John Bankston, Ph.D.

University of Colorado Anschutz Medical Campus | Department of Physiology and Biophysics | 12800 E. 19th Pl MS 8307 Rm 7133 Aurora, CO 80045 |

EDUCATION:

2000 B.S., Biomedical Engineering, **Columbia University**, New York, NY
2009 PhD, Physiology and Cellular Biophysics, **Columbia University**, New York, NY
Mentor: Robert (Rocky) Kass
2016 Post-doctoral Training, Department of Physiology and Biophysics, **University of Washington**, Seattle, WA
Mentor: William Zagotta

Professional Appointments/Employment:

2000-2001 Research Technician, Hospital for Special Surgery, New York, NY
Mentor: Robert Blank

2001-2003 Research Technician, Massachusetts Institute of Technology, Boston, MA
Mentor: Vernon Ingram

2010-2016 Postdoctoral Fellow, University of Washington, Seattle, WA
Mentor: William Zagotta

2016-present Assistant Professor, University of Colorado Anschutz Medical Center, Aurora, CO

Honors and Awards:

2007 Award for best poster at the Physiology and Cellular Biophysics research day

Membership in Professional Organizations:

2004-present Member of the Biophysical society
2019-present Member of the Society of General Physiologists

Committee and Service Responsibilities:

Departmental

2017-2018 Faculty Search Committee

SOM

2018-present Faculty Senate representative for the Department of Physiology and Biophysics
2018-present Member of the admissions committee for the Neuroscience Program
2018 Steven Fadul Award committee member
2019-present Chair of the Steven Fadul Award committee
2019-present Chair of the Retreat/Symposium committee for the Structural Biology and Biochemistry Program

Outside University

2018 Discussion leader, “Post-doc to Faculty Transition”, Biophysical Society Annual Meeting, Feb. 2018

2021-present Editor for Frontiers in Physiology. Asked to edit a special issue of the journal out in late 2022.

2022-present Reviewer for the French National Research Agency (ANR).

2022-present Reviewer for the American Heart Association.

Review and Referee Work:

Ad hoc reviewer for PNAS, Nature Communication, eLife, Journal of General Physiology, Biophysical Journal, PloS one, Scientific Reports, and Journal of Visualized Experiments

Reviewer for the French National Research Agency (ANR). Reviewed grants for the 2022 generic call for proposals.

Reviewer for the American Heart Association. Reviewed pre- and postdoc fellowship proposals for AHA.

Invited Presentations:

2013 Platform presentation at the Biophysical Society Annual Meeting, Philadelphia, PA
2015 Platform presentation at the Biophysical Society Annual Meeting, Baltimore, MD
2015 Presentation at the 5th International Ion Channel Conference, Luzhou, China
2015 Seminar at Zejiang University, Hangzhou, China
2015 Department of Pharmacology Seminar Series, Northwestern University Feinberg School of Medicine, Chicago, IL
2016 Department of Pharmacology Seminar Series, University of Indiana School of Medicine, Indianapolis, IN
2016 Department of Physiology Seminar Series, University of Maryland School of Medicine, Baltimore, MD
2016 Department of Physiology Seminar Series, University of Pennsylvania School of Medicine, Philadelphia, PA
2016 Department of Biophysics Seminar Series, University of Michigan, Ann Arbor, MI
2016 Department of Physiology and Biophysics Seminar Series, Stony Brook University Renaissance School of Medicine, Stony Brook, NY
2016 Department of Physiology and Biophysics Seminar Series, University of Colorado Anschutz Medical Campus, Aurora, CO
2016 Department of Molecular Physiology and Biophysics Seminar Series, Vanderbilt University School of Medicine, Nashville, TN
2016 Department of Cell and Molecular Physiology Seminar Series, Loyola University Chicago Stritch School of Medicine, Chicago, IL
2018 Nanion meeting on Ion channels, Boston MA
2019 Department of Biology Seminar Series, University of Pittsburgh, Pittsburgh, PA
2020 KIHA Biophysics Conference, University of Denver
2022 75th Annual Meeting of the Society of General Physiologists. Woods Hole, MA.

