

# Tyler Barker, PhD

Curriculum Vita  
(09/29/2022)



Precision Genomics  
5171 S. Cottonwood Street, Suite #400  
Murray, UT 84107  
[tyler.barker@imail.org](mailto:tyler.barker@imail.org)

801-507-3653 office  
801-574-4509 cell

## CITIZENSHIP

USA

## EDUCATION

### Doctor of Philosophy, 2009

Oregon State University, Corvallis, OR USA

### Master of Science, 2003

Kansas State University, Manhattan, KS USA

### Bachelor of Science, 2000

University of Utah, Salt Lake City, UT USA

## PROFESSIONAL EXPERIENCE

**Senior Clinical Researcher / Scientist & Scientific Review Committee Chair**, 2018-present  
Precision Genomics, Intermountain Healthcare, Salt Lake City & St. George, UT USA

*Senior Clinical Researcher / Scientist.* In this role as a principal investigator, my objective is to identify biomarkers (such as, cytokines, nutrients, and redox biology signaling pathways and genetics) involved in osteoarthritis, osteoarthritis-related conditions, and cancer-induced cachexia. This position supports research and development initiatives and ongoing research efforts throughout the system and is accountable to support and/or lead research projects and to ensure that appropriate processes are implemented and maintained according to research protocol. This role advises project managers regarding project identification, data collection and analysis, computer programming and integration into the electronic medical record. This position designs research and assessment techniques to achieve desired outcomes and/or to comply with regulatory, grant requirements, compliance, or clinical excellence initiatives. This position translates pragmatic research into clinical applications (bench-to-bedside), which may involve managing large databases, creating reports, training clinicians / scientists / associates, and designing metrics to measure clinical outcomes resulting from translational research applied to clinical settings. This position creates the procedures for research data collection and/or electronic medical records and is responsible for managing the ongoing research efforts, the integrity of existing data systems, and ensuring integration across the organization. This position develops and reviews grants as part of the Foundation or other scientific review group as needed, mentors junior and senior investigators, and works alongside clinicians in developing research ideas, reviewing and editing abstracts and manuscripts, serving on external scientific committees on behalf of Intermountain Healthcare or other internal research leadership positions.

*Chair, Scientific Review Committee.* In this role, I have been responsible for the conduct of all committee activities (such as scientific merit assessment) and provide strategic guidance, overall direction, and review of all studies that incorporate Precision Genomics researchers, staff, and resources. These roles and responsibilities are accomplished through stringent planning and oversight of activities for investigator-initiated studies.

**Scientific Review Committee Chair, Principal Investigator, & Research Operations Manager**, 2017-2018

Precision Genomics, Intermountain Healthcare, Salt Lake City & St. George, UT USA

*Chair, Scientific Review Committee.* In this role, I have been responsible for the conduct of all committee activities (such as scientific merit assessment) and provide strategic guidance, overall direction, and review of all studies that incorporate Precision Genomics researchers, staff, and resources. These roles and responsibilities are accomplished through stringent planning and oversight of activities for investigator-initiated studies.

*Principal Investigator.* In this role, my objective is to identify biomarkers (such as, cytokines, nutrients, and redox biology signaling pathways and genetics) involved in osteoarthritis, osteoarthritis-related conditions, and cancer-induced cachexia.

*Research Operations Manager.* I provide management and scientific lead across several diverse projects and investigative teams, manage budgets, write papers describing research, coordinate clinical activities with physicians, and secure internal and external funding for research projects. I am also responsible for obtaining various approvals to conduct research (departmental, facility, accounting, IRB/privacy, and contractual agreements), as well as training and mentoring of MD and MD/PhD investigators along with support personnel, such as research coordinators and assistants. When appropriate, I also write the timely completion of advanced manuals, project documentation, and executive reports for senior and junior level staff members at Precision Genomics.

**Clinical Researcher – Director of the Physiology Research Lab, 2012-2016**

The Orthopedic Specialty Hospital, Murray, UT USA

*Physiology Research Lab:* As the Principal Investigator, my objective is to identify the role of cytokines, inflammation, and the immune system on skeletal muscle function and pathophysiology. I have conducted several studies focusing on the relationships between cytokines and clinically-based outcomes in diverse patient populations.

*Clinical research roles:* My responsibilities include establishing strong research collaborations within orthopedics and with other clinical disciplines (e.g. cardiovascular, infectious disease, hyperbaric, pulmonary, and critical care medicine). In this role, I apply advanced knowledge of scientific research principles, strategies, and methodologies to achieve timely laboratory, departmental, facility, or institutional research aims. Depending on the project, my roles include serving as a Principal Investigator, Co-Investigator, Study Coordinator, or Collaborator. I have conducted research of various designs – from case studies to pre-clinical studies to randomized clinical trials in humans. In this position, I accepted an invitation from Histogenics (Boston, MA) to serve as a site Principal Investigator for a Phase III, multi-site randomized clinical trial investigating the influence of an autologous cell matrix in the repair of cartilage defects on the lateral or medial femoral condyle.

*Administrative duties:* I provide management and scientific lead across several diverse projects and investigative teams, manage budgets, write papers describing research, coordinate clinical activities with physicians, and secure funding for research projects. I am also responsible for obtaining various approvals to conduct research (departmental, facility, accounting, IRB/privacy, and contractual agreements), as well as training and mentoring of junior staff. When appropriate, I also write the timely completion of advanced manuals, project documentation, and executive reports for senior and junior level staff members at The Orthopedics Specialty Hospital.

**Post-Doctoral / Research Consultant – Director of the Physiology Research Lab, 2009-2012**

The Orthopedic Specialty Hospital, Murray, UT USA

*Physiology Research Lab:* As the Principal Investigator, my objective is to identify the role of cytokines, inflammation, and the immune system on skeletal muscle function and pathophysiology. I conducted

several studies focusing on the relationships between redox biology, cytokines, and clinically-based and patient-oriented outcomes in diverse orthopedic patient populations.

*Clinical research roles:* Depending on the scope of the study, I served as a Principal Investigator, Co-Investigator, Study Coordinator, or as a Collaborator. A primary focus of my research during this time was to investigate the influence of inflammation on musculoskeletal- and clinically-based outcomes in collaboration with several orthopedic surgeons and physical therapists at The Orthopedics Specialty Hospital.

*Administrative duties:* In this position, my duties included the collaboration with other disciplines within Intermountain Healthcare, to obtain approvals to conduct research (departmental, facility, accounting, IRB/privacy), the training and mentoring of staff, managing research personnel and budgets, disseminating research, coordinating research with physicians, securing financial support, and to re-establish the Physiology Research Lab at The Orthopedics Specialty Hospital. When appropriate, I also wrote the timely completion of advanced manuals, project documentation, and executive reports for senior and junior level staff members at The Orthopedic Specialty Hospital.

**Clinical Researcher and Exercise Physiologist, 2005-2009**  
The Orthopedic Specialty Hospital, Murray, UT USA

*Clinical research roles:* During this time, I served as a Principal Investigator, Co-Investigator, Study Coordinator, or Collaborator in multiple studies investigating the influence of diverse musculoskeletal and inflammatory-based factors that modulate the recovery from an anterior cruciate ligament (ACL) injury and surgery. In this position, I independently initiated and secured external funding for my first randomized, double-blind, placebo controlled study conducted in orthopedic patients. This study started in 2007.

*Administrative duties:* This was a seminal point in my career when I started to develop and demonstrate expertise in related research, the understanding of the necessary approvals required to conduct research in a clinical environment (departmental, facility, accounting, IRB/privacy), the importance of training and mentoring of staff, the significance of publishing results, the delicacy of coordinating research efforts with physicians and collaborators, and the daunting task of securing financial support to fund research.

**OTHER PROFESSIONAL EXPERIENCE**

**Adjunct Associate Professor**, February 2021-Present  
University of Utah, School of Medicine, Salt Lake City, UT USA

**Adjunct Assistant Professor**, October 2015-Present  
University of Utah, Salt Lake City, UT USA

**Adjunct Faculty**, January 2011-May 2011  
University of Colorado, Colorado Spring, CO USA

**Linus Pauling Research Fellowship**, June 2005-December 2005  
Linus Pauling Institute, Oregon State University, Corvallis, OR USA

**Graduate Teaching Assistant**, 2003-2005  
Department of Nutrition and Exercise Sciences, Oregon State University, Corvallis, OR USA

**Graduate Teaching Assistant**, 2002  
Kinesiology Department, Kansas State University, Manhattan, KS USA

**Exercise Specialist & Research Assistant**, 2000-2001  
The Orthopedic Specialty Hospital, Murray, UT USA

**SELECTED COMMITTEES & ACTIVITIES**

2022                      Editor, Special Issue, Nutrients  
2022                      Scientific Advisory Committee, Nutrients Conference

2018-present	Editor, Nutrients 2006-present
2006-present	Peer reviewer for more than 35 scientific and medical journals (see list below)
2017	Committee Member, Cancer Immunotherapy Council
2014-present	Associate Editor, BMC Nutrition
2014-2015	Early Career Reviewer, Center for Scientific Review, National Institutes of Health (NIH)
2014	Research/Grant Reviewer, Intermountain Research & Medical Foundation
2013-2016	Quality Control Council, The Orthopedic Specialty Hospital
2012-2014	Pain Management Team Member, The Orthopedic Specialty Hospital
2011-2016	Research Oversight Committee Member, The Orthopedic Specialty Hospital
2010-2011	Membership Retention Committee, Society for Free Radical Biology and Medicine
2010-2016	Osteoarthritis Advisory Committee Member, The Orthopedic Specialty Hospital
2009-2019	Institutional Review Board (IRB) Committee Member, Intermountain Healthcare, Central Region

### **ACTIVE SOCIETY ORGANIZATIONS**

The American Association of Immunologists (AAI)  
 American Physiological Society (APS)  
 International Cytokine and Interferon Society (ICIS)

### **SELECTED PERSONAL HIGHLIGHTS, HONORS, & AWARDS**

2013	Nominated for Researcher of the Year at Intermountain Healthcare
2012	Nominated for Outstanding Alumni from Oregon State University
2008-2009	Thayer Raymond Research Fellowship, Oregon State University
2008	Scholarship / Grant, Free Radical Summer School, Spetses, Greece

### **PEER REVIEWER JOURNALS**

1. Antioxidants
2. Applied Physiology, Nutrition, and Metabolism
3. BMC Nutrition
4. British Journal of Nutrition
5. Cancer Management and Research
6. Cancer Reports
7. Clinical Endocrinology
8. Clinical Nutrition Open Science
9. Cytokine
10. European Journal of Applied Physiology
11. European Journal of Sport Sciences
12. Experimental Gerontology
13. Experimental Physiology
14. Free Radical Research
15. Frontiers in Immunology
16. Immunology Letters
17. International Journal of Molecular Sciences
18. International Journal of Sport Nutrition and Exercise Metabolism
19. International Journal for Vitamin and Nutrition Research
20. Journal of Applied Physiology
21. Journal of Clinical Endocrinology & Metabolism
22. Journal of Inflammation
23. Journal of Investigative Surgery
24. Journal of Science and Medicine in Sport
25. Journal of the American College of Nutrition
26. Lipids
27. Medical Hypotheses

28. Medicine in Sport and Exercise
29. Molecules
30. Nutrients
31. Nutrition & Metabolism
32. PLOS One
33. Research in Veterinary Science
34. Respiratory Physiology and Neurobiology
35. SpringerPlus
36. The Surgeon
37. Journal of Zhejiang University-SCIENCE B

## SELECTED PUBLICATIONS

### *Peer-reviewed Journal Articles*

- Barker T**, Poole DC, Noble ML, & Barstow TJ (2006). Human critical power-oxygen uptake relationship at different pedaling frequencies. *Experimental Physiology*, 91; 621-632
- Widrick JJ & **Barker T** (2006). Peak power of muscles injured by lengthening contractions. *Muscle & Nerve*, 34; 470-477
- Barker T**, Leonard SW, Trawick RH, Kjeldsberg CR, Martins TB, Hill HR, & Traber MG (2009). Modulation of inflammation by vitamin E and C supplementation prior to anterior cruciate ligament surgery. *Free Radical Biology & Medicine*, 46; 599-606
- Barker T**, Leonard SW, Trawick RH, Walker JA, & Traber MG (2009). Antioxidant supplementation lowers circulating IGF-1 but not F2-isoprostanes immediately following ACL surgery. *Redox Report*, 14; 221-226
- Barker T**, Leonard SW, Hansen J, Trawick RH, Ingram R, Burdett G, Lebold K, Walker JA, & Traber MG (2009). Vitamin E and C supplementation does not ameliorate muscle dysfunction following anterior cruciate ligament surgery. *Free Radical Biology & Medicine*, 47; 1611-1618
- Barker T** & Traber MG (2011). Does vitamin E and C supplementation improve the recovery from anterior cruciate ligament surgery? *Journal of Evidenced-Based Complementary & Alternative Medicine*, 16; 114-128
- Barker T**, Martins TB, Kjeldsberg CR, Hill HR, Leonard SW, Trawick RH, & Traber MG (2011). Vitamin E and C supplementation modulates the association between reciprocally regulated cytokines after an ACL injury and surgery. *American Journal of Physical Medicine and Rehabilitation*, 90; 638-647
- Barker T**, Martins TB, Hill HR, Kjeldsberg CR, Trawick RH, Weaver LK & Traber MG (2011). Low vitamin D impairs strength recovery after anterior cruciate ligament surgery. *Journal of Evidenced-Based Complementary & Alternative Medicine*, 16; 201-209
- Barker T**, Martins TB, Hill HR, Kjeldsberg CR, Henriksen VT, Dixon BM, Schneider ED, Dern A, & Weaver LK (2012). Different doses of supplemental vitamin D maintain interleukin-5 without altering skeletal muscle strength: a randomized, double-blind, placebo-controlled study in vitamin D sufficient adults. *Nutrition & Metabolism*, 9; 1-12
- Barker T**, Martin TB, Kjeldsberg CR, Trawick RH, & Hill HR (2012). Circulating interferon- $\gamma$  correlates with 1,25(OH)D and the 1,25(OH)D-to-25(OH)D ratio. *Cytokine*, 60; 23-26
- Barker T**, Henriksen VT, Martins TB, Kjeldsberg CR, and Hill HR (2012). Fluctuations in the skeletal muscle power-velocity relationship and interferon- $\gamma$  after a muscle-damaging event in humans. *Extreme Physiology & Medicine*, 1; 1-6
- Dixon B, **Barker T**, McKinnon T, Cuomo J, Frei B, Borregaard N, & Gombart AF (2012). Positive correlation between circulating cathelicidin antimicrobial peptide (hCAP/LL-37) and 25-hydroxyvitamin D in healthy adults. *BMC Research Notes*, 5; 575
- Barker T**, Martins TB, Hill HR, Kjeldsberg CR, Dixon BM, Schneider ED, Henriksen VT, & Weaver LK (2013). Circulating pro-inflammatory cytokines are elevated and peak power output correlates with 25-hydroxyvitamin D in vitamin D insufficient adults. *European Journal of Applied Physiology*, 113; 1523-34
- Barker T**, Henriksen VT, Martins TB, Hill HR, Kjeldsberg CR, Schneider ED, Dixon BM, & Weaver LK (2013). Serum 25-hydroxyvitamin D predicts muscular weakness after intense exercise. *Nutrients*, 5; 1253-75

- Mah E, Pei R, Guo Y, Ballard KD, **Barker T**, Rogers VE, Parker BE, Taylor AW, Traber MG, Volek JS, & Bruno RS (2013).  $\gamma$ -Tocopherol-rich supplementation additively improves vascular endothelial function during smoking cessation: a randomized, double-blind, placebo-controlled trial. *Free Radical Biology & Medicine*, 65: 1298-1299
- Barker T**, Schneider ED, Dixon BM, Henriksen VT, & Weaver LK (2013). Supplemental vitamin D enhances the recovery in peak isometric force shortly after intense exercise: a randomized, double-blind, placebo-controlled study in humans. *Nutrition & Metabolism*, 10: 1-10
- Henriksen VT, Rogers VE, Rasmussen GL, Trawick RH, Momberger NG, Aguirre D, & **Barker T** (2014). Pro-inflammatory cytokines mediate the decrease in serum 25(OH)D concentrations after total knee arthroplasty? *Medical Hypotheses*, 84: 134-137
- Barker T**, Martins TB, Hill HR, Kjeldsberg CR, Dixon BM, Schneider ED, Henriksen VT, & Weaver LK (2014). Vitamin D sufficiency associates with an increase in anti-inflammatory cytokines after intense exercise in humans. *Cytokine*, 65: 134-137
- Barker T**, Henriksen VT, Rogers VE, Aguirre D, Trawick RH, Rasmussen GL, & Momberger (2014). Vitamin D deficiency associates with  $\gamma$ -tocopherol and quadriceps weakness but not inflammatory cytokines in subjects with knee osteoarthritis. *Redox Biology*, 2: 466-474
- Barker T**, Rogers VE, Henriksen VT, Aguirre D, Trawick RH, Rasmussen GL, & Momberger NG (2014). Serum cytokines are increased and circulating micronutrients are not altered in subjects with early compared to advanced knee osteoarthritis. *Cytokine*, 68: 133-136
- Barker T**, Rogers VE, Levy M, Templeton J, Goldfine H, Schneider ED, Dixon BM, Henriksen VT, & Weaver LK (2015). Supplemental vitamin D increases serum cytokines in those with initially low 25-hydroxyvitamin D: A randomized, double blind, placebo-controlled study. *Cytokine*, 71: 132-138
- Levy M, McKinnon T, **Barker T**, Dern A, Helland T, Robertson J, Cuomo J, Wood T, & Dixon BM (2015). Predictors of vitamin D status in subjects that consume a vitamin D supplement. *European Journal of Clinical Nutrition*, 69: 84-89
- Broxterman RM, Ade CJ, **Barker T**, & Barstow TJ (2015). Influence of pedal cadence on the respiratory compensation point and its relation to critical power. *Respiratory Physiology & Neurobiology*, 208: 1-7
- Christensen J, Goldfine L, **Barker T**, & Collingridge D (2015). What can the first two months tell us about outcomes after anterior cruciate ligament reconstruction? A cross sectional study. *Journal of Athletic Training*, 50: 508-515
- Barker T**, Henriksen VT, Rogers VE, & Trawick RH (2015). Improvement in muscle strength after an anterior cruciate ligament injury corresponds with a decrease in serum cytokines. *Cytokine*, 73:199-202
- Barker T**, Henriksen VT, Rogers VE, & Trawick RH (2015). Serum cytokines and muscle strength after anterior cruciate ligament surgery are not modulated by high-doses of vitamins E ( $\alpha$ - and  $\gamma$ -tocopherols) and C. *Cytokine*, 74: 279-286
- Barker T**, Rogers VE, Henriksen VT, Brown KB, Trawick RH, Momberger NG, & Rasmussen GL (2015). Is there a link between the neutrophil to lymphocyte ratio and venous thromboembolic events after knee arthroplasty? A pilot study. *Journal of Orthopaedics and Traumatology*, 17: 163-168
- Barker T**, Henriksen VT, Rogers VE, Momberger NG, Rasmussen GL, & Trawick RH (2016). Circulating interleukin-6 is not altered while  $\gamma$ -tocopherol is increased in subjects scheduled for knee surgery with low vitamin D. *Cytokine*, 88: 108-114
- Barker T**, Rogers VE, Brown KB, Henriksen VT, & Rasmussen GL (2017). Tourniquet use during total knee arthroplasty does not modulate the neutrophil-to-lymphocyte ratio, pain, or activity. *Journal of Orthopaedics and Traumatology*, 18: 283-287
- Barker T**, Brown KB, & Rogers, VE (2017). Soluble TNF receptors are modulated by vitamin D status but not by acute perturbations in 25-hydroxyvitamin D following a bolus of supplemental vitamin D. *Journal of Cytokine Biology*, 2: 1-9
- Barker T**, Rogers VE, Henriksen VT, Dixon BM, Momberger NG, Rasmussen GL, & Trawick RH (2019). Muscular-based and patient-reported outcomes differentially associate with circulating superoxide dismutases and cytokines in knee osteoarthritis. *Cytokine*, 115: 45-49
- Barker T**, Rogers VE, Henriksen VT, Levy M, Schneider ED, Templeton J, Goldfine H, Dixon BM, Rasmussen GL, Trawick RH, & Momberger NG (2019). Circulating cytokine concentrations are not altered by

