Ishmail Abdus-Saboor
Mitchell and Margo Blutt Presidential Assistant Professor

University of Pennsylvania
Department of Biology
319 Leidy Laboratories
Philadelphia, PA, 19104
Phone: 215-898-0144
email: ishmail@sas.upenn.edu
website: www.abdus-saboorlab.com

Education and Training

B.A., Central High School (261st graduating class), Philadelphia, PA	2002
B.S., Animal Science, *summa cum laude*, North Carolina A&T University	2006
Ph.D., Cell and Molecular Biology, University of Pennsylvania	2012
Postdoctoral Fellow, Cornell University	2012 – 2014
Postdoctoral Fellow (K99/R00 award), University of Pennsylvania	2014 – 2018

Professional Positions

Mitchell J. and Margo Krody Blutt Presidential Assistant Professor, Department of Biology, University of Pennsylvania	July 1, 2018 –

Awards and Honors

Gloria Twine Chisum Fellowship, Penn	2006
Society for Developmental Biology Award	2011
Tom Kadesch Prize in Genetic Research	2012
NIH K12 IRACDA Postdoctoral Fellowship	2014
Burroughs Wellcome Fund PDEP Postdoctoral Fellowship	2015
Rising Stars in Biomedical, M.I.T.	2017
NIH K99/R00 Pathway to Independence Award	2017
NIH Mitchell Max Award for Pain Research	2018
Mitchell J. Blutt and Margo Krody Blutt Presidential Endowed Chair	2018 – 2023

Peer-reviewed publications (*equal contributions)

As a graduate student (2 articles)

1. **Ishmail Abdus-Saboor***, Vincent P. Mancuso*, John I. Murray, Katherine Palozola, Carolyn Norris, David Hall, Kelly Howell, Kai Huang, Meera V. Sundaram. Notch and Ras promote sequential steps of excretory tube development in C.elegans. ***Development*** 138, 3545–3555 (2011).

- Research Highlight in *Nature Reviews Molecular Cell Biology*

2. **Ishmail Abdus-Saboor**, Craig Stone, John I. Murray, Meera Sundaram. The Nkx5/Hmx homeodomain protein MLS-2 is required for proper tube cell shape in the C.elegans excretory system. ***Developmental Biology*** 366, 298–307 (2012).

As a postdoctoral fellow (5 articles)

3. Alexander Fleischmann, **Ishmail Abdus-Saboor**, Atef Sayed, Benjamin Shykind. Functional interrogation of an odorant receptor locus reveals multiple axes of transcriptional regulation. ***PLoS Biology*** 11(5):e1001568 (2013).

4. **Ishmail Abdus-Saboor**, Alexander Fleischmann, Benjamin Shykind. Setting limits: maintaining order in a large gene family. ***Transcription*** 5:e28978 (2014). Review

5. **Ishmail Abdus-Saboor**, Muhammad Al-Nufal, Maha Agha, M. Ruinart de Brimont, Alexander Fleischmann, Benjamin Shykind. An expression refinement process ensures singular odorant receptor gene choice. ***Current Biology*** 26, 1083–90 (2016).

6. Lian Cui*, Xuerong Miao*, Lingli Liang, **Ishmail Abdus-Saboor**, William Olson, Michael Fleming, Minghong Ma, Yuanxiang Tao, Wenqin Luo. Identification of early RET+ deep dorsal spinal cord interneurons in gating pain. ***Neuron*** 91, 1–17 (2016).

7. William Olson, **Ishmail Abdus-Saboor***, Lian Cui*, Justin Burdge, Tobias Raabe, Minghong Ma, and Wenqin Luo. Sparse genetic tracing reveals regionally specific functional organization of mammalian nociceptors. ***eLife*** 6:e29507 (2017).

As a tenure-track assistant professor (6 articles)

8. **Ishmail Abdus-Saboor***, Nathan Fried*, Mark Lay, Kathryn Swanson, Justin Burdge, Jessica Jones, Peter Dong, Weihua Cai, Xinying Guo, Yuan-Xiang Tao, Roman Fischer, John Bethea, Minghong Ma, Xinzhong Dong, Long Ding, Wenqin Luo. Development of a mouse pain scale using sub-second behavioral mapping and statistical modeling. ***Cell Reports*** 28, 1623 – 1634 (2019).