Teaching Record:

Medical Students

11/2018, 11/2019, 11/2020 M2M, Cell Physiology Block, Lecturer

Graduate Students

08/2018, 08/2019, 08/2020 08/2021, 08/2022	Core I: Foundations in Biomedical Sciences 002, Lecturer
10/2018, 10/2019, 10/2020 01/2022, 01/2023	NRSC 7600, Lecturer
09/2017, 09/2018, 09/2019 09/2020, 09/2021, 09/2022	Frontiers in Pharmacology, Lecturer
01/2021	IPHY 7800: Comprehensive Physiology, Lecturer
03/2022-04/2022	NRSC 7617: The Biophysics of Ion Channels, Course Director

Mentees

2017-2019	Anna VanKeuren, Professional Research Associate. Current: PhD candidate with Dr. Chandra Tucker
2017-2019	Prafulla Aryal, Research Associate. Current: Senior Scientist Visterra Inc.
2018-present	Robert Klipp, Post-doctoral Fellow
2018-present	Megan Cullinan, STBB program PhD student
2019-2021	Stephanie Fullam, Masters Student UC Denver Chemistry, Current: Research Associate II, Arcus Biosciences
2020-2022	Abigail Camenisch, Professional Research Associate. Current: Pursuing MD at the University of Arizona
2021-present	Rohit Singh, Post-doctoral Fellow
2022-present	Lucas Blecker, Neuroscience program PhD student
2022-present	Rebecca Roth, Neuroscience program PhD student

<u>Funding Sources/Grants and Fellowships Awarded:</u>

Current –

2020-2025 "Dynamics of Acid-sensing ion channels"
John Bankston (PI)
R35 MIRA Award (R35GM136908)
National Institute of General Medical Sciences
50% effort, $1,912,465 total cost

2021-2025 "Allosteric modulation of HCN channels"
John Bankston (Co-I)
R01 Award (R01GM140004-01)
National Heart Lung Blood Institute

Expired (last 5 years)

2019-2022 "Structural Mechanisms of Acid-sensing ion channels"

Megan Cullinan (PI)
F31 (DE028739)
National Institute of Dental and Craniofacial Research
Role: Mentor
Total direct costs: $107,907

2017-2021 "Function and regulation of Acid-sensing ion channels in corneal neurons"
John Bankston (PI)
R00 Award (R00EY024267)
National Eye Institute
25% effort, $747,000 total cost

Peer-Reviewed Publications:

2023 Cullinan MM, Klipp RC, Camenisch A, **Bankston JR**. (2023) Dynamic landscape of the intracellular termini of the acid-sensing ion channel 1a eLife. (accepted).

2023 Tsa CW, Liu TY, Chao, FY, Tu YC, Rodriguez MX, Van Keuren AM, Ma Z, **Bankston JR**, and Tsai MF. (2023) Evidence supporting the MICU1 occlusion mechanism and against the potentiation model in the mitochondrial calcium uniporter complex. PNAS. 120 (16). PMID: 37036971.

2022 Klipp RC, **Bankston JR**. (2022) Polyunsaturated fatty acid structure determines the strength of potentiation of Acid-sensing ion channel. *J Gen Physiol*. 154(7). PMID: 35583814.

2020 Peters CH, Myers ME, Juchno J, Haibaugh C, Bichraoui H, Du Y, **Bankston JR**, Walker LA, Proenza C. "Isoform-specific regulation of HCN4 channels by a family of endoplasmic reticulum proteins." **P.N.A.S, USA**. July 28,2020; 117(30):18079-18090. PMID: 32647060

2020 Klipp RC, Cullinan MM, **Bankston JR**. "Insights into the molecular mechanisms underlying the inhibition of acid-sensing ion channel 3 gating by Stomatin." ***Journal of General Physiology*.** 2020 Mar 2;152(3):e201912471. PMID: 32012213

2017 **Bankston JR**, DeBerg HA, Stoll S, Zagotta WN. "Mechanism for the inhibition of the cAMP dependence of HCN ion channels by the auxiliary subunit TRIP8b." ***J. Biol Chem***. Oct 27;292(43):17794-17803.

