

PROMOTION RECOMMENDATION  
The University of Michigan  
School of Kinesiology

David B. Lipps, assistant professor of kinesiology, School of Kinesiology, is recommended for promotion to associate professor of kinesiology, with tenure, School of Kinesiology.

Academic Degrees:

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|--------|------|------------------------|
| Ph.D.  | 2012 | University of Michigan |
| B.S.E. | 2009 | University of Michigan |
| B.S.E. | 2007 | Tulane University      |

Professional Record:

2015 – Present      Assistant Professor, School of Kinesiology, University of Michigan

Summary of Evaluation:

Teaching: Professor Lipps has consistently and effectively taught a required course (MVS 330 Biomechanics of Human Movement) and introduced an upper-level elective course (MVS 438 Musculoskeletal Imaging) in the Movement Science curriculum. His involvement and efforts in revising the format of MVS 330 to use a team-based learning approach is innovative and pioneering from a pedagogical perspective. Professor Lipps' teaching reflects a strong knowledge of and commitment to using a range of evidence-based pedagogical approaches to enhance student learning in his courses. Professor Lipps has a strong commitment to continuing professional development through the Center for Research Learning and Teaching that has translated into the improvement of his teaching and strong student teaching evaluations. He has shared his experience with the school's faculty by creating a learning community whereby others can apply his innovative approach to teaching.

Research: Professor Lipps has published a total of 30 peer reviewed journal articles, of which 19 have been published since starting his faculty position at the University of Michigan in 2015. The vast majority of his publications at UM are first authored or senior authored (n=14) demonstrating his intellectual leadership in research. This body of work is mostly focused on Lipps' primary research area of biomechanics and cancer rehabilitation, and most articles appear in high-quality journals (eg. *Radiotherapy & Oncology*, *Breast Cancer Research & Treatment*, and *Journal of Biomechanics*). Beyond conducting mechanistic research, he has demonstrated an interest in seeing his work translated into clinical practice and this research is beginning to directly benefit women receiving mastectomy and breast reconstruction surgeries. The research from his laboratory has already resulted in positive changes among surgeons at UM who conduct these procedures.

In addition to his publication record, he has secured a diverse array of external and internal grants to support his research program. Most prominent among these are an R03 from the NIH (NICHD) and a Research Scholar Grant from the American Cancer Society. These grants not only provide a strong foundation for long-term success as an independent investigator, but they

also serve as a rigorous external endorsement of his work as a scientist and the quality of his past and current research.

#### Recent and Significant Publications:

- Setlock, C.A., Lulic-Kuryllo, T., Leonardis, J.M., Kulik, M., Lipps, D.B. (2021), "Age and Sex Influence the Activation-Dependent Stiffness of the Pectoralis Major," *Journal of Anatomy*, 239: 479-488.
- Leonardis, J.M., Wolff, W.L., Momoh, A.O., Lipps, D.B. (2021), "Neuromuscular Compensation Strategies Adopted at the Shoulder Following Bilateral Subpectoral Implant Breast Reconstruction," *Journal of Biomechanics*, 120: 110348.
- Leonardis, J.M., Alkayyali, A.A., Lipps, D.B. (2020), "Posture-Dependent Neuromuscular Contributions to Three-Dimensional Isometric Shoulder Torque Generation," *Journal of Neurophysiology*, 123: 1526-1535.
- Lipps, D.B., Baillargeon, E.M., Ludvig, D., Perreault, E.J. (2020), "Quantifying the Multidimensional Impedance of the Shoulder During Volitional Contractions," *Annals of Biomedical Engineering*, 48: 2354-2369.
- Wolff, W.L., Leonardis, J.M., Lipps, D.B. (2020), "The Relationship between Muscle Activation and Shear Elastic Modulus of the Sternocleidomastoid Muscle During 3-D Torque Production," *Journal of Electromyography and Kinesiology*, 55: 102480.
- Chodock, E., Hahn, J., Setlock, C.A., Lipps, D.B. (2020), "Identifying Predictors of Upper Extremity Muscle Elasticity with Healthy Aging," *Journal of Biomechanics*, 103: 109687. PMID:PMC7168868.
- Lipps, D.B., Leonardis, J.M., Dess, R.T., McGinnis, G.J., Marsh, R.B., Strauss, J.B., Hayman, J.A., Pierce, L.J., Jagsi, R. (2019), "Mechanical Properties of the Shoulder and Pectoralis Major in Breast Cancer Patients Undergoing Breast-Conserving Surgery with Axillary Surgery and Radiotherapy," *Scientific Reports*, 9(1):17737.
- Leonardis, J.M., Diefenbach, B.J., Lyons, D.A., Olinger, T.A., Giladi, A.M., Momoh, A.O., Lipps, D.B. (2019a), "The Influence of Reconstruction Choice and Inclusion of Radiation Therapy on Functional Shoulder Biomechanics in Women Undergoing Mastectomy for Breast Cancer," *Breast Cancer Research Treatment*, 173: 447-453.
- Leonardis, J.M., Lyons, D.A., Giladi, A.M., Momoh, A.O., Lipps, D.B. (2019b), "Functional Integrity of the Shoulder Joint and Pectoralis Major Following Subpectoral Implant Breast Reconstruction," *Journal of Orthopaedics Research*, 37: 1610-1619.

