DANIELA FERA

Associate Professor
Department of Chemistry and Biochemistry
Swarthmore College, 500 College Ave
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610-690-3308

Faculty Academic Appointments:

2026 - Present	**Adjunct Associate Professor of Biochemistry,** Department of Biochemistry and Molecular Biophysics, University of Pennsylvania, Philadelphia, PA
2025 - 2026	**Department Chair,** Department of Chemistry and Biochemistry, Swarthmore College, Swarthmore, PA
2023 - Present	**Associate Professor of Biochemistry,** Department of Chemistry and Biochemistry, Swarthmore College, Swarthmore, PA
2018 - Present	**Adjunct Assistant Professor of Biochemistry,** Department of Biochemistry and Molecular Biophysics, University of Pennsylvania, Philadelphia, PA
2017 - 2023	**Assistant Professor of Biochemistry,** Department of Chemistry and Biochemistry, Swarthmore College, Swarthmore, PA
2015 - 2016	**Adjunct Professor of Chemistry,** School of Arts and Sciences, Massachusetts College of Pharmacy and Health Sciences, Boston, MA
2014 - 2015	**Adjunct Faculty,** Department of Chemistry and Physics, Emmanuel College, Boston, MA
2014	**Adjunct Faculty,** Department of the Sciences, Wentworth Institute of Technology, Boston, MA

Education and Training

2012 - 2017 **Boston Children's Hospital / Harvard Medical School, Boston, MA,** Postdoctoral Research Fellow

- Research Focus: Investigated the interplay between in the immune response and virus evolution in donors or animals infected with or vaccinated against HIV.
- Research Advisor: Stephen C. Harrison, Ph.D.

2006 - 2012 **University of Pennsylvania**, Graduate School of Arts and Science, Philadelphia, PA
Ph.D. in Biological Chemistry, 06/12

- Dissertation Title: "Identification and Characterization of Small Molecule Antagonists of Human Papillomavirus Oncoproteins"
- Research Advisor: Ronen Marmorstein, Ph.D.

2001 - 2005 **New York University**, College of Arts and Science, New York, NY
B.A. in Chemistry, with Honors; B.A. in Mathematics, 05/05

- Dissertation Title: Analyzed RNA sequences and secondary structures from a variety of genomes to try to correlate structure to function.
- Research Advisor: Tamar Schlick, Ph.D.

Awards and Honors:

2018	Scientific Teaching Fellow, 2018 Summer Institute on Scientific Teaching, led by Yale Center for Teaching & Learning
2017	Kiehl's LifeRide for amfAR Grant Recipient
2017	Travel Award, Boston Children's Hospital Postdoctoral Association
2015	Postdoctoral Award, CHAVI-ID Annual Retreat
2015	Poster Prize, CHAVI-ID Annual Retreat
2012	Second Place Poster Prize, Wistar Institute Cancer Retreat
2007	Penn Prize for Excellence in Teaching by Graduate Students
2007	Chemistry Department Teaching Award
2005	Merck Award
2002 – 2005	College of Arts and Science Presidential Scholar

Submitted Manuscripts

1. Gong, L., Goli, K.D., Tarquis-Medina, M., Relano-Rodriguez, I., Palacio, M.B., Kerwin, M., Urbano, E., Länger, N., Rubio, A.A., Garay, M.G., Park, J., Walsh, A.A., Melo, M. B., Irvine, D., Barnes C., Fera, D., Kulp, D.W., and Escolano, A. Vaccine-induced epitope switching derails HIV-1 antibody maturation.

Publications (Swarthmore College undergraduate researchers underlined)**:**

1. Tao, K., Hershhorn, A. **Fera, D.** Lynch, R.M., Julg, B.D., Korber, B., and Shafer, R.W. (2026) Genotypic challenges in implementing broadly neutralizing antibody-based long-acting HIV-1 therapies. *Commun Med* **6**, 313.

