



Integrative Physiology

University of Colorado
Boulder

Department
Newsletter

IPHY

Issue #20

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Special points of interest:

- The use of running-specific prostheses for running and sprinting does not provide an advantage to athletes with lower limb amputations compared to non-amputees
- Although older adults, on average, do not meet the recommended guidelines for regular aerobic exercise or healthy dietary practices, there are a variety of alternative approaches which are emerging as safe and effective therapeutic strategies
- You supported the admission of several of our most outstanding students

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A Few Words from Chair Marissa Ehringer

The past year brought continued success for our students, faculty, and staff in their academic and research endeavors. This issue highlights the research accomplishments for several faculty and demonstrates the breadth of expertise in our department spanning biomechanics and healthy cardiovascular aging. We are also proud to announce a new Study Abroad course developed by Teaching Professors Amanda Schaetzel and Ruth Heisler which provided an active learning experience about the history of medicine in London. Another example of how a degree in IPHY prepares students for “real-world” opportunities was highlighted in a recent e-mail received by Teaching Professor Steve Hobbs. Please also review the Kudos/News page for other outstanding accomplishments by IPHY members.

We are thrilled to announce also that two new faculty will be joining us! This fall 2023, Rachel Rowe will begin as tenure-track Assistant Professor and in fall 2024, Matthew Olm will also join as a new tenure-track Assistant Professor. It is exciting to be a part of recruiting these outstanding junior investigators and educators, who will add innovation and new opportunities for students.

Please follow us on Facebook, Instagram, and Twitter (@CUBoulderIPHY) to keep up with everything in real time!!





The Anatomy of Running by Alena Grabowski

There is much more to running that lies beneath the surface. To run, people utilize their bones, ligaments, tendons, and muscles to develop force on the ground and move in a spring-like fashion. These coordinated movements and forces, or biomechanics, require metabolic energy, which is delivered to the muscles via the cardiopulmonary system. Running performance is ultimately influenced by the biomechanics and metabolic energy required.

People with an amputation require the use of specialized prostheses that enable them to run. These prostheses are passive-elastic meaning that they cannot generate energy but can store and return elastic energy and behave like springs. Unlike biological legs, running-specific prostheses cannot flex or extend (dorsi-flex or plantar-flex), sense the ground, be controlled by the user, or change their mechanical properties dynamically. From many of our previous research studies on running and sprinting, we found that prosthetic legs result in different biomechanics and adaptations compared to biological legs. Despite these biomechanical differences, we also found that the metabolic energy required to run is similar between athletes with and without lower limb amputation. Importantly, from our previous research, we found that the use of running-specific prostheses for running and sprinting does not provide an advantage to athletes with lower limb amputations compared to non-amputees. People with a lower limb amputation who use running-specific prostheses are remarkable in their ability to adapt to using a passive-elastic device and have achieved remarkable running performances.





Emerging Strategies for Healthy CV Aging *by Zach Clayton*

The development of age-related cardiovascular (CV) dysfunction increases the risk of CV disease as well as other age-associated disorders, including chronic kidney disease, and Alzheimer's disease and related dementias. Major manifestations of age-associated CV dysfunction that increase disease risk are vascular dysfunction, primarily vascular endothelial dysfunction, large elastic artery (e.g., aorta) stiffening and elevated systolic blood pressure (SBP). Declines in the bioavailability of the vasodilatory molecule nitric oxide, secondary to increased oxidative stress (a primary source being mitochondria) and inflammation are well-established mechanisms of CV dysfunction with aging.

Healthy lifestyle behaviors, such as regular aerobic exercise and certain dietary patterns, are considered "first-line" strategies to prevent and/or treat age-associated CV dysfunction. Despite the well-established benefits of these strategies, many older adults do not meet the recommended guidelines for exercise or consume a healthy diet. Therefore, it is important to establish alternative and/or complementary evidence-based approaches to prevent or reverse age-related CV dysfunction. Targeting fundamental mechanisms of CV aging with interventions such as time-efficient exercise training, "exercise-inspired" lifestyle practices, or select natural and synthetic pharmacological agents represents a promising approach.

