

Nicole C. Colussi, Ph.D.

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EDUCATION

University of Pittsburgh, Pittsburgh, PA

Aug 2020 – Nov 2025

Ph.D. in Molecular Pharmacology

Dissertation: Nitrated fatty acids are endogenous regulators of systemic inflammation

Advisor: Francisco Schopfer

University of the Sciences, Philadelphia, PA

Aug 2016 – May 2020

B.S. in Pharmacology and Toxicology, Summa Cum Laude

CORE SKILLS

Chromatography & Mass Spectrometry

- HPLC/UHPLC (reverse phase, HILIC)
- LC-MSMS (Sciex 6500+ QTRAP, Thermo Q Exactive)
- GC-MS (EI, CI)
- HPLC-UV-Vis/CAD
- Routine maintenance & troubleshooting

Lipidomic/Small Molecule Workflows

- Biological sample processing for MS
- Organic, liquid-liquid extractions
- Solid phase extraction
- Deproteinization
- Chemical derivatization

Biological Techniques

- Mammalian cell culture
- Animal handling and dosing
- Tissue and biofluid collection
- qRT-PCR & western blot

Communication & Teamwork

- Scientific presentations
- Interdisciplinary collaboration
- Mentorship
- Manuscript preparation

Data Analysis & Software

- XCalibur
- Chromeleon
- LIPID MAPS
- GraphPad Prism
- CorelDraw

- Analyst
- Compound Discoverer
- PEAKS
- ChemDraw
- Microsoft Office

RESEARCH EXPERIENCE

University of Pittsburgh, School of Medicine

Pittsburgh, PA

Postdoctoral Research Associate, Straub Lab

Jan 2026 – Current

- Using click chemistry-MS reporter tools to trace the lipid metabolism and distribution of nitrated fatty acids

University of Pittsburgh, School of Medicine

Pittsburgh, PA

Graduate Researcher, NIH F31 Predoctoral Fellow

Aug 2020 – Nov 2025

- Designed and implemented analytical approaches to characterize the formation and metabolism of endogenous nitrated fatty acids across cellular, rodent, and clinical sample matrices in the context of sepsis
- Developed and troubleshoot HR-LCMS methods for low-abundance nitrated phospholipids, addressing chromatographic separation, sensitivity, and peak selection challenges
- Executed cell and animal-based experiments, biological sample collection, and processing for LC-MS
- Performed lipidomic analyses using high-resolution MS platforms, Compound Discoverer, and the open access lipidomics resource LIPID MAPS

- Applied molecular biology techniques (qRT-PCR, western blotting) to evaluate the signaling of endogenous NO₂-CLA in cell and mouse models
- Evaluated the temporal formation of NO₂-FA in human plasma and urine samples
- Prepared and edited manuscripts, reviews, and grants

Universidad de la Republica, Facultad de Ciencias

Montevideo, UY

Visiting Researcher

Nov 2023

- Performed stopped-flow kinetic analyses to evaluate the reaction rates and mechanisms of the NO₂-FA derivatives with biologically relevant thiols
- Collaborated with geographically distributed teams, resulting in a peer-reviewed publication

Sanofi Pasteur, Pharmaceutical Technology Department

Swiftwater, PA

Undergraduate Summer intern

May 2019 – Aug 2019

- Supported process development and technology transfer activities for the ActHIB vaccine within a regulated (GMP) manufacturing environment
- Assisted with pilot-scale studies to optimize lyophilization cycle parameters for vaccine drug product

Sanofi Pasteur, Analytical Process & Technology Department

Swiftwater, PA

Undergraduate Summer Intern

May 2018 – Aug 2018

- Applied a validated LC-MSMS method for the quantitative analysis of the flu protein neuraminidase in drug product samples
- Performed trypsin digestions and peptide analysis with PEAKS software for protein characterization
- Improved analytical workflows to support influenza vaccine formulation and product development

University of the Sciences, Department of Pharmaceutical Sciences

Philadelphia, PA

Undergraduate Researcher

Sep 2018 – Mar 2020

- Optimized HPLC-UV/Vis methods for quantitative analysis of thiazolidinedione derivatives MPMT and MPMT-I
- Conducted stability and degradation studies under hydrolytic conditions
- Documented experiment results and contributed to data interpretation

MENTORING

Matias Badino, Computer Science Undergraduate Student

May 2024 – Current

- Developed MS deconvolution tools for use in parallel with Compound Discoverer to support lipidomic assessments
- Mentored his co-authorship on a *Cell Chem Bio* manuscript in review

Cameron Cason, PhD Rotation Student

Aug 2024 – Dec 2024

- Conducted biochemical evaluations of phospholipid nitration for LC-MSMS
- Validated findings for pending short communication

Agustina Schopfer, Biology Undergraduate Student

May 2024 – Aug 2025

- Supported LC-MSMS sample preparation and processing for NO₂-CLA analysis in tissue
- Mentored her co-authorship on a *Cell Chem Bio* manuscript in review

Kaylee Uribe, Biomedical Engineering Undergraduate Student

May 2023 – Aug 2024

- Supported LC-MSMS sample preparation and processing for NO₂-CLA analysis in tissue
- Co-author on pending manuscript

FUNDING

NIH/NHLBI F31 Predoctoral Fellowship (highly competitive)