- supplemental vitamin D in knee osteoarthritis: A pilot study. *Journal of Nutrition & Intermediary Metabolism*, 18: 1-7
- Kazmers NH, Yu Z, **Barker T**, Abraham T, Romero R, & Jurynech MJ (2020). Evaluation for Kienböck's disease familial clustering: A population-based cohort study. *The Journal of Hand Surgery*, 45: 1-8
- Xia LC, Van Hummelen P, Kubit M, Lee HJ, Bell JM, Grimes SM, Wood-Bouwens C, Greer SU, **Barker T**, Haslem DS, Ford JM, Fulde G, Ji HP, Nadauld LD (2020). Whole genome analysis identifies the association of TP53 genomic deletions with lower survival in stage III colorectal cancer. *Scientific Reports*, 10: 1-10
- Barker T**, Fulde G, Moulton B, Nadauld LD, & Rhodes (2020). An elevated neutrophil-to-lymphocyte ratio associates with weight loss and cachexia in cancer. *Scientific Reports*, 10: 1-9
- Kazmers NH, Novak KA, Yu Z, Meeks HD, Fulde GL, Thomas JL, **Barker T**, & Jurynech MJ (2020). Familial clustering of erosive hand osteoarthritis in a large statewide cohort. *Arthritis & Rheumatology*, 73: 440-447
- Barker T**, Rogers VE, Henriksen VT, Trawick RH, Momberger NG, & Rasmussen GL (2021). Circulating IL-10 is compromised in the absence of TNF- $\alpha$  deviations in patients predisposed to and in patients with severe knee osteoarthritis. *Scientific Reports*, 11: 1812
- Barker T**, Henriksen VT, Rogers VE, Trawick RH, Momberger NG & Rasmussen GL (2021). Multi-vitamin supplementation blunts the circulating IL-6/IL-10 ratio increase after knee arthroplasty: A randomized, double-blind, placebo controlled study. *Cytokine*, 140: 155435
- Barker T**, May HT, Doty J, Lappe D, Knowlton K, Carlquist J, Konery K, Inglet S, Chisum B, Galenko O, Anderson J, & Muhlestein J (2021). Vitamin D supplementation protects against reductions in plasma 25-hydroxyvitamin D induced by open-heart surgery: ASSESS-D trial. *Physiological Reports*, 9: e14747
- Barker T** (2021). Comment on: Association of serum levels of inflammatory markers and adipokines with joint symptoms and structures in participants with knee osteoarthritis. *Rheumatology*, 60: e414-e415
- Gavile CM, Kazmers NH, Novak KA, Meeks HD, Yu Z, Thomas JL, Hansen C, **Barker T**, & Jurynech MJ (202X). Familial clustering and genetic analysis of severe thumb carpometacarpal joint osteoarthritis in a large statewide cohort. In press, *The Journal of Hand Surgery*

### ***Book Chapters***

- Barker T** (2013). Nutrition and Inflammation. Fat soluble vitamins: Chapter 2.5. Vitamin D and inflammation. **Nutrition & Physical Activity in Inflammatory Diseases**
- Barker T** (2013). Nutrition and Inflammation. Fat soluble vitamins: Chapter 2.6. Vitamin E and inflammation. **Nutrition & Physical Activity in Inflammatory Diseases**

### ***Reviews or Commentaries***

- Barker T** & Traber MG (2007). From animals to humans: evidence linking oxidative stress as a causative factor in muscle atrophy. *Journal of Physiology*, 583; 421-422
- Barker T** & Traber MG (2008). Response to the Letter to the Editor by Rennie et al. *Journal of Physiology*, 586; 309-310
- Barker T** (2010). Vitamin D and orthopedics. Letter, *Journal of Bone and Joint Surgery (America)*, electronic
- Barker T** (2011). Influence of vitamins E and C on the recovery from an anterior cruciate ligament injury and surgery. *SCANs Pulse*, 30: 11-14. Invited Review
- Barker T** (2014). Vitamin D and muscular strength in reportedly healthy adults. *SCAN's Pulse*, 33: 5-9. Invited Review
- Barker T** (2021). Comment on: Association of serum levels of inflammatory markers and adipokines with joint symptoms and structures in participants with knee osteoarthritis. *Rheumatology*, 60: e414-e415

### ***Abstracts***

- Barker T**, Leonard S, Trawick RH, Martins TB, Hill HR, & Traber MG (2008). The influence of  $\alpha$ -tocopherol and ascorbic acid on circulating inflammatory cytokines following anterior cruciate ligament surgery. Society for Free Radical Biology and Medicine. Free Radical Summer School, Spetses, Greece