2. Finkelstein*, M.T, Parker Miller*, E., Erdman, M.C., and **Fera, D.** (2022) Analysis of Two Cooperating Antibodies Unveils Immune Pressure Imposed on HIV Env to Elicit a V3-Glycan Supersite Broadly Neutralizing Antibody Lineage. *Frontiers in Immunology. 13:962939* (*equal contribution)

3. Tao*, K., Tzou*, P.L., Nouhin, J., Gupta, R.K., de Oliveira, T., Kosakovsky-Pond, S.L., **Fera, D.** and, Shafer, R.W., (2021) The biological and clinical significance of emerging SARS-CoV-2 variants. *Nature Reviews Genetics*. Sep 17:1-17 (*equal contribution)

4. Parker Miller*, E., Finkelstein*, M.T, Erdman, M.C., Seth, P.C., and **Fera, D.** (2021) A Structural Update of Neutralizing Epitopes on the HIV Envelope, a Moving Target. *Viruses. 13*(9), 1774 (*equal contribution)

5. Williams, W.B, Meyerhoff, R.R., Edwards R.J., Li, H., Manne, K., Nicely, N., Henderson, R., Zhou, Y., Janowska, K., Mansouri, K., Gobeil, S., Evangelous, T., Hora, B., Madison, B., Abuahmad, A.Y., Sprenz, J., Deyton, M., Stalls, V., Kopp, M., Hsu, A., Borgnia, M., Stewart-Jones, G., Lee, M., Bronkema, N., Moody, M.A., Wiehe, K., Bradley, T., Alam, S.M., Parks, R.J., Foulger, A., Oguin, T., Bonsignori, M., LaBranche, C.C., Montefiori, D.C., Seaman, M., Santra, S., Perfect, J., Francica, J., Lynn, G., Aussedet, B., Walkowicz, W.E., Laga, R., Kelsoe, G., Saunders, K.O, **Fera, D.**, Kwong P.D., Seder, R., Bartesaghi, A., Shaw, G.M., Acharya, P., and Haynes, B.F., (2021) Fab-dimerized glycan-reactive antibodies are a structural category of natural antibodies. *Cell* 184(11):295-2972.e25

6. Finkelstein*, M.T, Mermelstein*, A.G., Parker Miller, E., Seth, P.C., Stancofski, E.D., and Fera, D. (2021). Structural Analysis of Neutralizing Epitopes of the SARS-CoV-2 Spike to Guide Therapy and Vaccine Design Strategies. *Viruses*. 13(1), 134 (*equal contribution)

7. Nguyen, D., Lin, Y, Zhou, J.O., Kibby, E., Sia, T., Tillis, T., Vapuryan, N., Xu, M.R., Potluri, R., Shin, Y.J., Erler, E., Bronkema, N., Boehlmer, D., Chung, C., Burkhard, C., Grasso, M., Acevedo, L.A., Marmorstein, R., and **Fera, D.** (2020) Identification and Characterization of a Critical Alpha Helix in B-Raf Kinase Critical for the Activity of MEK Kinase in MAPK Signaling *Biochemistry*, 59, 50, 4755-4765

8. Zhou, J.O., Zaidi, H., Ton, T., **Fera, D.** (2020) The Effects of Framework Mutations at the Variable Domain Interface on Antibody Affinity Maturation in an HIV-1 Broadly Neutralizing Antibody Lineage. *Frontiers in Immunology.* 11:1529

9. Bajic, G., Maron, M., Caradonna, T., Tian, M., Mermelstein, A., **Fera, D.**, Kelsoe, G., Kuraoka, M, Schmidt, A. (2020) Structure-guided molecular grafting of a complex broadly neutralizing viral epitope. *ACS Infect Dis.* 6,5:1182-1191

10. Zhou, J.O., Ton, T., Morriss, J.W., Nguyen, D., **Fera, D.**, (2018) Structural Insights from HIV-Antibody Co-Evolution and Related Immunization Studies. *AIDS Research and Human Retroviruses*. 34(9):760-768

11. **Fera, D.**, Lee, M.S., Wiehe, K., Meyerhoff, R.R., Piai, A., Bonsignori, M., Aussedat, B., Walkowicz, W.E., Ton, T., Zhou, J.O., Danishefsky, S., Haynes, B.F., and Harrison, S.C. (2018) HIV Envelope V3 Region Mimic Embodies Key Features of a Broadly Neutralizing Antibody Lineage Epitope. *Nat Commun.* 16;9(1):1111

12. Williams*, W.B., Zhang*, J., Jiang*, C., Nicely*, N.I., **Fera*, D.**, Luo, K., Moody, M.A., Liao, H.X., Alam, S.M., Kepler, T.B., Ramesh, A., Wiehe, K., Holland, J.A., Bradley, T., Vandergrift, N., Saunders, K.O., Parks, R., Foulger, A., Xia, S.M., Bonsignori, M., Montefiori, D.C., Louder, M., Eaton, A., Santra, S., Scearce, R., Sutherland, L., Newman, A., Bouton-Verville, H., Bowman, C., Bomze, H., Gao, F., Marshall, D.J., Whitesides, J.F., Nie, X., Kelsoe, G., Reed, S.G., Fox, C.B., Clary, K., Koutsoukos, M., Franco, D., Mascola, J.R., Harrison, S.C., Haynes, B.F., Verkoczy, L. (2017) Initiation of HIV neutralizing B cell lineages with sequential envelope immunizations. *Nat Commun.* 23;8(1):1732 (*equal contribution)

