Curriculum Vitae

Xavier R. Chapa-Dubocq
Department of Physiology
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Education and Training

UNIVERSITY OF PUERTO RICO: MEDICAL SCIENCE CAMPUS, SAN JUAN, PR, 2016-2021
PhD in the department of physiology and biophysics, specializing in cardio-pathophysiology.

UNIVERSITY SAGRADO CORAZON, SAN JUAN, PR, 2011-2016
B.S in General Science with honors.

FOREST HIGH SCHOOL, OCALA, FL, 2006-2010
High school diploma.

Academic, Professional, and Research Appointments

Post doctorate Researcher: Department of Physiology | LSU Health Sciences Center | 2023-Present
(Research Advisor: Dr. Molina)

- In my postdoctoral training, I am delving into the intricate changes within mitochondria following Traumatic Brain Injury (TBI), particularly exploring how alcohol exacerbates these alterations. My overarching aim is to understand the interplay between TBI, alcohol, and the role of both ferroptosis and mitochondrial dysfunction in shaping the injury's progression, paving the way for targeted interventions and treatments.

Chapter Advisor Committee Representative | Puerto Rico Physiological Society (PRPS) | 2022 – Present

- I contributed to organizing the PRPS local meeting and outreach initiatives for marginalized groups. Additionally, I engage in monthly meetings with APS chapter committees to strategize events for the annual American Physiology Summit. This involves coordinating chapter-specific awards, aiding in member recruitment, and collaborative event planning among chapters.

Medical Technician | U.S Air Force: 156th MDG Muniz AFB | 2011-Present

- I strategize, deliver, and assess standard patient care for various individuals, including those in specialized operational roles. Additionally, I coordinate the medical setup, oversee and actively participate in support tasks during patient care scenarios, which encompass contingency operations and handling emergencies like disasters. Performs duty as licensed practical nurse (LPN) in military facilities.

Section Supervisor | U.S Air Force: 156th MDG Muniz AFB | 2019-Present

- I oversee junior enlisted personnel, providing guidance for their career advancement. I contribute to medical education by leading courses for enlisted personnel, covering topics like TBI, cardiac dysfunction, EKG procedures, and more. I also ensure accurate documentation of personnel and deliver comprehensive reports on our enlisted group's medical readiness status.

WOC Appointment Researcher: Department of Research and Development | VA Caribbean Healthcare System | 2022-2023

Updated April 29, 2025.

Post doctorate Researcher: Department of Physiology | University of Puerto Rico, Medical Sciences Campus | 2022-2023 (Research Advisor: Dr. Javadov)

- During my postdoctoral research, I spearheaded a project aimed at designing a comprehensive biophysical model of mitochondrial swelling in collaboration with Dr. Jason Bazil, Michigan State University. Dr. Bazil helped me conceptualize and troubleshoot the codes for modelling mitochondrial ionic transport systems.

Graduate Student: Department of Physiology | University of Puerto Rico, Medical Sciences Campus | 2016-2021 (Research Advisor: Dr. Javadov)

- During graduate school, my research initially focused on exploring the intricacies of mitochondrial supercomplexes, elucidating their role in optimizing ATP production through efficient electron transfer in the electron transport chain. As my studies progressed, I shifted gears toward investigating mitochondrial-specific cell death pathways, delving specifically into ferroptosis—a form of iron-dependent cell death. I aim to apply this understanding of ferroptosis to a different tissue and pathology, leveraging its concepts in a novel context within my current research endeavors.

Undergraduate Student: Department of Physiology |University of Puerto Rico, Medical Sciences Campus | 2015-2016 (Research Advisor: Dr. Javadov)

Math Tutor | University Sagrado Corazon | 2014-2015

- Performed tutoring tasks for Basic Math Courses, Pre-Calculus 1&2, Statistics, and Physics 1.

Work-Study Student | Veterans Affairs | 2013-2014

- Refilled sharp containers, assisted patients in daily tasks such as assisted feeding, stocking medical carts, making copies, attending the telephone, participating in floor meetings, and cleaning up the workspace.

