ISMAIL A. AHMED

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EDUCATION

New York University Grossman School of Medicine — New York, NY
Postdoctoral Research Fellow, Neuroscience — 09/2019 – present

Advisor: Dr. Robert Froemke
The Development of Chemical Tools to Control and Detect Oxytocin in Modulation of Social Behavior

University of Pennsylvania, School of Medicine — Philadelphia, PA
Ph.D. in Biochemistry and Molecular Biophysics — 08/2012 – 05/2019

Advisor: Dr. Feng Gai
Thesis: *The Development of Unnatural Amino Acid-Based Probes and Methods for Biological Studies*

The City College of New York (CUNY) — New York, NY
B.S. in Biochemistry — 08/2006 – 09/2011

Advisor: Dr. Ronald Koder
Thesis: *Measuring Cofactor Binding in Designer Heme-Binding Proteins*

RESEARCH INTERESTS

My primary goal is to unravel the mechanisms behind neuropeptide signaling in both the mammalian central and peripheral nervous systems. Specifically, I am interested in how these signaling pathways impact social behavior in both physiological and pathological states. My research centers on two key neuropeptides: oxytocin and vasopressin. To achieve this, I leverage a multidisciplinary approach that combines the development of advanced chemical and molecular tools for real-time tracking and manipulation of neuropeptides in living organisms along with a range of techniques including electrophysiology, optics, and behavioral analysis.

GRANTS AND AWARDS **completed research grants are marked with an asterisk*

Career Awards at the Scientific Interface (CASI) — **$500,000**
Burroughs Wellcome Fund — 2023 – 2028

Scholar to Faculty Pathway Award — **$160,000**
NYU Grossman School of Medicine — 2023 – 2025

Postdoctoral Enrichment Program Fellowship — **$60,000**
Burroughs Wellcome Fund — 2021 – 2024

NIH Blueprint D-SPAN Award (K00) — **$318,800**
National Institute of Mental Health (NIMH) — 2019 – 2023
Grant Number: 8K00 MH123667

NIH F99 Blueprint D-SPAN Award (F99)* — **$55,000**
National Institute of Mental Health (NIMH) — 2018 – 2019
Grant Number: 1F99 NS108544

NIH T32 Interdisciplinary Cardiovascular Training Grant* — **$90,000**
University of Pennsylvania — 2016 – 2018
Grant Number: T32 HL007954

NIH PREP Scholar* — **$24,000**
Case Western Reserve University — 2011 – 2012
NIH R25GM075207

NIGMS MARC USTAR Grant* — **$30,000 + Full Tuition Support**
City College of New York — 2010 – 2012

Grant Number: 25 T34-GM007639-29

TEACHING & MENTORING EXPERIENCE

UPenn High School Biomedical Research Academy — Summer, 2018
Lead Journal Club Instructor

UPenn, Department of Chemistry: Grant Writing Seminar — Spring, 2018
Teaching Assistant

UPenn, Upward Bound Academy — Summer 2012-2014
Laboratory Instructor

Past Mentees:

Kelsey Wun (NYU) — 2022 – 2023
Undergraduate Research Assistant

Michelle Qu (Touro College of Osteopathic Medicine) — 2021 – 2022
Medical Research Assistant

Ayo Adewakun, (NYU) — 2020 – 2022
Undergraduate Research Assistant

Sydney Hart, (NYU) — 2020 – 2021
Graduate Rotation Student

Christina Eng, (UPenn) — 2017 – 2019
Undergraduate Research Assistant

Lilliana Ortiz Rodriguez, (U of Puerto Rico, Humacao) — 2016 – 2018
Undergraduate Research Assistant

Mariana León Berríos (U of Puerto Rico, Cayey) — 2016 – 2018
Undergraduate Research Assistant