13. Horwitz*, J.A., Bar-On*, Y., Lu*, C.L., **Fera, D.**, Lockhart, A.A.K., Lorenzi, J., Nogueira, L., Golijanin, J., Scheid, J.F., Seaman, M.S., Gazumyan, A., Zolla-Pazner, S. and Nussenzweig, M.C. (2017) Non-Neutralizing Antibodies Alter the Course of HIV-1 Infection *in vivo. Cell.* 10;170(4):637 (*equal contribution)

14. Bonsignori*, M., Kreider*, E.F., **Fera*, D.**, Meyerhoff*, R.R., Bradley*, T., Wiehe, K., Alam, S. A., Aussedat, B., Walkowicz, W.E., Hwang, K.K., Saunders, K.O., Zhang, R., Gladden, M.A., Monroe, A., Kumar, A., Xia, S.M., Cooper, M., Louder, M.K., McKee, K., Bailer, R.T., Pier, B.W., Jette, C.A., Kelsoe, G., Williams, W.B., Morris, L., Kappes, J., Wagh, K., Kamanga, G., Cohen, M.S., Hraber, P.T., Montefiori, D.C., Trama, A., Liao, H.X., Kepler, T.B., Moody, M.A., Gao, F., Danishefsky, S.J., Mascola, J.R., Shaw, G.M., Hahn, B.H., Harrison, S.C., Korber, B.T., Haynes, B.F. (2017) Staged induction of HIV-1 glycan-dependent broadly neutralizing antibodies. *Science Translational Medicine.* 9(381) (*equal contribution)

15. Easterhoff, R., Moody, M. A., **Fera, D.,** Cheng, H., Ackerman, M., Wiehe, K., Saunders, K.O., Vandergrift, N., Parks, R., Kim, J., Michael, N.L., O'Connell, R.J., Excler, J.L., Robb, M.L., Vasan, S., Rerks-Ngarm, S., Kaewkungwal, J., Pitisuttithum, P., Nitayaphan, S., Sinangil, F., Tartaglia, J., Phogat, S., Kepler, T.B., Alam, S.M., Liao, H.X., Ferrari, G., Seaman, M.S., Montefiori, D.C.,

Tomaras, G.D., Harrison, S.C. and Haynes, B.F. (2017) HIV envelope CD4 binding site antibodies with long variable heavy third complementarity determining region boosted with a HIV vaccine. *PLoS Pathogens.* 13(2)

16. Bradley*, T., **Fera*, D.**, Bhiman, J., Eslamizar, L., Lu, X., Anasti, K., Zhang, R., Sutherland, L.L., Scearce, R.M., Stolarchuk, C., Lloyd, K.E., Parks, R., Martelli, A., Foulger, A., Abdool-Karim, S.S., Barnett, S., Kepler, T.B., Alam, S.M., Montefiori, D.C., Moody, M.A., Liao, H.X., Morris, L.,Santra, S., Harrison, S.C., and Haynes, B.F. (2016) Structural Constraints of Vaccine-Induced Tier-2 Autologous HIV Neutralizing Antibodies Targeting the Receptor Binding Site. *Cell Reports,* 14; 1-12 (*equal contribution)

17. **Fera, D.**, Schmidt, A.G, Haynes, B.F., Gao, F., Liao, H.X., Kepler, T.B., and Harrison, S.C. (2014) Affinity Maturation in an HIV Broadly Neutralizing B-cell Lineage Through Reorientation of Variable Domains. *PNAS,* 111; 10275-10280

18. Malecka*, K.A., **Fera*, D**., Schultz, D.C., Hodawadekar, S., Reichman, M., Donover, P.S., Murphy, M., and Marmorstein, R. (2014) Identification and characterization of small molecule human papillomavirus E6 inhibitors*. ACS Chemical Biology,* 9; 1603-12 (*equal contribution)

19. **Fera, D.** and Marmorstein R. (2012) Different Regions of the HPV E7 and Ad E1A Viral Oncoproteins Bind Competitively but Through Distinct Mechanisms to the CH1 Transactivation Domain of p300. *Biochemistry*, 51; 9524-9534

