Sarah E. Cobey
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Department of Ecology & Evolution
1101 East 57th Street
Chicago, Illinois 60637

Education

2004-2009 **University of Michigan**, Ann Arbor
Ph.D. in Ecology and Evolutionary Biology

1998-2002 **Princeton University**
A.B. *summa cum laude* in Ecology and Evolutionary Biology
Certificates in Environmental Studies and Russian Studies

Academic appointments

University of Chicago

2022- Professor in the Department of Ecology & Evolution
Committee on Microbiology
Graduate Program in Biophysical Sciences

2018-2022 Associate Professor in the Department of Ecology & Evolution
Committee on Microbiology
Graduate Program in Biophysical Sciences

2013-2018 Assistant Professor in the Department of Ecology & Evolution
Committee on Microbiology (2016-2018)

2010-2013 **Harvard School of Public Health**
Postdoctoral Research Fellow and NIH Kirschstein Fellow

Publications

Peer-reviewed

Garretson, T.A., Liu, J., Li, S.H., Scher, G., Santos, J.J.S., Hogan, G., **Vieira, M.C.**, Furey, C., Atkinson, R.K., Ye, N., Ort, J., **Kim, K.**, Hernandez, K.A., Eilola, T., Schultz, D.C., Cherry, S., **Cobey, S.** and S. Hensley. 2025. Immune history shapes human antibody responses to H5N1 influenza viruses. *Nature Medicine* (in press)

Ibiebele, J.C., Godonou, E.T., Callear, A.P., Smith, M.R., Truscon, R., Johnson, E., Eisenberg, M.C., Lauring, A.S., Monto, A.S., **Cobey, S.** and E.T. Martin. 2025. The role of viral interaction in household transmission of symptomatic influenza and respiratory syncytial virus. *Nature Communications* 16(1): 1249

Kim, K., Gouma, S., **Vieira, M.C**., Weirick, M., Hensley, S.E. and **S. Cobey**. Measures of population immunity can predict the dominant clade of influenza A (H3N2) in the 2017-2018 season and reveal age-associated differences in susceptibility and antibody-binding specificity. 2024. *Influenza and Other Respiratory Viruses* 18(11): e70033

Park, S.W., **Cobey, S.**, Metcalf, J., Levine, J., and B. Grenfell. 2024. A unified theory for predicting pathogen mutual invasibility and co-circulation. *Science* 386(6718): 175-179

Loes, A.N., Tarabi, R.A.L., Huddleston, J., Touyon, L., Wong, S., Cheng, S.M.S., Leung, N.H.L., Hannon, W.W., Bedford, T., **Cobey, S.**, Cowling, B.J., and J.D. Bloom. 2024. High-throughput

sequencing-based neutralization assay reveals how repeated vaccinations impact titers to recent human H1N1 influenza strains. *Journal of Virology* 98(10): e00689-24

S. Cobey. 2024. Vaccination against rapidly evolving pathogens and the entanglements of memory. *Nature Immunology* 25(11): 2015-2023

Cowling, B.J., Wong, S., Santos, J.J.S., Touyon, L., Ort, J., Ye, N., Kwok, N.K.M., Ho, F., Cheng, S.M.S., Ip, D.K.M., Peiris, M., Webby, R.J., Wilson, P.C., Valkenburg, S.A., Tsang, J.S., Leung, N.H.L., Hensley, S.E. and **S. Cobey**. 2024. Preliminary findings from the Dynamics of the Immune Responses to Repeat Influenza Vaccination Exposures (DRIVE I) Study: a Randomized Controlled Trial. *Clinical Infectious Diseases* 79(4): 901-909

McGough, L. and **S. Cobey**. 2024. A speed limit on serial strain replacement from original antigenic sin. *PNAS*. 121(25): e2400202121

Bi, Q., Dickerman, B.A., McLean, H.Q., Martin, E.T., Gaglani, M., Wernli, K.J., Goundappa, B., Flannery, B., Lipsitch, M. and **S. Cobey** and US Flu Vaccine Effectiveness Network Investigators. 2024. Reduced effectiveness of repeat influenza vaccination: distinguishing among within-season waning, recent clinical infection, and subclinical infection. *The Journal of Infectious Diseases* jiae220

Vieira, M.C., Palm, A.E.K., Stamper, C.T., Tepora, M.E., Nguyen, K.D., Pham, T.P., Boyd, S.D., Wilson, P.C. and **S. Cobey**. 2023. Germline-encoded specificities and the predictability of the B cell response. *PLOS Pathogens* 19(8): e1011603

Shaw, D.E., Aguirre-Gamboa, R., **Vieira, M.C.**, Gona, Saideep, S., DiNardi, N., Wang, A., Dumaine, A., Gelderloos-Arends, J., Earley, Z.M., Meckel, K.R., Ciszewski, C., Castillo, A., Monroe, K., Torres, J., Shah, S.C., Colombel, J., Itzkowitz, S., Newberry, R., Cohen, R.D., Rubin, D.T., Quince, C., **Cobey, S.**, Jonkers, I.H., Weber, C.R., Pekow, J., Wilson, P.C., Barreiro, L.B., and B. Jabri. 2023. Antigen-driven colonic inflammation is associated with development of dysplasia in primary sclerosing cholangitis. *Nature Medicine* 29: 1520-1529

Tsang, T.K., **Gostic, K.M**., Chen, S., Wang, Y., **Arevalo, P**., Lau, E.H.Y., **Cobey, S.** and B.J. Cowling. 2023. Investigation of impact of childhood immune imprinting on birth year-specific risk of clinical infection during influenza A virus epidemics in Hong Kong. *The Journal of Infectious Diseases* jiad009

Du, Z., Wang, L., Pandey, A., Lim, W.W., Chinazzi, M., Lau, E.H.Y., Wu, P., Malani, A., **Cobey, S.** and B.J. Cowling. 2022. Modeling comparative cost-effectiveness of SARS-CoV-2 vaccine dose fractionation in India. *Nature Medicine* 1-5.