In a recent review article published in the *Journal of Cardiovascular Aging*, Drs. Zachary Clayton, Daniel Craighead and Matthew Rossman highlighted emerging strategies for healthy CV aging. These strategies included time-efficient exercise training, exercise-inspired interventions, and synthetic pharmacological agents.

Time-efficient exercise training could be accomplished via high-resistance inspiratory muscle strength training. We recently demonstrated that high-resistance inspiratory muscle strength training (30 breaths per day at 75% maximal inspiratory pressure, 6 days per week, for 6 weeks) was safe, promoted excellent adherence (~95% of all prescribed training sessions completed), decreased SBP by 9 mmHg and increased vascular endothelial function in mid-life/older adults with above normal initial SBP.

Moreover, interventions that mimic the acute CV response to traditional aerobic exercise (e.g., increased heart rate, peripheral vasodilation, increased cardiac output), without the associated physical demands (e.g., load bearing), could be viewed as exercise-inspired interventions for improving CV health. Passive heat therapy (thirty 60-min sessions of 40.5°C water immersion), represents an exercise-inspired intervention that could promote CV health with aging. In a pilot clinical trial, we have shown that passive heat therapy can lower SBP by ~10 mmHg, increase vascular endothelial function and lower aortic stiffness. Synthetic pharmacological agents that can suppress excess mitochondria-derived oxidative stress with aging also represent a viable alternative approach. In a pilot, placebo-controlled, crossover design clinical in mid-life/older adults, we have shown that oral supplementation (20 mg/day for 6 weeks) with the mitochondria-targeted antioxidant, MitoQ, could improve NO-mediated endothelial function and lower aortic stiffness.

In conclusion, although older adults, on average, do not meet the recommended guidelines for regular aerobic exercise or healthy dietary practices, there are a variety of alternative approaches which are emerging as safe and effective therapeutic strategies.



Zachary Clayton (left)

Daniel Craighead (middle)

Matthew Rossman (right)



History of Medicine IPHY Study Aboard Course by Ruth Heisler

In August of 2022, Teaching Professors Amanda Schaezel and Ruth Heisler spent a week in London preparing for a new History of Medicine course being offered through Education Abroad. As part of their preparation, they walked the city in search of museums and experiences to best highlight the significant and often disturbing history of medical advancement in and around London. Highlights of their trip included:

- visiting the Old Operating Theatre where surgery pre-anesthesia was performed in front of an audience (and speed was the greatest surgical asset);
- speculating at the use of the wide variety of surgical instruments on display in the British Museum and Science Museum;
- learning more about how overcrowding, handling of waste and water led to illness and plagues in London;
- mud larking with an archaeologist on the shore of the Thames to discover artifacts;
- discovering the many challenges of staying alive and healthy aboard ships at the National Maritime Museum;
- And wandering through the Roman Baths in Bath where the health benefits of cleanliness were apparent in their daily rituals.

With historical buildings and fascinating museums scattered across the city, a week was not nearly enough time to explore!

Several years in the making, IPHY 4040 (3 credits) was first offered Maymester of 2023. It was exciting to share their enthusiasm for the cool, crazy, and macabre historical medical practices with their inaugural class of 16 students. Learning about the past helps guide the future!





Thank You For Sending Us Great Students!!

Subject: Thank you for sending us great students!
From: Maureen Stabio; University of Colorado School of Medicine Associate Professor
To: Steve Hobbs, Integrative Physiology Associate Teaching Professor

Dear Dr. Hobbs,

I wanted to take a moment to thank you for recommendations you've written over the years in support of applicants to our Master of Science of Modern Human Anatomy program. You supported the admission of several of our most outstanding students. One of those students, Charlotte Wilson, graduated from our program in 2020. Charlotte was such an outstanding student and become a respected and valued colleague as she progressed in our program. After graduation, Charlotte was a Visiting Assistant Professor at Tulane University, and is now an Academic Services Associate at Baylor College of Medicine. Charlotte had a lasting, positive impact on our program, and we are grateful we had the opportunity to work with and train her.