Membership in Professional Organizations

American Physiological Society	2016-present
Puerto Rico Physiological Society	2016-present

Awards and Honors

APS CNS Section Research Recognition Award	2025
RSA Junior Investigator Meeting Award	2024
Martin Frank Diversity Travel Award	2024
Annual NHSN Conference 2023 Travel Award	2023
Certification of academic excellence, UPR: Medical Sciences Campus, Santurce, PR	2019 - 2021
Certification of research excellence, UPR: Medical Sciences Campus, Santurce, PR	2018 - 2021
Awarded 2 Air Force achievement medals, Muniz AFB	2013, 2015
Certification of the honor society, Universidad of Sacred Hearts, Santurce, PR	2014

Research and Scholarship

Ongoing Research Support:

1F32AA031902-01A1 Chapa-Dubocq, X. (PI)
Activation Date: 02/01/2025
Termination Date: 07/31/2026

Updated April 29, 2025.

NIH/NIAAA Institutional Research Training Grant
Role: Post-doctoral fellow

T32AA007577 Molina, P. (PI)
Activation Date: 07/31/2023
Termination Date: 01/31/2025
NIH/NIAAA Institutional Research Training Grant
Role: Post-doctoral fellow

This program provides research training in alcohol-related fields. It provides resources to educational institutions to enhance and expand their training programs, enabling the development of a skilled workforce in alcohol-related research.

Publications:

Garcia-Baez J, Chaves-Negrón I, Javadov S, Bazil JN, and **Chapa-Dubocq XR***. Developing a Physiologically Relevant Cell Model of Ferroptosis in Cardiomyocytes. Free Radic. Biol. Med. 2025. PMID: 40185165

Chapa-Dubocq XR, Rodríguez-Graciani KM, Garcia-Baez J, Vadovsky A, Bazil JN, Javadov SJ. The Role of Swelling in the Regulation of Opa1-Mediated Mitochondrial Function in the Heart in Vitro. Cells. 2023. Volume 12(16). PMID: 37626827.

Chapa-Dubocq XR, Rodríguez-Graciani KM, Escobales N, Javadov SJ. | Mitochondrial Volume Regulation and Swelling Mechanisms in Cardiomyocytes. Antioxidants. 2023. Volume 12(8), PMID: 37627512.

Rodríguez-Graciani KM, **Chapa-Dubocq XR**, Ayala-Arroyo EJ, Chaves-Negrón I, Jang S, Chorna N, S Maskrey T, Wipf P, Javadov S Effects of Ferroptosis on The Metabolome in Cardiac Cells: The Role of Glutaminolysis. Antioxidants. 2022, 12(8), PMID: 35204160.

Chapa-Dubocq XR, Garcia-Baez J, Bazil JN, Javadov S. Crosstalk between Adenine Nucleotide Transporter and Mitochondrial Swelling: Experimental and Computational Approaches. Cell Biol. Toxicol. 2022, 39(2), PMID: 35606662

Jang S, **Chapa-Dubocq XR**, Parodi-Rullán RM, Fossati S, Javadov S. Beta-Amyloid Instigates Dysfunction of Mitochondria in Cardiac Cells. Cells. 2022, 11(3), PMID: 35159183

Jang S, **Chapa-Dubocq XR**, Fossati S, Javadov S. Analysis of Mitochondrial Calcium Retention Capacity in Cultured Cells: Permeabilized Cells Versus Isolated Mitochondria. Frontier Physiology. 2021, 12: 773839, PMID: 34950052.

Chapa-Dubocq XR*, Sehwan J, Tyurina YY, St Croix CM, Kapralov A, Tyurin V, Bayir H, Kagan VE, Javadov S. Elucidating The Contribution of Mitochondrial Glutathione to Ferroptosis in Cardiomyocytes. Redox Biology. 2021, 45, PMID: 34102574.

Javadov S, Jang S, **Chapa-Dubocq XR**, Khuchua Z, Camara AK. Mitochondrial Respiratory Supercomplexes in Mammalian Cells: Structural versus Functional Role. J Mol Med. 2020, 99(1), PMID: 33201259.

Rodríguez-Graciani KM, **Chapa-Dubocq XR**, Macmillan-Crow LA, Javadov S. Association between L-Opa1 Cleavage and Cardiac Dysfunction during Ischemia-Reperfusion Injury in Rats. Cell Physiol Biochem. 2020, 54(6), PMID: 33119220

Chapa-Dubocq XR, Rodríguez-Graciani KM, Guzmán-Hernández RA, Jang S, Brookes PS, Javadov S. Cardiac Function Is Not Susceptible to Moderate Disassembly of Mitochondrial Respiratory Supercomplexes. Int J Mol Sci. 2020, 21(5), PMID: 32106430.

Parodi-Rullán RM, **Chapa-Dubocq X**, Guzmán-Hernández, R, Jang S, Torres-Ramos CA, Ayala-Peña S, Javadov S. The Role of Adenine Nucleotide Translocase in the Assembly of Respiratory Supercomplexes in Cardiac Cells Cells. 2019, 8(10), PMID: 31614941.

Updated April 29, 2025.

Parodi-Rullán R, Soto-Prado J, Vega-Lugo J, **Chapa-Dubocq X**, Díaz-Cordero S, and Javadov S. Divergent Effects of Cyclophilin-D Inhibition on the Female Rat Heart: Acute Versus Chronic Post-Myocardial Infarction. Cell Physiol Biochem. 2018, 50(1), PMID: 30282073.

Parodi-Rullán RM, **Chapa-Dubocq X**, and Javadov S. Acetylation of Mitochondrial Proteins in the Heart: The Role of Sirt3. Front. Physiol. 2018. 9:1094, PMID: 30131726

Chapa-Dubocq X, Makarov V, and Javadov S. Simple Kinetic Model of Mitochondrial Swelling in Cardiac Cells. Journal of Cellular Physiology. 2017, Volume 233(7), PMID: 29215716.

Javadov S, **Chapa-Dubocq X**, and Makarov V. Different Approaches to Modeling Analysis of Mitochondrial Swelling. Mitochondrion. 2017, 38, PMID: 28802667.

Parodi-Rullán RM., **Chapa-Dubocq X**, Pedro J, Rullán JR, , Jang S Javadov S. High Sensitivity of Sirt3 Deficient Hearts to Ischemia-Reperfusion is Associated with Mitochondrial Abnormalities. Front Pharmacol. 2017, 8, PMID: 28559847.

* Indicates shared first authorship.

Abstracts

Xavier Chapa-Dubocq, Alejandra Jacotte-Simancas, Andrea Martinez-Santana, Nicholas Gilpin, Scott Edwards, Patricia Molina | Alcohol Exposure Post-Traumatic Brain Injury Worsens Neurobehavioral Outcomes in Rats; Potential Role of Bioenergetic Alterations at the Site of Injury| 26 Apr 2025 | 2025 American Physiology Summit | Baltimore, MD

Xavier Chapa, Alejandra Jacotte-Simancas, Scott Edwards, Liz Simon, Patricia E. Molina | Assessing the Impact of Alcohol on Traumatic Brain Injury: a Focus on Mitochondrial Bioenergetics and Spatial Working Memory | 03 Oct 2024 | 24th Annual NHSN Conference | New Orleans, LA.

Xavier Chapa, Sydney Vita, Scott Edwards, Liz Simon, Nick W. Gilpin, Patricia E. Molina | Increased ferroptotic signaling in the frontal lobe of adolescent rats: impact of intermittent ethanol vapor exposure after repeated mild traumatic brain injury | 24 Jun 2024 | 47th Annual Research Society on Alcohol (RSA) Scientific Meeting | Minneapolis, MN

Xavier Chapa, Sydney Vita, Scott Edwards, Liz Simon, Nick W. Gilpin, Patricia E. Molina | Intermittent ethanol vapor exposure enhances ferroptosis following repeated mild traumatic brain injury in the frontal lobe of adolescent rats; potential role of mitochondrial dysregulation| 06 Apr 2024 | 2024 American Physiology Summit | Long Beach, CA.

Xavier Chapa, Sydney Vita, Scott Edwards, Liz Simon, Nick W. Gilpin, Patricia E. Molina | The Effect of Alcohol on Mitochondrial Alterations in the Frontal Lobe Induced by rmTBI in Adolescence | 23 Sep 2023 | Annual NHSN Conference 2023 | Arlington, VA.

Xavier Chapa-Dubocq, Jorge Garcia-Baez, Jason Bazil, Sabzali Javadov | Uncovering the Relationship between Optic Atrophy-1 Protein and Mitochondria Function| 23 May 2023 | APS Summit | Long Beach, CA.

Jorge Garcia-Baez, **Xavier Chapa-Dubocq**, Sabzali Javadov | The Interplay Between Iron Regulation and Ferroptosis Cell Death Signaling| 23 May 2023 | APS Summit | Long Beach, CA.

Xavier Chapa-Dubocq, Jorge Garcia-Baez, Jason Bazil, Sabzali Javadov | Elucidating the Role of Adenine Nucleotide Transporter in Mitochondrial Swelling: an Experimental and Computational Approaches | 2-5 Apr 2022 | Experimental Biology | Philadelphia, PA.

Sehwan Jang, **Xavier Chapa-Dubocq**, Silvia Fossati, Sabzali Javadov | Comparative Analysis of Mitochondrial CRC in Permeabilized Cells and Isolated Cell Mitochondria| 2-5 Apr 2022 | Experimental Biology | Philadelphia, PA.

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Keishla Rodríguez-Graciani, **Xavier Chapa-Dubocq**, Ivana Chaves-Negrón, Sabzali Javadov | The Role of IR-Induced Swelling in OPA1-MICOS Interaction in Cardiac Mitochondria | 2-5 Apr 2022 | Experimental Biology | Philadelphia, PA.

Xavier Chapa-Dubocq, Sehwan Jang, Esteban Ayala, Sabzali Javadov | The Effects of Glutaminolysis Inhibition on Ferroptotic Cell Death Signaling in Cardiomyocytes | 27-30 Apr 2021 | Experimental Biology 2021 | Virtual.

Keishla M. Rodrguez-Graciani , **Xavier Chapa-Dubocq**, Natalya Chorna, Sabzali Javadov | Metabolomic Profile of Ferroptosis in Cardiac Cells | 27-30 Apr 2021 | Experimental Biology 2021 | Virtual.

Xavier Chapa-Dubocq, Yulia Y. Tyurina, Esteban Ayala, Keishla Rodriguez-Graciani, Sehwan Jang, Hulya Bayir, Valerian E. Kagan, Sabzali Javadov | The Role of Ferroptosis in Cardiac Dysfunction Induced by Ischemia-Reperfusion Injury | 21 Feb 2020 | 9th Annual Meeting Of The Puerto Rico Physiology Society | Rio Piedras, PR.

Xavier R. Chapa-Dubocq, Keishla M. Rodrguez-Graciani, Roberto A. Guzman-Hernandez, Sehwan Jang, Sabzali Javadov | Elucidating the Physiological Role of Mitochondrial ETC Supercomplexes in the Heart | 6-9 Apr 2019 | Experimental Biology 2019 | Orlando, FL.

Keishla M. Rodríguez-Graciani, **Xavier R. Chapa-Dubocq**, Sabzali Javadov | Challenges in the Separation of Purified Cardiac Mitochondrial Membranes| 6-9 Apr 2019 | Experimental Biology 2019 | Orlando, FL.

Keishla M. Rodríguez-Graciani, **Xavier R. Chapa-Dubocq**, Sabzali Javadov | Proteolytic Cleavage of OPA1 in Response to Ischemia-Reperfusion In the Heart: The Role of Mitochondrial Permeability Transition | 15 Feb 2019 | | 8th Annual Meeting Of The Puerto Rico Physiology Society | Rio Piedras, PR.

Jorge Garcia-Baez, **Xavier Chapa-Dubocq**, Carlos Rivero-Quiles, Roberto Hernandez-Guzman, Keishla M. Rodríguez-Graciani, Annabell C Segarra, Sabzali Javadov | Acute Effects of Cocaine on the Respiratory Function of Mitochondria in the Brain | 15 Feb 2019 | 8th Annual Meeting of the Puerto Rico Physiology Society | Rio Piedras, PR.

Roberto Guzmán-Hernández, **Xavier Chapa-Dubocq**, Keishla Rodríguez-Graciani, Sabzali Javadov | Elucidating Functional Characteristics of Mitochondrial Subpopulations in the Rat Heart | 14-17 Nov 2018 | ABRCMS 2018 | Indianapolis, IN.

