

James J. Yu

PhD Candidate, Biomedical Sciences, UC San Diego
jyu@health.ucsd.edu • jamesjyu.com

EDUCATION

University of California, San Diego, La Jolla, CA Sept 2018-Present
Ph.D., Biomedical Sciences (Army Leave of Absence Oct 2021-Sept 2022)
Genetics Training Program
Anthropogeny Specialization Track

Army Aviation Flight School and Basic Officer Leadership Course Oct 2016-Apr 2018
UH-60 Black Hawk Advanced Airframe Course
UH-72 Lakota Initial Entry Rotary Wing Course

Duke University, Durham, NC Aug 2012-May 2016
B.S. with Distinction in Evolutionary Anthropology
Minors in Global Health and Biology

RESEARCH INTERESTS

- Understanding genetic and physiological mechanisms underlying human adaptation to high altitude
- Identifying and implementing interventions to improve performance at high altitude and extreme environments
- Understanding the effects of extreme environments on sleep, including sleep-disordered breathing

RESEARCH EXPERIENCE

Graduate Researcher; Advisor: Tatum Simonson Sept 2018-Present
University of California, San Diego, La Jolla, California
• Led a clinical trial to test a probiotic's effect on acclimatization to high altitude at Barcroft Research Station
• Conducted a wide range of physiological measurements in humans (sleep, cognitive, exercise, etc.)
• Conducted over 400 hypoxic ventilatory response measurements in the remote highlands of Mustang, Nepal
• Cell culturing techniques utilizing CRISPR-Cas9 Base-Edited HEK293 Cells
• Multi-omics analysis of data/samples from Cerro de Pasco, Peru (physiological, genetic, proteomic, metabolomic)
• Developed and edited multiple human subject IRB protocols

Associate in Research; Advisor: Charles Nunn June 2016-Oct 2016
Duke University, Durham, North Carolina
• Collected and analyzed sleep data in humans from a rural village in Madagascar
• Assisted in conducting the first polysomnography recordings of sleep in a traditional population

Volunteer Researcher; Advisor: Julie Horvath Sept 2015-Dec 2015
N.C. Museum of Natural Sciences, Raleigh, North Carolina
• Isolated DNA and PCR-amplified samples from human and cattle skin microbial swabs for microbiome study

Undergraduate Student Researcher; Advisor: Charles Nunn Aug 2014-May 2016
Duke University, Durham, North Carolina
• Led a fieldwork study testing the effects of antibacterial soap on the human skin microbiome in Madagascar
• Tested cognitive performance after sleep inhibition of lemurs at the Duke University Lemur Center

Undergraduate Research Assistant

Summer 2013

Duke University Marine Lab, Beaufort, North Carolina

- Isolated DNA from crab tissue and prepared solutions for PCR amplification

FELLOWSHIPS AND RESEARCH GRANTS

Center for Academic Research & Training in Anthropogeny Fellowship

Sept 2023-Jun 2024

Fellowship for students in the Anthropogeny Specialization track that engage in transdisciplinary training and research in human origins and evolution

White Mountain Research Center Minigrant

Summer 2023

Grant awarded by the White Mountain Research Center (WMRC) for graduate students conducting fieldwork research in one of the WMRC's research stations

National Defense Science and Engineering Graduate Fellowship

Sept 2020-Jul 2024

Three year fellowship to support PhD students whose research aligns with the DoD's broad research interests

Duke Undergraduate Independent Study Grant

Fall 2015

Research grant to assist undergraduate students in conducting their research

4-Year National Army ROTC Scholarship

Aug 2012-Jun 2016

Scholarship that covers all tuition fees for a four-year undergraduate education while training to become an Army Officer

PUBLICATIONS

Lawrence, E.S., Gu, W., Bohlender, R.J., Anza-Ramirez, C., Cole, A.M., **Yu, J.J.**, ... Simonson, T.S. (2024). Functional *EPAS1/HIF2A* missense variant is associated with hematocrit in Andean Highlanders. *Science Advances*, 10(6), eadj5661.

