Owen N. Beck, Ph.D.

University of Texas at Austin
Email: owen.beck@austin.utexas.edu
Human Locomotion Lab:
sites.edb.utexas.edu/hll/human-locomotion-lab

Office: 536 Bellmont Hall
2109 San Jacinto Blvd
Austin, Texas, 78712
Updated: August 2024

EDUCATION & PROFESSIONAL APPOINTMENTS

Assistant Professor, Kinesiology & Health Education 2023 -
University of Texas at Austin
Director: Human Locomotion Lab

McCamish Postdoctoral Fellow, Biomedical Engineering 2021 - 2022
Emory University (PI: Lena H. Ting, Ph.D.)

NIH Postdoctoral Fellow, Mechanical Engineering 2018 - 2021
Georgia Institute of Technology (PI: Gregory S. Sawicki, Ph.D.)

Ph.D. Integrative Physiology 2014 - 2017
University of Colorado Boulder (PI: Alena M. Grabowski, Ph.D.)

B.S. Kinesiology 2009 - 2013
Humboldt State University (PI: Justus D. Ortega, Ph.D.)

AFFILIATE APPOINTMENTS

- Adjoint Professor, Translation Science Graduate Program 2023 -
  University of Texas at Austin
- Affiliate Faculty, Center on Aging and Population Sciences 2023 -
  University of Texas at Austin

PEER-REVIEWED PUBLICATIONS

Mentee (**) & Mentor (*)
Corresponding Author (†)

h-index: 17

32. Jakubowski K.L., **Beck O.N.,** Sawicki G.S.,* Ting L.H.* (In Review) Center of Mass States Render Multi-Joint Torques Throughout Standing Balance Recovery**.**
31. Joubert J.P., **Beck O.N.,** Hayden L., Cohan A. (In Review) Running Economy Benefits of Advanced Footwear Technology are Similar for Treadmill and Overground Running**.**
30. Fallah N.** & **Beck O.N.**† (In Review) The Metabolic Cost of Producing Joint Moments is Greater at the Hip vs. Ankle.
29. **Beck O.N.,**† Schroeder, J.N., Sawicki G.S.* (2024) Habitually Wearing High Heels May Improve User Walking Economy in Any Footwear. *Journal of Applied Physiology.* 136:3, 567-572. doi.org/10.1152/japplphysiol.00016.2024
    - Featured in the Washington Post & The Late Night Show with Stephen Colbert
    - APSselect, April 2024. Top 8 Articles across all American Physiology Society Journals.
28. Martino G.,† **Beck O.N.,** Ting L.H.†* (2023) Voluntary Muscle Coactivation in Quiet Standing Elicits Reciprocal Rather Than Coactive Agonist-Antagonist Control of Reactive Balance in Young Adults. *Journal of Neurophysiology.* 129:6, 1378-1388
    - Invited article discussion at University of Michigan Journal Club (2023)
27. Zhang-Lea J.H.,† Tacca J.R., **Beck O.N.,** Taboga P., Grabowski A.M.* (2023) Prosthetic Legs Run Shorter Than Biological Legs. *Scientific Reports.* 11;13(1):7679. doi: 10.1038/s41598-023-34346-x.

26. Gill P.K.,† Kipp S., **Beck O.N.,** Kram R. (2023) It is Time to Abandon Single-Value Oxygen Uptake Energy Equivalents. *Journal of Applied Physiology.* 134(4), 887-890 doi.org/10.1152/japplphysiol.00353.2022

25. **Beck O.N.,†** Shepherd M.K., Rastogi R., Martino G., Ting L.H., Sawicki G.S.* (2023) Exoskeletons Need to React Faster than Physiological Responses to Improve Standing Balance. *Science Robotics*. 8, eadf1080, doi:10.1126/scirobotics.adf1080
    - Featured *Science Robotics* Cover Article

24. Allen S.A.,† **Beck O.N.,** Grabowski A.M.* (2022) Evaluating the "Cost of Generating Force" Hypothesis Across Frequency in Human Running and Hopping. *Journal of Experimental Biology.* 225(18): jeb244755. doi.org/10.1242/jeb.244755

23. **Beck O.N.,†** Trejo, L.H., Schroeder, J.N., Franz J.R., Sawicki G.S.* (2022) Shorter Muscle Fascicle Operating Lengths Increase the Metabolic Cost of Cyclic Force Production. *Journal of Applied Physiology.* 133:3, 524-533. doi.org/10.1152/japplphysiol.00720.2021

22. Tacca J.R.,† **Beck O.N.,** Taboga P., Grabowski A.M.* (2022) Running-Specific Prosthesis Model, Stiffness, and Height Affect Biomechanics and Asymmetry of Athletes with Unilateral Leg Amputations Across Velocities. *Royal Society Open Science.* **9:** 211691. 211691

21. **Beck O.N.,** Taboga P., Grabowski A.M.†* (2022) Sprinting with Prosthetic versus Biological Legs: Insight from Experimental Evidence. *Royal Society Open Science*. **9:** 211799. 211799

20. Krupenevich R.L.,† **Beck O.N.,** Sawicki G.S.,* Franz J.R. (2021) Reduced Achilles Tendon Stiffness Disrupts Calf Muscle Neuromechanics in Elderly Gait. *The Journals of Gerontology: Series A*. 68:241–251

19. **Beck O.N.,†** Golyski P.R., Sawicki G.S.* (2020) Adding Carbon Fiber to Shoe Soles May Not Improve Running Economy: A Muscle-Level Explanation. *Scientific Reports*. 10:17154

18. **Beck O.N.,†** Gosyne J., Franz J.R., Sawicki G.S.* (2020) Cyclically Producing the Same Average Muscle-Tendon Force with a Smaller Duty Increases Metabolic Rate. *Proceedings of the Royal Society B: Biological Sciences*. 287:20200431
    - Invited article discussion at Katholieke Universiteit Leuven International Journal Club (2022)
    - Invited article discussion at University of Nebraska Omaha Journal Club (2021)

17. Alcantara R.S.,† **Beck O.N.,** Grabowski A.M.* (2020) Lower Limb Mass Does Not Affect Biomechanical Asymmetry But Increases Metabolic Power in Runners With a Unilateral Transtibial Amputation. *European Journal of Applied Physiology*. 120, 1449-56

16. Nuckols R.W.,† Dick T.J.M., **Beck O.N.,** Sawicki G.S.†* (2020) Ultrasound Imaging Links Soleus Muscle Neuromechanics and Energetics during Human Walking with Elastic Ankle Exoskeletons. *Scientific Reports.* 10:3604

15. Taboga P.,† **Beck O.N.,** Grabowski A.M.* (2020) Prosthetic Shape, but not Stiffness or Height, Affects the Maximum Speed of Sprinters with Bilateral Transtibial Amputations. *Plos One*. 15(2): e0229035

14. Sawicki G.S.,†* **Beck O.N.,** Kang I., Young A.J.† (2020) The Exoskeleton Expansion: Improving Walking and Running Economy. *Journal of NeuroEngineering and Rehabilitation.* 17(25)
    - Editor's pick: https://jneuroengrehab.biomedcentral.com/editors-picks

13. Taboga P.T.,† Drees E.K., **Beck O.N.,** Grabowski A.M.* (2020) Prosthetic Model, but not Stiffness or Height, Affects Maximum Running Velocity in Athletes with Unilateral Transtibial Amputations. *Scientific Reports*. 10, 1763

12. **Beck O.N.,†** Punith L.K., Nuckols R.W., Sawicki G.S.* (2019) Exoskeletons Improve Locomotion Economy by Reducing Active Muscle Volume. *Exercise and Sport Sciences Reviews*. 47(4):237-45