Roberto Guzmán-Hernández, Rebecca M. Parodi-Rullán, **Xavier Chapa-Dubocq**, Sehwan Jang, Sabzali Javadov | Expression of Fusion Proteins in Different Subpopulations of Cardiac Mitochondria | 21-25 Apr 2018 | Experimental Biology 2018 | San Diego, CA.

Rebecca Maria Parodi-Rullán, Jadira Soto-Prado, Sara Isabel Diaz-Cordero, Jesús Vega-Lugo, **Xavier Chapa-Dubocq**, Sabzali Javadov | Sanglifehrin A has No Protective Effects in Non-Reperfused Myocardial Infarction: The Role of Mitochondria | 21-25 Apr 2018 | Experimental Biology 2018 | San Diego, CA.

Rebecca M. Parodi-Rullán, Jadira Soto-Prado, Jesús Vega-Lugo, **Xavier Chapa-Dubocq**, Sabzali Javadov | Mitochondrial PTP Inhibition Through Cyclophilin D Has No Protection Against Non-Reperfused Myocardial Infarction in Female Rats| Nov 29-02 Dec 22-26 Apr 2017 | SFRBM 2017 | Chicago, IL.

Jesús Vega-Lugo, Rebecca M. Parodi-Rullán, Jadira Soto-Prado, **Xavier Chapa-Dubocq**, Sabzali Javadov | The Effects of Myocardial Infarction With or Without Subsequent Reperfusion on Respiratory Function of Mitochondria in Rat Heart | 22-26 Apr 2017 | Experimental Biology 2017 | Chicago, IL.

Rebecca M. Parodi-Rullán, Jadira Soto-Prado, Jesús Vega-Lugo, **Xavier Chapa-Dubocq**, Sabzali Javadov | Inhibition of Cyclophilin D During Acute and Chronic Myocardial Infarction in Rats: The Effect of Reperfusion | 22-26 Apr 2017 | Experimental Biology 2017 | Chicago, IL.

Xavier Chapa-Dubocq, Vladimir Makarov, Sabzali Javadov | Modeling of Calcium-Induced Swelling in Spatially Divergent Populations of Cardiac Mitochondria | 22-26 Apr 2017 | Experimental Biology 2017 | Chicago, IL.

Rebecca M. Parodi-Rullán, Jadira Soto-Prado, Jesús Vega-Lugo, **Xavier Chapa-Dubocq**, Sabzali Javadov | The Effect of Cyp-D Inhibition on Cardiac Function During Acute and Chronic Myocardial Infarction and

Ischemia-Reperfusion | 10 Jan 2017 | 7th Annual Meeting Of The Puerto Rico Physiology Society | San Juan, PR.

Xavier Chapa-Dubocq, Vladimir Makarov, Sabzali Javadov | Modeling of Calcium-Induced Swelling in Cardiac Mitochondria | 10 Jan 2017 | 7th Annual Meeting Of The Puerto Rico Physiology Society | San Juan, PR.

Rebecca M. Parodi-Rullán, Pedro J. Rullán, **Xavier Chapa**, Sabzali Javadov. | SIRT3 Deficiency Aggravates Heart Recovery after Global Ischemia: The Role of Mitochondrial ROS Production and Permeability Transition | 2-6 Apr 2016 | Experimental Biology 2016 | San Diego, CA.

Xavier Chapa-Dubocq, Vladimir Makarov, Sabzali Javadov | A Simple Kinetics Analysis of Mitochondrial Swelling | 18 Mar 2016 | 36th Annual Research and Educational Forum | San Juan, PR.

Xavier Chapa-Dubocq, Vladimir Makarov, Sabzali Javadov | A Simple Kinetics Analysis of Mitochondrial Swelling | 12 Feb 2016 | 6th Annual Meeting of the Puerto Rico Physiology Society | San Juan, PR.

Oral Scientific Presentations

Xavier Chapa-Dubocq, Alejandra Jacotte-Simancas, Andrea Martinez-Santana, Nicholas Gilpin, Scott Edwards, Patricia Molina | Alcohol Exposure Post-Traumatic Brain Injury Worsens Neurobehavioral Outcomes in Rats; Potential Role of Bioenergetic Alterations at the Site of Injury| 25 Apr 2025 | 2025 American Physiology Summit | Baltimore, MD

Xavier Chapa, Alejandra Jacotte-Simancas, Scott Edwards, Liz Simon, Patricia E. Molina | Assessing the Impact of Alcohol on Traumatic Brain Injury: a Focus on Mitochondrial Bioenergetics and Spatial Working Memory | 03 Oct 2024 | 24th Annual NHSN Conference | New Orleans, LA.