2015 DeBerg HA*, **Bankston JR* (co-first authors)**, Rosenbaum JC, Brzovich PS, Zagotta WN, Stoll S. "Structural mechanism for the regulation of HCN ion channel by the accessory protein TRIP8b." ***Structure.*** Apr 7;23(4):734-44.

2015 Hines KE, **Bankston JR**, Aldrich RW. "Analyzing single-molecule time series via nonparametric Bayesian inference." ***Biophysical Journal***. 103(3):540-556.

2014 Sun J, **Bankston JR**, Payandeh J, Hinds TR, Zagotta WN, Zheng N. "Crystal Structure of the plant dual-affinity nitrate transporter NRT1.1." ***Nature***. 507(7490):73-7.

2013 Moreno JD, Yang PC, **Bankston JR**, Grandi E, Bers DM, Kass RS, Clancy CE. "Ranolazine for congenital and acquired late INa-linked arrhythmias: in silico pharmacological screening." ***Circulation Research***. 113(7):e50-61.

2012 **Bankston JR**, Camp SS, DiMaio F, Lewis AS, Chetkovich DM, Zagotta WN. "Structure and stoichiometry of an accessory subunit TRIP8b interaction with hyperpolarization-activated cyclic nucleotide-gated channels." ***P.N.A.S., USA***. 109(20):7899-904.

2011 Moreno JD, Zhu ZI, Yang PC, **Bankston JR**, Jeng MT, Kang C, Wang L, Bayer JD, Christini DJ, Trayanova NA, Ripplinger CM, Kass RS, Clancy CE. "A computational model

to predict the effects of class I anti-arrhythmic drugs on ventricular rhythms." ***Science Translational Medicine*****.** 3(98):98ra83.

2010 **Bankston JR** and Kass RS. "Therapeutic management of Long QT Syndrome Variant 3: Local anesthetic properties of beta-blocking drugs." ***Journal of Molecular and Cellular Cardiology.*** 48(1):246-53.

2009 Kurokawa J, **Bankston JR**, Kaihara A, Furukawa T, Kass RS**.** "KCNE variants reveal a critical role of the beta subunit carboxyl terminus in PKA-dependent regulation of the I(Ks) potassium channel." ***Channels****.* 3(1): 16-24.

2009 Chung DY, Chan PJ, **Bankston JR**, Yang L, Liu G, Marx SO, Karlin A, Kass RS. " Location of KCNE1 relative to KCNQ1 in the I(KS) potassium channel by disulfide cross-linking of substituted cysteines." ***P.N.A.S., USA*****.** 106(3):743-8.

2008 Holland KD, Kearney JA, Buck G, Keddache M, **Bankston JR**, Glaaser IW, Kass RS, and Meisler MH. "Mutation of the sodium channel SCN3A in a patient with cryptogenic partial epilepsy." ***Neuroscience Letters***. 33(1):65-70.

2007 **Bankston JR**, Yue M, Chung W, Spyres M, Pass RH, Silver E, Sampson KJ, Kass RS. "A Novel and Lethal De Novo LQT-3 Mutation in a Newborn with Distinct Molecular Pharmacology and Therapeutic Response. ***PloS ONE.*** 2(12): e1258.

2007 **Bankston JR**, Sampson KJ, Kateriya S, Glaaser IW, Malito DL, Chung WK and Kass RS. "A novel LQT-3 mutation disrupts an inactivation gate complex with distinct rate-dependent phenotypic consequences." ***Channels****.* 1(4): 273 – 280.

2006 Glaaser IW, **Bankston JR**, Liu H, Tateyama M, Kass RS. "A carboxyl-terminal hydrophobic interface is critical to sodium channel function: Relevance to inherited disorders." ***Journal of Biological Chemistry***. 281(33): 24015-23.

2005 Dahlgren PR, Karymov MA, **Bankston J**, Holden T, Thumfort P, Ingram VM, Lyubchenko YL. "Atomic force microscopy analysis of the Huntington protein nanofibril formation." ***Nanomedicine***. 1(1): 52-7.

Commentaries and Reviews:

2022 Peters CH, Singh R, **Bankston JR**, Proenza C. "Regulation of HCN channels by protein interactions". Frontiers in Physiology. ***Frontiers in Physiology.*** 13:928507. PMID: 357956512021

2022 Cullinan MM, Klipp RC, **Bankston JR**. "Regulation of Acid-sensing Ion Channels by Protein Binding Partners." ***Channels***..Dec 2021;15(1):635-647.

2008 **Bankston JR**, Kass RS. "Ion channels: The voltage-sensor quartet." ***Nature***. 13;456(7219):183-85.

2007 **Bankston JR**, Kass RS. "Fading sodium channels in failing hearts." ***Circ Res***. 101(11):1073-4.

Conference Activity:

Conference Talks

2023 Singh RK, Langley AA, Peters CH, **Bankston JR**, Proenza CP. "Defining the interactions between the HCN4 and the regulatory protein IRAG and LRMP." Biophysical Society 67th Annual Meeting, San Diego, CA. Feb. 2023

2022 **Bankston JR.** "Regulation of Acid-sensing ion channels by single acyl chain lipids." 75th Annual Meeting of the Society of General Physiologists. Woods Hole, MA. Sept 2022.

2022 Klipp RC**, Bankston JR.** "Polyunsaturated fatty acid structure determines the strength of potentiation of Acid-sensing ion channels." Biophysical Society 66th Annual Meeting, San Francisco, CA. Feb. 2022

2020 Peters CH, **Bankston JR**, Proenza CP. " Isoform-specific regulation of HCN4 channels by a family of novel interacting proteins." Biophysical Society 64th Annual Meeting, San Diego, CA. Feb. 2020.

2019 Cullinan MM, Aryal P, **Bankston JR**. "Measuring dynamics of the Acid-sensing ion channel N-terminus using transition metal ion FRET." Biophysical Society 63rd Annual Meeting, Baltimore, MD. Mar. 2019.

2015 **Bankston JR**, Deberg, HA, Rosenbaum JC, Brzovic, PS, Stoll S, Zagotta WN. "Spectroscopic and biochemical studies of TRIP8b regulation of HCN channels" Biophysical Society 59th Annual Meeting, Baltimore, MD. Feb. 2015.

2015 **Bankston JR**, Deberg, HA, Rosenbaum JC, Brzovic, PS, Stoll S, Zagotta WN. " Spectroscopic and biochemical studies of TRIP8b regulation of HCN channels" 5th International Meeting on Ion Channels, Luzhou, China. June. 2015.

2015 **Bankston JR**, Deberg, HA, Rosenbaum JC, Brzovic, PS, Stoll S, Zagotta WN. " Spectroscopic and biochemical studies of TRIP8b regulation of HCN channels" 5th International Meeting on Ion Channels (small group meeting), Hangzhou, China. June. 2015.

2013 **Bankston JR**, Camp SS, Zagotta WN. "Dimeric TRIP8b binds to the cyclic nucleotide binding domain of HCN channels." Biophysical Society 57th Annual Meeting, Philadelphia, PA. Feb. 2013.

Conference Posters

2023 Cullinan MM, **Bankston JR**. "Revealing the arrangement of the intracellular termini of ASIC1a using transition metal ion FRET." Biophysical Society 67th Annual Meeting, San Diego, CA. Feb. 2023.

