Saniya Virani

Curriculum Vitae

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Professional Summary

PhD trained medicinal chemist with extensive experience leading multidisciplinary drug discovery projects focused on medicinal chemistry, computational modeling, and translational therapeutic development. Expertise in designing and optimizing small molecules through structure-based drug design, molecular docking, molecular dynamics simulations, and synthetic chemistry. Proven ability to manage complex research projects, optimize laboratory operations, mentor researchers, and collaborate across scientific disciplines to advance innovative therapeutic strategies from concept through preclinical evaluation.

Education

2020 – 2026 **Ph.D. in Chemistry**, *Purdue University*, West Lafayette, IN.
- Advisor: Dr. Gaurav Chopra
- Concentration: Medicinal & Analytical Chemistry
- Thesis: "*Computatinally Guided Design ans Synthesis of Multifunctional Therapeutics for Targeted Modulation of Lipid and Immune Pathways*"
- Group: Chopra Lab

2016 – 2018 **Master of Science in Organic Chemistry**, *Georgia State University*, Atlanta, GA.
- Advisor: Dr. Suazette Reid Mooring
- Concentration: Medicinal Organic Chemistry
- Thesis: "*Synthesis & Analysis of Pyridine Derivatives as Small Molecule Antagonists of CXCR4*"
- Group: Mooring Research Group

2013 – 2016 **Bachelor of Science in Chemistry**, *Georgia State University*, Atlanta, GA.
- Concentration: Biochemistry

Technical Skills

Simulation	GROMACS - Molecular Dynamics
Docking	CANDOCK, AutoDock Vina, BIOVIA Discovery Studios, & Pymol
Programming	Python, RStudio, Bash, Docker, & Apptainer
Chemistry	ChemDraw, Topspin, & ACD Labs
OS	Linux (Ubuntu), macOS, Windows

Laboratory Skills

- Laboratory Safety and Compliance
- Synthesis of Small Molecules
- SAR Analysis (SAR)
- Extraction & Purification of Molecules
- Gas Chromatography
- High-Performance Liquid Chromatography
- Proton and Carbon NMR
- Preparatory Plate TLC
- Project Management
- Design of Molecules for Target Proteins
- Synthesis of Air-sensitive Reactions
- Hit-to-Lead Optimization and Development
- Flash Column Chromatography
- Thin Layer Chromatography
- Mass Spectrometry
- 2D Chromatography

Work Experience

2020 – 2026 **Graduate Researcher**, *Purdue University*.

- Advisor: Dr. Gaurav Chopra | Department of Chemistry
- Led multidisciplinary drug discovery projects focused on developing immunomodulatory small molecules and bifunctional therapeutics for targeted cell-specific delivery and modulation of multiple disease pathways.
- Designed and executed complex multistep synthetic strategies from hit identification through lead optimization, improving compound yield, purity, and synthetic scalability.
- Directed computational structure-based drug design using molecular docking (AutoDock Vina, CANDOCK) and molecular dynamics simulations (GROMACS) to guide medicinal chemistry decisions.
- Integrated computational modeling with experimental medicinal chemistry to prioritize lead compounds and accelerate design cycles.
- Characterized synthesized compounds using NMR, HRMS, and chromatographic purification systems including CombiFlash.
- Conducted structure-activity relationship (SAR) analyses to optimize biological activity and pharmacological properties.
- Performed literature surveillance and competitive landscape analyses to identify emerging therapeutic targets and guide research strategy.
- Managed laboratory operations as Laboratory Safety Officer, ensuring regulatory compliance, laboratory safety, chemical inventory management, and efficient research workflows.
- Collaborated with interdisciplinary scientists across chemistry, computational biology, and pharmacology to advance translational research programs.
- Mentored junior researchers and provided technical guidance on experimental design, computational workflows, and laboratory best practices.

2018 – 2020 **Laboratory Coordinator**, *Georgia State University*.