Lin, Y., Yang, B., **Cobey, S.**, Lau, E.H.Y., Adam, D.C., Wong, J.Y., Bond, H.S., Cheung, J.K., Ho, F., Gao, H., Taslim Ali, S., Leung, N.H.L., Tsang, T.K., Wu, P., Leung, G.M. and B.J. Cowling. 2022. Incorporating temporal distribution of population-level viral load enables real-time estimation of COVID-19 transmission. *Nature Communications* 13(1):1-8.

Richardson, R., **Arevalo, P.**, Jorgensen, E., Pacilli, M., Lightner, S., **Cobey, S.** and J. Gerardin. 2022. Tracking changes in SARS-CoV-2 transmission with a novel outpatient sentinel surveillance system in Chicago, Illinois, USA. *Nature Communications* 13(1): 5547

Goyal, S., Gerardin, J., **Cobey, S.**, Son, C., McCarthy, O., Dror, A., Lightner, S., Ezike, N.O., Duffus, W.A. and A.C. Bennett. 2022. SARS-CoV-2 infection among pregnant people at labor and delivery and changes in infection rates in the general population: Lessons learned from Illinois. *Public Health Reports* 137(4): 672-678

Simon, V., Kota, V., Bloomquist, R.F., Hanley, H.B., Forgacs, D., Pahwa, S., Pallikkuth, S., Miller, L.G., Schaenman, J., Yeaman, M.R., Manthei, D., Wolf, J., Gaur, A.H., Estepp, J.H.,

Srivastava, K., Carreño, J.M., Cuevas, F., PARIS/SPARTA Study Group, Ellebedy, A., Gordon, A., Valdez, R., **Cobey, S.,** Reed, E.F., Kolhe, R., Thomas, P.G., Schultz-Cherry, S., Ross, T.M., and F. Krammer. 2022. PARIS and SPARTA: Finding the Achilles' Heel of SARS-CoV-2. *mSphere* 7(3):e00179-22

Wen, F., Malani, A. and **S. Cobey.** 2022. The potential beneficial effects of vaccination on antigenically evolving pathogens. *American Naturalist* 199(2): 223-227

Clipman, S.J., Wesolowski, A., Mehta, S.H., **Cobey, S.**, Cummings, D.A.T., and S.S. Soloman. 2021. Improvements in Severe Acute Respiratory Syndrome Coronavirus 2 testing cascade in the United States: Data from serial cross-sectional assignments. *Clinical Infectious Diseases* ciab683

Vieira, M.C., Donato, C.M., **Arevalo, P.**, Rimmelzwaan, G.F., Wood, T., Lopez, L., Huang, Q.S., Dhanasekaran, V., Koelle, K. and **S. Cobey.** 2021. Lineage-specific protection and immune imprinting shape the age distributions of influenza B cases. *Nature Communications* 12: 4313

Holden, T.M., Richardson, R.A.K., **Arevalo, P**., Duffus, W., Runge, M., Whitney, E., Wise, L., Ezike, N.O., Patrick, S., **Cobey, S.** and J. Gerardin. 2021. Geographic and demographic heterogeneity of SARS-CoV-2 diagnostic testing in Illinois, USA, March to December 2020. *BMC Public Health* 21(1): 1-13

Cobey, S., Larremore, D.B., Grad, Y.H. and M. Lipsitch. 2021. Concerns about SARS-CoV-2 evolution should not hold back effort to expand vaccination. *Nature Reviews Immunology* 21(5) 330-335

Guthmiller, J.J., Utset, H.A., Henry, C., Li, L., Zheng, N., Sun, W., **Vieira, M.C**., Zost, S., Huang, M., Hensley, S.E., **Cobey, S.**, Palese, P. and P. Wilson. 2021. An egg-derived sulfated N-acetyllactosamine glycan is an antigenic decoy of influenza virus vaccines. *mBio* 12(3), e00838-21

Bubar, K.M., Reinholt, K., Kissler, S.M., Lipsitch, M., **Cobey, S.**, Grad, Y.H. and D. B. Larremore. 2021. Model-informed COVID-19 vaccine prioritization by age and serostatus. *Science* 371(6532):916-921

Gostic, K.M., McGough, L., Baskerville, E., Abbott, S., Joshi, K., Tedijanto, C., Kahn, R., Niehus, R., Hay, J.A., De Salazar, P.M., Hellewell, J., Meakin, S., Munday, J., Bosse, N., Sherratt, K., Thompson, R.M., White, L.F., Huisman, J., Scire, J., Bonhoeffer, S., Stadler, T., Wallinga, J., Funk, S., Lipsitch, M, and **S. Cobey**. 2020. Practical considerations for measuring the effective reproductive number, R_t. *PLOS Computational Biology* 16(12):e1008409

Dugan, H., Guthmiller, J.J., **Arevalo, P**., Huang, M., Chen, Y.Q., Neu, K.E., Henry, C., Zheng, N., Lan, L.Y., Tepora, M.E., Stovicek, O., Bitar, D., Palm, A.E., Stamper, C.T., Changrob, S., Utset, H.A., Coughlan, L., Krammer, F., **Cobey, S.** and P. Wilson. 2020. Preexisting immunity shapes distinct antibody landscapes after influenza virus infection and vaccination in humans. *Science Translational Medicine* 12(573)

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Gouma, S., **Kim, K**., Weirick, M., Gumina, M.E., Branche, A., Topham, D.J., Martin, E.T., Monto, A.M., **Cobey, S.** and S. Hensley. 2020. Middle-aged individuals may be in a perpetual state of H3N2 influenza virus susceptibility. *Nature Communications* 11(1): 1-8

Cobey, S. 2020. Perspective: Modelling infectious disease dynamics. *Science* 368(6492):713-714.