PUBLICATIONS *(*asterisk denotes co-first authorship)*

1. **Ahmed IA**, Liu J, Gieniec KA, Bair-Marshall CJ, Adewakun AB, Hetzler BE, Arp C, Khatri L, Vanwalleghem GC, Seidenberg AT, Cowin P, Trauner D, Chao MV, Tsien RW, Davis FM, Froemke RC. "Optopharmacological tools for precise spatio-temporal control of oxytocin signaling in the central nervous system and periphery." BioRxiv (2022). (Currently Under revision at *Nature Methods*)
2. **Ahmed I**, Armstrong A, Clemons TA, Clune-Taylor C, Love-Rutledge ST, Phillips MA, Rogers CD, Williams MJ. How do DEI initiatives impact STEMM, and why do we still need them? Cell (2023) 186(12):2506-2509.
3. Mukherjee D*, **Ahmed IA***, Gai F. "Site-specific Interrogation of Protein Structure and Stability." *Methods Mol Biol.* (2022) 2376:65-87. | Book chapter in Volume 685 "New Experimental Probes for Enzyme Specificity and Mechanism" edited by John P. Richard and Graham R. Moran.
4. Fong KP, **Ahmed IA**, Mravic M, Jo H, Kim OV, Litvinov RI, Weisel JW, DeGrado WF, Gai F, Bennett JS. "Visualization of Platelet Integrins via Two-Photon Microscopy Using Anti-transmembrane Domain Peptides Containing a Blue Fluorescent Amino Acid." *Biochemistry.* (2021) Jun1;60(21):1722-1730.
5. Micikas RJ*, **Ahmed IA***, Acharyya A, Smith AB, Gai F. "Tuning the electronic transition energy of indole via substitution: application to identify tryptophan-based chromophores that absorb and emit visible light." *Phys Chem Chem Phys.* (2021) Mar 21;23(11):6433-6437.
6. Acharyya A*, **Ahmed IA***, Gai F. "4-Cyanoindole-based fluorophores for biological spectroscopy and microscopy." *Methods Enzymol.* (2020) 639:191-215. | Book chapter in Volume 639 "Chemical Tools for Imaging, Manipulating, and Tracking Biological Systems: Diverse Methods for Optical Imaging and Conjugation" edited by David M. Chenoweth.
7. **Ahmed IA**, Rodgers JM, Eng C, Troxler T, Gai F. "PET and FRET utility of an amino acid pair: tryptophan and 4- cyanotryptophan." *Phys Chem Chem Phys*. (2019) Jun 28;21(24):12843-12849.

8. Zhang K*, **Ahmed IA***, Kratochvil HT, DeGrado WF, Gai F, Jo H. "Synthesis and application of the blue fluorescent amino acid l-4-cyanotryptophan to assess peptide-membrane interactions." *Chem Commun* (Camb). (2019) Apr 25;55(35):5095-5098.
9. **Ahmed IA**, Acharyya A, Eng CM, Rodgers JM, DeGrado WF, Jo H, Gai F. "4-Cyanoindole-2'-deoxyribonucleoside as a Dual Fluorescence and Infrared Probe of DNA Structure and Dynamics." *Molecules.* (2019) Feb 8;24(3):602.
10. Hilaire MR*, **Ahmed IA***, Lin CW, Jo H, DeGrado WF, Gai F. "Blue fluorescent amino acid for biological spectroscopy and microscopy." *Proc Natl Acad Sci* U S A. (2017) Jun 6;114(23):6005-6009.
11. **Ahmed IA**, Gai F. Simple method to introduce an ester infrared probe into proteins. *Protein Sci.* (2017) Feb;26(2):375-381.
12. Markiewicz BN, Lemmin T, Zhang W, **Ahmed IA**, Jo H, Fiorin G, Troxler T, DeGrado WF, Gai F. "Infrared and fluorescence assessment of the hydration status of the tryptophan gate in the influenza A M2 proton channel." *Phys Chem Chem Phys*. (2016) Oct 19;18(41):28939-28950.
13. Pazos IM*, **Ahmed IA***, Berríos MI, Gai F. "Sensing pH via p-cyanophenylalanine fluorescence: Application to determine peptide pKa and membrane penetration kinetics." *Anal Biochem.* (2015) Aug 15;483:21-6.
14. Mutter AC, Norman JA, Tiedemann MT, Singh S, Sha S, Morsi S, **Ahmed I**, Stillman MJ, Koder RL. "Rational design of a zinc phthalocyanine binding protein." *J Struct Biol.* (2014) Feb;185(2):178-85
15. Zhang L, Anderson JL, **Ahmed I**, Norman JA, Negron C, Mutter AC, Dutton PL, Koder RL. "Manipulating cofactor binding thermodynamics in an artificial oxygen transport protein." *Biochemistry.* (2011) Nov 29;50(47):10254-61.