Yu, J. J., Non, A. L., Heinrich, E. C., Gu, W., Alcock, J., Moya, E. A., ... Simonson, T. S. (2022). Time Domains of Hypoxia Responses and -Omics Insights. *Frontiers in Physiology*, 13. doi:10.3389/fphys.2022.885295.

Yu, J. J., Manus, M. B., Mueller, O., Windsor, S. C., Horvath, J. E., & Nunn, C. L. (2018). Antibacterial soap use impacts skin microbial communities in rural Madagascar. *PloS One*, 13(8), e0199899.

Manus, M. B., **Yu, J. J.**, Park, L. P., Mueller, O., Windsor, S. C., Horvath, J. E., & Nunn, C. L. (2017). Environmental influences on the skin microbiome of humans and cattle in rural Madagascar. *Evolution, Medicine, and Public Health*, 2017(1), 144–153.

Samson, D. R., Manus, M. B., Krystal, A. D., Fakir, E., **Yu, J. J.**, & Nunn, C. L. (2017). Segmented sleep in a nonelectric, small-scale agricultural society in Madagascar. *American Journal of Human Biology: The Official Journal of the Human Biology Council*, 29(4). doi:10.1002/ajhb.22979

LEADERSHIP EXPERIENCE

Synthetic Biology Innovation Engagement Officer, US Army Reserves

Sept 2023-Present

- Biomedical sciences subject matter expert for the Army
- Develop partnerships for the Biomedical and Biotechnology Portfolio

- Forward Site Lead Officer and Medevac Platoon Leader**, US Army, Jordan/Syria May 2022-Sept 2022
- Directly managed a forward-deployed site in a combat zone for an Aviation Battalion
 - Oversaw over 50 Air Missions and personally flew 19 Medevac missions in a combat zone
- Operations Officer and Medevac Pilot**, US Army, Kuwait Oct 2021-May 2022
- Oversaw Current Operations of over 600 soldiers and 50 aircraft deployed to 7 locations and 5 countries
 - Supervised over 10,000 flight hours, 900 air missions, and 230 Medevac missions
 - Personally flew 8 Medevac missions
 - Pilot-in-Command in the HH-60M Black Hawk helicopter
- Aeromedical Evacuations Pilot and Officer**, US Army Reserves Apr 2018-Sept 2023
- Platoon Leader overseeing the training and readiness of a Medevac platoon
 - Pilot-in-Command in the UH-60L Black Hawk helicopter
 - Air Mission Commander
 - Completed Survival, Evasion, Resistance, and Escape (SERE) Level-C training
- Cadet**, Duke University Army R.O.T.C. Aug 2012-June 2016
- Completed Airborne School and executed 5 successful parachute jumps out of a C-130 airplane
 - Completed Cultural Understanding and Language Proficiency (CULP) training in Thailand
 - Engaged in courses, labs, and field exercises to become an Army Officer while a full-time undergraduate student

TEACHING EXPERIENCE

- Teaching Assistant**, Human Evolutionary Genetics Winter 2020
- Reoccurring Guest Lecturer**, Genetics in Modern Society Quarterly 2020-2023
- Volunteer**, Jail Outreach Program at Las Colinas Detention Facility 2023-2024
- Mentor**, Biology Undergraduate and Master's Mentorship Program 2023-2024

MENTORSHIP

- Nam Nguyen, Undergraduate, University of California, San Diego 2023-2024
- Saniya Thomas, Undergraduate, University of California, San Diego 2023-2024
- Hunter Cheng, Undergraduate, University of California, San Diego 2022-2024
- Kiana Kaya, Undergraduate, University of California, San Diego 2022-2024
- Tim Ochoa, Undergraduate, University of California, San Diego 2022-2024
- Jeevan Singh, Undergraduate, University of California, San Diego 2022-2024