Caudill, V.R., Qin, S., Winstead, R., Kaur., J., Tisthammer, K…. **Cobey, S.** … Tran, K., Tran, L., Winters, E.J., Wong, A. and P. Pennings. 2020. CpG-creating mutations are costly in many human viruses. *Evolutionary Ecology* 34: 339-359

Gouma, S., Zost, S. J., Parkhouse, K., Branche, A., Topham, D. J., **Cobey, S.**, and S. Hensley. 2019. Comparison of human H3N2 antibody responses elicited by egg-based, cell-based, and recombinant protein-based influenza vaccines during the 2017-2018 season. *Clinical Infectious Diseases* 71(6):1447-1453

Ranjeva, S., Subramanian, R., Fang, V. J., Leung, G. M., Ip, D. K. M., Perera, R. A. P. M., Peiris, J. S. Malik, Cowling*, B. J., and **S. Cobey***. 2019. Age-specific differences in the dynamics of protective immunity to influenza. *Nature Communications* 10: 1660 (*equal authorship)

Henry, C., Zheng, N., Huang, M., Cabanov, A., Rojas, K., Kaur, K., Andrews, S.F., Palm, A., Chen, Y., Li, Y., Hoskova, K., Utset, H.A., **Vieira, M.C.**, Wrammert, J., Ahmed, R., Holden-Wiltse, J., Topham, D.J., Treanor, J.T., Ertl, H.C., Schmader, K.E., **Cobey, S.**, Krammer, F., Hensley, S.E., Greenberg, H., He, X. and P.C. Wilson. 2019. Influenza virus vaccination elicits poorly adapted B cell responses in elderly individuals. *Cell Host & Microbe* 13;25(3):357-366.e6

Neu, K.E., Guthmiller, J.J., Huang, M., La, J., **Vieira, M.C., Kim, K.**, Zheng, N., Cortese, M., Tepora, M.E., Hamel, N.J., Rojas, K., Henry, C., Shaw, D., Dulberger, C.L., Pulendran, B., **Cobey, S.**, Khan, A., and P.C. Wilson. 2018. Spec-seq unveils transcriptional subpopulations of antibody-secreting cells following influenza vaccination. *Journal of Clinical Investigation* 129(1):93-105

Cai, F.Y., Fussell, T., **Cobey, S.** and M. Lipsitch. 2018. Use of an individual-based model of pneumococcal carriage for planning a randomized trial of a vaccine. *PLOS Computational Biology* 14(10):e1006333

Wen, F., Bell, S., Bedford, T. and **S. Cobey**. 2018. Estimating vaccine-driven selection in seasonal influenza. *Viruses* 10(9):509

Lewnard, Joseph A. and **S. Cobey**. 2018. Immune history and influenza vaccine effectiveness. *Vaccines* 62(2): 28

Vieira, M., Zinder, D. and **S. Cobey**. 2018. Selection and neutral mutations drive pervasive mutability losses in long-lived B cell lineages. *Molecular Biology & Evolution* 35(5): 1135-1146

Cobey, S., Gouma, S., Parkhouse, K., Chambers, B.S., Ertl, H.C., Schmader, K. E., Halpin, R.A., Lin, X., Stockwell, T. B., Das, S. R., Landon, E., Tesic, V., Youngster, I., Pinsky, B., Wentworth, D.E., Hensley, S.E. and Y.H. Grad. 2018. Poor immunogenicity, not vaccine strain egg adaptation, may explain the low H3N2 influenza vaccine effectiveness in 2012-2013. *Clinical Infectious Diseases* 67(3): 327-333

Ranjeva, S., Baskerville, E., Dukic, V., Villa, L., Lazcano-Ponce, E., Giuliano, A., Dwyer, G. and **S. Cobey**. 2017. Recurring infection with ecologically distinct human papillomavirus (HPV) types explains high prevalence and diversity. *PNAS* 114(51):13573-13578

Zost, S.J., Parkhouse, K., Gumina, M.E., **Kim, K.**, Perez, S.D., Wilson, P.C., Treanor, J.J., Sant, A.J., **Cobey, S.** and S. Hensley. 2017. Contemporary H3N2 influenza viruses have a glycosylation site that alters binding of antibodies elicited by egg-adapted vaccine strains. *PNAS* 114(47):12578-12583

Cobey, S., **Baskerville, E.**, Colijn, C., Hanage, W., Fraser, C. and M. Lipsitch. 2017. Host population structure and treatment frequency maintain balancing selection on drug resistance. *Journal of the Royal Society Interface* 14(33): 20170295

Cobey, S. and S. Hensley. 2017. Immune history and influenza virus susceptibility. *Current Opinion in Virology* 22:105-111

Cobey, S. and **E. Baskerville**. 2016. Limits to causal inference with state-space reconstruction for infectious disease. *PLOS One* 11(12). e0169050

Lipsitch, M., Barclay, W., Raman, R., Russell, C.J., Belser, J.A., **Cobey, S.**, Kasson, P., Lloyd-Smith, J.O., Maurer-Stroh, S., Riley, S., Beauchemin, C.A.A., Bedford, T., Friedrich, T.C., Handel, A., Herfst, S., Murcia, P.R., Roche, B., Wilke, C.O., and C.A. Russell. 2016. Viral factors in influenza pandemic risk assessment. *eLife*. e18491

Wen, F., Bedford, T. and **S. Cobey.** 2016. Explaining the geographic origins of seasonal influenza A (H3N2). *Proceedings of the Royal Society B.* 283(1838)

Pessia, A., Grad, Y., **Cobey, S.**, Puranen, J.S., and J. Corander. 2015. K-Pax2: Bayesian identification of cluster-defining amino acid positions in large sequence datasets. *Microbial Genomics*. 1(1)

Cobey, S., Wilson, P. and F. Matsen. 2015. The evolution within us. *Philosophical Transactions of the Royal Society B.* 370(1676): 20140235