- Supervisor: Stephanie Young
- Managed daily operations of instructional chemistry laboratories supporting hundreds of undergraduate students, graduate teaching assistants, and faculty.
- Supervised, trained, and scheduled graduate and undergraduate teaching assistants while coordinating laboratory staffing and workflow.
- Directed laboratory safety initiatives by implementing safety protocols, maintaining SDS documentation, conducting compliance inspections, and managing hazardous chemical inventories.
- Coordinated procurement, inventory control, chemical waste disposal, and laboratory equipment maintenance using Chematix.
- Developed and validated new laboratory experiments and protocols prior to course implementation.
- Prepared reagents, standards, experimental materials, and instructor resources while ensuring consistency and quality across laboratory sections.
- Troubleshot laboratory instrumentation and coordinated maintenance to minimize operational downtime.

2016 – 2018 **Graduate Researcher**, *Georgia State University*.

- Advisor: Dr. Suazette Mooring
- Designed and synthesized novel CXCR4 antagonists targeting cancer-related signaling pathways using medicinal chemistry approaches.
- Optimized synthetic methodologies including air- and moisture-sensitive reactions to improve reaction efficiency and reproducibility.
- Purified and characterized compounds using flash chromatography, preparative TLC, NMR spectroscopy, IR, UV-Vis spectroscopy, and mass spectrometry.
- Collaborated with researchers at Emory University to support biological evaluation and structure-activity relationship studies.
- Maintained laboratory inventories, managed hazardous waste, and ensured compliance with institutional laboratory safety requirements.

2015 – 2016 **Undergraduate Researcher**, *Georgia State University*.
- Advisor: Dr. Suazette Mooring
- Investigated microwave-assisted synthetic methodologies to improve reaction efficiency and product yield.
- Optimized reductive amination protocols for synthesis of CXCR4 inhibitor candidates.

2015 – 2016 **Peer-Led Team Learning Lead**, *Georgia State University*.
- Supervisor: Dr. Suazette Mooring
- Facilitated collaborative workshops improving student engagement and scientific problem-solving.
- Developed instructional materials and mentored undergraduate students in chemistry coursework.

2015 **Undergraduate Research Student**, *Georgia State University*.
- Supervisor: Dr. Jun Ying
- Performed molecular biology techniques including PCR, cloning, bacterial transformation, and gel electrophoresis to support TRAF6 protein expression studies.

2014 – 2016 **Statistics Learning Assistant**, *Georgia State University*.
- Supervisor: Dr. Leslie Meadows
- Provided individualized instruction in statistics, data analysis, and Excel.
- Conducted review sessions and supported student learning through tutoring and assessment preparation.

Publications

Pre-Print

In Progress **Saniya Virani**, Katherine Walker, Surabhi Pandey, Pooja Saklani, KanagaVijayan Dhanabalan, Caitlin Randolph, and Gaurav Chopra, "Cell-Specific Bifunctional Molecule Targetting ELOVL1 to Reduce Toxic Fatty Acids".

In Progress Pooja Saklani, **Saniya Virani**, Ahad Hossain, Krushna C. Hembram, Lu Bai, Guang Yang, and Gaurav Chopra, "Screening of DGAT2 Degraders".

In Progress KanagaVijayan Dhanabalan,**Saniya Virani**, Pooja Saklani, and Gaurav Chopra, "Structural Insights into DGAT2: A Review Based on Predicted Model".

In Progress KanagaVijayan Dhanabalan, Pooja Saklani, **Saniya Virani**, Jitika Rajpoot, Ramaswamy Subramanian, and Gaurav Chopra, "Predictive Structural Analysis of DGAT2 and Its Role in Lipid Biosynthesis".

In Progress Gabriel Amankwah, Deepti Nehra, Guang Yang, Surabhi Pandey, **Saniya Virani**, Ruilin Yu, Mayuri Patel, Tanner Wolov, David Foreman, Yihao Chen, Katherine Walker, Jitika Rajpoot, Victoria Wendt, and Gaurav Chopra, "Bridging In Silico and Experimental ADMET Profiling: A Multi-Dataset Benchmark Study".

In Progress Ahad Hossain, Pooja Saklani, Ruilin Yu, Krushna C. Hembram, Guang Yang, **Saniya Virani**, Lu Bai, Jessie Fu, Mayuri Patil, Katherine A. Walker, Sam Alakhras, Krupal P. Jethava, and Gaurav Chopra, "MemTAD: Membrane Targeted Degradation of Immune Checkpoints using Small Molecule Degraders".

In Progress Jitika Rajpoot, Ahad Hossain, Victoria Wendt, Pooja Saklani, Krushna C. Hembram, Palak Manchanda, Kanchan Bisht, Kaushik Sharma, Evangelia Paouri, Guang Yang, Yihao Chen, Lu Bai, **Saniya Virani**, Jessie Fu, Alexandra Wildridge, Mayuri Patil, Harshit Arora, Dimitrios Davalos, Scot J. Stone, and Gaurav Chopra, "Targeting DGAT2 degradation for reducing lipid droplets to combat Alzheimer's Disease".

arXiv Matthew Muhoberac, Atharva Parikh, Nirvi Vakharia, **Saniya Virani**, Aco Radujevic, Savannah Wood, Meghav Verma, Dimitri Metaxotos, Jeyaraman Soundararajan, Thierry Masquelin, Alexander G. Godfrey, Sean Gardner, Dobrila Rudnicki, Sam Michael, and Gaurav Chopra, "State and Memory is All You Need for Robust and Reliable AI Agents", *arXiv*. 2507.00081, 2025. https://arxiv.org/abs/2507.00081.

Journal Articles

2024 Baskar Ramdas, Neetu Dayal, Ruchi Pandey, Elizabeth Larocque, Rahul Kanumuri, Santhosh Kumar Pasupuleti, Sheng Liu, Chrysi Kanellopoulou, Elizabeth Fei Yin Chu, Rodrigo Mohallem, **Saniya Virani**, Gaurav Chopra, et al. Alkynyl nicotinamides show antileukemic activity in drug-resistant acute myeloid leukemia. *Journal of Clinical Investigation*, volume 134, page e169245, 2024. https://doi.org/10.1172/JCI169245.

2023 Partha Radhakrishnan Santhakumari, KanagaVijayan Dhanabalan, **Saniya Virani**, Amber S Hopf-Jannasch, Joshua B Benoit, Gaurav Chopra, and Ramaswamy Subramanian. Variability in phenylalanine side chain conformations facilitates broad substrate tolerance of fatty acid binding in cockroach milk proteins. *PLoS One*, volume 18, page e0280009, 2023. https://doi.org/10.1371/journal.pone.0280009.

2019 **Saniya Virani**, Zhongxing Liang, Younghyoun Yoon, Hyunsuk Shim, and Suazette R. Mooring. Synthesis and evaluation of 2,5-diamino and 2,5-dianilinomethyl pyridine analogues as potential cxcr4 antagonists. *Bioorganic and Medicinal Chemistry Letters*, volume 29, pages 220–224, 2019. https://doi.org/10.1016/j.bmcl.2018.11.052.

2019 Theresa Gaines, Francisco Garcia, **Saniya Virani**, Zhongxing Liang, Younghyoun Yoon, Yoon Hyeun Oum, Hyunsuk Shim, and Suazette Reid Mooring. Synthesis and evaluation of 2,5-furan, 2,5-thiophene and 3,4-thiophene-based derivatives as cxcr4 inhibitors. *European Journal of Medicinal Chemistry*, volume 181, page 111562, 2019. https://doi.org/10.1016/j.ejmech.2019.111562.

Theses

2026 **Saniya Virani**, "Computational Design and Synthesis of Multifunctional Therapeutics for Targeted Modulation of Lipid and Immune Pathways", *Doctor of Philosophy - Thesis*, Purdue University, 2026. https://doi.org/10.25394/PGS.32764644.