- Barker T**, Leonard S, Martins TB, Trawick RH, Hill HR, Kjeldsberg CR, & Traber MG (2009). Cytokine alteration following antioxidant supplementation and anterior cruciate ligament surgery. American College of Sports Medicine. *Medicine and Science in Sport and Exercise*, 41; 5 Supplement
- Barker T**, Leonard SW, Trawick RH, Martins TB, Kjeldsberg CR, Hill HR, Walker JA, & Traber MG (2009). The supplementation of vitamins E and C modulate the relationship between circulating mediators of muscle weakness but not limb strength following anterior cruciate ligament surgery. Society for Free Radical Biology and Medicine, and Oxygen Club of California. Diet and Optimum Health Conference (Poster 31)
- Leonard SW, **Barker T**, Mustacich DJ, & Traber MG (2009). Measurement of vitamin K homologues in biological fluids and tissues by APCI LC/MS. Society for Free Radical Biology and Medicine, and Oxygen Club of California. Diet and Optimum Health Conference (Poster 34)
- Barker T**, Martins TB, Hill HR, Kjeldsberg CR, Trawick RH, Leonard SW, Walker JA, & Traber MG (2010). Antioxidants induced cytokine alterations indicative of a better prognosis after ACL surgery. *FASEB J*, 24:535.7
- Leonard SW, **Barker T**, Mustacich DJ, & Traber MG (2010). Measurement of vitamin K homologues in biological fluids and tissues by APCI LC/MS. *FASEB J*, 24:533.1
- Broxterman RM, **Barker T**, & Barstow TJ (2010). Respiratory compensation point-oxygen uptake relationship at different pedaling frequencies. *Medicine and Science in Sport and Exercise Supplement*, 42:507
- Barker T**, Dixon BM, & Weaver LK (2011). Smaller concentration-supplementation slopes at a higher vitamin D treatment dose. *FASEB J*, 25:996.3
- Barker T** & Walker JA (2011). Disparate velocity and force responses at peak power following muscle damage. *FASEB J*, 25:1051.5
- Barker T** & Trawick RH (2012). Changes in the circulating 1,25(OH)D-to-25(OH)D ratio correlate with IFN- $\gamma$  alterations. *FASEB J*, 26:1126.3
- Christensen J, Goldfine L, **Barker T**, & West H (2012). Associations between early range of motion and force output on the international knee documentation committee subjective form after anterior cruciate ligament reconstruction. CSM, American Physical Therapy Association
- Barker T**, Dixon BM, Schneider ED, & Weaver LK (2013). Circulating pro-inflammatory cytokines are elevated and peak power output correlates with 25-hydroxyvitamin D in vitamin D insufficient adults. *FASEB J*, 27:643.2
- Barker T**, Dixon BM, Schneider ED, & Weaver LK (2013). Serum 25-hydroxyvitamin D predicts muscular strength after a muscle-damaging event. *FASEB J*, 27:710.14
- Levy M, Dern A, **Barker T**, Schneider E, McKinnon T, Helland T, Robertson J, Cuomo J, Wood T, Dixon B (2013). Predictors of vitamin D status in subjects that consume a vitamin D supplement. *FASEB J*, 27:1059.2
- Barker T**, Dixon BM, Schneider EK, Weaver LK (2013). Vitamin D insufficiency modulates the pro- and anti-inflammatory cytokine balance without altering regulators of circulating 25-hydroxyvitamin D. *Journal of Immunology*, 190: 184.12
- Barker T**, Henriksen VT, Rogers VE, Aguirre D, Trawick RH, Rasmussen GL, Momberger NG (2014). Vitamin D deficiency impairs quadriceps strength without modulating inflammatory cytokines in patients with knee osteoarthritis. *FASEB J*, 28:1041.2
- Barker T**, Schneider ED, Dixon BM, Henriksen VT, Weaver LK (2014). Supplemental vitamin D enhances strength recovery after damaging-exercise. *FASEB J*, 28:634.2
- Barker T**, Henriksen VT, Rogers VE, & Trawick RH (2015). A decrease in  $\gamma$ -tocopherol associates with impaired muscular performance after anterior cruciate ligament surgery. *FASEB J*, 29:920.1
- May HT, Galenko O, Carlquist JF, Weaver LK, Knight S, **Barker T**, & Muhlestein JB (2016). Which vitamin D metabolite best predicts future adverse cardiovascular events? Results from the Intermountain Heart Collaborative Study. *J Am Coll Cardiol* 2016;67(suppl A): 735-1097 (A385).
- Horton B, Gates S, Marland J, West HS, & **Barker T** (2016). Post-operative rehabilitation following hip arthroscopy: A retrospective study looking at early patient outcomes comparing two protocols. CSM, American Physical Therapy Association



- May HT, Galenko O, Carlquist JF, Weaver LK, Knight S, **Barker T**, & Muhlestein JB (2017). The association of the different vitamin D metabolites to death, myocardial infarction, heart failure, and stroke: Results from the Intermountain Heart Collaborative Study. Submitted to the American Heart Association
- Rhodes TD, Fulde G, Romero R, Abraham T, Moulton B, Van Meter M, Thota R, Lewis MA, Haslem DS, Nadauld LN, & **Barker T** (2018). The neutrophil-to-lymphocyte ratio prior to checkpoint blockade immunotherapy (CBI) or radiation plus CBI is associated with overall survival in melanoma patients. ASCO
- Lewis MA, Haslem DS, Thota R, Rhodes TD, **Barker T**, Moulton B, Abraham T, Fulde G, Romero R, Christensen B, & Nadauld L (2018). Mutational landscape of metastatic colorectal cancer: Aggregate insights from a molecular tumor board. ASCO
- Thota R, Fulde G, Lewis MA, Haslem DS, Nadauld L, Moulton B, Romero R, Abraham T, Christensen B, Raghunath S, & **Barker T** (2018). DNA Damage repair (DDR) pathway defects in gastrointestinal (GI) malignancies. ASCO
- Thota R, Lewis MA, Raghunath S, Haslem DS, Nadauld L, Rhodes TD, Moulton B, Abraham T, Romero R, Fulde G, Christensen B, & **Barker T** (2018). Utility of next generation sequencing in clinical decision making in hepatocellular carcinoma (HCC). ASCO
- Thota R, Lewis MA, Nadauld L, Haslem DS, Rhodes TD, Moulton B, Fulde G, Abraham T, Romero R, Moulton B, Raghunath S, & **Barker T** (2018). Cell cycle checkpoint defects in gastrointestinal malignancies. ASCO
- Muhlestein JB, Doty JR, Lappe D, Knowlton K, May H, **Barker T**, Carlquist J, Konery K, Inglet S, Chisum B, Viet TL, Galenko O, & Anderson J (2018). Acute effects of cardiac surgery on 25 (OH) vitamin D (VITD) levels and response to VITD supplementation: Primary results of the ASSESS-D study. Journal of the American College of Cardiology
- Thota R, Johnson C, Raghunath S, Christensen B, Fulde G, Lewis M, Haslem DS, Rhodes TD, Nadauld L, & **Barker T** (2019). Characterization of the Tumor Mutation Burden in Hepatobiliary Tumors. Journal of Clinical Oncology, 37: 295
- Kazmers NH, Yu Z, **Barker T**, Abraham T, Romero R, & Jurynech MJ (2019). Evaluation for a genetic basis of Kienböck's disease: A population-based cohort study. ASSH
- Chen J, Pflieger L, Grimes S, **Barker T**, Brems M, Fulde G, Moulton B, Snow S, Howe P, Sathe A, Christensen B, Ji H, & Rhodes T (2020). Oral Presentation, Society for Immunotherapy of Cancer
- Sandhu Z, Sanchez-Garcia J, **Barker T**, Raghunath S, Shortt K, Hwang SH, Fulde G, Zendejas-Ruiz IR, Haslem DS, Yeatman TJ, & Thota R (2021) Immune related biomarkers in biliary tract cancers (BTC). Journal of Clinical Oncology, 39: e16191
- Kazmers NH, Gavile C, Meeks H, Yu DZ, Novak K, **Barker T**, & Jurynech MJ (2021). Familial clustering of thumb carpometacarpal osteoarthritis in a large statewide cohort. American Association for Hand Surgery
- Kazmers NH, Novak KA, **Barker T**, Jurynech MJ. Genetic Analysis of a High-Risk Kienböck's Disease Pedigree and Characterization of a Rare Variant in the Proangiogenic Gene SCG2. Poster presentation given at the American Society for Surgery of the Hand 77th Annual Meeting; Boston, MA; 2022