Childs, L., **Baskerville, E.** and **S. Cobey**. 2015. Tradeoffs in antibody repertoires to complex antigens. *Philosophical Transactions of the Royal Society B*. 370(1676): 20140245

Perron, G., Inglis, R., Pennings, P. and **S. Cobey**. 2015. Fighting microbial drug resistance: a primer on the role of evolutionary biology in public health. *Evolutionary Applications.* 8(3):211-222

Cobey, S. 2014. Pathogen evolution and the immunological niche. *Annals of the New York Academy of Sciences* 1320:1-15

Cobey, S. and M. Lipsitch. 2013. Pathogen coexistence through hidden regimes of apparent competition. *American Naturalist* 181(1):12-24

Cobey, S. and M. Lipsitch. 2012. Niche and neutral effects of acquired immunity permit coexistence of pneumococcal serotypes. *Science* 335(6074):1376-1380

Flanagan, M., Parrish, C., **Cobey, S.**, Glass, G., Bush, R. and T. Leighton. 2011. Anticipating the species jump: Surveillance for emerging viral threats. *Zoonoses and Public Health* doi:10.1111/ j.1863-2378.2011.01439

Bedford, T., **Cobey, S.** and M. Pascual. 2011. Strength and tempo of selection revealed in viral gene genealogies. *BMC Evolutionary Biology* 11:220

Goldstein, E., **Cobey, S.**, Takahashi, S., Miller, J.C., and M. Lipsitch. 2011. Predicting the epidemic sizes of A/H1N1, A/H3N2, and B: a statistical method. *PLoS Medicine* 8(7):e1001051

Cobey, S. and M. Pascual. 2011. Consequences of host heterogeneity, epitope immunodominance, and immune breadth for strain competition. *Journal of Theoretical Biology* 270(1):80-87

Cobey, S., Pascual, M. and U. Dieckmann. 2010. Ecological factors driving the long-term evolution of influenza's host range. *Proceedings of the Royal Society B* 277(1695): 2803-2810

Bedford, T., **Cobey, S.**, Beerli, P. and M. Pascual. 2010. Global migrational dynamics underlie evolution and persistence of human influenza A (H3N2). *PLoS Pathogens* 6(5):e1000918

Cobey, S. and K. Koelle. 2008. Capturing escape in infectious disease dynamics. *Trends in Ecology and Evolution* 23(10):572-577

Koelle*, K., **Cobey*, S.**, Grenfell, B. and M. Pascual. 2006. Epochal evolution shapes the phylodynamics of interpandemic influenza A (H3N2) in humans. *Science* 314: 1898-1903 (*equal authorship)

Other publications

Hensley, S. and **S. Cobey.** 2022. Original antigenic sin and childhood immune responses against SARS-CoV-2. *Science* 1148-1149

Grubaugh, N. and **S. Cobey.** 2021. Preview: Of variants and vaccines. *Cell*. 184 (26): 6222-6223

Cowling, B.J., Lim, W.W., and **S. Cobey.** 2021. Fractionation of COVID-19 vaccine doses could extend limited supplies and reduce mortality. *Nature Medicine*. 27: 1321-1323

Bloom, J.D., Chan, Y.A., Baric, R.S., Bjorkman, P.J., **Cobey, S.**, Deverman, B.E., Fisman, D.N., Gupta, R., Iwasaki, A., Lipsitch, M., Medzhitov, R., Neher, R.A., Nielsen, R., Patterson, N., Stearns, T., van Nimwegen, E., Worobey, M. and David A. Relman. 2021. Investigate the origins of COVID-19. *Science.* 372(6543): 694

Lipsitch, M., Joshi, K. and **S. Cobey**. 2020. Comment on Pan, A., Liu, L., Wang, C., et al., "Association of public health interventions with the epidemiology of the COVID-19 outbreak in Wuhan, China," *JAMA*. Published online April 20, 2020.

Cobey, S. 2018. Repeated vaccination may protect children from influenza infection. *JAMA Network Open* 1(6): e183730

Cobey, S. and P. Wilson. 2018. Characterization of the immunologic repertoire: a quick start guide. *Immunological Reviews* 284(1): 5-8

Cobey, S. 2017. Immune evolution: Sick if you do, sick if you don't. *Nature Ecology & Evolution* (News & Views) 1, 1602-1603

Baskerville, E. and **S. Cobey**. 2017. Does influenza drive absolute humidity? *PNAS* (Letter) 114(2): E2270-E2271

Gilbert, J., Smith, D., Shogun, B., Packman, A., Kelley, S., Landon, E., Bhangar, S., Vora, G., Jones, R., Keegan, K., Stephens, B., Ramos, T., Kirkup, B., Levin, H., Rosenthal, M., Foxman, B., Chang, E., Siegel, J., **Cobey, S.**, An, G., Alverdy, J., Olsiewski, P., Martin, M., Marrs, R., Hernandez, M., Christley, S., Morowitz, M. and S. Weber. 2013. The Hospital Microbiome Project: Meeting Report for the 2nd Hospital Microbiome Project, Chicago, USA, January 15, 2013. *Standards in Genomics* 8(3)

WHO Writing Group, Ampofo, W., Baylor, N., **Cobey, S.**, Cox, N., Daves, S., Edwards, S., Ferguson, N., Grohmann, G., Hay, A., Katz, J., Kullabutr, K., Lambert, L., Levandowski, R., Mishra, A., Monto, A., Siqueira, M., Tashiro, M., Waddell, A., Wairagkar, N., Wood, J., Zambon, M., Zhang, W. 2012. Improving influenza vaccine virus selection: Report of a WHO informal consultation held at WHO headquarters, Geneva, Switzerland, 14-16 June 2010. *Influenza and Other Respiratory Diseases* 6(2):142-152