11. **Beck O.N.,†** Grabowski A.M.* (2019) Athletes With vs. Without Leg Amputations: Different Biomechanics, Similar Running Economy. *Exercise and Sport Sciences Reviews*. 47(1):15-21
    - Featured *Exercise & Sports Science Reviews* Cover Article
10. **Beck O.N.,†** Azua E.A.,** Grabowski A.M. (2018) Step time asymmetry increases metabolic energy expenditure during running. *European Journal of Applied Physiology*. 118(10):2147-54
9. **Beck O.N.,†** Grabowski A.M.,* Ortega J.D.* (2018) Neither Total Muscle Activation nor Co-activation Explains How Older Runners Retain Youthful Walking Economy. *Gait and Posture*. 65:163-8
8. **Beck O.N.,†** Kipp S., Byrnes W.C., Kram R.* (2018) Viewpoint: Use Aerobic Energy Expenditure Instead of Oxygen Uptake to Quantify Exercise Intensity and Predict Endurance Performance. *Journal of Applied Physiology*. 125(2):672-4
7. **Beck O.N.,†** Grabowski A.M.* (2017) Case Studies in Physiology: The Biomechanics of the Fastest Sprinter with a Unilateral Transtibial Amputation. *Journal of Applied Physiology*. 124(3):641-5
6. **Beck O.N.,†** Taboga P., Grabowski A.M.* (2017) How do Prosthetic Stiffness, Height, and Running Speed Affect the Biomechanics of Athletes with Bilateral Transtibial Amputations? *Royal Society Interface*. 14(131)
5. **Beck O.N.,†** Taboga P., Grabowski A.M.* (2017) Prosthetic Model, but not Stiffness or Height, Affects the Metabolic Cost of Running for Athletes with Unilateral Transtibial Amputations. *Journal of Applied Physiology*. 123(1):38-48
4. **Beck O.N.,†** Taboga P., Grabowski A.M.* (2017) Reduced Prosthetic Stiffness Lowers the Metabolic Cost of Running for Athletes with Bilateral Transtibial Amputations. *Journal of Applied Physiology.* 122(4):976-84
3. **Beck O.N.,†** Taboga P., Grabowski A.M.* (2016) Characterizing the Mechanical Properties of Running-Specific Prostheses. *Plos One*. 11(12):e0168298
2. **Beck O.N.,†** Kipp S., Roby J.M., Grabowski A.M.,* Kram R., Ortega J.D.* (2016) Older Runners Retain Youthful Running Economy Despite Biomechanical Differences. *Medicine and Science in Sports and Exercise*. Apr;48(4):697-704
1. Ortega J.D.,†* **Beck O.N.,** Roby J.M., Turney A.L., Kram R.* (2014) Running for Exercise Mitigates the Age-Related Deterioration of Walking Economy. *Plos One*. 10.1371/journal.pone.0113471

Non-Peer Reviewed Publications

Beck O.N.,† & Kipp S. (2021) Comment on Viewpoint: World Class Cyclists Must Risk it All-Including their Bone Health. *Journal of Applied Physiology.* 131:1, 29-33

GRANTS & FELLOWSHIPS

Submitted

National Institute Child Health & Human Development (NICHD ECR R03) – PI: Owen N. Beck
Towards Improving Muscle-Tendon Remodeling and Function Post-Surgical Lengthening

National Institute of Health (NIBIB R21) – Multi-PI Owen N. Beck
AI-Driven Hip Exoskeleton Control Framework That Rapidly Generalizes to a Broad Range of Users and Real-World Locomotor Tasks

Completed

McCamish Parkinson's Disease Innovation Program Training Fellowship $120,000
PI: Owen N. Beck (12/2021 – 12/2022)

National Institute of Health (NIA F32) - PI: Owen N. Beck $152,000
Linking Muscle-Tendon Dynamics and Energetics to Inform Exoskeleton Design for Improved Locomotor Economy of Aging (09/2019 – 11/2022)

Not Funded

National Institute of Health (NIA K99/R00) – PI: Owen N. Beck
Title: The Role of Neuromechanical Stiffness on Balance Capacity & Neural Strategies in Older Adults
Impact Score: 26

National Institute of Health (NIA R21) - PI: Owen N. Beck
Wearables to Structurally Remodel User Muscles and Improve Walking Ability across the Lifespan
Impact Score: 51/62

Department of Defense – PI: Owen N. Beck
Congressionally Directed Medical Research Program (OPORP Level 1)
Revealing Salient Aspects of Rehabilitation to Enable Economical Walking Post Limb-Loss
Score: 2.2

HONORS AND AWARDS

- Atlanta Science Communication Fellowship ($600) 2018
- Best Graduate Student Podium Presentation Award ($100) 2017
  Rocky Mountain American Society of Biomechanics Conference
- Beverly Sears Graduate Student Research Grant ($1,000) 2017
- University of Colorado Graduate Assistance Travel Award (3x$300) 2014, 15, 16
- American Society of Biomechanics Student Travel Award ($300) 2014
- Professional Service Award 2013
  Humboldt State University – Department of Kinesiology
- Presidential Scholar Award – Humboldt State University 2012 & 2013
- NCAA Student Athlete All-Academic Award 2011

TEACHING

University of Texas at Austin

Graduate Courses:

KIN 395 (Clinical Biomechanics)
- Fall ’23 (16 students)

KIN 386 (Research Methods: Proposal Writing)
- Spring ’24 (13 students)

KIN 397 (MCRS Seminar)
- Spring ’24 (15 students)

KIN W698A/B (Thesis)
- Summer ’23, Fall ’23, Spring ’24, Summer ’24 (1-3 students per section)

Undergraduate Courses:

KIN 320 (Applied Biomechanics of Human Movement)
- Spring ’23 (51 students), Fall ’23 (41 students), Fall ’24 (TBD)

KIN 327R (Fieldwork/Internship)
- Spring ’24 (2 students)

University of Colorado Boulder

IPHY 4540 (Biomechanics **–** Lead Teaching Assistant**)**

- Spring '16

Invited Guest Lectures

Spring 2023, University of Texas at Austin, KIN 395 (Running with Prostheses)
Spring 2023, University of Texas at Austin, KIN 397C (Locomotion Performance)
Spring 2023, University of Texas at Austin, KIN 397C (Selecting an Academic Journal)
Fall 2022, Sacramento State University (Running with Prostheses)
Fall 2018, University of Colorado Boulder (Co-activation & Aging)

TRAINEES

University of Texas at Austin - Human Locomotion Lab

Kinesiology Ph.D. Students

2023 - Hui Tang
- Texas New Scholar Fellowship – $15,000
- Joseph Hamill Access to Science Award - $2,000
- Dept. KHE Travel Award - $1,000

2023 - Ningzhen Zhao (Co-advised by Dr. Griffin)
- Texas New Scholar Fellowship – $15,000

Translational Science Ph.D. Students

2024 - Ciera Price

Kinesiology Master's Students

2023 - Brooke Measeles
- Dept. KHE Travel Award - $1,000

2023 - 2024 Negin Fallah
- Dept. KHE Travel Award x2 - $1,500

Mechanical Engineering Master's Students

2023 - Kaleigh Renninger
- Dept. ME Recruitment Fellowship - $10,700
- South Central ASB Best Oral Presentation - $50
- Dept. ME Travel Award - $400

Undergraduate Students (*Honors Thesis*)

2023- Jason Cullum
- Undergraduate Research Fellowship - $1,000

2023- William Dure (Option II)
2024- Dev Rajagopalan (Polymathic Honors)

University of Texas at Austin - Non-Lab Trainees

Ph.D. Student Dissertation Committee Member (MCRS)

2023 - 2024 Forouzan Foroughi
2023 - 2024 Keng-Hung Shen
2023 - 2024 Huiying Zhu
2023 - Theran Suresh
2023 - Mohsen Alighanbari
2024 - Donald Prible

Master's Student Report Committee Member (MCRS)

2023 Ningzhen Zhao

Other Institutions
University of Texas at San Antonio
Ph.D. Students
2023 - 2024 Matthew Gonzalez, *Translational Science Program*

PROFESSIONAL SERVICE

Expert Testimony for International Court Hearing
Blake Leeper vs. World Athletics. 2020 & 2021
Testified as scientific expert at the Court of Arbitration for Sport

Journal Reviewer
elife, Science Robotics, Journal of Applied Physiology, Journal of Biomechanics, IEEE: Transactions on Neural Systems and Rehabilitation Engineering, Scientific Reports, Medicine and Science in Sports and Exercise, Bioinspiration & Biomemetics, PLoS One, Prosthetics and Orthotics International, Sports Biomechanics, European Journal of Applied Physiology, International Journal of Sports Physiology and Performance, Journal of Applied Biomechanics, Sports Medicine, Footwear Science, & Journal of Experimental Biology, Proceedings of the Royal Society B

Biomechanics Society Service
Conference Organizing Committee Member
- Annual Meeting of the American Society of Biomechanics 2020
- Dynamic Walking Conference 2018 & 2021

Abstract Reviewer
North American Congress on Biomechanics, American Society of Biomechanics Annual Conference (’21, ’22, ’23), Dynamic Walking Conference, & International Conference for Biomedical Robotics and Biomechatronics

Awards Committee
- Best podium presentation committee, South Central American Society of Biomechanical Annual Meeting, 2023 & 2024
- Junior faculty research award committee, American Society of Biomechanics Annual Meeting, 2023

Trainee Programs
- Trainee Round Table Host, Preparing Materials for Faculty Applications. Annual Meeting of the American Society of Biomechanics. Knoxville, Tenn. 2023
- Mentor-Mentee Program
  - Annual Meeting of the American Society of Biomechanics. Madison, WI. 2023
  - Annual Meeting of the American Society of Biomechanics. Knoxville, TN. 2023
  - South Central American Society of Biomechanics Meeting, Fort Worth, TX. 2023

University of Texas at Austin
- Undergraduate Research Fellowship Reviewer 2024
- Dept. KHE Merit Committee 2023, 2024
- Dept. KHE GSC & MCRS Committee member 2023, 2024

PRESENTIONS

Mentee (**)

Invited Presentations
- **Beck O.N.,** Stiffen Up for More Economical Locomotion. 8th International Autumn School on Movement Sciences. Berlin, GER, Oct. 2024.