20. **Fera, D.**, Schultz, D.C., Hodawadekar, S., Reichman, M., Donover, P.S., Melvin, J., Huryn, D.M., and Marmorstein, R. (2012) Identification and Characterization of Small Molecule Antagonists of pRb Inactivation by Viral Oncoproteins. *Chemistry and Biology*, 19; 518-528

21. Yi, C., Troutman, S., **Fera, D.**, Stemmer-Rachamimov, A., Avila, J. L., Christian, N., Luna Persson, N., Shimono, A., Speicher, D. W., Marmorstein, R., Holmgren, L., and Kissil, J.(2011) Tight Junction- Associated Merlin-Angiomotin Complex Mediates Merlin's Regulation of Mitogenic Signaling and Tumor Suppressive Functions. *Cancer Cell*, 19; 527-540

22. Elmatad, Y., Zitolo, M., **Fera, D.**, and Jerschow, A. (2007) Examining Gas Kinetics in MATLAB. *Chem. Educator*. 12; 89-93

23. **Fera**, **D.**, Kim, N., Shiffeldrim, N., Zorn, J, Laserson, U., Gan, H.H., and Schlick, T. (2004) RAG: RNA-As-Graphs web resource. *BMC Bioinformatics*. 5:88

24. Gan, H.H, **Fera, D.**, Zorn, J, Shiffeldrim, N., Laserson, U., Kim, N., and Schlick, T. (2004) RAG: RNA-As-Graphs Database - Concepts, Analysis, and Features. *Bioinformatics*, 20; 1285-1291

Patents:

1. WO 2013070586 A1, Issued: 05-16-2013; "Small molecule modulators of pRb inactivation"

Student Poster Presentations at National and International Meetings
(undergraduate co-authors underlined; presenters are marked with *)

1. Thammavongxay, A.*, Fera, D., and Davidson, B. (2024) Analysis of Activity and Structure Across MEK and ERK Kinase Variants. *American Chemical Society (ACS) – Middle Atlantic Region Meeting* – State College, PA, USA

2. Fujishiro, M.*, and Fera, D. (2024) Generation and Analysis of a Cysteine-less Lyn Kinase. *RNADay@Penn*, Philadelphia, PA, USA

3. Fujishiro, M.*, and Fera, D. (2024) Structural Investigation of Lyn Kinase. *Jean Dreyfus Lectureship for Undergraduate Institutions Poster Session*, Swarthmore, PA, USA

4. Nguyen, G.*, Chen, Y., and Fera, D. (2024) Exploring the KD/SH3 Interface of Lyn Kinase. *Jean Dreyfus Lectureship for Undergraduate Institutions Poster Session*, Swarthmore, PA, USA

5. Thammavongxay, A.*, Fera, D., and Davidson, B. (2024) Conservation of Activity and Structure Across MEK and ERK Kinase Variants. *Jean Dreyfus Lectureship for Undergraduate Institutions Poster Session*, Swarthmore, PA, USA

6. Hotan, Q.*, and Fera, D. (2022) Identification and characterization of important residues involved in MEK-ERK docking site interactions. *Swarthmore Chapter Sigma Xi Poster Session,* Swarthmore, PA, USA

7. Lin, S.*, Naagaard, D., Fera, D. (2022) Investigating the MEK and ERK Interface to Find Allosteric Binding Sites. *Swarthmore Chapter Sigma Xi Poster Session,* Swarthmore, PA, USA

8. Naagaard, D., and Fera, D. (2022) Initial Investigation into Lyn Kinase – *Swarthmore Chapter Sigma Xi Poster Session,* Swarthmore, PA, USA

9. Lin, S.*, Naagaard, D., Fera, D. (2022) Analysis of the interactions between MEK and ERK kinases. *American Chemical Society (ACS) – Middle Atlantic Region Meeting* – Ewing, NJ, USA

10. Hotan, Q.*, Ye, M., Fera, D. (2022) Identification and characterization of important residues involved in MEK1-ERK2 binding and phosphorylation. *American Chemical Society (ACS) – Middle Atlantic Region Meeting* – Ewing, NJ, USA

11. Erdman, M.*, Parker Miller, E., Finkelstein, M., Fera, D. (2022) Analysis of HIV-1 cooperating antibodies. *American Chemical Society (ACS) – Middle Atlantic Region Meeting* – Ewing, NJ, USA

12. Lin, S.*, Naagaard, M.D., Pham, T., Fera, D. (2022). Investigating the Interaction Interface between MEK and ERK Kinase. *ASBMB Annual Meeting/Experimental Biology Poster Session,* Philadelphia, PA, USA

13. Ye, M.*, Hotan, Q., Glatz, G., Finkelstein, M.T., Hayashi, S., Parker Miller, E., Lau, B., Li, K., Chen, H., LeBlanc, J., Zaidi, H., Fera, D. (2022). Biochemical analysis of human ERK2 mutants reveals important residues in MEK1-ERK2 binding and phosphorylation. *ASBMB Annual Meeting/Experimental Biology Poster Session,* Philadelphia, PA, USA

14. Finkelstein, M.T., Erdman, M.*, Fera, D. (2022). Characterization of the DH475 cooperating antibody and its interaction with the HIV-1 spike. *ASBMB Annual Meeting/Experimental Biology Poster Session,* Philadelphia, PA, USA

15. Parker Miller, E.*, Fera, D. (2022). Analysis of the interactions between the HIV-1 spike and the F7-22 “cooperating” antibody. *ASBMB Annual Meeting/Experimental Biology Poster Session,* Philadelphia, PA, USA

16. Parker Miller, E.*, Fera, D. (2021). Analysis of the interactions between the HIV-1 spike and the F7-22 “cooperating” antibody. *Swarthmore Chapter Sigma Xi Poster Session,* Swarthmore, PA, USA

17. Finkelstein, M.*, Fera, D. (2021). Structural characterization of a cooperating antibody to a broadly neutralizing lineage targeting HIV. *Swarthmore Chapter Sigma Xi Poster Session,* Swarthmore, PA, USA

18. Morriss, J.W.*, Zhou, J.O., Fera, D. (2019). Structural Analysis of an Early Intermediate of the DH270 Broadly Neutralizing B-cell Lineage. (Poster Presentation). *HIV Vaccines (X7) Keystone Symposia*, Whistler, British Columbia Canada

19. Morriss, J.W.*, Fera, D. (2018). An analysis of HIV antibody-virus co-evolution to guide vaccine design. *Swarthmore Chapter Sigma Xi Poster Session,* Swarthmore, PA, USA

20. Morse, E. *, Fera, D. (2018) Identification of the unfavorable characteristics of 1A102R, 1AZCET, and 1AH92U antibodies against HIV. *Swarthmore Chapter Sigma Xi Poster Session,* Swarthmore, PA, USA

21. Ton, T.*, Zhou, J.O., Fera, D. (2018). Purification of a fragment of an Anti HIV-1 progenitor antibody mutant, and mutation of V1/V2 loops of HIV-1 Envelopes. *Swarthmore Chapter Sigma Xi Poster Session,* Swarthmore, PA, USA

22. Zhou, J.O. *, Fera, D. (2018). Characterizing a CH103 Quadruple Mutant. *Swarthmore Chapter Sigma Xi Poster Session,* Swarthmore, PA, USA

23. Zhou, J.O. *, Ton, T.*, Fera, D. (2018). Probing Affinity Maturation in the HIV-Induced CH103 Broadly Neutralizing Antibody Clonal Lineage., FCBIS Symposium, University of Pennsylvania, Philadelphia, PA, USA

Student Oral Presentations at National and International Meetings
(undergraduate co-authors underlined; presenters are marked with *)

1. Fujishiro, M.*, and Fera, D. (2024) Generation and Analysis of a Cysteine-less Lyn Kinase. Intercollegiate Student Chemists Convention, Lincoln University, PA, USA

2. Thammavongxay, A.*, Fera, D., and Davidson, B. (2024) Analysis of Activity and Structure Across MEK and ERK kinase Variants. Lincoln University, PA, USA

Invited Oral Presentations: *(since joining Swarthmore College in 2017)*

1. *Connecting Microscopes to Computation: How Shared Infrastructure Accelerates Structure Determination*. The NSF Pennsylvania Science DMZ, October 2025, Virtual

2. *Immuno-Viral Archaeology: Tackling and HIV-Antibody Arms Race*. The Summer Science Program, Georgetown University, June 2024

3. *Identification of Allosteric Sites on MEK and ERK Kinases Critical in MAPK Signaling.* American Chemical Society (ACS) – Middle Atlantic Region Meeting June 2024, State College, PA

4. *Immuno-Viral Archaeology: Tackling and HIV-Antibody Arms Race*. Astria Therapeutics, Virtual, August 2023

5. *Analysis of protein-protein interactions by undergraduate researchers to understand viral-antibody co-evolution*. American Chemical Society (ACS) – Middle Atlantic Region Meeting June, 2022, Ewing, NJ

6. *Identification of Allosteric Sites on Protein Kinases Critical in MAPK Signaling.* American Chemical Society (ACS) – Middle Atlantic Region Meeting June 2022, Ewing, NJ

7. *Immuno-Viral Archaeology: Tackling the HIV-Antibody Arms Race.* Drexel University College of Medicine, Biochemistry and Molecular Biology Department, Invited Seminar, March 2022

8. *Uncovering Allosteric Sites Critical for MAPK Signaling.* ACS Chem Bio Connections, Protein Structure and Engineering July 2021, Virtual

9. *Identification and Characterization of a B-Raf Kinase Alpha Helix Critical for the Activity of MEK Kinase in MAPK Signaling.* American Society for Biochemistry and Molecular Biology, Experimental Biology April 2021, Virtual

10. *Biochemical and structural analysis of an antibody-glycopeptide complex to understand initial events in antibody-HIV-1 co-evolution.* American Chemical Society, April 2021, Macromolecular Chemistry: The Second Century, Virtual.

11. *Uncovering an Allosteric Site Critical for the Interaction between B-Raf and MEK Kinases and Downstream MAPK Signaling.* SBGrid Consortium Webinar. March 2021

12. *Biochemical and Structural Analysis of Antibody-Virus Co-Evolution to Guide HIV Vaccine Design Strategies.* Rowan University, College of Science and Mathematics, Department of Chemistry and Biochemistry, Invited Seminar, December 2020

13. *Analysis of the effects of protein-protein interactions on signaling through a team-based undergraduate biochemistry course*. 2020 Biennial Conference on Chemical Education. Abstract accepted March 31, 2020. Because of the global COVID-19 pandemic, the 2020 Biennial Conference on Chemical Education was terminated on April 2, 2020, by the Executive Committee of the Division of Chemical Education, American Chemical Society; and, therefore, this presentation could not be given.

14. *Structural Mimic of the HIV Envelope V3 Region Reveals Key Features of the DH270 Broadly Neutralizing Antibody Lineage Epitope and Stages of Affinity Maturation*. Duke Center for HIV/AIDS Vaccine and Immunology and Immunogen Discovery, Duke University, Durham, NC, October 2017

Grants (*since joining Swarthmore College in 2017*):

2026 – 2031	Redirecting Antibody Epitope Specificity with HIV-1 Env-Based Immunization. NIH NIAID 1R01AI200748-01 Co-Investigator ($472,874 – total direct costs to D. Fera) The major goal is to analyze, structurally, the mechanisms of antibody epitope switching between neutralizing and non-neutralizing epitopes on HIV-1 Env to inform the rational design of immunogens that elicit broadly neutralizing antibodies.
2024 – 2029	Dissection of protein kinase interactions and their effects on immune cells Camille and Henry Dreyfus Foundation, Henry Dreyfus Teacher-Scholar Award PI ($75,000) The proposed work will develop a high-resolution model of the MEK-ERK kinase complex. Together with an analysis of the effects of kinase mutations in immune cells, this work will identify allosteric sites that can be used to modulate downstream activity. This research is also incorporated into course-work.
2024 – 2026	Partnering with AI to scale up access to research experience for science majors Research Corporation for Science Advancement. Cottrell Scholar Collaborative Award

In Collaboration with Lead Cottrell Scholar Vera Gluscevic ($25,000)
The goal is to create a research coach using artificial intelligence tools that students can use when joining a research laboratory to get preliminary training.

2021 – 2025 Dissecting the interactions and conformations of protein kinases to understand biochemical signaling
Research Corporation for Science Advancement. Cottrell Scholar Award
PI ($100,000 – total direct costs)
The goal is to engage undergraduate research and upper-level biochemistry laboratory course students in the study of the Lyn protein kinase, which is critical in B-cell development and activation and therefore antibody production.

2021 – 2024 A Cottrell Scholars Workshop on Authentic Grading in STEM and Holistic Evaluation of Students' Performance
Research Corporation for Science Advancement. Cottrell Scholar Collaborative Award
In Collaboration with Lead Cottrell Scholar Mario Affatigato ($25,000)
The goal is to help faculty develop more authentic and equitable assessments of student abilities by hosting a workshop for the participants to hear about different grading practices that are becoming wore widely used in academia, and to extend the discussion toward a more holistic interpretation of students' abilities by going beyond measures like the GPA or GRE scores.

2020 – 2024 Jean Dreyfus Lectureship for Undergraduate Institutions
PI ($18,500)
The goal is to support lectures by a leading researcher in the chemical sciences and support summer research and scientific advancement for two undergraduates.