Cobey, S. 2005. "Sea lampreys in the Great Lakes." *In* Ecological Networks. J.A. Dunne and M.P. Pascual, eds. (Oxford University Press)

Invited talks

Plenaries, keynotes, & featured talks

Epidemics[9] International Conference on Infectious Disease Dynamics. Plenary. Bologna, Italy. December 2023.
30th Dynamics & Evolution of Human Viruses. Plenary. Heidelberg, Germany. April 2023.
WHO Global Consultation on SARS-CoV-2 Variants of Concern. March 2021.
AAAS 2021 Annual Meeting, "An Epidemiological Blueprint for Understanding the Dynamics of a Pandemic" Symposium. Respondent and speaker at news briefing. February 2021.
Center for Molecular and Clinical Epidemiology of Infectious Diseases (MAC-EPID) Symposium. University of Michigan School of Public Health, Ann Arbor. October 2019.
Bridging Scales: Microbial Eco-Evolutionary Dynamics Across the Space-Time Continuum. Gulbenkian Science Institute. Lisbon, Portugal. October 2018.
American Society for Virology Annual Meeting. College Park, Maryland. July 2018.
ASM Biothreats. Baltimore, Maryland. February 2018.
Viral Genomics and Evolution, Wellcome Genome Campus Scientific Conference. Cambridge, United Kingdom. June 2016.
Forecasting Evolution? SFB 680 Conference. Lisbon, Portugal. July 2015.
Microbes in Action! Dynamics of single cells to communities. 113th Meeting of the American Society for Microbiology. Denver, Colorado. May 2013.

Other invited talks

2025 (Planned) Eco-evolutionary Processes in Context: A Statistical Physics Approach. Nordita. Stockholm, Sweden. July.
(Planned) Vaccine Company. Virtual. June.
(Planned) National Institute for Theory and Mathematics in Biology. Chicago. April.
(Cancelled) NIAID-FIC Respiratory Virus Transmission Meeting. Rockville. April.
(Planned) Carnegie Mellon University-Pittsburgh Computational Biology Seminar. March.
Workshop on Quantitative Immunology, Princeton Center for Theoretical Science. Princeton University. February.

2024 St. Jude Children's Research Hospital, Department of Host-Microbe Interactions. Memphis. December.
Microbiology Seminar. University of Illinois, Urbana-Champaign. November.
Interactions and Co-evolution between Viruses and Immune Systems. Kavli Institute for Theoretical Physics. Santa Barbara. October.
NIH Vaccine Research Center. Bethesda. May.
Immunological Imprinting in SARS-CoV-2 Infection and Vaccination Workshop, NIH NIAID. Rockville. April.
Determinants and Dynamics of Viral Emergence and Establishment in Human Populations. Princeton University. April.
Math-Bio Seminar, University of Maryland. April.
Comparative Immunology Meeting. Burroughs Wellcome Fund. Durham. February.

2023 Individual and Population Immunity to Respiratory Viruses. Hong Kong. November.
University of Pennsylvania Microbiology Seminar. October.
Columbia University School of Public Health. April.
NSF LEVERS workshop. Online. January.

2022 Summer School and 4th Annual Symposium on Physical Concepts and Computational Models in Immunology. Corsica. August.
Johns Hopkins Bloomberg School of Public Health. April.

EPPICenter. University of California, San Francisco. March.
Emerging Pathogens Institute. University of Florida, Gainesville. March.
Cell Biology and Molecular Genetics and Microbiology seminar series. Duke University. February.

2021 Public Health Modeling Seminar, Yale School of Public Health. November.
14th Australian Influenza Symposium. WHO Collaborating Centre for Reference and Research on Influenza, Melbourne, Australia. November.
2021 Program in Quantitative Genomics Conference, Harvard T.H. Chan School of Public Health. Boston, Massachusetts. October.
Panelist. ASM COVID-19 Virtual Journal Club. September.
Virtual Quantitative Biosciences Hands-on Workshop on Epidemic Modeling, Georgia Tech. May.
Los Alamos National Laboratory, Theoretical Biology and Biophysics Division. Los Alamos, New Mexico. April.
Virtual Analytic Exchange: "Global Dynamics of COVID-19: The Next Five Years," Office of Analytic Outreach, Bureau of Intelligence & Research, U.S. Department of State. Washington, D.C. March.
Institute for Global Health, Northwestern University. March 2021.
Infectious Disease Across Scales seminar series, Emory University. February.
Quantitative Evolution, Phylogeny and Ecology: from models to data and back. Institut Henri Poincaré (IHP), Sorbonne University. Paris. February.
SARS-CoV-2 Modeling: What have we learned from this pandemic about how (not) to model disease spread? Theory and Modeling of Living Systems, Emory University. January.

2020 Influenza and COVID-19: What should we expect this winter? Panel discussion. Library of Congress, Washington, D.C. December.
Institute for Mathematical and Statistical Innovation, University of Chicago. Dealing with COVID-19 in Theory and Practice. October.
(Cancelled) Influenza and Other Infections. University of Tokyo, Japan. June.
(Cancelled) Delbrück Seminar on Evolution, University of Cologne, Germany. March.
École Normale Superieure, Paris. March.
Systems Biology of Infectious Disease Workshop. Center for Viral Systems Biology, Scripps Research Institute, La Jolla, California. February.
Virginia Technical University, Department of Biology, Blacksburg, Virginia. February.

2019 U.S. Centers for Disease Control, Influenza Division. Atlanta, Georgia. November.
Bill & Melinda Gates Foundation Expert Consultation on Imprinting in Influenza. Seattle, Washington. November.
Physical Concepts and Computational Models in Immunology. Ragon Institute, Boston, Massachusetts. September.
Options X for the Control of Influenza, Singapore. August.

2018 University of California, San Diego, Department of Biology. December.
Hong Kong University School of Public Health. December.
University of Illinois, Chicago, Department of Microbiology and Immunology. November.
Institute for Dynamical Modeling. Seattle, Washington. November.
Towards a New Universal Influenza Vaccine: Lessons from the Great Influenza Pandemic of 1918 to Now. Human Vaccines Project, Sabin Vaccine Institute, Vanderbilt University Medical Center, Burroughs Wellcome Fund, and Sanofi. Nashville, Tennessee. November.
NIH. Epidemiology and Evolutionary Dynamics of Broadly Cross-protective Influenza Vaccines. Bethesda, Maryland. September.

Mount Sinai Icahn School of Medicine, Department of Microbiology. June.
Stanford University, Department of Biology. April.
University of Idaho, Department of Biology. March.
University of California, Los Angeles, Department of Ecology & Evolutionary Biology. February.

2017 Princeton University, Department of Ecology & Evolutionary Biology. November.
Infectious Disease Week (IDWeek). Evolution informing infectious diseases, infectious diseases informing evolution. San Diego, California. October.
Burroughs Wellcome Integrated Training Program. Microbial Systems Models: At the intersection of data and discovery, University of Michigan, Ann Arbor. August.
Mathematical Virology Satellite Symposium of the American Society of Virology Annual Meeting. Madison, Wisconsin. June.
Stochasticity and Control in the Dynamics and Diversity of Immune Repertoires. Israeli Institute for Advanced Studies. Jerusalem, Israel. June.
Immunology and Evolution of Influenza Symposium. Emory University. May.
Math+X Simons Foundation Symposium on Immunology and Systems Biology. University of Pennsylvania. May.
Innovative Approaches to Widening and Deepening Research on the Value of Vaccination. Harvard T.H. Chan School of Public Health. May.
Harvard T.H. Chan School of Public Health, Department of Immunology & Infectious Disease. April.
Northwestern University Lurie Children's Hospital, Pathology Grand Rounds. April.
The value of vaccines in the avoidance of antimicrobial resistance. Chatham House, London. March.

2016 Exploring Predictive Models for Improving Influenza Vaccine Virus Selection. Princeton University. July.
Influenza Immunology: Data, Systems, & Models. Yale University. June.
New York University, Department of Biology. April.

2015 RAPIDD Workshop on Modeling and Predicting Influenza Phenotypes. Cambridge University. March.

2014 Ecology and Evolution of Infectious Disease, Center for the Study of Biodiversity in Amazonia. Merida, Mexico. November.
Jacques Monod Conference: From emerging to pandemic viruses: Interplay between host ecology and viral evolution. Roscoff, France. April.

2013 J. Craig Venter Institute. December.
Swarthmore College, Department of Biology. October.

Pre-2013 Hong Kong University. Area of Excellence: Control of Pandemic and Inter-Pandemic Influenza. July 2012.
Next-generation Molecular Evolutionary Epidemiology of Infectious Disease Satellite Meeting. Kavli Royal Society International Centre, Buckinghamshire, United Kingdom. May 2012.
Informal Consultation for Improving Influenza Vaccine Virus Selection. WHO, Geneva, Switzerland. June 2010.
Anticipating the Species Jump: Surveillance for Emerging Viral Threats. DTRA and SAIC, McLean, Virginia. December 2009.
Harvard School of Public Health, Department of Epidemiology. May 2007.
Influenza Seasonality Workshop. Center for Infectious Disease Dynamics, Penn State University. October 2006.

Contributed talks and posters

NIH High Risk, High Reward Symposium. Bethesda, Maryland. June 2019. (Talk)
Immunological Assays and Correlates of Protection for Next Generation Influenza Vaccines. Siena, Italy. (Poster)
Epidemics[5]. Clearwater Beach, Florida. December 2015. (Talk)
Pneumococci & Pneumococcal Disease Symposium (ISPPD8), Brazil. March 2012. (Talk/Poster)
Epidemics[3]. Boston, Massachusetts. December 2011. (Talk)
MIDAS Meeting. Atlanta, Georgia. June 2011. (Talk)
Epidemics. Asilomar, California. December 2008. (Poster)
Ecological Society of America Annual Meeting, Milwaukee, Wisconsin. August 2008. (Talk)
Viral Paradigms. Emory University, Atlanta, Georgia. January 2008. (Poster)
Preparedness to the Influenza Pandemic—an International Outlook. St. Petersburg, Russia. March 2007. (Talk)
EcoHealthONE. Madison, Wisconsin. October 2006. (Talk)
Bridging the Scales of Disease Dynamics. Vancouver, B.C. September 2006. (Poster)

Grant support

Current

2025-2029 NIH NIAID U01, "Computational models of adaptive immunity to influenza." U01AI87063. PI: Cobey

2022-2027 NIH NIAID R01, "Drivers of individual variation in influenza vaccine response and protection from infection." R01AI170116. PIs: Cobey (contact), Benjamin Cowling, and John Tsang

2021-2028 NIH NIAID Centers for Excellence in Influenza Research and Response (CEIRR) Contract 75N93021C00015. PI: Scott Hensley. Involves three subawards, including leadership of the R01-level CEIRR Computational Modeling Core and co-leadership of another project (with Jesse Bloom).