Jun 2024 – Nov 2025

Award: F31HL172595-01

Title: Bridging the gap of endogenous NO₂-CLA formation and signaling

NIH T32 Predoctoral Training in Pharmacological Sciences

Aug 2023 – Jun 2024

Award: 5T32GM133332

AWARDS

Best Trainee Presentation, Nitric Oxide Gordon Research Conference	Feb 2025
Best Abstract, University of Pittsburgh School of Medicine Graduate Student Research Symposium	Oct 2024
2 nd Place Trainee Seminar, Society for Free Radical Biology & Medicine Regional Redox Symposium	Mar 2024
1 st Place Pittsburgh Innovative Case Competition	Feb 2023
Louis J. Ignarro Cardiovascular Pharmacology Departmental Fellowship	Aug 2021 – 2023
G. Victor Rossi Scholarship, University of the Sciences	May 2020

LEADERSHIP

Interdisciplinary Biomedical Graduate Program Interview Weekend Student Host	Jan 2023/24
VP of Programming, Biomedical Graduate Student Association (BGSA)	2023 – 2024
Molecular Pharmacology Graduate Program Representative for the BGSA	2023 – 2024
Student Organizer for Department of Pharmacology & Chemical Biology Retreat	Oct 2023

PUBLICATIONS

Research Articles

1. **Colussi N**, Salvatore SR, Vazquez MM, Guiterrez MV, Hahn S, Ricart K, Vendrame F, Badino M, Schopfer A, Vitturi DA, Patel RP, Skarke C, Straub AS, Schopfer FJ. Nitrated fatty acids are biochemical cell membrane capacitors that regulate inflammation. *Cell Chemical Biology*. In 2nd round of review.
2. **Colussi N**, Salvatore, SR, Chang F, Schopfer FJ. Tackling inconsistencies in phospholipid nitration: degree of conjugation and nitrating agent determine conversion into NO₂-PC. Preparing for submission.
3. Chang F, Gunderstofte C, **Colussi N**, Pitts M, Salvatore SR, Thielke AL, Turell L, Alvarez B, Goldbach-Mansky R, Villacorta L, Holm CK, Schopfer FJ, Hansen AL. Development of nitroalkene-based inhibitors to target STING-dependent inflammation. *Redox Biol.* 2024 Aug;74:103202. doi: 10.1016/j.redox.2024.103202.
4. Yuan S, Hahn SA, **Colussi N**, Mullett SJ, Gelhaus SL, Schopfer FJ, Straub AC. CYB5R4 sustains endothelial proliferation and ischemia-induced angiogenesis by maintaining RRM2-dependent nucleotide balance. *bioRxiv [Preprint]*. 2025 Sep 20:2025.09.17.676962. doi: 10.1101/2025.09.17.676962.
5. Vazquez MM, Salvatore SR, Rowart P, Anand S, **Colussi N**, Fazzari M, Cole A, Espinosa-Diez C, Jobbagy S, Liu S, Gomez D, Skarke C, Jurczak M, Wheeler M, Khoo N, Rom O, Chang F, Schopfer FJ. Furan fatty acids enhance metabolic flexibility to protect against obesity-driven hepatic steatosis. In 2nd round of review at Science Advances.

Reviews

1. **Colussi N**, Chang F, Schopfer FJ. The specificity of endogenous fatty acid nitration: only conjugated substrates support the in vivo formation of nitro-fatty acids. *Redox Biochem Chem.* 2024; 9: 100037. doi:10.1016/j.rbc.2024.100037.

2. Chowdhury FA, **Colussi N**, Sharma M, Wood KC, Xu JZ, Freeman BA, Schopfer FJ, Straub AC. Fatty acid nitroalkenes- Multi-target agents for the treatment of sickle cell disease. Redox Biol. 2023 Dec;68:102941. doi: 10.1016/j.redox.2023.102941.

PRESENTATIONS

International Conferences

Year	Conference	Location	Format
Feb 2025	Nitric Oxide GRC, GRS	Ventura, CA	Seminar, Poster
Nov 2023	SfRBM-SFRR Conference	Punta Del Este, UY	Seminar
Feb 2023	Nitric Oxide GRC, GRS	Ventura, CA	Poster, Seminar

National and Local Meetings

Year	Conference	Location	Format
Jan 2025	Department of Pharmacology & Chemical Biology Seminar Series	Pittsburgh, PA	Seminar
Oct 2024	School of Medicine Graduate Student Research Symposium	Pittsburgh, PA	Seminar
Mar 2024	SfRBM Regional Redox Symposium	Shreveport, LA	Seminar, Poster
Jun 2023	UPMC Genome Stability Retreat	Pittsburgh, PA	Seminar
Oct 2023	School of Medicine Graduate Student Research Symposium	Pittsburgh, PA	Poster
Oct 2022	School of Medicine Graduate Student Research Symposium	Pittsburgh, PA	Poster

REFERENCES

Francisco J. Schopfer, Ph.D. (Dissertation Advisor)

Professor

University of Pittsburgh School of Medicine

Department of Pharmacology & Chemical Biology

Email: fjs2@pitt.edu

Adam Straub

Professor & Vice Chair, Research

University of Pittsburgh School of Medicine

Department of Pharmacology & Chemical Biology

Email: astraub@pitt.edu

Bruce Freeman, Ph.D.

Irwin Fridovich Distinguished Professor and Chair

Department of Pharmacology & Chemical Biology

University of Pittsburgh School of Medicine

Email: freerad@pitt.edu