- **Beck O.N.,** Distance Running with Prostheses. Highlighted Symposium at The Annual Meeting of the Annual College of Sports Medicine (ACSM). Boston, MA, May 2024.
- **Beck O.N.,** Running with Prostheses. Depts. of Physical Therapy & Mechanical Engineering Northeastern University, July. 2023.
- **Beck O.N.,** Faster Grandparents: Maintaining Mobility into Advanced-Age. Center for Non-Linear Dynamics Seminar. University of Texas at Austin, Feb. 2023.

Conference Podium Presentations

- Kim J., Rastogi R.,** Martino G., **Beck O.N.,** Shepherd M.K., Sawicki G.S., Ting L.H., Jakubowski K.L. Excess Exoskeleton "Assistance" Disrupts Standing Balance by Altering Sensory Feedback." Annual Meeting of the American Society of Biomechanics. Madison Wisc.
- Measeles B.,** Fallah N.,** Mistry A.,** **Beck O.N.** Neural or Musculoskeletal: which system drives the age-related decline in walking economy? Annual Meeting of the American Society of Biomechanics. Madison, Wisc. 2024.
- Renninger K.,** **Beck O.N.** Is There an Ideal Heel-Toe Drop for Economical Running? South Central American Society of Biomechanics Conference. Fort Worth, TX, April 2024.
- Tang H.,** **Beck O.N.,** The Influence of Foot Arch Stiffness on Running Biomechanics and Economy. South Central American Society of Biomechanics Conference. Fort Worth, TX, April 2024.
- **Beck O.N.,** Schroeder J.S., Sawicki G.S. Wearing High Heels Remodels Leg Muscle-Tendons and Improves Walking Economy. Annual Meeting of the American Society of Biomechanics. Knoxville, Tenn. 2023.
- Jakubowski K.L., Martino G., **Beck O.N.,** Sawicki G.S, Ting L.H. The Intrinsic and Neurally-Mediated Contributions to the Balance-Correcting Torque Response Differ Between the Ankle and Hip. International Society of Biomechanics. Fukuoka, Japan 2023.
- Rastogi R., Jakubowski K.L., Martino G., **Beck O.N.,** Shepherd M.K., Sawicki G.S, Ting L.H. Too Much Exoskeleton “Assistance” Can Disrupt User Balance Correction. Annual Meeting of the American Society of Biomechanics. Knoxville, Tenn. 2023.
- Schroeder J.S., **Beck O.N.,** Sawicki G.S. Impact of Triceps-Surae Operating Lengths on Whole Body Metabolic Cost. Annual Meeting of the American Society of Biomechanics. Knoxville, Tenn. 2023.
- **Beck O.N.,** Shepherd M.K., Rastogi R., Ting L.H., Sawicki G.S. Exoskeletons Need to React Faster than Reflexes to Improve Standing Balance. North American Congress on Biomechanics. Ottawa, Canada. 2022.
- Martino G., **Beck O.N.,** Rastogi R., Ting L.H. Shear wave tensiometry of the Achilles tendon to estimate muscle force and coactivation during balance perturbations. International Society for Posture and Gait Research World Congress. Montreal, Canada. 2022.
- Rastogi, R., Shepherd, M.K., Sawicki, G.S., Ting, L.H., **Beck, O.N.** Ankle exoskeleton torque improves reactive standing balance capacity if delivered before physiological response. International Society for Posture and Gait Research World Congress. Montreal, Canada. 2022.
- **Beck O.N.,** Taboga P., Grabowski A.M. Sprinting with Prosthetic versus Biological Legs: An Unfair Advantage? Annual Meeting of the American Society of Biomechanics, 2021.
- **Beck O.N.,** Schroeder, J.N., Trejo, L.H., Franz J.R., Sawicki G.S. Relatively Shorter Muscle Lengths Increase the Metabolic Rate of Cyclic Force Production. Congress of the International Society of Biomechanics, 2021.
- Allen S.P., **Beck O.N.,** Grabowski A.M. Biomechanics Predict Changes in Metabolic Cost during Running and Hopping at Different Frequencies. Congress of the International Society of Biomechanics, Calgary, CAN. 2019.
- **Beck O.N.** & Sawicki G.S. Exoskeletons Improve Locomotion Economy by Steering Muscle Dynamics. American Society of Mechanical Engineers Dynamics Systems and Controls Conference. Atlanta, GA. 2018.
- Southern E.K., **Beck O.N.,** Taboga P., Grabowski A.M. Running-Specific Prosthetic Model Affects Top Sprinting Speed in Athletes with Unilateral Transtibial Amputations. Annual Meeting of the American Society of Biomechanics, Rochester, MN. 2018.
- **Beck O.N.,** Taboga P., Grabowski A.M. How do Prosthetic Stiffness, Height, and Running Speed Affect the Biomechanics of Running for Athletes with Bilateral Transtibial Amputations? Rocky Mountain Regional Conference of the American Society of Biomechanics, Estes Park, CO. 2017; Annual Meeting of the American Society of Biomechanics, Boulder, CO. 2017.