2020-2025 NIH NIAID U01, "The 'Dynamics of the immune responses to repeat influenza vaccination exposures' (DRIVE) Study." U01AI153700, clinicaltrials.gov: NCT04576377. PIs: Cobey (contact) and Benjamin Cowling

2020-2025 HHS CDC U01. "Data-driven transmission models to optimize influenza vaccination and pandemic mitigation strategies" (with COVID-19 supplement, 2020-2023). U01IP0001138. PI: Jonathan Zelner

2019-2026 NIH NIAID Sinai-Emory Multi-Institutional Collaborative Influenza Vaccine Innovation Center (CIVIC) contract 75N93019C00051 (with COVID-19 supplement, 2020-2023). PIs: Florian Krammer and Rafi Ahmed

2019-2025 NIH NIAID R01, "Longitudinal dynamics of protection after influenza infection and vaccination." R01AI149747. PI: Cobey (contact) and Aubree Gordon

Completed

2020-2022 HHS CDC Contract 75D30120C07963. "Development of a multi-level integrated strategy for regional evaluation of influenza viruses and vaccines." PI: Emily Martin

2019-2022 Bill & Melinda Gates Foundation Grand Challenge. PI: Patrick Wilson

2016-2022 NIH NIAID Centers of Excellence for Influenza Research and Surveillance (CEIRS) subcontract. PIs: John Treanor/David Topham

2016 NIH NIGMS Models of Infectious Disease Agent Study (MIDAS) subaward 5U54GM088558. PI: Marc Lipsitch

2014-2019	NIH New Innovator Award DP2AI117921. PI: Cobey
2014-2018	James S. McDonnell Complex Systems Scholar Award; PI with co-PI Patrick Wilson
2014	University of Chicago BIG Ideas Generator Seed Grant. PI with co-PIs Fred Wulczyn and Stefano Allesina
2013-2015	NSF National Evolutionary Synthesis Center Working Group, "Trends in the evolution of human viruses" (co-PI: Pleuni Pennings)
2013	University of Chicago—Argonne Seed Grant. Co-PI with Jack Gilbert
2011-2013	NIH Kirschstein National Research Service Award F32GM097997
2008	Block Grant, Department of Ecology and Evolutionary Biology, U. Michigan
2007	Rackham Graduate Student Research Grant, U. Michigan

Awards and fellowships

2016	Neubauer Faculty Development Fellowship, U. Chicago
2014	NIH New Innovator Award
2014	James S. McDonnell Complex Systems Scholar Award
2011	NIH Kirschstein National Research Service Award (F32GM097997) (2 years)
2005	NSF Graduate Research Fellowship (3 years)
2005	YSSP Fellowship Grant from U.S. National Committee for IIASA
2002	Senior Book Prize, Department of Ecology and Evolutionary Biology, Princeton
2002	Phi Beta Kappa, Princeton
2002	Sigma Xi Society, Princeton

Teaching and professional service

Reviews	*American Journal of Epidemiology*, *American Naturalist*, *BioEssays*, *Current Biology, Ecology Letters*, *eLife*, *Evolution, Medicine, and Public Health, Frontiers in Immunology*, *Genome Medicine*, *JAMA, Journal of Infectious Diseases*, *Journal of Molecular and Genetic Medicine*, *Journal of the Royal Society Interface*, *Journal of Theoretical Biology*, *Journal of Virology, Lancet Infectious Diseases, Molecular Biology & Evolution*, *Nature*, *Nature Communications, Nature Ecology & Evolution, Nature Medicine*, *PLOS Biology, PLOS Computational Biology*, *PLOS Pathogens*, *PLOS One*, *Philosophical Transactions of the Royal Society*, *PNAS*, Princeton University Press, *Proceedings of the Royal Society B, Science*, *Science Advances, Scientific Reports, Trends in Parasitology*, *Vaccine*, and other journals
Grant reviews	US NIH Population-Based Research in Infectious Disease (PRID) Study Section (ad hoc, 2025) US NIH Special Emphasis Panel (2021) US NIH DP2 New Innovator Award (mail-in reviewer, 2020) US NIH Infectious Diseases, Reproductive Health, Asthma and Pulmonary Conditions (IRAP) Study Section (ad hoc, 2020) US NIH Computational Immunology U01 Study Section (2019) US NIH Modeling and Analysis of Biological Systems (MABS) Study Section (ad hoc, 2017, 2019) UK Biotechnology and Biological Sciences Research Council UK Medical Research Council US-Israel Binational Science Foundation Swiss National Science Foundation

Editing	Board of Reviewing Editors, *eLife* (2021-2023) Associate Editor, *Science Advances* (2020-2021) *PLOS Biology* (ad hoc, 2020-2021) *PLOS Computational Biology* (ad hoc, 2019) *Immunological Reviews* (co-editor of special issue: Characterization of the immunologic repertoire, 2018) *eLife* (ad hoc, 2017, 2018) *PLOS Genetics* (ad hoc, 2016) *Philosophical Transactions of the Royal Society* (co-editor of special issue: Dynamics of antibody repertoires, 2015) *Evolutionary Applications* (co-editor of special issue: Antimicrobial resistance, 2015)
Doctoral students	Rita Wang (2024-present, Ecology & Evolution) Alexander Pillai (2023-present, Ecology & Evolution) Chris Russo (2021-present, Biophysics; co-advised with Arvind Murugan) Marcos Vieira (2014-2020, Ecology & Evolution) Frank Wen (2015-2018, MSTP) Sylvia Ranjeva (2013-2018, MSTP; co-advised with Greg Dwyer)
Doctoral committees	Sophie Lockwood, Ecology & Evolution, U. Chicago (2025-present) Juan Santos Rosas, Ecology & Evolution, U. Chicago (2025-present) Casey Middleton, Computer Science, U. Colorado Boulder (2024-present) Bonnie Mendelson, Ecology & Evolution, U. Chicago (2024-present) Qi Zhan, Ecology & Evolution, U. Chicago (2021-present) Sophie Horigan, Ecology & Evolution, U. Chicago (2021-present) Will Koval, Ecology & Evolution, U. Chicago (2020-2024) Katie Dixon, Ecology & Evolution, U. Chicago (2019-2024) Jiawei Liu, Ecology & Evolution, U. Chicago (2018-2022) Haley Dugan, Committee on Immunology, U. Chicago (2018-2021) Carlos Calzada, Ecology & Evolution, U. Chicago (2018-2020) Chris Stamper, Committee on Immunology, U. Chicago (2016-2021) Arvind Pillai, Ecology & Evolution, U. Chicago (2016-2021) Alyson Yee, Committee on Microbiology, U. Chicago (2016-2019) Mauricio Santos-Vega, Ecology & Evolution, U. Chicago (2016-2018) Matthew Michalska-Smith, Ecology & Evolution, U. Chicago (2015-2018) Pamela Martinez, Ecology & Evolution, U. Chicago (2016-2017) Simon Lax, Ecology & Evolution, U. Chicago (2014-2017) Molly Gallagher, Ecology & Evolution, U. Chicago (2013-2017) Colin Kyle, Ecology & Evolution, U. Chicago (2013-2015)
External examiner	École Normale (2022) Icahn School of Medicine at Mount Sinai (2021) University of Melbourne (2021)
Postdoctoral fellows	Graham Northrup (October 2024-present) Sang Woo (Daniel) Park (July 2024-present) Qifang Bi (November 2020-July 2022) Rachel Oidtman (September 2020-2021) Lauren McGough (March 2020-present)