## CONFERENCE ACTIVITIES AND PUBLIC PRESENTATIONS

- Barker T** (2009). Vitamins E and C and the recovery from anterior cruciate ligament surgery. The University of Utah Graduate Student Seminar. Salt Lake City, UT USA
- Barker T** (2011). The influence of vitamin D supplementation on muscular strength and inflammatory cytokines. ACSM's 58<sup>th</sup> Annual Meeting and 2<sup>nd</sup> World Congress on Exercise is Medicine. June 3<sup>rd</sup>, Denver, CO USA
- Barker T** (2012). The connection between vitamin D and osteoarthritis. Salt Lake City, UT USA. Sponsored by Osteoarthritis Foundation
- Barker T** (2013). Co-Chair. Vitamins and Minerals: Micronutrient Bioavailability, Functions, and Interventions. Experimental Biology, Boston, MA USA
- Barker T** (2013). Poster/Abstract Judge. Vitamins and Minerals: Research Interest Section. Experimental Biology, Boston MA USA

- Barker T** (2013). Poster/Abstract Judge. Nutrient - Gene Interaction: Research Interest Section. Experimental Biology, Boston, MA USA
- Barker T** (2013). Vitamin D and orthopedics. Biomedical Sciences Department, Oregon State University. Corvallis, OR USA
- Barker T** (2014). Vitamin D and orthopedics. Intermountain Healthcare, 11<sup>th</sup> Annual Research Summit. Salt Lake City, UT USA
- Barker T** (2014). Vitamin D and knee osteoarthritis. Arthritis Foundation, Salt Lake City, UT USA
- Barker T** (2015). Vitamin D and orthopedics. Utah's Annual Nutrition and Dietetics conference, Provo, UT USA
- Barker T** (2020). Vitamin D deficiency increase T-cell expression of pro-inflammatory cytokines in the tumor micro-environment. i3 meeting, Intermountain Healthcare, Precision Genomics, St. George, UT USA
- Barker T** (2021). Circulating cytokines and vitamin supplementation in knee osteoarthritis and total joint patients. Intermountain Healthcare, Total Joint Replacement Committee, Salt Lake City, UT USA
- Barker T** (2021). Heredigene: Population Study. University of Utah, School of Medicine, Salt Lake City, UT USA

## RESEARCH SUPPORT

ACTIVE				
Years	Source	Role	Amount	Objective
2019-present	Amgen/deCode Genetics	Co-Investigator	\$25,000,000	To collect and to establish a biorepository of medical information, genetic sequencing data, and storage of additional blood for future research.
2018-Present	Intermountain Research & Medical Foundation	Co-Investigator	\$58,843	Effect of Enhanced Physical Therapy Group Exercise Program on Fatigue, Strength, and Balance for Patients Undergoing Stem Cell Transplant for Leukemia, Lymphoma and Multiple Myeloma.
subtotal:			\$25,058,843	

COMPLETE				
Years	Source	Role	Amount	Objective
2015-2017	Intermountain Research & Medical Foundation	Principal Investigator	\$60,000	To determine if IL-6 can accurately diagnose a periprosthetic joint infection and if local concentrations of the soluble IL-6 and gp130 receptors are modulated by a periprosthetic joint infection.
2015-2019	SavvySherpa (second funding source for this study)	Co-Investigator	\$22,000	To determine if levels of vitamin D-binding protein, bioavailable 25(OH)D, free 25(OH)D, or total 25(OH)D are better indicators of CV risk and how genetic polymorphisms affect outcomes.
2014-2020	Histogenics	Principal Investigator	\$2,000,000	To evaluate the safety and effectiveness of NeoCart in cartilage repair of the knee, and to compare the NeoCart safety and effectiveness to microfracture repair.