2020 – 2024 Dissecting Interactions of Protein Kinases Critical to Antibody Production
The Pittsburgh Foundation UN2020-114825
PI ($100,000 – total direct costs)
The goal is to engage both undergraduate student researchers and biochemistry laboratory course students in interrogating interactions among MEK and ERK protein kinases and their effects on the development of antibodies

2020 – 2024 Analysis of the initiation of an HIV Broadly Neutralizing Antibody Lineage in a Single Host.
NIH NIAID 1R15AI150484 - 01A1
PI ($250,000 – total direct costs)
The major goal is to analyze, structurally, the initiation of a virus-antibody "arms race" in a donor who developed antibodies of significant breadth, which would be informative for immunogen design.

2020 Developing and integrating course-based undergraduate research experiences (CUREs) across the Tri-College communities.
Mellon Tri-College Faculty Forum Brainstorming Grant.
Co-PI with Dr. Louise Charkoudian and Dr. Yan Kung. ($600)
The major goal is to integrate the development and execution of course-based undergraduate research experiences in various STEM disciplines.

2018 – 2019 Expanding the impact of biochemistry course-based undergraduate research experiences (CUREs) by integrating efforts across the Tri-College communities.
Mellon Tri-College Faculty Forum Brainstorming Grant.

Co-PI with Dr. Louise Charkoudian and Dr. Yan Kung. ($300)
The major goal was to identify ways to integrate the development and execution of biochemistry course-based undergraduate research experiences.

2017 – 2018 Structural analyses of antibody-virus complexes to guide immunogen design.
amFAR Mathilde Krim Fellowship in Basic Biomedical Research, Phase II
PI ($69,565.22 – total direct costs for 1-year period)
The major goal was to biochemically and structurally investigate an earlier member of a broadly neutralizing N332-glycan dependent antibody lineage in complex with the HIV envelope to determine features of the HIV envelope that triggered this lineage, and contribute to vaccine design strategies.

Teaching Activities (*at* Swarthmore College):

Courses: Biological Chemistry I Lecture (CHEM038)
Spring semesters: 2023, 2024
Biological Chemistry I Laboratory (CHEM038)
Spring semesters: 2018, 2019, 2020, 2022, 2023**,** 2024, 2026
Biological Chemistry II (CHEM048)
Fall semesters: 2017, 2018, 2019, 2021
Advanced Experimental Biological Chemistry (CHEM058)
Fall semesters: 2018, 2019, 2021, 2023, 2025
Special Topics in Biochemistry and its Applications (CHEM118)
Spring semesters: 2018, 2019, 2020, 2022
Senior Thesis Workshop (CHEM199)
Fall semester: 2023, Spring Semester 2024

Research: Research Project (CHEM094)
Fall semesters, 2018, 2023, Spring semesters: 2018, 2019, 2022, 2023, 2024, 2026
Research Thesis (CHEM096)
Fall semester: 2024, Spring semesters: 2023, 2025
Honors – Thesis Research (CHEM180)
Fall semesters: 2018, 2019, 2021, Spring semesters: 2019, 2020, 2022

Teaching Activities (*before* Swarthmore College**):**

2015 – 2016 **Adjunct Professor of Chemistry,** School of Arts and Sciences, Massachusetts College of Pharmacy and Health Sciences
Principles of Chemistry Laboratory I

2014 – 2015 **Adjunct Faculty,** Department of Chemistry and Physics, Emmanuel College
Principles of Chemistry I Lecture and Laboratory

2014 **Adjunct Faculty,** Department of the Sciences, Wentworth Institute of Technology
Engineering Chemistry I Lecture and Laboratory

2007 – 2008 **CTL Graduate Fellow,** Center for Teaching and Learning, University of Pennsylvania
Teaching Workshops – organized and held teaching workshops for graduate students and postdoctoral fellows

2006 – 2007 **General Chemistry Teaching Assistant,** Chemistry Department, University of Pennsylvania

Principles of Chemistry I/II Lecture Demos and Recitations

2005 – 2006 **Math Teacher**, College Now Program, York College/Far Rockaway HS
SAT preparatory course

2005 – 2006 **Math Teacher of Algebra and Trigonometry,** Math Department, Frederick Douglass Academy VI High School
Algebra and Trigonometry

2003 – 2006 **General Chemistry Recitation Teaching Assistant,** Chemistry Department, New York University
Principles of Chemistry I/II Recitations

2002 – 2004 **General Chemistry Clinic Instructor,** Chemistry Department, New York University
Principles of Chemistry I/II Clinics

