

PROMOTION RECOMMENDATION

The University of Michigan
College of Engineering

Jan P. Stegemann, associate professor of biomedical engineering, without tenure, Department of Biomedical Engineering, College of Engineering, is recommended for the granting of tenure to be held with his title of associate professor of biomedical engineering, Department of Biomedical Engineering, College of Engineering.

Academic Degrees:

Ph.D.	2002	Georgia Institute of Technology, Biomedical Engineering, Atlanta, GA
M.S.	1992	University of Toronto, Chemical Engineering, Toronto, ON, Canada
B.S.	1989	University of Toronto, Chemical Engineering, Toronto, ON, Canada

Professional Record:

2008-present	Associate Professor (without tenure) Department of Biomedical Engineering, University of Michigan
2004-2008	Adjunct Assistant Professor, Center for Cardiovascular Sciences, Albany Medical College, Albany, NY
2002-2008	Assistant Professor, Biomedical Engineering, Rensselaer Polytechnic Institute, Troy, NY
2002	Postdoctoral Fellow, Institute for Bioengineering & Biosciences, Rensselaer Polytechnic Institute, Troy, NY
1992-1997	Research Engineer, Research and Development, