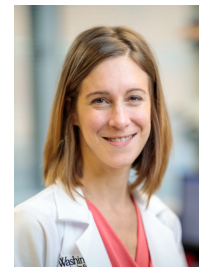


CURRICULUM VITAE

Gretchen A. Meyer, Ph.D.



Date: May 27, 2021

Citizenship: USA

Contact Information

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Washington University School of Medicine
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Present Position

Assistant Professor in Physical Therapy, Neurology, Biomedical Engineering and Orthopaedic Surgery, Washington University School of Medicine, St. Louis, MO

Education

2000-2004 **BS Mechanical Engineering;** Washington University in St. Louis, St. Louis, MO
2003-2004 **MS Mechanical Engineering;** Washington University in St. Louis, St. Louis, MO
2006-2011 **Ph.D. Bioengineering;** University of California, San Diego, San Diego, CA
2011-2014 **Postdoctoral Fellowship, Bioengineering;** University of California, San Diego, San Diego, CA

Academic Positions/Employment

05/02-08/03 **Research Assistant,** Dynamics Laboratory
Washington University in St. Louis, Philip V. Bayly, Director
08/04-09/06 **Engineer/Scientist 1,** Dynamics Group
The Boeing Company (St. Louis, MO), Robert Mullans, Group Lead
07/07-07/11 **Graduate Research Assistant,** Muscle Physiology Laboratory
University of California, San Diego, Richard L. Lieber, Director
09/11-07/14 **Postdoctoral Fellow,** Stem Cell Biology and Bioengineering Laboratory
University of California, San Diego, Adam J. Engler, Director
08/14-07/15 **Instructor,** Physical Therapy and Neurology
Washington University in St. Louis
07/15-07/17 **Assistant Professor,** Physical Therapy, Neurology and Biomedical Engineering, Washington
University in St. Louis
07/17-present **Assistant Professor,** Physical Therapy, Neurology, Biomedical Engineering and Orthopaedic
Surgery, Washington University in St. Louis

Honors and Awards

2000 – National Merit Scholarship & Dean’s Honorary Scholarship

2004 – Most Outstanding Member, American Society of Mechanical Engineers (Washington University Chapter)

2007 – Pass with Distinction, Departmental Qualifying Examination (University of California, San Diego, Bioengineering)

2009 – Young Investigator Award Finalist, Workshop on Multi-scale Muscle Mechanics

2016 – California Physical Therapy Association Publication Award

Editorial Responsibilities

Editorial board:

- Journal of Orthopaedic Research
- Journal of Applied Physiology

National Scientific Panels

Conference Organization:

- Co-chair - Alternative Muscle Club Annual Meeting, 2013
- MRC/CRM Conference Planning Committee for 2017 Conference
- Co-organizer – Orthopaedic Research Society Workshop: In vivo and in vitro techniques to study skeletal muscle growth and regeneration, 2018
- Co-organizer – Orthopaedic Research Society Research Interest Group: Cell and gene therapies for skeletal muscle regeneration and repair after injury, disease and aging, 2019
- Organizer – Society for Engineering Science Symposium: Engineering tools to model altered soft tissue mechanics, 2019
- Co-organizer – Combined Sections Meeting of the APTA: Muscle Degeneration of the Rotator Cuff: Scientific advances to guide surgery and rehabilitation, 2019
- Skeletal Muscle Topic Chair – Orthopaedic Research Society Annual Meeting 2021-2022
- Co-organizer – Orthopaedic Research Society Research Interest Group: The Cellular Orchestration of Muscle Regeneration, 2021

Conference Session Moderator:

- World Congress of Biomechanics, Session: Altered Cell Mechanics in Diseased Environments, July 11, 2014, Boston, MA
- Orthopaedic Research Society, Session: Muscle Spotlight Session, March 13, 2018
- Orthopaedic Research Society, Session: Skeletal Muscle – Injury and Healing, February 5, 2019

Grant Review:

- DoD/CDMRP Regenerative Medicine Research Panel, 2020
- NIH NIAMS Loan Repayment Program, 2021

Professional Societies and Organizations

Professional Society Membership:

- Biomedical Engineering Society, Member
- American Society of Mechanical Engineers, Member
- American Society of Biomechanics, Member

Curriculum Vitae - Gretchen A. Meyer, Ph.D.

