

PROMOTION RECOMMENDATION
The University of Michigan
College of Engineering
Department of Biomedical Engineering

Carlos A. Aguilar, assistant professor of biomedical engineering, Department of Biomedical Engineering, College of Engineering and Medical School, is recommended for promotion to associate professor of biomedical engineering, with tenure, Department of Biomedical Engineering, College of Engineering and Medical School.

Academic Degrees:

Ph.D.	2008	University of Texas at Austin, Biomedical Engineering, Austin, TX
M.S.	2005	University of Texas at Austin, Mechanical Engineering, Austin, TX
B.S.	2002	University of Michigan, Mechanical Engineering, Ann Arbor, MI

Professional Record:

2017 – present	Assistant Professor, Department of Biomedical Engineering, University of Michigan.
2009 – 2016	Member of Technical Staff, MIT Lincoln Laboratory, Lexington, MA

Summary of Evaluation:

Teaching: Professor Aguilar's contributions to teaching include classroom instruction at the undergraduate and graduate levels. He has developed and taught a graduate course in Bioinformatics (BIOMEDE 599) receiving high ratings. Professor Aguilar has made a major impact through instruction and mentorship of student researchers at all academic levels including undergraduates, masters students, Ph.D. students and post-doctoral scholars. Students describe him as passionate and a positive role model. He has been active in ensuring a high success rate for his mentees. Many of his students have been recognized for their work in research with three students receiving the National Science Foundation Graduate Research Fellowship, two receiving the G.V. Edmonson Scholarship for Biomedical Engineering and one being awarded the highly prestigious HHMI Gilliam Fellowship. He has graduated one student and has four more in progress, including one student who is expected to graduate this year. Professor Aguilar was recognized with the Graduate Student Leadership Award from the Hispanic Engineer Achievement Awards Conference.

Research: Professor Aguilar's research is in the interdisciplinary field of regenerative medicine with an emphasis on skeletal muscle and skeletal muscle stem cells. The goal of his research program is to gain insights into the molecular networks governing skeletal muscle processes to improve recovery after extremity trauma and prevention of sarcopenia (age-associated muscle wasting). Professor Aguilar and his team's work has well-positioned his group as a collaborative hub that can add fundamental and applied questions through the lens of skeletal muscle biology, aging, and regenerative medicine. Professor Aguilar has published over 27 papers since coming to UM and authored two chapters in separate books. His research is very well funded with grants from the Department of Defense, a Genentech Research award, and a National Science Foundation - CAREER award being just a few of the awards he has received.

Recent and Significant Publications:

- J. Larouche, P. Fraczek, S. Kurpiers, B. Yang, C. Davis, J. Castor-Macias, K. Sabin, S. Anderson, J. Harrer, M. Hall, S. Brooks, Y. Jang, N. Willett, L. Shea, C. Aguilar, "Neutrophil and natural killer cell imbalances prevent muscle stem cell-mediated regeneration following murine volumetric muscle loss," *Proceedings of the National Academy of Sciences of the United States of America*, 2022 Apr 12;119(15) :e2111445119.
- B. Yang, J. Castor-Macias, P. Fraczek, A. Cornett, L. Brown, M. Kim, S. Brooks, I. Lombaert, J. Lee, C. Aguilar, "Sestrins regulate muscle stem cell metabolic homeostasis," *Stem Cell Reports*. 2021 Sep 14;16(9):2078-2088.
- J. Larouche, M. Mohiuddin, J. Choi, P. Ulintz, P. Fraczek, K. Sabin, S. Pitchiaya, S. Kurpiers, J. Castor-Macias, W. Liu, R. Hastings, L. Brown, J. Markworth, K. De Silva, B. Levi, S. Merajver, G. Valdez, J. Chakkalakal, Y. Jang, S. Brooks, C. Aguilar, "Murine muscle stem cell response to perturbations of the neuromuscular junction are attenuated with aging," *Elife*. 2021 Jul 29;10:e66749.
- A. Shcherbina, J. Larouche, P. Fraczek, B. Yang, L. Brown, J. Markworth, C. Chung, M. Khaliq, K. De Silva, J. Choi, M. Fallahi-Sichani, S. Chandrasekaran, Y. Jang, S. Brooks, C. Aguilar, "Dissecting murine muscle stem cell aging through regeneration using integrative genomic analysis," *Cell Reports*. 2020 Jul 28;32(4):107964.
- B. Yang, T. Westerhof, K. Sabin, S. Merajver, C. Aguilar, "Engineered tools to study intercellular communication," *Advanced Science*. 2020 Dec;8(3):2002825.