- "The mouse pain scale: a more reliable and unbiased way to assess animal behavior in pain research." *Pain Research Forum (PRF). Selected by PRF as 1 of 10 best pain research papers of 2019.*
- "A new tool puts a number on mouse pain." *Lab Animal* **48**, 297 (2019)

9. Saumitra Pitake, Leah Middleton, **Ishmail Abdus-Saboor**, Santosh K Mishra. Inflammation induced sensory nerve growth and pain hypersensitivity requires the N-type calcium channel Cav2.2. ***Front. Neurosci.*** 13, 1 – 13 (2019).

10. Melanie Schaffler, Leah Middleton, **Ishmail Abdus-Saboor**. Mechanisms of tactile sensory phenotypes in autism: current understanding, and future directions for research. ***Curr. Psychiatry Rep***. 21:134, 1-10 (2019). Review

11. Heather Rossi, Lily Pachanin, William Foster, Saumitra Pitake, Jennifer Gibbs, Brian Schmidt, Claire Mitchell, **Ishmail Abdus-Saboor**. Evoked and spontaneous pain assessment in a dental pulp injury model. ***Scientific Reports*** 10:2759 (2020).

12. Nathan Fried, Alexander Chamessian, Mark Zylka, **Ishmail Abdus-Saboor**. Improving pain assessment in mice and rats with advanced videography and computational approaches. ***Pain*** (in press). Review

13. Jessica Jones, William Foster, Colin Twomey, Justin Burdge, Osama Ahmed, Jessica Wojick, Gregory Corder, Joshua Plotkin, **Ishmail Abdus-Saboor**. A machine-vision approach for automated pain measurement at millisecond timescales. **bioRxiv** (2020)

In preparation

Andre Touissant, William Foster, Jessica Jones, Meghan Wachira, Bobby Hughes, Nathan Fried, Mathieu Wimmer, **Ishmail Abdus-Saboor**. An intergenerational pain scale for rats using fast imaging and machine learning.

Grant Support

Current:

NIH K99/R00 Pathway to Independence Award (DE026807) 9/2017 – 8/2021
"Determining the functions of molecularly defined populations of nociceptors in spinal and dental pain."
Role: PI, $955,440 total costs.

- Research Supplement to R00 Award 12/2018 – 12/2020
  $161,115 total costs.

Pending:

NIH U19 BRAIN Initiative 6/2020 – 5/2025
"Molecular composition, encoding dynamics, and functional connectivity of non-canonical affective pain circuits"
Role: Co-I, $24,462,503 overall costs. $1,959,965 total costs to I.Abdus-Saboor.
(Co-PIs, Co-Is, and Core Directors: M.Bruchas, G.Stuber, R. Palmiter, A.Chesler, L.Zweifel, S.Golden, A. Dhaka, D.Witten, V.Abraira, B. Beliveau)

NIH R01 9/2020 – 8/2025
"Automated identification of pain behavioral signatures in genetically diverse mice with divergent pain sensitivity"
Role: PI, $2,672,075 total costs.

Completed:
Burroughs Wellcome Fund Postdoctoral Enrichment Program 9/2015 – 8/2018
"Defining the neural mechanisms mediating crosstalk between touch and pain."
Role: PI, $60,000 total.

Burroughs Wellcome Fund Collaborative Research Travel Grant 6/2016 – 12/2017
"Optogenetic and brain imaging investigation of pain neural circuitry."
Role: PI, $8,000 total. Co-PI (Jin Lee, Stanford)

NIH IRACDA Postdoc Fellowship (K12 GM081295) 9/2014 – 7/2017
"Dissect neural mechanisms underlying the crosstalk between touch and pain."
$190,488 total.

NIH Pre-Doctoral Training Program in Genetics (T32 GM008216) 2009 – 2011

Invited Research Talks (56 total)

As a tenure-track assistant professor

2020
University of Chicago, Biochemistry and Molecular Biophysics Seminar Series
University of Michigan, Dpt of Molecular/Cellular/Developmental Biology
NYU School of Medicine, Marie M. Daly Speaker Series
Keystone Meeting, Pain: Aligning the Target, Colorado
Gordon Conference on Molecular and Cellular Neurobiology, Hong Kong
Penn, Dermatology Research Seminar Series
University of Texas San Antonio, Neuroscience Seminar Series
Temple University, Neuroscience Seminar Series
University of Rochester, Department of Pharmacology and Physiology
Next Generation Pain Therapeutics Meeting, Texas
Pain Research Forum (Webinar Speaker)
Rowan University, Molecular and Cellular Biosciences Seminar Series
Bowdoin College, Departments of Biology and Neuroscience Seminar Series
Lehigh Valley Molecular and Cell Biology Society Meeting (Keynote Speaker)
2019
University of Washington, Neuroscience Seminar Series
University of Texas at Dallas, School of Behavioral and Brain Sciences
Penn, Psychology Colloquium Series
University of Illinois at Chicago, Integrative Neuroscience Seminar Series