- Orthopaedic Research Society

Major Invited Professorships and Lectureships

2019	University of Rochester, Center for Musculoskeletal Research, William F. Neuman Visiting Speaker
2019	Shirley Ryan Ability Lab, AbilityLab Research Seminar Series
2021	Icahn School of Medicine at Mount Sinai, Orthopaedic Research Laboratories Seminar Series

Research Support

Active:

2017-2021	NIH NIAMS R01 AR057836-07 (Co-Investigator ; PI: Thomopoulos): Rotator cuff degeneration and repair (\$1.8M total award; responsible for \$189,845)
2018-2019	NIH NIAMS P30 AR074992-01 (Core Associate Director ; PI: Silva): Core Center for Musculoskeletal Biology and Medicine
2018-2021	NIH NIAMS R21 AR071582-01A1 (Principal Investigator): Fat-Muscle Cross-Talk in the Injured Rotator Cuff (\$378,281 total award)
2019-2024	NIH NIAMS R01 AR075773-01 (Principal Investigator): Promoting Muscle Regeneration through Adipose Signaling (\$1,250,000 total award)

Past:

2012-2014	NIH 1F32AR063588-01 (Principal Investigator): Promoting regeneration in muscular dystrophy with adipose derived stem cells (\$146,070 total award)
2015-2016	MRC Pilot & Feasibility Program (Internal) (Principal Investigator): Promoting rotator cuff muscle regeneration with paracrine adipose signaling (\$35,000 total award)
2015-2016	Program in Physical Therapy Research Division Pilot Funding (Internal) (Co-Principal Investigator Co-PI: Hastings): The role of intermuscular fat in diabetic muscle pathology (\$3,000 total award)
2015-2017	NIH NIAMS R56 2AR057836-06 (Co-Investigator): Rotator cuff degeneration and repair (\$8,113 total award)
2017-2019	American Orthopaedic Foot and Ankle Society 2017-30-E (Principal Investigator): Defining the cellular basis for poor muscle performance in diabetic peripheral neuropathy (\$45,842 total award)
2018-2020	Center for Regenerative Medicine Seed Award (Internal) (co-Principal Investigator ; Co-PI: Lake): Mechanical priming to direct adipose progenitor cells toward an anti-fibrotic phenotype (\$40,000 total award)
2019-2021	NIH NIAMS R01 AR075017-01A1 (Co-Investigator ; PI: Hughes): Promoting Muscle Regeneration through Adipose Signaling (\$1,250,000 total award)

Teaching Title and Responsibilities

Coursemaster

2021. L63 Bioenergetics

Lectures (2014-2021 average rating 4.5/5):

2006-2007 Graduate Teaching Assistantships (University of California, San Diego)
BENG101: Foundations of Biomedical Imaging
BENG122A: Biosystems and Control
BENG125: Modeling and Computation in Bioengineering
BENG112A: Biomechanics

2009 CSD1: Cells, Systems and Disease 1 – Lecture: *Skeletal Muscle Physiology* (Washington University in St. Louis, Physical Therapy)

2012-2013 BENG87: Engineering Stem Cells – Lecture: *Stem Cells and Disease* (University of California, San Diego, Bioengineering)

2013-2014 BENG277: Tissue Engineering Laboratory – Module: *Stiffness Driven Differentiation* (University of California, San Diego, Bioengineering)

2015 BIOL328: Principles in Human Physiology: Muscle Structure and Function (2hr)

2016 IPMS5510: Biomechanics: Muscle Injury & the Popping Sarcomere Theory (3hr)
BME301A: Modeling Skeletal Muscle Structure & Function

2014-present 604 CSDI: Skeletal Muscle Extracellular Matrix (2 hr)
(Annually) 604 CSDI: Muscle Regeneration and the Satellite Cell (2hr)
606 Kines I: Muscle Structure and Function (2hr)

Training / Mentee Record:

Current Trainees / Mentees:

Thesis Sponsorship:

- Jacob Parson (MSP Ph.D.)
- Chang Gui (BME Ph.D.)

Formal Mentorship:

- Rita Brookheart (NIH K01, Mentor)
- Calvin Cole (NIH K01, Mentor)
- Kelsey Collins (NIH K99, Mentor)
- Jennifer Zellers (NIH F32, Mentor)

Past Trainees / Mentees:

Chelsey Dunham	(2016-2020)	Postdoctoral Fellow, Johns Hopkins University
Nicole Biltz	(2014-2017)	Instructor, Western University of Health Sciences

Bibliography:

A. Peer-reviewed manuscripts:

1. Lange, S., Ouyang, K., **Meyer, G.**, Cui, L., Cheng, H., Lieber, R., Chen, J., "Obscurin determines longitudinal SR architecture" *Journal of Cell Science* 2009 1;122(Pt 15): 2640-50
2. **Meyer, G.A.**, Kiss, B., Ward, S.R., Morgan, D.L., Kellermayer, M, Lieber, R.L. "Theoretical predictions of the effects of force transmission by desmin on intersarcomere dynamics" *Biophysical Journal* 2010 98(2):258-66
3. **Meyer, G.A.**, Lieber, R.L., "Elucidation of extracellular matrix mechanics from muscle fibers and fiber bundles" *Journal of Biomechanics* 2011 Feb 24;44(4):771-3
4. Philp, A., Chen, A., **Meyer, G.A.**, Lan, D., Murphy, A.N., Knapp, A., Marcotte, G.R., Olfert, I.M., Carr, J.A., Hogan, M.C., Lieber, R.L., Baar, K., Schenk, S., "Sirtuin 1 (SIRT1) deacetylase activity is not required for mitochondrial biogenesis or peroxisome proliferator-activated receptor-gamma coactivator-1alpha (PGC-1alpha) deacetylation following endurance exercise" *Journal of Biological Chemistry* 2011 Sep 2;286(35):30561-70.
5. **Meyer, G.A.**, McCulloch, A.D., Lieber, R.L., "A nonlinear model of passive muscle viscosity" *Journal of Biomechanical Engineering* 2011 Sep;133(9):091007.
6. **Meyer, G.A.**, Lieber, R.L., "Skeletal muscle fibrosis develops in response to desmin deletion" *Am J Physiol Cell Physiol.* 2012 Jun; 302(11):C1609-20.
7. Chao, L.C., Wroblewski, K., Ilkayeva, O.R., Stevens, R.D., Bain, J., **Meyer, G.A.**, Schenk, S., Martinez, L., Vergnes, L., Narkar, V.A., Drew, B.G., Hong, C., Boyadjian, R., Hevener, A.L., Evans, R.M., Reue, K., Spencer, M.J., Newgard, C.B., Tontonoz, P. "Skeletal muscle Nur77 expression enhances oxidative metabolism" *Journal of Lipid Research* 2012 Dec 53(12):2610:9.
8. **Meyer, G.A.**, Schenk, S., Lieber, R.L., "Role of the cytoskeleton in muscle mechanical and transcriptional responses to altered use" *Physiological Genomics* (2013) Apr 16;45(8):321-31.
9. Palmisano, M.G., Bremner, S.N., Hornberger, T.A., **Meyer, G.A.**, Shah, S.B., Kellermeyer, M., Ryan, A.F., Lieber, R.L., "Muscle intermediate filaments form a stress-transmitting and stress-signaling network" *Journal of Cell Science* (2015) Jan 15;128(2):219-24
10. **Meyer, G.A.**, Farris, A.L., Sato, E., Gibbons, M., Lane J.G., Ward, S.R., Engler, A.J. "Muscle progenitor cell regenerative capacity in the torn rotator cuff" *Journal of Orthopaedic Research* 2015 Mar;33(3):421-9†
11. **Meyer, G.A.**, Gibbons, M., Sato, E., Lane J.G., Ward, S.R., Engler, A.J. "Epimuscular fat in the human rotator cuff is a novel beige depot" *Stem Cells: Translational Medicine* 2015 Jul;4(7):764-74
12. Biltz, N.K., **Meyer, G.A.**, "A novel method for the quantification of fatty infiltration in skeletal muscle" *Skeletal Muscle* 2017 Jan;10;7:1
13. Mastenbrook MJ, Commean PK, Hillen TJ, Salsich GB, **Meyer GA**, Mueller MJ, Clohisy JC, Harris-Hayes M. Hip abductor muscle volume and strength differences between women with chronic hip joint pain and asymptomatic controls. *Journal of Orthopaedic and Sports Physical Therapy.* 2017 Dec;47(12):923-930
14. Dent JR, Martins VF, Svensson K, LaBarge SA, Schlenk NC, Esparza MC, Buckner EH, **Meyer GA**, Hamilton DL, Schenk S, Philp A. Muscle-specific knockout of general control of amino acid synthesis 5 (GCN5) does not enhance basal or endurance exercise-induced mitochondrial adaptation. *Molecular Metabolism.* 2017 Dec;6(12):1574-1584
15. **Meyer G**, Lieber RL. Muscle fibers bear a larger fraction of passive muscle tension in frogs compared with mice. *J Exp Biol.* 2018 Nov 16;221(Pt 22).
16. Dunham CL, Chamberlain AM, **Meyer GA**, Lake SP. Muscle does not drive persistent posttraumatic elbow contracture in a rat model. *Muscle Nerve.* 2018 Dec;58(6):843-851
17. **Meyer GA**. Evidence of induced muscle regeneration persists for years in the mouse. *Muscle Nerve.* 2018 Dec;58(6):858-862†
18. Bryniarski AR, **Meyer GA** Brown fat promotes muscle growth during regeneration. *Journal of Orthopaedic Research.* 2019 August;37(8):1817-1826
19. Roberts J, Liu Q, Cao C, Jackson SE, Zong, X, **Meyer GA**, Yang L, Cade WT, Zheng X, Lopez-Sanchez GF, Wu X, Smith L. Association of Hot Tea Consumption with Regional Adiposity Measured by Dual-Energy X-Ray Absorptiometry in NHANES 2003-2006. *Obesity.* 2020 Feb;28(2):445-451
20. Svensson K, LaBarge SA, Sathe A, Martins VF, Tahvilian S, Cunliffe JM, Sasik R, Mahata SK, **Meyer GA**, Philp A, David LA, Ward SR, McCurdy CE, Aslan JE, Schenk S. p300 and cAMP response element-binding protein-binding