Service: Professor Lipps has been active in university, school and program service affairs. At the university level, he is an advisory group member of the UM Precision Health Initiative, a facilitator for the Center for Interprofessional Education. As a part of this group he contributed to the "Resilient Teaching Through Times of Crisis and Change" MOOC that was developed in the early days of the pandemic. Professor Lipps is also engaged in the Rogel Cancer Center early career faculty group. Nationally, he has been a grant reviewer for the National Institutes of Health and the National Science Foundation and a fellowship reviewer for the National Science Foundation and the Department of Defense, and multiple service roles within the American Society of Biomechanics. Within the School of Kinesiology, he co-authored a hiring proposal in exercise oncology as part of the school's strategic hiring initiative along with serving on multiple search committees.

External Reviewers:

Reviewer A: “He has active federal funding for his research (NIH R03 – Early Career Award), and has a grant from the American Cancer Society. He also has a large grant under review by the National Cancer Institute. It is currently a competitive funding environment, so his funding record is good for this stage of his career.... Overall, his efforts to obtain funding to support his research are commendable, and his success in obtaining grants laudable....”

Reviewer B: “Dr. Lipps has demonstrated a clear and impactful focus on using biomechanical approaches to better identify and alleviate upper extremity impairments in breast cancer survivors. This focus area is sorely understudied relative to the incredibly large quantity of scholarship in breast cancer.... Several of Lipps’s [sic] scholarly publications are outstanding in they represent true innovation in the area of breast cancer survivorship. Before he entered the field, there was no one – NO ONE! – attempting to quantitatively evaluate the functional impairments experienced by this patient population.”

Reviewer C: “Dr. Lipps has produced 3-4 papers per year since beginning his position. This is certainly a respectable quantity of work and compares favorably with peers internationally. His zone and focus of research, primarily morbidities associated with breast cancer, is clear and important. I believe he has produced several innovative and very informative works that have helped to refine the important challenges and questions facing the field of radiation oncology. These contributions have spanned several fields, which is remarkable for a junior academic.”

Reviewer D: “Given his collaborations, he clearly recognizes the importance of interdisciplinary work and the crucial step of involving clinicians in his research. This is especially important since he has chosen to focus on the biomechanics and movement patterns of breast cancer patients, as opposed to a more traditional orthopaedic or neurological patient population. One of the advantages of this approach is that he has the opportunity to establish himself as one of the pre-eminent experts in this area. It also puts him in the enviable position of being able to apply for funding from a wide range of funding agencies. ... Dr. Lipps is a promising scholar with an upward trajectory in this field. He compares very well with his academic peers. In fact, I would consider the scope of his research agenda to be exceptional for someone so early in their career.”

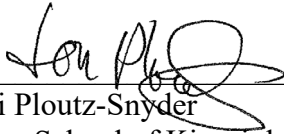
Reviewer E: “Dr. Lipps’ research will enable the development of treatment targets to optimize interventions for patients during surgical, oncological and post radiation medical management phases of care. It is clear that his research is translational and impactful.”

Reviewer F: “Dr. Lipps has moved beyond measurement of these deficits toward the development of new treatments and techniques that minimize them.... Dr. David Lipps has a strong record of scholarship that places him among the best and most promising researchers in the area of functional biomechanics. His skills at applying biomechanics research methods to help women following breast cancer reconstruction is a bold choice that has begun to form the basis of a productive career.”

Reviewer G: “His unique research line provides much needed insight to the musculoskeletal effects of devastating diagnosis and invasive treatment protocol and provides guidance to choosing treatment strategies that can limit impacts to limb function or approaches to restore

shoulder mobility.... Dr. Lipps has developed a well-regarded and focused research program, and he is respected nationally. His work is technically sound and is making clinical impact by bringing biomechanical analyses into the important area of limb function following breast cancer. His publication record is very strong and he has developed a funding record that will support his ongoing research program. His teaching and mentoring record is also very strong, and he provides important service to the field of biomechanics.”

Summary of Recommendation: Professor Lipps’ aggregate achievements in research, teaching, and service have resulted in strong and enthusiastic support at all levels in our school. The impact of his pioneering efforts to contribute and develop the new discipline of biomechanics and oncology is admirable and meritorious. It is with the support of the School of Kinesiology Executive Committee that I recommend David B. Lipps for promotion to associate professor of kinesiology, with tenure, School of Kinesiology.



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Lori Ploutz-Snyder  
Dean, School of Kinesiology

May 2022