- Azua E., **Beck O.N.,** Grabowski A.M. Asymmetric Step Frequencies Increase the Metabolic Cost of Running. Rocky Mountain Regional Conference of the American Society of Biomechanics, Estes Park, CO. 2017.
- Dassler A., **Beck O.N.,** Grabowski A.M. How do Asymmetric Biomechanics Affect the Metabolic Cost of Running for Athletes with a Unilateral Transtibial Amputation? Rocky Mountain Regional Conference of the American Society of Biomechanics, Estes Park, CO. 2017.
- **Beck O.N.**, Taboga P., Grabowski A.M. Characterizing the Stiffness of Running-Specific Prostheses. Annual Meeting of the American Society of Biomechanics, Raleigh, NC. 2016; & National Assembly of the American Orthotic Prosthetic Association, Boston, MA. 2016.
- **Beck O.N.**, Taboga P., Grabowski A.M. Characterizing the Stiffness of Running-Specific Prostheses.
- Jeffers, J.R., **Beck O.N.**, Taboga P.T., Grabowski A.M. Optimizing leg prostheses for walking and running: Can we augment performance? Annual Meeting of the American Society of Biomechanics, Columbus, OH. 2015.
- Roby J.M., **Beck O.N.,** Turney A.L., Grabowski A.M., Kram R., Ortega J.D. Walking Energetics and Biomechanics of Older Runners. Rocky Mountain Regional Conference of the American Society of Biomechanics, Estes Park, CO. 2014.
- **Beck O.N.,** Roby J.M., Turney A.L., Grabowski A.M., Kram R., Ortega J.D. Do Older Runners Lose the Spring in Their Step? Rocky Mountain Regional Meeting of the American Society of Biomechanics, Estes Park, CO. 2014.

Conference Poster Presentations – Thematic

- **Beck O.N.,** Schroeder, J.N., Trejo, L.H., Franz J.R., Sawicki G.S. Relatively Shorter Muscle Lengths Increase the Metabolic Rate of Cyclic Force Production. Annual Meeting of the American Society of Biomechanics, Virtual. 2021.
- Alcantara R.S., **Beck O.N.**, Grabowski A.M. Mass Added to a Running-Specific Leg Prosthesis Increases Metabolic Power During Running. Annual Meeting of the American Society of Biomechanics, Rochester, MN. 2018.
- **Beck O.N.**, Sawicki G.S. Tuning Shoe Stiffness for More Economical Muscle Force Production During Running. Dynamic Walking. Pensacola, FL. 2018.
- **Beck O.N.**, Grabowski A.M. Is the Metabolic Cost of Running Different for Athletes with Unilateral versus Bilateral Transtibial Amputations? Annual Meeting of the American College of Sports Medicine. Denver, CO. 2017.
- **Beck O.N.**, Taboga P., Grabowski A.M. Lower Prosthetic Stiffness Minimizes the Metabolic Cost of Running for Individuals with Bilateral Leg Amputations. Annual Meeting of the American Society of Biomechanics, Columbus, OH. 2015.
- **Beck O.N.**, Taboga P., Grabowski A.M. Asymmetric Forces Increase the Metabolic Cost for Individuals with a Unilateral Leg Amputation. Annual Meeting of the American Society of Biomechanics, Columbus, OH. 2015.