PRESENTATIONS

Oral Presentations

- Yu JJ**, Moya EA, Cheng H, Kaya K, Ochoa T, Fassardi S, ... Simonson T.S. Oral bacteriotherapy improves oxygen saturation during acclimatization to high altitude. Talk presented at: White Mountain Research Center; 2024 Mar; Bishop, California.
- Yu JJ**, Gu W, Anza C, Huff CD, Bohlender RJ, Villafuerte FC, Simonson TS. A putatively adaptive missense variant in *ICAM1* is associated with systolic blood pressure in Andean highlanders. Talk presented at: American Physiology Summit; 2023 Apr; Long Beach, California. **Awarded 2nd Place best Talk.**
- Yu JJ**, Moya EA, Gu W, Di Rienzo A, Witonsky D, Craig SR, Buchanan CA, Powell FL, Beall CM, Simonson TS. Ventilatory and heart rate responses to hypoxia associate with pre- and post-menopausal status and genetic

signatures in Tibetan women at high altitude. Talk presented at: International Hypoxia Symposium; 2023 Feb; Lake Louise, Alberta, Canada. **Awarded 1st Place best Talk.**

Ye S, Sun J, Basnyat B, Craig SR, Simonson TS, **Yu JJ**, Moya EA, Powell FL, Witonsky D, Di Rienzo A, Beall CM. Cardiopulmonary adaptations measured after childbearing are associated with Tibetan women's reproductive success. Invited talk at: Leh Symposium; 2022 May; Leh, India.

Moya EA, **Yu JJ**, Craig SR, Buchanan CA, Powell FL, Simonson TS, Beall CM. Higher ventilatory response to hypoxia associates with higher oxygen saturation and lower hemoglobin concentration among ethnically Tibetan women residing above 3500m in Nepal. Talk given at: Thriving-at-Miles-High Symposium for American Association of Physical Anthropologists; 2020 Apr (virtual).

Heinrich EC, Orr JE, Gilbertson D, Anza-Ramirez C, Deyoung PN, **Yu JJ**, Moya EA, Djokic MA, Corante N, Vizcardogalindo G, Macarlupu JL, Gaio E, Powell FL, Malhotra A, Villafuerte FC, Simonson TS. Integrative studies of altitude adaptation: Cross-population genomic and physiological analyses from Tibet and Peru. Talk given at: Thriving-at-Miles-High Symposium for American Association of Physical Anthropologists; 2020 Apr (virtual).

Podium presentation co-author. Cooking practices, health, and deforestation in Madagascar. Presented at: Duke Lemur Center 50th Anniversary Scientific Symposium & Gala; 2016 Sept; Durham, NC.

Poster Presentations

Yu JJ, Gu W, Anza C, Huff CD, Bohlender RJ, Houck J, Toledo-Jaldin L, Julian CG, Villafuerte FC, Simonson TS. A putatively adaptive missense variant in *ICAM1* is associated with systolic blood pressure in Andean highlanders. Poster presented at: International Society for Evolution, Medicine & Public Health Conference; 2023 Apr; Irvine, California.

Yu JJ, Gu W, Anza C, Huff CD, Bohlender RJ, Villafuerte FC, Simonson TS. A putatively adaptive missense variant in *ICAM1* is associated with systolic blood pressure in Andean highlanders. Poster presented at: UCSD Department of Medicine Research Day; 2023 May; La Jolla, California.

Yu JJ, Gu W, Anza C, Huff CD, Bohlender RJ, Villafuerte FC, Simonson TS. A putatively adaptive missense variant in *ICAM1* is associated with systolic blood pressure in Andean highlanders. Poster presented at: American Physiology Summit; 2023 Apr; Long Beach, California.

Moya EA, **Yu JJ**, Craig SR, Buchanan CA, Basnyat B, Powell FL, Beall CM, Simonson TS. Reduced Hypoxic Ventilatory and Heart Rate Responses to Hypoxia in Post- versus Pre-menopausal Tibetan Women in Mustang, Nepal. Poster presented at: American Physiology Summit; 2023 Apr; Long Beach, California.

