

OGAN K. KUMOVA, PHD

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TEACHING PHILOSOPHY

I teach science as a process of discovery. My approach is question-driven: rather than delivering answers, I guide students through a Socratic process of reasoning from first principles — using case studies, collaborative discussion, and real clinical scenarios to make abstract concepts concrete. Drawing on over 20 years of instruction from museum education through doctoral mentorship, I design learning environments that are rigorous, inclusive, and adaptive to diverse student backgrounds. In every course, my goal is not only that students master the content, but that they leave with stronger scientific habits of mind: the ability to question, analyze evidence, and think for themselves.

TEACHING EXPERIENCE

Senior Adjunct Faculty

August 2020 – Present

Rowan University / Rowan College at Burlington County – STEM Division

- Creator and lead instructor for BIO 112: Health and Human Microbiology, designed from the ground up for students in health-profession tracks.
- Teaches BIO 155: Basic Microbiology; BIO 120: Biology I; BIO 122: Biology II.
- Delivers all courses across in-person, hybrid, and fully asynchronous online formats, maintaining consistent rigor and engagement across modalities.
- Advises students on transfer planning, health-profession pathways, and academic skill development.

Visiting Lecturer

March 2022 – 2025

Uniformed Services University Medical College

- Delivered invited graduate and medical school lectures in Molecular Pathogenesis.

Lecturer & Graduate Teaching Assistant

March 2015 – Present

Drexel University College of Medicine – Graduate School of Biomedical Sciences and Professional Studies

- Delivers lectures to PhD and medical students in:
 - Vaccine Development (MIIM-524, January 2019–Present)
 - Medical Microbiology
 - Immunology I (MIIM-607, Fall 2016–Present): Antiviral Immunity, CD8+ T Cells, NK Cells, Apoptosis
 - Introduction to Infectious Diseases (Spring 2016)
 - Clinical Correlations in Infectious Diseases (Fall 2015, Fall 2016)
 - Clinical Correlation in Immunology (Spring 2017)
- Served as Teaching Assistant for MIIM-512 & MIIM-521: Molecular Pathogenesis I & II.
- CRLA Level II Certified Tutor; provided structured academic mentorship to graduate and professional students.
- Mentored undergraduate, graduate, medical, postdoctoral, and neonatology fellows.

Adjunct Faculty

January 2012 – June 2013

Drexel University – School of Arts and Sciences, Philadelphia, PA

- Chemistry II; Physical Chemistry Lab (thermodynamics and kinetics for chemical engineers); Organic Chemistry Lab; Analytical Chemistry / Instrumental Analysis.

Adjunct Faculty

January 2012 – June 2013

Drexel University – Goodwin College of Professional Studies

- Chemistry for Engineers; Chemistry for Health Science (lecture and lab) for adult and non-traditional learners.

Adjunct Faculty**December 2010 – 2015***Philadelphia University – School of Science and Health*

- Chemistry I & II (lecture and laboratory instructor).
- Designed and developed curricula for chemistry laboratories and the undergraduate course Critical Evaluation of Primary Scientific Literature.
- Consulted on the physical remodeling and redesign of laboratory facilities to support modern, hands-on pedagogy.

Teaching Assistant & Instructor**August 2007 – September 2010***University of the Sciences – Department of Chemistry & Biochemistry*

- Lead Instructor: General Chemistry Laboratories CH 102 & CH 104.
- Instructor: Critical Evaluation of Primary Scientific Literature.
- Teaching Assistant: Principles of Chemistry Lab CH 113 & CH 114; Biochemistry Lab CH 346; Chemical Sciences Orientation CH 110.
- Guest Lecturer: Discussions in Chemistry (3rd years).

Teaching Assistant*University of the Sciences – Department of Biological Sciences / University of Pennsylvania Museum of Archaeology and Anthropology*

- Forensic Anthropology laboratory teaching assistant (held at the University of Pennsylvania Museum of Archaeology and Anthropology).

Museum Educator & Curriculum Developer**May 2003 – March 2020***Franklin Institute Science Museum, Philadelphia, PA*

- Delivered interactive, inquiry-based science education to public audiences of all ages, translating complex STEM concepts for learners with diverse backgrounds and prior knowledge.
- Developed curriculum and hands-on activities for summer camp programs and outreach initiatives, fostering scientific curiosity and literacy.
- Experience reading real-time audience engagement shaped an adaptive, responsive teaching style that I carry into every classroom.

E D U C A T I O N**Doctor of Philosophy in Microbiology & Immunology****August 2015 – July 2020***Drexel University College of Medicine, Philadelphia, PA | GPA: 4.0**Dissertation: Altered Innate Immune Responses to Influenza in the Neonate**Minor: Health Administration | CRLA Level II Certified Tutor***Master of Science in Infectious Diseases****January 2013 – May 2015***Drexel University College of Medicine, Philadelphia, PA | GPA: 3.97***Bachelor of Science in Biochemistry & Bachelor of Science in Bioinformatics****August 2005 – May 2009***University of the Sciences in Philadelphia, PA | Minor in Mathematics*

P R O F E S S I O N A L B A C K G R O U N D**Program Officer, Vaccine Safety****February 2023 – Present***National Academies of Sciences, Engineering, and Medicine, Washington, D.C.*

Leads expert committee reviews on vaccine safety. Edited Evidence Review of the Adverse Effects of COVID-19 Vaccination (2024) and Vaccine Risk Monitoring and Evaluation at the CDC (2025), National Academies Press.