Another student, Kyetiil Vicenti, graduated this past May and is currently a 1st year medical student at University of New Mexico. Kyetiil's growth in our program was a joy to witness. Her capstone project was incredible, as she created learning modules for our medical students at CU in their Mind and Behavior course: <https://hippocampusgame.com/>.

Lauren Wahl also graduated from our MHA program in 2021. She worked as our gross anatomy lab technician and is now a Forensic Autopsy Technician in Washington State.

Please keep sending us your amazing students! Warm regards, Maureen

[The Master of Science Program in Modern Human Anatomy (MHA) at CU Anschutz School of Medicine provides graduate level training and teaching experience in the physical and virtual anatomical sciences. The curriculum integrates 3D computer imaging and modeling with human cadaver dissection, neuroanatomy, histology, and embryology. All three CU Boulder undergraduates prepared for this MS program by taking anatomy lecture and laboratory courses from the Department of Integrative Physiology. Steve Hobbs is the instructor and lab coordinator for the Integrative Physiology Human Anatomy Laboratory.]



Left: Charlotte Wilson
Psychology BA — Class of 2015
MS of Modern Human Anatomy — Class of 2020



Right: Kyetiil Vicenti
Integrative Physiology BA — Class of 2018
Modern Human Anatomy MS — Class of 2022



Left: Lauren Wahl
Anthropology BA — Class of 2017
Modern Human Anatomy MS — Class of 2021



Alumni News

Zach Ehling

**Boulder Medical Center — Working as a Medical Assistant
Integrative Physiology BA — Class of 2022**

Since graduating May 2022, I have been a medical assistant in the Allergy, Asthma, and Immunology Department at the Boulder Medical Center. It has been a rich experience that let me interact with a diverse patient population and perform exciting tasks daily. In addition to providing health education for patients, I observe and participate in procedures like shot clinic, skin testing, spirometry, and food allergy challenges for adult and pediatric patients. My work has been an excellent introduction to clinical medicine and patient care. I now understand medicine is not just a scientific discipline but also a unique blend of science and social skills that must be balanced to give patients the necessary care. My belief is that these skills are the foundation of my future clinical endeavors.

To all of you pre-med students out there, I strongly encourage you to pursue clinical work before medical school. It has become quite mainstream for pre-meds to take a gap year and gain clinical experience of some kind. Most importantly, working in a clinical setting lets you figure out the path you want to pursue. If you are on the fence about applying to nursing, PA, or medical school, I strongly recommend working at a clinic like BMC to understand which career path you will enjoy!

Now almost one year after starting my pursuit of a medical degree at Loyola University Chicago Stritch School of Medicine, I am exploring internal medicine and subspecialties like allergy, rheumatology, or sports medicine. As of yet, no commitment to a particular path!

**Madden Brewster**

**IPHY — My Home for Eight Years
Integrative Physiology PhD — Class of 2022**

The IPHY department was home to me for over 8 years. After starting as an undergraduate student, I quickly decided to continue my graduate training there as well. The professors, peer cohort, and administrative staff of the IPHY department became familiar, friendly, and consistent faces, though the learning and research goals were ever evolving.

In my research, I uncovered small physiological details of vascular influence: the extracellular microvesicle. Small, outward blebblings of the plasma cell membrane of all cell types, which carried biological information from cell to cell to influence the actions of their recipient cell. In particular, I studied unique groups with increased vascular risk, such as spinal cord injured adults and Andean highlanders with chronic mountain sickness. Through this research, I forged international collaborations and traveled on research expeditions with world renowned investigators, which inspired a newfound research interest of environmental physiology. I spent the summer in Croatia with researchers representing Canada, the United Kingdom, Serbia, Croatia, and Spain to study the physiology of breath hold diving in elite spear fishers and free divers, and, more recently, I met up with a group of investigators at Barcroft high altitude research station in California to carry out several weeks of studies involving the acute and chronic effects and adaptations to high altitude.

Luckily, these expeditions have led me to an amazing environmental physiology and cerebrovascular research group at University of British Columbia Okanagan, where I am conducting my postdoctoral studies. Before starting at BC, I enjoyed backcountry skiing, rock climbing, and downhill mountain biking for some much-needed post-PhD rest and relaxation.

If I had advice for aspiring researchers and students, it is this: your path will most likely not be linear and you often will not know exactly where you are going until you get there, so, embrace the unknown and try to pick up as many skills, tools, and resources as possible along the way. I am very grateful to the IPHY department for equipping me with such things on my path as an academic researcher!





Kudos/News

Teresa Foley received the first “Principal Instructor” appointment in the Department of Integrative Physiology, and at the same time was newly appointed as Associate Chair for Undergraduate Affairs!

Rachel Rowe and Mark Opp have been notified that their \$3M, 5-year Department of Defense Partnering PI award entitled “The Role of Microglia in Sleep Disturbances Following a Traumatic Brain Injury” has been recommended for funding.

Emily Yeo (Alderete Lab) received the Curci Scholarship. <https://www.colorado.edu/asmagazine/2022/06/17/major-gift-enhance-diversity-life-science-researchers>.

Ken Wright’s research and mentoring was highlighted in a recent College of Arts and Sciences magazine article: <https://www.colorado.edu/asmagazine/2022/06/03/trailblazer-science-slumber>.

Will Patterson (Alderete Lab) was awarded a 3-year NIH F31 Research Fellowship Award “Exposure to Ambient Air Pollutants, Circulating microRNAs, and Hepatic Fat Fraction Among Young Adults”!

Marissa Ehringer was promoted to the rank of professor and was also elected as Chair of the Department of Integrative Physiology.

Sophia Mahoney (Seals Lab) was awarded an NIH NRSA T32 predoctoral fellowship and the American Physiological Society’s Porter Diversity predoctoral fellowship.

Kaitlin Freeberg (Seals Lab) won the American Physiological Society Translational Physiology Interest Group flash talk award sponsored by Physiological Reports.

Rachel Rowe was awarded the Neurotrama Rising Star Award for her sleep and traumatic brain injury research.

Tabitha Green (Opp Lab/Rachel Rowe supervisor) won the Women in Neurotrauma Research Visa Award from the National Neurotrauma Society.

Nicole Stob took part in the Climate Across the Curriculum Workshop at CU Boulder. The workshop allows faculty members “to learn, to brainstorm, and to practice in a cross-disciplinary context about major climate topics.”

Doug Seals received the Honor Award from the Environmental and Exercise Physiology section of the American Physiological Society. He also reached a big milestone—he has now been at CU Boulder for 30 years!

Charles Hoeffler, Jerry Stitzel, and Marissa Ehringer were awarded an NIH/NIDA R21/R33 grant “Role of glial expression in nicotine behaviors for genes identified through human GWAS”.

Saydie Sago, PhD student in the Lowry Lab, was awarded a highly competitive ARCS scholarship.

Evan Holbrook and Caelan Wright (Lowry Lab), received NSUR awards from St. Jude Children’s Research Hospital Graduate School of Biomedical Sciences National Symposium .

Luke Desmond (Lowry Lab) received a Stanford Program for Integrated Neuroscience Technologies (SPrint) award.

Xavier Cisneros, Lucie Nguyen, Nolan Watts, Haoting Zhang (Lowry Lab) were awarded BSI Scholars First Time Applicant awards.

Andrew Tan was awarded a CU Boulder Thrive Grant to support new faculty impacted by COVID

Chris DeSouza, who along with Andrew Park at Craig Hospital, was awarded a grant from the Paralyzed Veterans of America Research Foundation “Characterizing Endothelial Derived Microvesicles in Adults with Spinal Cord Injury as a Predictive Tool of Endothelial Cell Dysfunction”.

Hannah Fandl (DeSouza Lab) received a New Investigator Scholarship Award, and she will be presenting her work on extracellular vesicles and stroke risk with HIV-1.

Tanya Alderete and MS student Kevin Clark were recently featured in CU Boulder Today for a recent study published in BMC Public Health regarding mask use during the pandemic. <https://www.colorado.edu/asmagazine/2023/02/23/vast-majority-students-were-mask>

Janet Casagrand and the Human Anatomy and Physiology Society (HAPS) physiology expert panel completed and published its Physiology Learning Outcomes after four years of hard work.



PhD & MS Graduates

Doctor of Philosophy Degrees

Mohammed Alenazy

Dissertation: The Influence of Electrical Stimulation Applied to Muscles on Motor Function in Health and Disease

Advisor: Dr. Roger Enoka

Stephen Allen

Dissertation: *Bouncing Gaits and Bicycling: The Biomechanics and Energetics of Human Locomotion With and Without Assistive Devices*

Advisor: Dr. Alena Grabowski

Kara Ashcraft

Dissertation: *Effects of Lower Limb Prosthetic & Orthotic Configurations on Biomechanics and Metabolic Power during Running & Jumping*

Advisor: Dr. Alena Grabowski

L. Madden Brewster

Dissertation: *Extracellular Microvesicle Phenotypes in Unique Populations*

Advisor: Dr. Christopher DeSouza

Hannah Fandl

Dissertation: *Endothelial Cell-Derived Microvesicles and Cardiomyocytes*

Advisor: Dr. Christopher DeSouza

Kaitlin Freeberg

Dissertation: *Preserving Brain Vascular Health with Aging*

Advisor: Dr. Douglas Seals

Sewan "Peter" Kim

Dissertation: *The Impact of Palm Cooling During Exercise on Thermoregulation and Post Exercise*

Advisor: Dr. William Byrnes

Niki Konstantinides

Dissertation: *Clinical Observations from the Bench: An Analysis of Collegiate Concussion Etiology, Symptomology, and Recovery*

Advisor: Dr. Tanya Alderete

Madeline Lemieux

Dissertation: *Investigation of the Relationship Between Alzheimer's Disease and Sleep Disturbances*

Advisor: Dr. Christopher Link

Abigail Longtine

Dissertation: *Gut microbiome-targeted interventions for enhancing vascular health with aging*

Advisor: Dr. Douglas Seals

Dana Withrow

Dissertation: *Impact of Sleep and Circadian Disruption on the Human Gut Microbiome, Circulating Metabolites and Host Health*

Advisor: Dr. Kenneth Wright

Master of Science Degrees

Graham Archer

Coursework only

Advisor: Dr. Kenneth Wright

Hannah Cardenas

(Bachelor's Accelerated Master's program)

Research Project: *Endothelial Derived Extracellular Vesicles Associated with Electronic Use Impair Cerebral Microvascular Cell Function*

Advisor: Dr. Christopher DeSouza

Kevin Clark

Research Project: *High rates of observed face mask use at Colorado universities align with students' opinions about masking and support the safety and viability of in-person higher education during the COVID-19 pandemic*

Advisor: Dr. Tanya Alderete

McKinley Coppock

Research Project: *Effects of inorganic nitrate supplementation on vascular endothelial function, arterial stiffness, and blood pressure in chronic kidney disease: an interim analysis*

Advisor: Dr. Douglas Seals

Sanna Darvish

Research Project: *Mitochondrial-targeted antioxidant supplementation for improving cerebrovascular function and cognitive performance in older adults*

Advisor: Dr. Douglas Seals

Makenna Hemmerle

Research Project: *The Effect of Acute Intermittent Hypoxia on Motor Learning During a Split-Belt Treadmill Task*

