring's teaching takes place in his laboratory,

where he trains students and fellows in the conduct of research and mentors their development as independent scientists. He has served on the preliminary exam committees for students in the Program in Biomedical Sciences (PIBS) Microbiology and PIBS Bioinformatics Programs and he has served on the dissertation committees for 12 students across campus. Additionally, he participated in a panel discussion on Ebola at the university's International Institute, and he has been invited as a guest on numerous podcasts through the Infectious Diseases Society of America, the *Journal of the American Medical Association* and *This Week in Virology*.

Research: The overarching goal of Dr. Lauring's research is to explain the fundamental mechanisms of RNA virus evolution. Throughout his post-doctoral program, Dr. Lauring worked with the poliovirus and his current research is building upon this work with the ultimate goal of defining the importance of mutation rate and mutational tolerance to the behavior of RNA viruses. Since becoming a faculty member at the University of Michigan, Dr. Lauring has worked on projects to define the population genetics of poliovirus, influenza and most recently, SARS-CoV-2 within and between human hosts. His work within this area has led to fruitful research collaborations with investigators at the School of Public Health. Their collaborations have now extended to studies of influenza and SARS-CoV-2 vaccine effectiveness. With his understanding of RNA virus evolution, Dr. Lauring has played a significant role in the institution's handling of COVID-19. He was the physician to diagnose our first COVID-19 patient and from there he worked to establish institutional guidelines for the management of COVID-19 and was instrumental in efforts to establish the RICU service. Dr. Lauring's lab turned their focus on the N95 disinfection project in which they performed key experiments, which ultimately informed the hospital's decision to process and re-use the N95 masks. Additionally, he played a significant part in establishing the COVID-19 Patient Registry and Biospecimen Repository and he has made key contributions in defining the spread of COVID variants and informing institutional protocols. Dr. Lauring has published 69 peer-reviewed articles, and his grant funding is robust and continuous. He is currently the principal investigator of seven grants, with funding by the NIH, Centers for Disease Control and Prevention, foundation and institutional grants.

Recent and Significant Publications:

Valesano AL, Taniuchi M, Fitzsimmons WJ, Islam MO, Ahmed T, Zaman K, Haque R, Wong W, Famulare M, Lauring AS: The early evolution of oral poliovirus vaccine is shaped by strong positive selection and tight transmission bottlenecks. *Cell Host and Microbe*, 29(1):32-43.e4, 2021. PM33212020/PMC7815045

Baang JH, Smith C, Mirabelli C, Valesano AL, Manthei DM, Bachman M, Wobus CE, Adams M, Washer L, Martin ET, Lauring AS: Prolonged SARS-CoV-2 replication in an immunocompromised patient. *Journal of Infectious Diseases*, 223(1):23-27, 2021. PM33089317/PMC7797758

Alpert T, Brito AF, Lasek-Nesselquist E, Valesano AL, Rothman J, MacKay MJ, Petrone ME, Breban MI, Watkins AE, Vogels CBF, Russell A, Kelly JP, Shudt M, Plitnick J, Schneider E, Fitzsimmons WJ, Khullar G, Metti J, Dudley JT, Nash M, Wang J, Liu C, Hui P, Muyombwe A, Downing R, Razeq J, Bart SM, Murphy S, Neal C, Laszlo E, Landry ML, Cook PW, Fauver JR, Mason CE, Lauring AS, St George K, MacCannell DR, Grubaugh ND: Early introductions and transmission of SARS-CoV-2 variant B.1.1.7 in the United States. *Cell* 184(10):2595-2604.e13, 2021. PM33891875/PMC8018830

Fitzsimmons W, Woods RJ, McCrone JT, Woodman A, Arnold JJ, Yennawar M, Evans R, Cameron CE, Lauring AS: A speed fidelity trade-off determines the mutation rate and virulence of an RNA virus. *PLoS Biology* 16(6): e2006459, 2018. PM29953453/PMC6040757

McCrone JT, Woods RJ, Malosh RE, Martin ET, Monto AS, and Luring AS: Stochastic processes constrain the within and between host evolution of influenza virus. *eLife*, 7:e35962, 2018. PM29683424/PMC5933925