Conference Poster Presentations

- Foroughi F., Sadeh S., **Beck O.N.,** Hsiao H. Effect of Real-Time Vertical Ground Reaction Force Biofeedback on Hip and Knee Neuromechanical Characteristics During Walking in Older Adults. Gait & Clinical Movement Analysis Society Annual Conference. Atlanta, GA. 2024.
- Tang H.,** **Beck O.N.,** The Influence of Foot Arch Stiffness on Running Biomechanics and Economy. Annual Meeting of the American Society of Biomechanics. Madison, Wisc. 2024.
- Renninger K.,** **Beck O.N.** Is There an Ideal Heel-Toe Drop for Economical Running? Annual Meeting of the American Society of Biomechanics. Madison, Wisc. 2024.
- Zhao N.,** Griffin L., **Beck O.N.** Electrically Stimulating the Soleus During Walking May Not Affect Metabolic Rate. Annual Meeting of the American Society of Biomechanics. Madison, Wisc. 2024.
- Fallah N.,** & **Beck O.N.** This Hip Expends More Metabolic Energy to Produce Extension Moments than the Ankle. South Central American Society of Biomechanics Conference. Fort Worth, TX, April 2024.
- Measeles B.,** Fallah N.,** Mistry A.,** **Beck O.N.** Neural or Musculoskeletal: which system drives the age-related decline in walking economy? South Central American Society of Biomechanics Conference. Fort Worth, TX, April 2024.
- Fallah N.,** **Beck O.N.** Does the Distal-to-Proximal Redistribution of Joint Mechanics Affect Walking Economy? Annual Meeting of the American Society of Biomechanics. Knoxville, Tenn. 2023.
- Schroeder J.S., **Beck O.N.,** Sawicki G.S. Relatively Small Changes in Foot-Ankle Mechanics Over Months Alter Musculoskeletal Structure. Annual Meeting of the American Society of Biomechanics. Knoxville, Tenn. 2023.

- **Beck O.N.,** Martino G., Ting L.H. Background muscle activity decouples muscle fascicle excursion from joint rotation and drives long latency feedback response during support surface translations. International Society for Posture and Gait Research World Congress. Montreal, Canada. 2022.
- **Beck O.N.,** Taboga P., Grabowski A.M. Sprinting with Prosthetic versus Biological Legs: An Unfair Advantage? Congress of the International Society of Biomechanics, Virtual. 2021.
- **Beck O.N.,** Gosyne J., Franz J.R., Sawicki G.S. Cyclically Producing the Same Average Muscle-Tendon Force with a Smaller Duty Increases Metabolic Rate. Annual Meeting of the American Society of Biomechanics, Virtual, 2020.
- **Beck O.N.,** Punith L.K., Nuckols R.W., Sawicki G.S. Exoskeletons Improve Locomotion Economy by Reducing Active Muscle Volume. Congress of the International Society of Biomechanics, Calgary, CAN, 2019.
- *Alcantara R.S., **Beck O.N.**, Grabowski A.M. Mass Added to a Running-Specific Leg Prosthesis Increases Metabolic Power During Running. Rocky Mountain Regional Conference of the American Society of Biomechanics, Estes Park, CO. 2018. **Best Student Poster*.
- Taboga P., **Beck O.N.**, Grabowski A.M. Sprint Biomechanics of Athletes with Bilateral Transtibial Amputations using Different Prosthetic Configuration. International Research Forum on Biomechanics of Running-Specific Prostheses. Tokyo, Japan. 2018.
- **Beck O.N.**, Grabowski A.M. How do Prosthetic Stiffness, Height, and Running Speed Affect the Biomechanics of Running for Athletes with Bilateral Transtibial Amputations? Military Health System Research Symposium, Kissimmee, FL. 2017.
- Azua E., **Beck O.N.,** Grabowski A.M. Asymmetric Step Frequencies Increase the Metabolic Cost of Running. Annual Meeting of the American Society of Biomechanics, Boulder, CO. 2017.
- Taboga P., **Beck O.N.**, Grabowski A.M. Top Sprinting Speed is Influenced by Prosthetic Model, but not Stiffness or Height, for Athletes with Bilateral Transtibial Amputations. Annual Meeting of the American Society of Biomechanics, Boulder, CO. 2017.
- Taboga P., **Beck O.N.**, Grabowski A.M. Optimal Running Prostheses for Sprinters with Unilateral Leg Amputations. Annual Meeting of the American Society of Biomechanics, Columbus, OH. 2015.
- Taboga P., **Beck O.N.**, Grabowski A.M. Optimal Running Prostheses for Sprinters with Bilateral Leg Amputations. Annual Meeting of the American Society of Biomechanics, Columbus, OH. 2015.
- **Beck O.N.**, Taboga P., Grabowski A.M. Lower Prosthetic Stiffness Minimizes the Metabolic Cost of Running for Individuals with Bilateral Leg Amputations. Rocky Mountain Regional Conference of the American Society of Biomechanics, Estes Park, CO. 2015.
- **Beck O.N.**, Taboga P., Grabowski A.M. Asymmetric Forces Increase the Metabolic Cost for Individuals with a Unilateral Leg Amputation. Rocky Mountain Regional Meeting of the American Society of Biomechanics, Estes Park, CO. 2015.
- Taboga P., **Beck O.N.**, Grabowski A.M. Optimal Running Prostheses for Sprinters with Unilateral Leg Amputations. Rocky Mountain Regional Meeting of the American Society of Biomechanics, Estes Park, CO. 2015.
- Taboga P., **Beck O.N.**, Grabowski A.M. Optimal Running Prostheses for Sprinters with Bilateral Leg Amputations. Rocky Mountain Regional Meeting of the American Society of Biomechanics, Estes Park, CO. 2015.
- **Beck O.N.,** Roby J.M., Turney A.L., Grabowski A.M., Kram R., Ortega J.D. Do Older Runners Lose the Spring in Their Step? World Congress of Biomechanics, Boston, MA. 2014.
- **Beck O.N.,** Roby J.M., Turney A.L., Grabowski A.M., Kram R, Ortega J.D. Running Improves the Economy of Walking Among Older Adults. Annual Meeting of the American College of Sports Medicine, Orlando, FL. 2014.