SELECT HONORS & AWARDS

2023 – 2028	Burroughs Wellcome Fund Career Awards at the Scientific Interface (CASI) Award
2023	ACNP Travel Award
2023 – 2025	NYU Grossman School of Medicine Scholar to Faculty Pathway Award
2022	Rising Stars in Biomedical Engineering, Columbia and Johns Hopkins University
2022	Optogenetics Gordon Research Conference (OptoGRC) Excellence in Citizenship Award
2022	The Carl Storm Underrepresented Minority Fellowship
2021 – 2024	Burroughs Wellcome Fund Postdoctoral Enrichment Program (PDEP) Fellowship
2021	Neuroscience Scholars Program Associate (*Society for Neuroscience*)
2021	1000 Inspiring Black Scientists in America, Rising Star (*Cell Press*)
2020	NIH Loan Repayment Program under Pediatric (National Institute of Mental Health (NIMH)
2020	100 More Inspiring Black Scientists, Rising Star (*Cell Press*)
2019	IBRO-RIKEN CBS Summer Program Travel Grant
2019	UPenn graduate nominee for Regeneron Prize for Creative Innovation
2018	Rising Stars in Biomedical, MIT
2019 – 2023	NIH F99/K00 Blueprint D-SPAN Award, National Institute of Mental Health (NIMH)
2018	UPenn Biomedical Graduate Studies Travel Award
2017	Leslie Dutton Award (best paper published by UPenn BMB graduate student)
2017	Fontaines Society, UPenn Research Travel Award
2011	Golden Key Honor Society
2011	Ira and Cecille Weber Scholarship in Biomedical Research (City College)

2009	Anne S. Kheel Scholarship in Community Service (City College)

INVITED RESEARCH SEMINARS

06/2023	Princeton Neuroscience Institute, TigerBrain: Postdoc Scholars Symposium
05/2023	American Society for Pharmacology and Experimental Therapeutics (ASPET), St. Louis, MO
04/2023	Center for Translational Social Neuroscience, Emory University
01/2023	Emerging Leaders in Neuroscience, Weill Cornell
02/2023	SYNAPSES Postdoctoral seminar series, Yale
01/2023	Emerging Leaders in Neuroscience, Weill Cornell
11/2022	Imaging in the Bay Symposium, UC Berkeley
11/2022	Wu Tsai Neuroscience Institute, Stanford University
11/2022	Laboratory of Neuroendocrinology Seminar (LNE) Series, UCLA
09/2022	Postdoctoral Rising Stars Symposium, University of Utah
09/2022	Neurocircuitry of Social Behavior Keystone Symposia, Daejeon, South Korea
06/2022	Society for Behavioral Neuroendocrinology, Atlanta
06/2022	Oxytocin / Vasopressin Workshop, Erice, Italy
04/2022	The City College of New York, Dept. of Biology
04/2022	NYU Dental, Pain Research Center
03/2022	Pace University, Dept. of Biology
03/2022	NYU Langone, Neuroscience Institute
03/2021	NYU Langone, Neuroscience Institute, Oxytocin Group
03/2021	UPenn, Biology Dept.
03/2020	American Chemical Society (ACS) Spring Meeting (Biomembrane Synthesis, Structure, Mechanics & Dynamics)
12/2020	The City College of New York, Dept. of Biology
01/2019	NYU Langone, The Skirball Institute of Biomolecular Medicine
01/2019	MIT Media Lab, Synthetic Neurobiology Group
04/2018	The College of New Jersey, Dept. of Chemistry
11/2017	UPenn Biochemistry and Biophysics. Dept. Annual Retreat (received from Dutton Award)

SERVICE, OUTREACH & DEI ACTIVITIES

2023	*Symposium Co-Chair* **|** Chemical Tools in Neuroscience, Mediterranean Neuroscience Society
2023	*Symposium Chair* **|** Molecular Tools in Neuroscience, Society for Neuroscience
2021 – 2022	*Committee Member* **|** CoNNExINS Colloquium Planning Committee, NYU Neuroscience
2021 – Present	*Committee Member* **|** Society for Neuroscience, Trainee Advisory Committee
2021 – 2022	*Mentor* | Summer Research Immersion Program, Skirball Institute, NYU
2020 – Present	*Founder and Director* **|** BioDiverseStory: BIPOC Scientists Speaker Series, NYU
2021	*Chair* **|** Symposium on Diversity of Social Behavior, NIH Brain Initiative
2020 – 2022	*Mentor* **|** Clear Direction, NYU (1-on-1 STEMM mentoring of high school students)

2020 – 2022 *Committee Member* | Diversity, Equity, Inclusion (DEI) Committee, Skirball Institute, NYU

2019 – 2022 *Board Member* | NYU Neuroscience Outreach Group (NOGN), Diversity Initiative Lead

2016 – 2017 *Committee Member* | UPenn Graduate School's Equity & Access Committee

2015 – 2016 *Graduate Representative* | for UPenn's Biomedical Graduate Student Assembly

PROFESSIONAL MEMBERSHIPS

2019 – present Society for Neuroscience (SfN)

2016 – present American Chemical Society (ACS)

2009 – present Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)