	Katelyn Gostic (September 2019-2022) Phil Arevalo (September 2017-2022) Kangchon Kim (April 2017-May 2020) Daniel Zinder (December 2015- June 2017)
Undergraduate students	Elena Whitney (Summer 2020-Spring 2021) Dannie Griggs (Summer 2020-Spring 2021) Rohan Dandavati (Summer 2017) Graham Northrup (Summer 2017) Lev Tsypin (Summer 2015)
Teaching	ECEV 42900: Theoretical Ecology (with Greg Dwyer), 2014-2019, 2021-2023, 2025 Statistics and Modeling in Infectious Diseases (SISMID) 2.5-day course with Trevor Bedford, University of Washington, 2015-2019, 2021-2023 BSD Quantitative Bootcamp, 2015-2017 (instructor), 2021 (instructor and co-director with John Novembre) BIOS 33365: Evolutionary & Genomic Medicine (with Chung-I Wu), 2015-2019
Committees	Provost's Early Career Success Program (2024-2025, U. Chicago) E&E/BSD Faculty Search Committee (2024-2025, U. Chicago) E&E Diversity, Equity, and Inclusion Committee (2020-2023, U. Chicago) E&E Student Advisory Committee (2017-2023; U. Chicago) COVID-19 response committee (2020, U. Chicago) E&E Faculty Search Committees (2018-2020, U. Chicago) E&E Population Genetics Search Committee (2016-2017, U. Chicago) E&E Computation Committee (2014-2016, U. Chicago) E&E Graduate Admissions Committee (2013-2014, U. Chicago) Center for Communicable Disease Dynamics representative to the MIDAS Software Sharing and Information Outreach Network (2011-2013, HSPH)
Consulting/ advising	Working group member, NIAID Immune Epitope Discovery Program (2025-) Nextstrain.org scientific advisory board (2024-) Scientific leadership board, Penn CEIRR (2020-) Scientific advisory board, University of Hong Kong Theme-Based Research Scheme, "Control of Influenza: Individual and Population Immunity" (2023) External advisor, NIH-CDC HEROES-RECOVER Cohorts (2020-2023) Ad hoc closed-door strategy consultations with federal government, international public health organizations, and foundation stakeholders (2021-2022) CSL Seqirus (2022) Steering committee member, UK MRC Virus Watch Study (2021-2022) Officer of the Governor, State of Illinois (2020-2021) Keystone Strategy (2020-2021) PATH (subaward through Harvard School of Public Health), 2014-2018 Pfizer (subaward through Harvard School of Public Health), 2014-2016
Outreach	Interviews on COVID-19 with the *New York Times, Washington Post*, *Wall Street Journal*, *Chicago Tribune, The Atlantic*, *Scientific American*, *STAT, MIT Technology Review*, *Nature*, *Science*, *Quanta*, *Consumer Reports*, *Roll Call, Dagens Nyheter*, *Al Jazeera*, Salon, Vox, CNN Tonight with Don Lemon, Chris Hayes on MSNBC, BBC World Service "The Inquiry", PRI's "Science

Friday," Talking Points Memo, ABC News, CBS-2 Chicago, WGN TV, WGN Radio, Fox News Radio Rundown, WBEZ, and others, March 2020-2024
Talk, Montgomery Place Retirement Community, Chicago, Illinois. April 2023.
Opinion: "We Study Virus Evolution. Here's Where We Think Covid is Going". Sarah Cobey, Tyler Starr, and Jesse Bloom. *New York Times*. 28 March 2022.
Opinion: "A Scientist's Guide to Understanding Omicron." Jesse Bloom and Sarah Cobey. *New York Times*, 12 December 2021.
Panelist, Midwestern Office of the Council of State Governments, "Back to Business: Assessing Economic Reopening Strategies", July 2020
Pro bono consultation on public health considerations in elections, Brennan Center for Justice, May 2020
Interview, *Chemical and Engineering News*, "The Flu Shot and the Egg", January 2020
Interview, Nerdette Podcast, 8 March 2019
Interview, *STAT*, "Flu science points to another culprit when vaccines fail—us," 29 January 2019
Interview, WBEZ The Morning Shift, 17 January 2018
Interview, PBS NOVA, "Does the flu shot work?" 17 January 2018 http://www.pbs.org/wgbh/nova/body/flu-shot-work.html
Interview, *STAT* and *Scientific American,* "'The problem child of seasonal flu': Beware this winter's virus," 8 January 2018
Interview, *Scientific American*, "Flu vaccine 'factories' create errors that reduce protection," 6 November 2017
Interview, NPR Morning Edition, "Inside each flu shot, months of virus tracking and predictions," 27 November 2015
Talk, Senior Center, Chicago Cultural Center, 1 September 2015
Interview, *Chicago Tribune*, "NorthShore University Health System develops Doppler for disease," 27 January 2015
Article, "Scientists create accurate predictor of the next flu virus," *The Conversation*, February 2014