2018 **Saniya Virani**, "Synthesis and Analysis of Pyridine Derivatives as Small Molecule Antagonists of CXCR4", *Master of Science - Thesis*, Georgia State University, 2018. https://doi.org/10.57709/12416622.

Poster Presentations

2024 Matthew Muhoberac, Connor Beveridge, Sanjay Iyer, Nirvi Vakharia, Atharva Parikh, **Saniya Virani**, and Gaurav Chopra, "A Specialized Platform for Innovative Research Exploration Ledger for Interactive Query eXecution (ASPIRE-LINQX)", *Merck-Purdue Symposium at Purdue University*, West Lafayette, IN, May 2024.

2023 Matthew Muhoberac, Sanjay Iyer, **Saniya Virani**, and Gaurav Chopra, "SciBORG: Scientific Bespoke Artificial Intelligence Agents Optimized for Research Goals", *Merck-Purdue Symposium at Purdue University*, West Lafayette, IN, May 2023.

2018 **Saniya Virani** and Suazette R. Mooring, "Synthesis and Analysis of Pyridine Derivatives as Small Molecules Antagonists of CXCR4", *Chemistry Graduate Student Association Symposium*, Atlanta, GA, March 2018.

2017 **Saniya Virani** and Suazette R. Mooring, "Synthesis of Chemokine Receptor Type 4 (CXCR4) Antagonists", *Southeastern Regional Meeting of the American Chemical Society*, Charlotte, NC, November 2017.

2017 **Saniya Virani**, Theresa Gaines, Francisco Garcia, and Suazette R. Mooring, "Synthesis of Chemokine Receptor Type 4 (CXCR4) Antagonists", *National Organization for the Professional Advancement of Black Chemists and Chemical Engineers Annual Meeting*, Minneapolis, MN, October 2017.

2017 **Saniya Virani**, Theresa Gaines, Francisco Garcia, and Suazette R. Mooring, "Synthesis of Chemokine Receptor Type 4 (CXCR4) Antagonists", *Chemistry Graduate Student Association Symposium*, Atlanta, GA, March 2017.

2016 **Saniya Virani** and Suazette R. Mooring, "Synthesis of Chemokine Receptor Type 4 (CXCR4) Antagonists", *National Organization for the Professional Advancement of Black Chemist and Chemical Engineers Annual Meeting*, Raleigh, NC, November 2016.

2016 **Saniya Virani**, Damilola Gbadebo, and Suazette R. Mooring, "Comparison of Conventional and Microwave-assisted Synthesis of Chemokine Receptor Type 4 (CXCR4)", *Georgia State Undergrad Research Conference*, Atlanta, GA, April 2016.

Undergraduate Mentorship

- Paige Davis (Feb 2023 – Apr 2024)
- Mia Martinez (Feb 2023 – Apr 2024)
- Effibe Ahoulou (Jun 2018 – Jul 2018)
- Zakiria Mays (Aug 2017 – Jul 2018)
- Tamra Blue (May 2017 – Dec 2017)
- Kyle Vuong (May 2017 – Jul 2017)
- Maria Hernandez (Jun 2017 – Jul 2017)

Awards

2013 – 2016 Zell Miller Scholarship – Georgia State Universtiy

2013 – 2016 1913 Founders Scholarship – Georgia State Universtiy

Professional Affiliations

2022 – 2023 Local American Chemical Society: Communications Representative at Purdue University.

2021 – 2022 Iota Sigma Pi: Outreach Chair at Purdue University.

2017 – 2018 Chemistry Graduate Student Association: Master's Representative at Georgia State University.

2017 – 2018 NOBCChE: Vice President at Georgia State University.

2013 – 2016 Honors Student Organization: Member at Georgia State University.

2014 – 2016 Chemistry Club: Member at Georgia State University.

2014 – 2016 Pre-Pharmacy Professional Society: Member at Georgia State University.

2013 – 2016 Undergrad STEM Research Society at Georgia State University.

References

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