PROFESSIONAL AFFILIATIONS

- American College of Sports Medicine (ACSM) 2022-Present
- International Society of Biomechanics (ISB) 2021-Present
- American Society of Biomechanics (ASB) 2014-Present
- CITI Training Certified 2012-Present

SELECT MEDIA

Footwear

- The Late Show with Stephen Colbert. The Sounds of Science Skit. 3/6/2024. https://youtu.be/mtSJQrEY3nc?si=4R7_etLNuQZXAk1p&t=265
- The Washington Post "High heels improve walking efficiency, study finds" 2024 https://www.washingtonpost.com/wellness/2024/02/21/high-heels-walking-health/

Exoskeletons

- The Conversation. "Faster-than-reflexes robo-boots boost balance" 2023 https://theconversation.com/faster-than-reflexes-robo-boots-boost-balance-199485
- UT Austin, College of Education. "Exoskeletons Must Act Faster Than Human Reaction Times to Improve Balance" https://education.utexas.edu/news/2023/02/17/exoskeletons-must-act-faster-human-reaction-times-improve balance?utm_campaign=https%3A%2F%2Feducation.utexas.edu%2F%3Futm_source%3Deducation.utexas.edu%26utm_medium%3Dweb%26utm_campaign%3Dwebsite-feature_social-sharing%26utm_con

Prostheses

- Runners World "New Study Shows Blade Runners Do Not Have a Competitive Advantage" 2023 https://www.runnersworld.com/news/a44521586/blade-runners-do-not-have-competitive-advantage/
- University of Colorado Boulder Today. "World's Fastest Blade Runner Gets No Competitive Advantage From Prostheses, Study Shows" 2022 https://www.colorado.edu/today/2022/01/05/worlds-fastest-blade-runner-gets-no-competitive-advantage-prostheses-study-shows
- University of Colorado Boulder Today. "Leep of Faith: CU Scientists Testing World's Fastest Blade Runner" 2018 https://www.colorado.edu/today/2018/08/24/leep-faith-cu-scientists-testing-worlds-fastest-blade-runner
- ABC News, Denver "CU-Boulder Lab Pushes Athletes and Their Prosthetics to be Stronger and Go Faster" 2015 https://www.youtube.com/watch?v=N-1lXYyU1tU
- CCTV America "Helping Amputees: New Technologies in Prosthetics" 2014 https://www.youtube.com/watch?v=eAFAOyzVWJc

Aging

- New York Times "Run to Stay Young" 2014 http://well.blogs.nytimes.com/2014/12/03/run-to-stay-young/?_r=0
- NPR "To Stay Energy Efficient As You Age, Keep On Running" 2014 http://www.npr.org/blogs/health/2014/11/21/365692427/to-stay-energy-efficient-as-you-age-keep-on-running
- Runner's Word "Older Runners Walk like People Decades Younger" 2014 http://www.runnersworld.com/newswire/older-runners-walk-like-people-decades-younger

Cycling

- Outside "How Cyclists Can Avoid Low Bone Density" 2021 https://www.outsideonline.com/health/training-performance/cyclists-low-bone-density/?utm_medium=social&utm_source=twitter&utm_campaign=onsitesha