Fox Chase Cancer Center, Molecular Therapeutics Department
University of Maryland Baltimore County, Biology/Chemistry & Biochemistry
University of California Santa Cruz, MCD Biology Department
Lasalle University, Department of Biology
ABRCMS Biomedical Research Conference, California
North Carolina A&T University, Department of Biology

2018

Gordon Conference on Molecular and Cellular Neurobiology, Hong Kong
Penn, mindCORE Seminar Series
Penn, Center for Neurobiology and Behavior Seminar
Mid-Atlantic Pharmacology Society Meeting on Opioids and Analgesia
St. Joseph's University, Department of Biology and Behavioral Neuroscience

As a graduate student and postdoc

Duke School of Medicine, Department of Pharmacology, 2018
Vanderbilt School of Medicine, Emerging Scholars Lecture, 2018
Rockefeller University, Sense to Synapse Conference, 2018
Bryn Mawr College, Chemistry Colloquia Series, 2018
Penn, Biology Seminar Series, 2018
NYU School of Dentistry, Department of Oral Surgery, 2018
Meharry Medical College, Department of Biochemistry/Cancer Biology, 2018
Annual NIH Pain Consortium Symposium, 2018
Johns Hopkins School of Medicine, Department of Pharmacology, 2017
Society for Neuroscience Meeting – Touch, Pain, Itch Symposium, 2017
MIT, Rising Stars in Biomedical, 2017
Syracuse University, Department of Biology, 2017
Haverford College, Department of Biology, 2017
Rutgers University, Biology Seminar Series, 2017
Penn Dental School, Department of Oral Surgery & Pharmacology, 2017
Temple University, Center for Substance Abuse Research, 2017
Virginia Tech University, Department of Biochemistry, 2016
Rutgers University, Biology Seminar Series, 2016
Swarthmore College, Department of Biology, 2016
Penn Dental School, Research Seminar Series, 2016
Bucknell University, Department of Biology, 2016
Mount Holyoke College, Department of Biological Sciences, 2016
College de France, Paris, International Symposium on Olfaction, 2013
Penn, Department of Genetics Symposium, 2012
UCLA, International *C.elegans* Meeting, 2011
Mid-Atlantic Society of Developmental Biology Meeting, 2011
Penn, Cell and Molecular Biology Graduate Group Symposium, 2011

Media Coverage and Feature Stories:

Stephanie Stahl, 2018. "From Central High School to His Own Lab, Penn Scientist Focused on Finding Better Treatments for Pain." *CBS Local News TV Special.*

Marla Vacek Broadfoot, 2018. "How early STEM program and mentors paved the way for a career in science." *Burroughs Wellcome Fund Feature Article.*

Gregory Richter, 2018. "PennPORT (al) into a Thriving Science Career." *Penn Medicine News*.

Katherine Baillie, 2019. "The Science of Sensations." *Penn Today*

EDUCATIONAL MISSION TO THE UNIVERSITY:

BIOL 221: Molecular Biology and Genetics. 50%, 130 students. Spring 2019.
BIOL 221: Molecular Biology and Genetics. 50%, 150 students. Spring 2020.

Additional Penn course lectures
BBB 499: Honors Seminar for Biological Basis of Behavior, Spring 2020.
NGG 588: Topics in Translational Neuroscience, Spring 2020.
Summer High School Program's Neuroscience Research Academy, Summer 2019.
Summer High School Program's Biomedical Research Academy, Summer 2019.

Graduate Group Memberships:

Biology Graduate Group	2018 – present
Cell and Molecular Biology Graduate Group	2018 – present
Neuroscience Graduate Group	2018 – present
Pharmacology Graduate Group	2018 – present

TRAINEES

Postdoctoral Fellows (2 total):
Saumitra Pitake, 2018 – 2020. Ph.D. from St. John's University, New York
Heather Rossi, 2018 – present. Ph.D. from University of Florida.

Ph.D. Students (3 total):
Melanie Schaffler (Neuroscience), 2018 – present. B.A. from Wesleyan.
Leah Middleton (Neuroscience), 2018 – present. B.A. from Mt. Holyoke College.
Justin Burdge (Biology), 2020. B.A. from Penn.

Research Specialists (2 total):
Jessica Jones, 2018 – present. B.S. from UCSC.
William Foster, 2018 – present. B.A. from Haverford.