Xavier R. Chapa-Dubocq, Keishla M. Rodrguez-Graciani, Roberto A. Guzman-Hernandez, Sehwan Jang, And Sabzali Javadov | Elucidating the Physiological Role of Mitochondrial ETC Supercomplexes in the Heart | 15 Feb 2019 | 8th Annual Meeting of the Puerto Rico Physiology Society | Rio Piedras, PR.

Teaching Experience

Formal Lectures:

HLSC3410 Pathophysiology— LSUHSC (Nursing)	2024-2025
Human Physiology— UPRRCM (Medicine)	2019-2022
Labs on Cardiovascular, Renal, Pulmonary, and Gastro-physiology	
FISA8532- Instrumentation— UPRRCM (Physiology)	2018-2022
Western Blot theory and lab	

Community Service and Outreach Activities

SCUBA DOGS SOCIETY | SAN JUAN, PR | 2021

- Participated in beach clean-up, captain of group.

CIMATEC SCIENCE FAIR / "FERIA CIENTIFICA CIMATEC" | VIRTUAL | 2021

- Participated in judging science project from the engineering section.

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VOLUNTEER FOR THE CENTER OF HISPANIC EXCELLENCE | UNIVERSITY OF PUERTO RICO MEDICAL SCIENCE CAMPUS | 2019

- Participated in presenting research conducted in the lab to high school student with the intention of motivating them in pursuing a career in a STEM program.

APS PHYSIOLOGY UNDERSTANDING (PHUN) WEEK 2018| ESCUELA SECUNDARIA ESPECIALIZADA EN CIENCIAS, MATEMÁTICAS Y TECNOLOGÍA (CIMATEC)| 2018

- Participated in presenting research conducted in the lab to high school student with the intention of motivating them in pursuing a career in a STEM program.

OPEN HOUSE VOLUNTEER FOR THE CENTER OF HISPANIC EXCELLENCE | UNIVERSITY OF PUERTO RICO MEDICAL SCIENCE CAMPUS | 2018

- Participated in presenting research conducted in the lab to high school student with the intention of motivating them in pursuing a career in a STEM program.

OPEN HOUSE VOLUNTEER FOR BIOMEDICAL SCIENCE | UNIVERSITY OF PUERTO RICO MEDICAL SCIENCE CAMPUS | 2017

- Participated in presenting research conducted in the lab to high school student with the intention of motivating them in pursuing a career in a STEM program.

PARTICIPATED IN SUMMER CAMP PROGRAM | UNIVERSITY OF PUERTO RICO MEDICAL SCIENCE CAMPUS | 2017

- Participated in presenting research conducted in the lab to high school student with the intention of motivating them in pursuing a career in a STEM program.

OPEN HOUSE VOLUNTEER |UNIVERSITY OF PUERTO RICO MEDICAL SCIENCE CAMPUS| 2016

- Participated in presenting the new graduate students around the campus and exposing them to the different research facilities within the campus. Additionally, I presented a PowerPoint explaining the work done in my assigned laboratory.

APS PHYSIOLOGY UNDERSTANDING (PHUN) WEEK 2016 |FRANSISCO GAZTAMBIDE VEGA ELEMENTARY SCHOOL| 2016

- Participated in a national coordinated event to promote the understanding of physiology in health and disease. Presented the physiological and pathophysiological process that occur in the respiratory system.

PARTICIPATED IN PHYSIOLOGY UNDERSTANDING (PHUN) WEEK |COLEGIO ESPIRITU SANTO ELEMENTARY SCHOOL| 2016

- Participated in a national coordinated event to promote the understanding of physiology in health and disease. Presented the physiological and pathophysiological process that occur in the respiratory system.

MEDICAL SERVICE OUTREACH | CULEBRA, PR | 2012

- Free medical services was provided to an underdeveloped community in Culebra, P.R from May 30 to June 3. Measured blood pressure, blood glucose levels, oxygen saturation, body weight, temperature, and extracted blood for HIV testing.

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