Service: Professor Aguilar has served on both the Graduate Admissions Committee and on the Faculty Search Committee throughout his appointment. Within the College of Engineering, he was on the Nominating Committee and served as graduate advisor for the Society of Hispanic Professional Engineers (SHPE). Professor Aguilar also serves on the DEI Task Force for the Cellular and Molecular Biology Graduate (CMB) Program and as diversity chair for the Cellular Biotechnology Training Program. He has reviewed applications for the NIH PREP program, CMB, PIBS and Medical School. Professor Aguilar reviews several articles per year for journals in his field including *Cell Reports*, *PNAS*, *eLife*, *JCI Insight*, *ACS Nano*, and *Biomaterials*, and many others. He has served as an associate editor at *Science Translational Medicine* and has participated in review panels for the NSF, NIH, DoD, and the Swiss Foundation for Research on Muscle Diseases. Professor Aguilar was asked to be a standing member of an NIH study section (CMAD) and will begin this year. He has also co-chaired sessions and judged posters for Gordon Research Conferences and served as the co-chair for the Tissue Engineering and Regenerative Medicine International Society (TERMIS) in 2022. For the TERMIS meeting, Professor Aguilar mandated that all proposed scientific sessions include a DEI statement, and he secured an NIH R13 grant to make sure under-represented minorities and women were able to attend the conference for free.

External Reviewers:

Reviewer A: "Dr. Aguilar has made outstanding scholarly contributions and established an excellent reputation in his field. He is well-funded, and his research is far-reaching."

Reviewer B: "Dr. Aguilar has been particularly active in outreach and DEI initiatives. His level of involvement and leadership in these activities are highly meritorious and will have major

impact in our community. As a highly successful Latino researcher, he is highly inspirational and a great role model for [junior] researchers.”

Reviewer C: “...I give Dr. Aguilar my highest level of support. He is a rising leader in the field of skeletal muscle regenerative medicine, an outstanding Latino investigator and mentor, and will be an invaluable contributor to success of diversity efforts in years to come.”

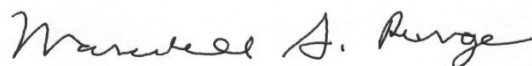
Reviewer D: “...what I consider most important is the quality of his research. I have read a number of his papers, and they address key issues in the field, are quite thorough in how they experimentally address the hypothesis, and reach important conclusions that provide significant progress for the field...His incorporation of single cell sequencing into his research is likely to yield numerous new insights in the coming years, and supports his ability to maintain a position in the top echelon of his research fields as research tools advance with time.”

Reviewer E: “He has demonstrated that he is a talented and creative researcher, a productive scholar, a thoughtful and effective teacher and mentor, and a generous servant to his local and professional communities. He has worked very hard to develop several lines of productive and innovative research projects, and he is well positioned to advance to the next stage of his academic career.”

Summary of Recommendation: Professor Aguilar has distinguished himself as a rising star in his field. He is dedicated to teaching, he is an inspirational mentor, and a leader in service. It is with the support of the College of Engineering Executive Committee that I recommend Carlos A. Aguilar for promotion to associate professor of biomedical engineering with tenure, Department of Biomedical Engineering, College of Engineering and Medical School.



Alec D. Gallimore, Ph.D.
Robert J. Vlastic Dean of Engineering
College of Engineering



Marschall S. Runge, M.D., Ph.D.
Executive Vice President for Medical Affairs
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