

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

Jianping Fu, associate professor of mechanical engineering, with tenure, Department of Mechanical Engineering, College of Engineering, associate professor of biomedical engineering, without tenure, Department of Biomedical Engineering, College of Engineering and Medical School, and associate professor of cell and developmental biology, without tenure, Department of Cell and Developmental Biology, Medical School, is recommended for promotion to professor of mechanical engineering, with tenure, Department of Mechanical Engineering, College of Engineering, professor of biomedical engineering, without tenure, Department of Biomedical Engineering, College of Engineering and Medical School, and professor of cell and developmental biology, without tenure, Department of Cell and Developmental Biology, Medical School.

Academic Degrees:

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| Ph.D. | 2007 | Massachusetts Institute of Technology, Mechanical Engineering, Cambridge, MA |
| M.S. | 2002 | University of California, Los Angeles, Mechanical and Aerospace Engineering, Los Angeles, CA |
| B.E. | 2000 | University of Science and Technology of China (USTC), Thermal Science and Energy Engineering, Hefei, Anhui, China |

Professional Record:

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| 2015-present | Associate Professor (with tenure), Department of Mechanical Engineering, University of Michigan |
| 2015-present | Associate Professor (without tenure), Department of Biomedical Engineering, University of Michigan |
| 2015-present | Associate Professor (without tenure), Department of Cell and Developmental Biology, University of Michigan |
| 2009-2015 | Assistant Professor, Department of Mechanical Engineering, University of Michigan |
| 2007-2009 | Post-doctoral Research Fellow, Bioengineering, University of Pennsylvania, Philadelphia, PA |

Summary of Evaluation:

Teaching: Professor Fu is an outstanding teacher, advisor, and mentor, and a previous recipient of the Mechanical Engineering (ME) Outstanding Faculty Achievement Award, which recognizes excellence in teaching. He teaches several courses at the graduate and undergraduate levels, including Heat Transfer, which is one of the largest core undergraduate courses in ME. His teaching evaluation scores for this course are consistently high, a clear indicator of his exceptional classroom leadership. Professor Fu has developed an advanced graduate-level course which bridges mechanical, biomedical, and chemical engineering with Medical School research, ME 599: Molecular, Cellular, and Tissue Biomechanics. He has graduated five Ph.D. students, all but one of whom currently hold faculty positions. He has also mentored three M.S. students, and five post-doctoral scholars. He is currently mentoring four Ph.D. students and one post-doctoral scholar. Professor Fu is also actively engaged in sponsoring undergraduate research having mentored nearly 50 undergraduate students since 2010. His students consistently praise his availability, approachability, and flexibility in and out of the classroom.

Research: Professor Fu's research focuses on cell mechanics, including the mechanobiology of human pluripotent stem cells (hPSCs), and synthetic human embryology. His original research on cell mechanics and mechanotransduction concerns the interaction between external forces and cell functions. He later advanced these methods to specifically probe mechanical signaling in hPSC differentiation. Most recently, Professor Fu and a collaborator pioneered a new line of research in synthetic human embryology, which earned them immediate international acclaim. He has published his contributions in prominent journals including *Nature*, *Nature Communications*, *Nature Methods*, *Nature Materials*, *Nature Biomedical Engineering*, *Nature Nanotechnology*, among others, and has over 100 refereed conference papers, summaries, or abstracts. Professor Fu's funding is robust having been awarded 26 grants or contracts totaling approximately \$12M, with approximately \$6M directly supporting his lab. These include major awards from the National Science Foundation, the National Institutes of Health, and the American Heart Association. The consensus among Professor Fu's reviewers is that he is a nationally and internationally known leader in the field of cell mechanics, whose research is exceptional and impactful. Evidence of his impact on research can be found in the numerous national awards he has received, which include the 2018 Breakthrough Technologies Award from MIT Technology Review, the 2016 Rising Star Award from the Biomedical Engineering Society, and a CoE Research Excellence Award.

Recent and Significant Publications:

- Y. Sun, K. M. Aw Yong, L.G. Villa-Diaz, X. Zhang, W. Chen, R. Philson, S. Weng, H. Xu., P. H. Krebsbach, J. Fu, "Hippo/YAP-mediated rigidity-dependent motor neuron differentiation of human pluripotent stem cells," *Nature Materials*, 13: 599-604, 2014.
- Y. Shao, K. Taniguchi, K. Gurdziel, R.F. Townshend, X. Xue, K.M. Aw Yong, J. Sang, J.R. Spence, D.L. Gumucio, J. Fu, "Self-organized amniogenesis by human pluripotent stem cells in a biomimetic implantation-like niche," *Nature Materials*, 16: 419-425, 2017.
- Y. Shao, K. Taniguchi, R.F. Townshend, T. Miki, D. L. Gumucio, J. Fu, "A pluripotent stem cell-based model for post-implantation human amniotic sac development," *Nature Communications*, 8: 208, 2017.
- X. Xue, Y. Sun, A. M. Resto-Irizarry, Y. Yuan, K. M. Aw Yong, Y. Zheng, S. Weng, Y. Shao, Y. Chai, L. Studer, J. Fu, "Mechanics-guided embryonic patterning of neuroectoderm tissue from human pluripotent stem cells," *Nature Materials*, 17: 633-641, 2018.
- Y. Zheng, X. Xue, Y. Shao, S. Wang, S. N. Esfahani, Z. Li, J. M. Muncie, J. N. Lakins, V. M. Weaver, D. L. Gumucio, J. Fu., "Controlled modeling of human epiblast and amnion development using stem cells," *Nature*, in press, 10.1038/s41586-019-1535-2, 2019.

Service: Professor Fu is a solid citizen of the department and has performed extensive external service to his scientific community. Internally, he has served on the Mechanical Engineering Faculty Search Committee, Internal Review Committee, Graduate Admission Committee, and Graduate Program Committee. Externally, he has a longstanding history of service to the ASME Bioengineering Division National Technical Committee on Tissue and Cellular Engineering, the BMES Cellular and Molecular Bioengineering Special Interest Group, and countless NIH review panels. He is serving as a guest co-editor of a 2020 edition of *Current Opinion of Biomedical Engineering*, co-organizing a Banff International Research Station Workshop, and co-organizing a Keystone Symposium.

External Reviewers:

Reviewer A: "...Jianping's focus on very early development processes make him unique among bioengineers... His range of efforts illustrate high creativity and intellectual rigor, and his additional efforts beyond stem cells illustrate a passion to pioneer."

Reviewer B: "...the quantity and quality of Prof. Fu's research output has equaled or exceeded the standards of other successful candidates at the similar stage of their careers.... I am extremely impressed by the enormous depth of Prof. Fu's research, as each of his studies are extremely thorough in data, the graphs, and the discussion of the results."

Reviewer C: "Professor Fu has earned a high scholarly esteem in the field, irrespective of the peer group. He has rapidly advanced in terms of his fundamental contributions compared to his peers in the field. It is fair to state that he is recognized as a leader in the field."

Reviewer D: "I would state that Dr. Fu is one of the top three scientists in his peer group who are working in the same field in terms of impact.... His service to the professional society and respective fields is outstanding."

Reviewer E: "He also is very concerned about promoting women and other underrepresented groups in STEM, and his efforts in this are admirable.... Jiangping is well on his way to establishing himself as one of the leaders in his field."

Summary of Recommendation: Professor Fu is a prominent, dedicated, and ambitious teacher, advisor, and mentor, who is making significant impact with his research. It is with the support of the College of Engineering Executive Committee that we recommend Jianping Fu for promotion to professor of mechanical engineering, with tenure, Department of Mechanical Engineering, College of Engineering, professor of biomedical engineering, without tenure, Department of Biomedical Engineering, College of Engineering and Medical School, and professor of cell and developmental biology, without tenure, Department of Cell and Developmental Biology, Medical School.



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



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

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