Rotation Students (5 total):
Melanie Schaffler, Neuroscience, 2018

Leah Middleton, Neuroscience, 2018
Justin Burdge, Biology, 2019
Erin Jean, Immunology, 2020
Ryan Schwark, Neuroscience, 2020

Undergraduates (9 total):
Migyana Thomas, 2018 –2019, Independent research
Justin Burdge, 2018 –2019, Independent research and work study (HSoc).

- *Currently a PhD student in Penn Biology.*

Emma Lu, 2019, Independent research and work study (Biology) Lucie Pham, 2019 – present, Independent research and work study (Biology) Justin Arnold, fall 2019 – present, Independent research (BBB)
Samuel Kaufmann, 2019 – present, Independent research, Independent Study 399 & 499 (Biology).

- *Benjamin Franklin Scholars Summer Funding Award; Pincus-Magaziner Family Undergraduate Research and Travel Award;*

Undergraduates from other universities
Isabella Succi, summer 2019 (student at St. Joseph's University)
Syphane Gibbs, summer 2019 (student at NCAT/SUIP intern)
Racquel Amadi, summer 2019 (student at Xavier University/DAPPG intern)

Co-Sponsor for 399/499 Independent Study: 2018 – present (11 total students)

High School Students (1 total):
Mariatu Fayia, summer 2019 (SAS Penn LENS student)

Scientific Society Memberships

Society for Neuroscience	2013 – present
International Association for the Study of Pain	2018 – present

Career Development

Penn Faculty Pathways Program	2019 – 2020
First Two Years Program, Penn School of Arts and Sciences	2018 – 2019
BRAINS Fellowship (NIH funded program)	2017
Future Faculty Development Program, Virginia Tech University	2016
Next Prof Program, University of Michigan	2015

SERVICE (*As a tenure-track assistant professor)*

Peer Review
Reviewer for: *eLife, Journal of Neuroscience, eNeuro, Molecular Pain, PLoS One, Neuroscience Letters*

Ad hoc and panel reviewer for: *Burroughs Wellcome Fund, Research Grants Council of Hong Kong*

Academic Community:

Session Chair at Keystone Pain Meeting:
"*Inclusivity and Diversity in the Field: What Works and How to Do Better*" 2020
Speaker, NIH Advancing Diversity Programs Conference 2019
Speaker, NIH/ENDURE underrepresented minority trainee meeting 2019
Panelist, Summer Success Institute Conference, UMBC 2019

Biology Department:

Co-Director, Mentoring Circle Program for underrepresented students 2018 – 2020
Recruitment Day Chair for PhD admissions 2020
Panelist, Center for Teaching/Learning *"Workshop on Inclusive Teaching"* 2019
Invited Research Seminar, Undergraduate Neuroscience Honors Society 2018
Faculty volunteer, Majors and More Dinner 2018

Master's student co-advisor (1 total):

2020 – present. Biology Graduate Group: Nicholas Tursi

Thesis Committees (2 total):

2019 – present. Biology Graduate Group: Melina Gyparaki, Bishwas Sharma

Prelim Committees (2 total):

2019 – present: Yongjun Li, Linyang Ju

School of Arts and Sciences:

Dean Fluharty's Strategic Working Group for *"Mapping the Mind"* 2019 – 2020
Speaker for mindCORE event, *"Beyond the CV: Stories from Faculty"* 2020
Panelist for mindCORE event, *"Navigating the academic job market"* 2019

School of Medicine:

Mahoney Institute of Neuroscience Seminar Committee 2020 – 2021
Speaker, Penn Neuroscience *"Public Lecture on Pain"* 2019
Research Seminar Speaker for SUIP underrepresented minority interns 2019
Rotation talks reviewer for Neuroscience Graduate Group 2018
Panelist, Neuroscience Graduate Group event at SFN Neuroscience Meeting 2018

Prelim Committees (1 total):

2019 – present. Neuroscience Graduate Group: Luigim Cifuentes

Thesis Committees (1 total):

2020 – present. Neuroscience Graduate Group: Brandon Bastien

School of Dental Medicine:

Thesis Committees (1 total):
Lily See, *DSc.D. program,* 2019 – present

Community Service

Interview for local middle school students for Healthy NewsWorks book	2020
Abdus-Saboor lab Science Day for 25 elementary students in West Philly	2019
Speaker, SMASH STEM program for high school minority students	2018
Panelist, Lasalle University STEM underrepresented minority day	2018