Supervision of Student Research (*at* Swarthmore College**):**

Year	**Student**	**Last Career Path Known**
2025	Ainsley Madden ‘28	Current Student
2025	Presley Simelus ‘28	Current Student
2025	Amba Darst-Campbell ‘27	Current Student
2025	Safaa Mohamed Aly ‘28	Current Student
2023 – 2025	Carlos Garcia ‘27	Current Student
2023 – 2024	Aaron Thammavonxay ‘25	Healthcare startup
2023 – 2024	Eleanor Streeper ‘26	Research Assistant, Dana Farber Cancer Institute
2023	Masaki Fujishiro ‘24	Japanese Medical School student
2023	Robert Mirabello ‘25	Unknown
2022 – 2023	Yurika Ryu ‘24	Japanese student
2022	Quynn Hotan ‘23	MD/PhD Student
2021 – 2023	Ming Ye ‘23	Graduate Student, MIT
2022	Daniel Naagaard ‘24	MS Student, KTH Royal Institute of Technology
2021 – 2023	Gwendolyn Glatz ‘22	Medical Student
2021 – 2023	Molly Erdman ‘23	MD/PhD Student,
2021 – 2022	Sabrina Lin ‘23	Graduate Student, Weill Cornell
2021	Maxwell Finkelstein ‘22	MD/PhD Student, University of North Carolina
2020 – 2022	Tammy Pham ‘24	Unknown
2020 – 2021	Emma Parker-Miller ‘22	Graduate Student, Cornell University
2020 – 2021	Paul Seth ‘23	PhD Student, University of Utah
2019	Erik-Stephane Stancofski ‘21	Medical Student
2019 – 2021	Sarah Leonard, ‘21	Unknown
2019	Adam Mermelstein, ‘21	Ophthalmic Technician, Kremer Eye Center
2019	Hussain Zaidi, ‘22	Unknown
2019 – 2020	Pearl Zhang, ‘22	Web Developer, Generation Labs LLC
2018 – 2019	Naomi Bronkema, ’20 (honors)	Graduate Student, Scripps Research Institute
2018 – 2019	Emilie Morse, ‘20	Medical Assistant
2018 – 2019	Julia Morriss, ’19 (honors)	Graduate Student, Harvard University
2017 – 2019	Diep Nguyen, ‘19	Medical Student
2017 – 2019	Therese Ton, ‘19	Research Coordinator, Astria Therapeutics, Inc.
	Jeffrey Zhou, ’19 (honors)	Medical Student

College and Departmental Service

2025	Department Chair
2021 – 2022, 2023 – 2024	Inclusive Excellence Committee
2019 – 2020, 2023 – 2024	Institutional Biosafety Committee (Chair)
2021 – 2022, 2023 – 2024	Department Colloquium Coordinator
2020 – 2020	Student Life Continuity: Health and Wellness sub-Committee
2019 – Present	Richard Rubin Scholar Mentor
2018 – 2022	Department Academic Assessment Liaison
2018 – 05/19	Fellowships and Prizes Committee

Service to the Scientific/Academic Community outside of Swarthmore

2025	Panel Speaker, Chemistry and Biology Interface Training Program Lunch, UPenn
2023	Community Reviewer, Frontiers in Immunology
2019	Panel Speaker, UPenn Career Services Academic Job Search Series for Ph.D. students and postdoctoral fellows
2019	Session Chair, HIV Vaccines (X7) Keystone Symposia, Whistler, British Columbia Canada
2018 – present	Scientific Advisory Committee member, amfAR, The Foundation for AIDS Research
2017 – present	Ad Hoc Reviewer for Scientific Journals
2016	Moderator, Antibody Viral Co-evolution Workshop, Los Alamos, NM (New Mexico Consortium)

Professional Development

2025	Academic Leader Training (ALT) Workshop, John's Hopkins University
2024	Enhancing Assessment of Student Learning in Your CURE
2022	ICABL Workshop on Summative Assessment in Biochemistry and Molecular Biology
2021	Cryo-EM Training at NIH National Center for CryoEM Access and Training
2019	Course Development Workshop for Flexible Learning Spaces, Swarthmore College
2018	The Scientific Institute, Yale's Center for Teaching and Learning
2017	The Cottrell Scholars Collaborative New Faculty Workshop

Memberships:

2025	Penn Center for AIDS Research
2025	Penn Institute of Structural Biology
2021	American Society for Biochemistry and Molecular Biology
2018	Sigma Xi
2012	American Chemical Society
2005	Phi Lambda Upsilon