protein in skeletal muscle homeostasis, contractile function, and survival. *J Cachexia Sarcopenia Muscle*. 2020 Apr;11(2):464-477

21. Bohnert KL, Hastings MK, Sinacore DR, Johnson JE, Klein SE, McCormick JJ, Gontarz P, **Meyer GA**. Skeletal Muscle Regeneration in Advanced Diabetic Peripheral Neuropathy. *Foot Ankle Int*. 2020 May;41(5):536-548
22. Biltz NK, Collins KH, Shen KC, Schwartz K, Harris CA, **Meyer GA**. Infiltration of intramuscular adipose tissue impairs skeletal muscle contraction. *J. Physiol*. 2020 Jul;598(13):2669-2683 †
23. Dunham C, Havlioglu N, Chamberlain A, Lake S, **Meyer G**. Adipose stem cells exhibit mechanical memory and reduce fibrotic contracture in a rat elbow injury model. *FASEB J* 2020 Sep;34(9):12976-12990
24. Kumar A, Xie L, Ta CM, Hinton AO, Gunasekar SK, Minerath RA, Shen K, Maurer JM, Grueter CE, Abel ED, **Meyer G**, Sah R. SWELL1 regulates skeletal muscle cell size, intracellular signaling, adiposity and glucose metabolism *Elife*. 2020 Sep 15;9:e58941. doi: 10.7554/eLife.58941.
25. Collins KH, Lenz KL, Pollitt EN, Ferguson D, Hutson I, Springer LE, Oestreich AK, Tang R, Choi YR, **Meyer GA**, Teitelbaum SL, Pham CTN, Harris CA, Guilak F. Adipose tissue is a critical regulator of osteoarthritis. *Proc Natl Acad Sci* 2021 Jan 5;118(1)
26. Koh HE, van Vliet S, **Meyer GA**, Laforest R, Gropler RJ, Klein S, Mittendorfer B. Heterogeneity in insulin-stimulated glucose uptake among different muscle groups in healthy lean people and people with obesity. *Diabetologia*. 2021 May;64(5):1158-1168

† Cover feature

B. Invited Publications

27. Smith, L.R., **Meyer, G.A.**, Lieber, R.L., Systems analysis of biological networks in skeletal muscle function. *Wiley Interdisciplinary Reviews Systems Biology and Medicine* 2013 Jan-Feb 5(1):55-71
28. Thomas, K., Engler, A.J., **Meyer, G.A.**, Extracellular matrix regulation in the muscle satellite cell niche. *Connective Tissue Research* 2015 Feb;56(1):1-8
29. **Meyer, G.A.**, Ward, S.R., Developmental Biology and Regenerative Medicine: Addressing the Vexing Problem of Persistent Muscle Atrophy in the Chronically Torn Human Rotator Cuff. *Physical Therapy (2016) Phys Ther*. 2016 May;96(5):722-33*
30. Smith LR, **Meyer GA**. Skeletal muscle explants: ex-vivo models to study cellular behavior in a complex tissue environment. *Connective Tissue Research*. 2020 May-Jul;61(3-4):248-261
31. Gui C, Parson J, **Meyer GA**. Harnessing adipose stem cell diversity in regenerative medicine. *APL Bioeng*. 2021 Apr 1;5(2):021501

* Winner of the California Physical Therapy Association Publication Award