Service: Dr. Luring is an active infectious disease specialist who sees patients on the inpatient consult service. Last year as Michigan Medicine sought to maneuver through the COVID pandemic, he became actively engaged on all fronts, he volunteered for four additional weeks of clinical service in the Spring of 2020. In recognition for his service during the COVID pandemic, he received the Department of Internal Medicine Chair's Impact Award in 2020. Dr. Luring currently sits on a number of institutional committees including the Ad Hoc Working Group on PPE Decontamination, COVID-19 Vaccine and Therapeutics Task Force, COVID-19 Clinical Trials Feasibility and the COVID-19 Research Prioritization Committee. Nationally, Dr. Luring has been providing his services as a member of the Infectious Diseases Society of America Research Committee since 2019, and in 2020, he joined the American Society for Virology as a Governing Council member. Dr. Luring's expertise in the field is recognized through his peer-reviewed service for top-tier journals such as the *Journal of Virology*, *PLoS One*, *JAMA*, *Annals of Internal Medicine* and *eLife*. He has also served as the associate editor for *PLoS Pathogens*, from 2014-2020, and then was named the section editor for *PLoS Pathogens*. Dr. Luring is also providing his services as a reviewer for numerous study sections, including the Wellcome Trust Investigator Awards, Israel Science Foundation, the NIH Special Panel for Rapid Investigation of SARS-CoV-2 and COVID-19 and the Doris Duke Charitable Foundation Clinical Scientist Development Award Study Section.

External Reviewers:

Reviewer A: "He has made seminal discoveries in the natural evolution of influenza during a flu season and defined mutational rates and bottlenecks that impact transmission. His work challenges current paradigms in the field around evolution, mutation and fitness and show that genetic drift and stochastic mutagenesis drive evolution in human host and that replicative speed drives fitness...He is intelligent, visionary, creative, innovative and productive."

Reviewer B: "Adam is productive, has done impactful work, is a good citizen, is respected in the field, and is well funded. His track record as a physician scientist is stellar...Adam is a world expert on viral evolution, viral population dynamics, and viral transmission and virulence. Since starting his lab, Adam has shown the importance of viral evolution and specific viral variants in a variety of systems including poliovirus, influenza virus, and SARS-CoV-2...He would be promoted to full professor at my institution without question."

Reviewer C: "Relatedly, Dr. Luring has performed basic research in his lab experiments to test evolutionary questions, and also has analyzed the importance of genetic variation in viruses, especially in pathogens such as polio virus, influenza virus and SARS CoV-2. I am extremely impressed by the rigor of Dr. Luring's research studies in these realms, and it is obvious to me that he is providing unique expertise as one of the few physicians working on these evolutionarily important questions. Some of my favorite papers produced by Dr. Luring also happen to be among the best-cited examples of his work."

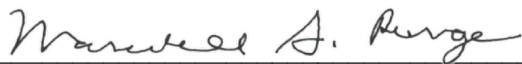
Reviewer D: "Through his translational work with colleagues at the University of Michigan, namely Arnold Monto, he has been able to obtain influenza virus isolates from volunteers that demonstrate vaccination does not result in selective pressure to drive to an antigenic drift in humans. This is exceedingly important as we plan for the design of future influenza vaccines as well as therapeutics...For his scientific contributions, Adam is exceedingly well funded, both from the

National Institutes of Health as well as from the Centers for Disease Control and Prevention... Certainly, Adam would be promoted to the Rank of Professor with Tenure at [my institution].”

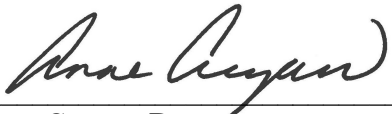
Reviewer E: “The overarching goal of his research program has been to understand the contribution of viral evolution to pathogenesis, immune (vaccine) escape, and transmission. Dr. Lauring has shown a remarkable capacity to apply this research approach to different viruses to further our understanding of interhost and intrahost viral diversity, which is key to overcoming immune escape against vaccines and monoclonal antibodies; elucidating complex mechanisms and routes of transmission; and defining viral mechanisms of pathogenesis that depend on replicative capacity. He has made major advances in this field and is widely recognized as a field leader...I am certain that Dr. Lauring would be promoted to Professor with tenure at my institution.”

Summary of Recommendation:

Dr. Lauring is recognized as an authority in the areas of viral biology and virus host interactions. He has made substantial contributions to the field through his research, clinical work, teaching and service. We are pleased to recommend Adam S. Lauring, M.D., Ph.D. for promotion to professor of internal medicine, with tenure, Department of Internal Medicine, professor of microbiology and immunology, without tenure, Department of Microbiology and Immunology, Medical School, and professor of ecology and evolutionary biology, without tenure, Department of Ecology and Evolutionary Biology, College of Literature, Science, and the Arts.



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