ORISE Postdoctoral Research Fellow**October 2020 – February 2023***U.S. Food and Drug Administration, Silver Spring, MD | PI: Margaret C. Bash, MD, MPH*

Developed *Neisseria* spp. vaccines using liposome and OMV platforms under the NIH-U19 Gonorrhea Vaccine Cooperative Research Center.

SELECTED PEER-REVIEWED PUBLICATIONS

- Rao AS, Onufer AP, Kumova OK, Roberts LTN, Mossabeh R, Pascasio J, Carey AJ. Myeloid TLR2 signaling amplifies immunopathology in influenza-infected murine neonates. *American Journal of Respiratory Cell and Molecular Biology*. In press.
- Matthias KA, Connolly KL, Jerse AE, Kumova OK, Macintyre AN, Gray MC, Thomas KS, Criss AK, Zielke RA, Li L, Sikora AE, Ramirez-Bencomo F, Thistlethwaite A, Derrick JP, Lu WE, Bash MC. Evaluation of immunization route in induction of vaccine-mediated anti-gonococcal immune responses in a murine model of ascending infection. *Journal of Infectious Diseases*. November 2025;232(5):e765–e777. PMID: 40971931.
- Rao AS, Ugwu N, Onufer AP, Kumova OK, Carey AJ. Cathelicidin-related antimicrobial peptide (CRAMP) is toxic during neonatal murine influenza virus infection. *Journal of Immunology*. May 2025;214(5):1022–1031. PMID: 40101750.
- Kumova OK, Galani IE, Rao A, Johnson H, Triantafyllia V, Matt SM, Pascasio J, Gaskill PJ, Andreacos E, Katsikis PD, Carey AJ. Severity of neonatal influenza infection is driven by type I interferon and oxidative stress. *Mucosal Immunology*. June 2022;15(6):1309–1320. PMID: 36352099.
- Marin C, Kumova OK, Ninio S. Characterization of a novel regulator of biofilm formation in the pathogen *Legionella pneumophila*. *Biomolecules*. January 2022;12(2):225. PMID: 35204726.
- Das P, Acharya S, Pahaladan VM, Kumova OK, Malaeb S, Behera S, Agarwal B, Christensen DJ, Carey AJ, Bhandari V. Chitin-derived AVR-48 prevents experimental bronchopulmonary dysplasia and BPD-associated pulmonary hypertension in newborn mice. *International Journal of Molecular Sciences*. August 2021;22(16):8547. PMID: 34445253.
- Chaubey S, Nader YM, Shah D, Kumova OK, Pahaladan VM, Carey AJ, Andersson S, Bhandari V. α 1,3-Fucosyltransferase-IX, an enzyme of pulmonary endogenous lung stem cell marker SSEA-1, alleviates experimental bronchopulmonary dysplasia. *Pediatric Research*. April 2021;89(5):1126–1135. PMID: 32303051.
- Gary E, O'Connor M, Chakhtoura M, Tardif V, Kumova OK, Malherbe DC, Sutton WF, Haigwood NL, Kutzler MA, Haddad EK. Adenosine deaminase-1 enhances germinal center formation and functional antibody responses to HIV-1 envelope DNA and protein vaccines. *Vaccine*. May 2020;38(22):3821–3831. PMID: 32280045.
- Kumova OK, Fike AJ, Thayer JL, Nguyen LT, Mell JC, Pascasio J, Stairiker C, Leon LG, Katsikis PD, Carey AJ. Lung transcriptional unresponsiveness and loss of early influenza virus control in infected neonates is prevented by intranasal *Lactobacillus rhamnosus* GG. *PLoS Pathogens*. October 2019;15(10):e1008072. PMID: 31603951.
- Kumova OK*, Fike AJ*, Carey AJ. Dissecting the defects in the neonatal CD8⁺ T-cell response. *Journal of Leukocyte Biology*. November 2019;106(5):1051–1061. PMID: 31260598. (Review)
- Fike AJ, Kumova OK, Tardif VJ, Carey AJ. Neonatal influenza-specific effector CTLs retain elevated CD31 levels at the site of infection and have decreased IFN- γ production. *Journal of Leukocyte Biology*. March 2019;105(3):539–549. PMID: 30536476.
- Carey AJ, Hope JL, Mueller YM, Fike AJ, Kumova OK, van Zessen DBH, Steegers EAP, van der Burg M, Katsikis PD. Public clonotypes and convergent recombination characterize the naïve CD8⁺ T-cell receptor repertoire of extremely preterm neonates. *Frontiers in Immunology*. December 2017;8:1859. PMID: 29312340.
- Fike AJ, Nguyen LT, Kumova OK, Carey AJ. Characterization of CD31 expression on murine and human neonatal T lymphocytes during development and activation. *Pediatric Research*. July 2017;82(1):133–140. PMID: 28355204.
- Goodwin IP, Kumova OK, Ninio S. A conserved OmpA-like protein in *Legionella pneumophila* required for efficient intracellular replication. *FEMS Microbiology Letters*. August 2016;363(16):fnw173. PMID: 27421957.
- Carey AJ, Gracias DT, Thayer JL, Boesteanu AC, Kumova OK, Mueller YM, Hope JL, Fraietta JA, van Zessen DB, Katsikis PD. Rapid evolution of the CD8⁺ TCR repertoire in neonatal mice. *Journal of Immunology*. March 2016;196(6):2602–2613. PMID: 26873987.