2023 Klipp RC**, Bankston JR.** "Mechanistic insight into lipid regulation of the Acid-sensing ion channel." Biophysical Society 67th Annual Meeting, San Diego, CA. Feb. 2023.

2023 Peters CH, Peraza DA, Blecker LM, **Bankston JR**, Proenza CP. "Calcium inhibits the funny current (IF) in sinoatrial myocytes." Biophysical Society 67th Annual Meeting, San Diego, CA. Feb. 2023

2023 Blecker LM, Peters CH, Peraza DA, **Bankston JR**, Proenza CP. "Functional charachterization of a metal ion coordination site in HCN4." Biophysical Society 67th Annual Meeting, San Diego, CA. Feb. 2023

2022 Klipp RC**, Bankston JR.** "Polyunsaturated fatty acid structure determines the strength of potentiation of Acid-sensing ion channels." Biophysical Society 66th Annual Meeting, San Francisco, CA. Feb. 2022

2020 Cullinan MM, **Bankston JR**. "Measuring Interactions between the intracellular domans of the Acid-sensing ion channel." Biophysical Society 64th Annual Meeting, San Diego, CA. Feb. 2020.

2020 Klipp RC, **Bankston JR**. "Polyunsaturated fatty acid regulation of the acid-sensing ion channel." Biophysical Society 64th Annual Meeting, San Diego, CA. Feb. 2020.

2019 Klipp RC, **Bankston JR**. "Stomatin Dependent Regulation of Acid-Sensing Ion Channels." Biophysical Society 63rd Annual Meeting, Baltimore, MD. Mar. 2019.

2015 **Bankston JR**, Deberg, HA, Rosenbaum JC, Brzovic, PS, Stoll S, Zagotta WN. "Mechanism of TRIP8b regulation of HCN channels" 5th International Meeting on Ion Channels, Luzhou, China. June 2015.

2015 Hines KE, **Bankston JR**, Aldrich RW. "Analyzing single-molecule time series via nonparametric bayesian inference." Biophysical Society 59rd Annual Meeting, Baltimore, MD. Mar. 2019.

2012 **Bankston JR**, Camp SS, Lewis AS, Chetkovich DM, Zagotta WN. "Molecular Determinants of the Interaction Between HCN2 and its Accessory Subunit TRIP8b." Biophysical Society 55th Annual Meeting, Baltimore, MD. Mar. 2011.

2012 Rougier JS, Albesa M, Remme CA, Ogrodnik J, Petitprez S, **Bankston JR**, Kass RS, Bezzina CR, Chung W, Abriel H. Long QT syndrome type 3 caused by a PY0motif mutation leading to altered ubiquitylation and increased expression of Nav1.5 in knock-in mice. ASPET Experimental Biology meeting. San Diego CA. April 2012.

2010 Moreno JD, **Bankston JR**, Kass RS, Clancy, CE. "Cardiac Dynamics In-Silico: Pharmacological Targeting of LongQT 3 Syndrome." Biophysical Society 54th Annual Meeting, San Francisco, CA. Feb. 2010.

2009 Bankston JR, Kass RS. "Molecular Basis for blockade of the cardiac sodium channel by beta blockers." Biophysical Society 52nd Annual Meeting, Baltimore, MD. Mar. 2011.

2006 **Bankston JR**, Sampson KJ, Kateriya S, Glaaser IW, Malito DL, Chung WK and Kass RS. "A novel LQT-3 mutation in the C-terminus of the cardiac sodium channel causes with distinct rate-dependent phenotypic consequences." Keystone Symposium on Cardiac Arrhythmias: Linking Structural Biology to Gene Defects. Tahoe City, CA. Jan-Feb 2006.

2005 **Bankston JR**, Kurokawa J, Kass RS. "Interaction between the intracellular domains of KCNQ1 and KCNE1 is critical for PKA-dependent regulation of the I_{Ks} potassium channel." Biophysical Society 48th Annual Meeting, Baltimore, MD. Mar. 2005.