Kong MC, Lawrence ES, Gu W, Moya EA, Sanchez-Azofra A, **Yu JJ**, et al. Identification of a putatively adaptive promoter variant in *PRKAA1* in Andean highlanders. Poster presented at: American Physiology Summit; 2023 Apr; Long Beach, California.

Moya EA, **Yu JJ**, Craig SR, Buchanan CA, Powell FL, Beall CM, Simonson TS. Reduced Hypoxic Ventilatory and Heart Rate Responses to Hypoxia in Post- versus Pre-menopausal Tibetan Women in Mustang, Nepal. Poster presented at: CA Society of Physiologists; 2022 Nov; Torrance, California.

Hall J, Kong MC, Gu W, **Yu JJ**, Anza-Ramirez C, Fox K, Villafuerte F, Gotesman M, Simonson TS. Genetic variation related to the regulation and expression of hemoglobin isoforms among global populations. Poster presented at: American Society of Human Genetics; 2022 Oct; Los Angeles, California.

Gu W, Lawrence ES, Bohlender RJ, Anza-Ramirez C, Cole AM, **Yu JJ**, et al. Genetic and phenotypic high-altitude adaptation at EPAS1/HIF2A in Andean highlanders. Poster presented at: American Society of Human Genetics; 2022 Oct; Los Angeles, California.

Ye S, Sun J, Basnyat B, Craig SR, Simonson TS, **Yu JJ**, Moya EA, Powell FL, Witonsky D, Di Rienzo A, Beall CM. Social, physiological, and genetic contributions to reproductive success among Tibetan women. Poster presented virtually at: Human Biology Association; 2022 Mar; Denver, Colorado.

Yu JJ, Mercader K, Gu W, Watrous JD, Long T, Ding J, Anza C, Heinrich EC, Vizcardo G, Villafuerte FC, Jain M, Simonson TS. A multi-omics approach to identifying adaptive variants in high-altitude Andeans. Poster presented at: International Society for Mountain Medicine; 2021 Jun (virtual).

Moya EA, **Yu JJ**, Brown S, Lawrence ES, Gu W, Carlson R, Brandes A, Wegeng WA, Amann K, McIntosh SE, Powell FL, Simonson TS. Lower hemoglobin concentration and blunted heart rate responses to hypoxia in Tibetans at intermediate altitude. Poster presented at: International Society for Mountain Medicine; 2021 Jun (virtual).

Moya EA, **Yu JJ**, Brown S, Lawrence ES, Gu W, Carlson R, Brandes A, Wegeng WA, Amann K, McIntosh S, Powell FL, Simonson TS. Tibetans at intermediate altitude exhibit lower hemoglobin concentration and distinct responses to poikilocapnic hypoxia relative to Han Chinese residents. Poster presented at: Experimental Biology; 2021 Apr (virtual).

Yu JJ, Mercader K, Gu W, Lawrence ES, Watrous JD, Long T, Ding J, Anza C, Heinrich EC, Vizcardo G, Villafuerte FC, Jain M, Simonson TS. A multi-omics approach to identifying adaptive variants in high-altitude Andeans. Poster presented at: Genetics Training Program 13th Annual Retreat; 2020 Mar; La Jolla, CA.

Manus MB, **Yu JJ**, Lawrence PP, Mueller O, Windsor SE, Horvath JE, Nunn CL. Environmental Influences on the skin microbiome of humans and cattle in rural Madagascar. Poster presented at: ISEMPH 3rd annual meeting; 2017 Aug; Groningen, Netherlands.

Manus MB, **Yu JJ**, Lawrence PP, Mueller O, Windsor SE, Horvath JE, Nunn CL. Environmental Influences on the skin microbiome of humans and cattle in rural Madagascar. Poster presented at: NC Microbiome Consortium Meeting; 2017 May; RTP, NC.

Greene LK, Klug T, Guidera L, Hess A, Litzow E, **Yu JJ**, Fakir E, Manus MB, Welch C, Nunn CL. Too many cooks: The influence of traditional cooking practices on local deforestation and endemic wildlife in rural Madagascar. Poster presented at: Biodiversity Days, Nicholas School for the Environment at Duke University; 2017 Mar 3; Durham, NC.

Manus MB, **Yu JJ**, Lawrence PP, Mueller O, Windsor SE, Horvath JE, Nunn CL. Environmental Influences on the skin microbiome of humans and cattle in rural Madagascar. Poster presented at: Duke University Program in Ecology Symposium; 2016 Dec; Durham, NC.

Carson B, Fakir E, Greene LK, Guidera L, Hess A, Klug T, Litzow E, Manus MB, Raharinoro N, **Yu JJ**, Welch C, Nunn CL. The effects of cooking practices on human and environmental health. Poster presented at: 5th Annual Duke Global Health Institute Poster Showcase; 2016 Nov; Durham, NC.

Carson B, Fakir E, Greene LK, Guidera L, Hess A, Klug T, Litzow E, Manus MB, Raharinoro N, **Yu JJ**, Welch C, Nunn CL. Cardiovascular and respiratory health in rural Madagascar. Poster presented at: 5th Annual Duke Global Health Institute Poster Showcase; 2016 Nov; Durham, NC.

Manus MB, **Yu JJ**, Lawrence PP, Mueller O, Windsor SE, Horvath JE, Nunn CL. Environmental Influences on the skin microbiome of humans and cattle in rural Madagascar. Poster presented at: Secret World Inside You Exhibit at NC Museum of Natural Sciences; 2016 Oct; Raleigh, NC.

Yu, JJ The Skin Microbiome and Soap Use: A study of a rural population in Madagascar. Poster presented at: Visible Thinking, Duke University; 2016 Apr; Durham, NC.

Manus MB, **Yu JJ**, Lawrence PP, Mueller O, Windsor SE, Horvath JE, Nunn CL. Sharing microbes in Madagascar. Poster presented at: Darwin Day at NC Museum of Natural Sciences; 2016 Feb; Raleigh, NC.

Sobel A, Ajayi T, Clarke R, Manus MB, Samson DR, Schmitt D, Trentadue T, Willoughby A, **Yu JJ**, Nunn CL. Shining Evolutionary Light on Global Health Challenges: Assessing Human Health in Rural Madagascar. Poster presented at: 4th Annual Duke Global Health Institute Poster Showcase; 2015 Oct; Durham, NC.

Manus MB, **Yu JJ**, Ajayi T, Horvath JE, Nunn CL. Inter-species microbial sharing in rural Madagascar: A study of environmental influences on the skin microbiome. Poster presented at: 4th Annual Duke Global Health Institute Poster Showcase; 2015 Oct; Durham, NC.

OTHER AWARDS, HONORS, ACTIVITIES

Reviewer for *Experimental Physiology*, 2024

Symposium Co-Chair, “Inflammatory and Immune Adaptations to Hypoxia”, American Physiology Summit, 2023

2nd Place Best Abstract/Talk, Physiological Omics Group, American Physiology Summit, 2023

1st Place Best Trainee Talk, International Hypoxia Symposium, 2023

DoD Air Medal with “C” Device, 2022

Admissions Committee, Biomedical Sciences Graduate Program, 2021

Symposium Co-Chair, “Insightful Multi-Omics Approaches: From Clinical Contexts to Extreme Environments”, Experimental Biology Annual Conference, 2021

Featured student spotlight, UC San Diego Student Veterans Resource Center, 2021

Army Achievement Medal, 2020

Project Global Officer Scholarship, Yonsei University, Seoul, South Korea, Summer 2014

PROFESSIONAL MEMBERSHIPS

American Physiological Society	2019-Present
American Alpine Club	2019-Present
American Society of Human Genetics	2020-Present
International Society for Evolution, Medicine & Public Health	2020-Present
Aerospace Medical Association	2024-Present

PROFESSIONAL CERTIFICATIONS

Open Water Diver, Professional Association of Diving Instructors	2020
Commercial Pilot-Helicopter, Federal Aviation Administration	2018
Instrument Helicopter Rating, Federal Aviation Administration	2018
DoD Security Clearance: Secret	2016