2014-2019	Intermountain Research & Medical Foundation	Co-Investigator	\$58,000	To determine if levels of vitamin D-binding protein, bioavailable 25(OH)D, free 25(OH)D, or total 25(OH)D are better indicators of CV risk and how genetic polymorphisms affect outcomes.
2014-2019	Intermountain Research & Medical Foundation	Co-Investigator	\$52,500	To measure serum 25(OH)D concentrations in open heart surgery patients, and to investigate the influence of vitamin D treatment on patient and clinical outcomes.
2012-2018	USANA Health Sciences, Inc.	Principal Investigator	\$105,000	Innovative micronutrient research in orthopedics: to identify the antioxidant potential of vitamin D in orthopedics and orthopedic related conditions in humans.
2011-2018	USANA Health Sciences, Inc.	Principal Investigator	\$275,000	To identify the influence of vitamin D supplementation on muscular-based outcomes in patients with osteoarthritis symptoms.
2009-2019	Intermountain Research & Medical Foundation and USANA Health Sciences, Inc.	Principal Investigator	\$60,000	To identify the influence of vitamin E and C supplementation on the strength recovery following anterior cruciate ligament (ACL) surgery?
2009-2019	USANA Health Sciences, Inc.	Principal Investigator	\$84,000	To identify the influence of antioxidant and chelated mineral supplementation on muscular strength and wound healing after total knee arthroplasty.
2009-2012	Intermountain Research & Medical Foundation	Principal Investigator	\$40,000	To identify the influence of vitamin D supplementation on inflammatory cytokines and muscle strength in young, physically active individuals.
2008-2009	Intermountain Research & Medical Foundation	Principal Investigator	\$10,500	To identify oxidative stress and the proteolytic pathways in skeletal muscle following ACL reconstructive surgery.
2007-2009	USANA Health Sciences, Inc.	Co-Principal Investigator	\$70,000	To identify both circulating and local oxidative stress during and following ACL reconstructive surgery.
			subtotal: \$2,837,000	

**LIST OF CLINICAL RESEARCH STUDIES WHILE AT INTERMOUNTAIN**

Years	Role	Study titles	Status
2007-present	Principal investigator	Oxidative stress and skeletal muscle pathology following an anterior cruciate ligament (ACL) injury and surgery	IRB open; enrollment closed
2009-present	Principal investigator	Vitamin D - muscle strength and cytokines	IRB open; enrollment closed

2009-present	Principal investigator	Total knee arthroplasty and vitamins C, D, and E	IRB open; enrollment open
2010	Principal investigator	Vitamin D and recovery from ACL surgery	IRB and enrollment closed
2012-present	Principal investigator	High dose vitamin D supplementation and muscle strength	IRB open; enrollment closed
2011-present	Principal investigator	Vitamin D supplementation and clinical outcomes in patients with knee osteoarthritis	IRB open; enrollment closed
2013-present	Principal investigator	The influence of supplemental vitamin D on neutrophil-derived oxidative burst	IRB open; enrollment closed
2014-present	Principal investigator	Retrospective analysis between unicompartmental and total knee arthroplasty	IRB open
2014-present	Principal investigator	Autologous blood salvage on transfusion rates and cost-effectiveness	IRB open
2014-present	Principal investigator	Hyperbaric oxygen, neutrophil-derived oxidative burst, and cytokines: a pilot study	IRB open; enrollment open
2014-present	Principal investigator	To evaluate the safety and effectiveness of NeoCart in cartilage repair of the knee, and to compare the NeoCart safety and effectiveness to microfracture repair.	IRB open; enrollment open
2014-present	Principal investigator	Are short- and long-term outcomes different between unicompartmental and total knee arthroplasty patients?	IRB open; enrollment open
2015-present	Principal investigator	IL-6 and periprosthetic joint infection	IRB closed
2015-present	Principal investigator	IFN- $\gamma$ and vitamin D	IRB open; enrollment open
2006-2014	Co-investigator/Coordinator	Anterior cruciate ligament (ACL) project	IRB open
2010-present	Co-investigator	Nationwide analysis of vitamin D supplementation and serum 25-hydroxyvitamin D	IRB open
2011	Co-investigator	Vitamin D and circulating antimicrobial peptide (hCAP18/LL-37)	IRB open
2013	Co-investigator	Vitamin D and clinical outcomes in sepsis patients	IRB open
2014	Co-investigator	The association of vitamin D binding protein, bioavailable 25-hydroxyvitamin D, and free 25-hydroxyvitamin D to adverse outcomes in patients with cardiovascular disease	IRB open
2014	Co-investigator	Acute effect of systemic stress on measured blood concentrations of 25-hydroxyvitamin D in coronary bypass surgery patients	IRB open
2013-2014	Co-investigator	Sleep apnea and CPAP outcomes	Internal quality control project
2015-2016	Co-investigator	Immune markers and sleep patterns in patients with colorectal cancer	IRB open, enrollment open
2016	Co-investigator	Carotenoids and total knee arthroplasty	IRB closed

2013	Collaborator	$\gamma$ -Tocopherol-rich supplement modulates inflammation	IRB open; enrollment closed
2014	Collaborator	Effect of hyperbaric oxygen on metabolism and signaling through the hypoxia inducible factor pathway	IRB open, enrollment open
2017-present	Principal investigator	Precision genomics and immunotherapy - retrospective study	IRB open
2017-present	Principal investigator	Precision medicine biobank - prospective study	IRB open
2017-present	Co-investigator	Utah investigation of general early onset osteoarthritis and other bone and joint abnormalities	IRB open, enrollment open
2017-present	Co-investigator	Circulating tumor DNA - breast cancer study	IRB open, enrollment open
2017-present	Co-investigator	Radiation - immunotherapy study: retrospective study	IRB open
2018-present	Principal investigator	Tumor-immune microenvironment in colon cancer patients with cachexia	IRB open
2018-present	Principal investigator	Vitamin D deficiency increases the T-cell expression of pro-inflammatory cytokines in the tumor micro-environment	IRB open
2018-present	Collaborator	Genetics of osteoarthritis	IRB open
2019-present	Co-investigator	Heredigene: Population Study	IRB open
2020-present	Co-investigator	Prevalence of COVID-19 infection in Intermountain caregivers	IRB open