Advisor: Dr. Andrew Tan

Christian Knobloch

Coursework only

Advisor: Dr. Kenneth Wright

Grace Maurer

Research Project: *The plasma metabolome is associated with preservation of physiological function following lifelong aerobic exercise in mice*

Advisor: Dr. Douglas Seals

Gabrielle Orié

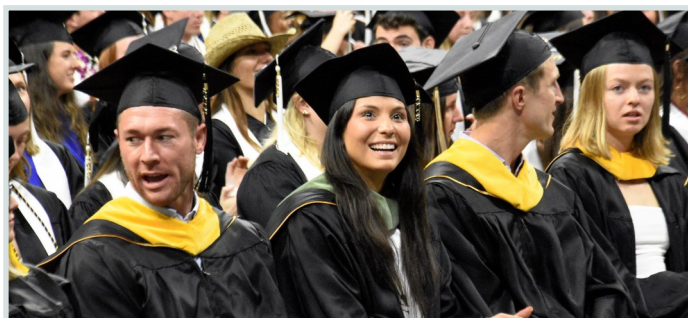
Coursework Only

Advisor: Kenneth Wright

Ravinandan Venkatasubramanian

Research Project: *Senolytic administration following doxorubicin chemotherapy prevents large elastic artery stiffening and endothelial dysfunction*

Advisor: Dr. Douglas Seals



Bachelor of Arts Graduates

Andrew Abel
Putri Abidin
Wendoleen Acevedo
Allyson Acosta
Victoria Addy
Nicole Adkins
Orlando AlanizCastañeda
Alannah Allan
Hilah Alves da Silva
Emily Archambault
Olivia Arjona
Cameron Arras
Alexander Aspel
Laurence Atkinson
Sandra Ayensah
Thomas Azadi
Clayton Baca
Kennedy Baca
Grace Baccellieri
Savannah Badt
Julia Bahr
Lilyrose Bahrabadi
Emir Bajric
Robert Barrett
Braden Bartlett
Kendall Bash
Micah Bast
Catherine Bates
Aaron BellButterfield
Drew Bergquist
William Blevins
Megan Boerem
Sophia Boss
Justin Bosset
Jessica Bourgan
Ashley Bradbury
Micah Brown
Christian Bruno
Gabrielle Bunch
Erica Burgholzer
Olivia Butler
Valeria Caballero
William Callahan
Carly Callan
Lindsey Carr
Rowan Carr
John-Paul Castillo
Melanie Castillo
Caden Champion
Nikita Chapagain
Rachel Cheang
Chloe Cherfils
Hayden Choi
Joyce Chu
Trae Chudacoff
Carla CobosHernandez
Miranda Cohen
Suzanne Cohen
Zachary Cohen
Haley Colling
Madison Cooper
Grace Coster

Kennedy Coventry
Kaylee Cowles
Kourtney Creaney
Samuel Dahm
Skye Dark
Brianna De La Cruz
Alessandra DeRose
Cara DeStefano
Anna Deubel
Isabelle Dever
Margaret Dickson
Jacy Dille
Teagan Dillon
Ingrid Dominguez
Brittany Dovidas
Samantha Dow
Raymond Drake
Sara Dunn
Alexandra Duvin
Lucille Egan
Sarila Ekin
Jamaika Elliott
Alaina Elnick
William Endres
Mitchell Engerman
Jonathan Epperson
Jack Erger
Carley Farella
Macy Feign
Terese Felker
Megan Fenwick
Elizabeth Fluellen
Cavo Fontana
Nana Fordwuo
Anna Forte
Henry Fox
Madelyne Francis
Parker Frautschi
Anna Funke
Nicholas Galambos
Brendan Gambrell
Luyi Gao
Kierra Garcia
Maxwell Gaston
Chelsea Gause
Carson George
Zvi Goldberg
Cormac Gorman
Isabel Gorsuch
Ryan Gossman
Kennedy Graves
Taia Greco
Alexius Gunning
Alexander Hahn
Ryan Haley
Michael Hamlin
Emma Hanson
Skylar Hanson
Justin Harrell
Sophia Healy
Chayse Heffler

Alec Helgeland
Megan Henderson
Lauren Hendy
Noah Hibbard
Brandon Hiraki
Morgan Hirsch
Peace HolguinWalth
Sydney Holtman
Tilden Huffaker
Erica Hurley
Regan Hurst
Julianna Hutchinson
Brittan Ingalls
Alexandra Jackson
Taylor James
Marek Janik
Kobe Jara
Karolina Jasiak
Alec Jenkins
Kyle Johnson
Mackenzie Johnson
Alexandra Jones
Elizabeth Jones
Colleen Kalafatich
Grace Karoly
Reid Kellogg
Carly Kelly
Sierra Keppler
Corrin Kevlyn
Adam Khan
Jordan Khan
Yubin Kim
Brooke King
Lily King
Evan Kistler
Natalia Klamut
Wolfgang Knappek
Brianna Knight
Grace Knight
Claire Koeppel
Katherine Korte
Aesha Kothamdi
Zoe Kouremenos
Angelina Kuzma
Geetali Lal
Sarah Lastition
Olivia Lawrence
Adaline Lawson
James Le
Alyssa Lee
Sydney Lee
Taryn Lee
Jasmine LeFevre
Elizabeth Levi
Zani Liddell
Maya Liester
Joseph Lim
Ella Lindberg
Alexandra Lindquist
Zofia Lisowska
Jack Liu

Celine Long
Isabelle Lopez
John Lorden
Alyssa Lucero
Claire Lueking
Holden Luong
Alexis MachaAstorga
Brigid MacKeigan
Alexander Maher
Lydia Mandeville
Romi Marder
Trevor Masters
Jeffrey Matney
Matthew McCarthy
Caley McDaniel
Genevieve McFadden
Jesus Mejia-Arias
Lauren Melvin
Maile Mijares
Francesco Military
Mackenzie Mimmo
Jackson Morgan
Kara Morgan
Rosemary Morrissey
Jacqueline Mosley
Gabrielle Murphy
Angela Na
Anna Nell
Derek New
Alyssa Nguyen
Calee Nguyen
Cindy Nguyen
ThomasKhôi Nguyen
Sophia Niquette
Lindsay Nisperos
Cara Niswonger
Anne Noebel
McKenna Nolan
Connor O'Brien
Rivenna Olden
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Aaron Smith
Fredrick Smith
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Emily Starritt
Amanda Stein
Lauren Suder
Rose Summers
Ellie Sundali
Daniyaal Syed
Jada Taylor
Levyn Thomas
Brendan Thompson
Vivian Tran
Kaelyn Trupp
McKayla Tsou
Mary Turner
Courtney Vale
Anthony VanSciver
Koby Varra
Ammar Vaseemuddin
Karen Vazquez
Brooke Vercauteren
Adrian VillagranaBanuelos
Janeth Villalobos
Nora Want
Valhalla Wasshuber
Charlotte Waugh

Alexej Webb
Meheret Wendemkun
Anne Wilhelm
Remy Willey
Francesca Williams
Ilya Willis
Kennedy Wilson
Alexis Winandy
Matthew Wisniewski
Landry Witherspoon
Angela Wongson
Stefan Woolley
Jordan Wubbena
Emma Yang
Justin Yi
Brandon Young
Gabrielle Young
Katherine Zacharias
Katie Zhou
Paige Zickerman
Nathan Zurfluh





Many Thanks to Donors

As usual, we thank our alumni and supporters. Your comments, suggestions, and financial support have contributed greatly to the success of our department.

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We Want To Hear From You

Please reach out and keep us updated on what is happening in your professional and personal lives.

Send updates to: marsha.cook@colorado.edu.

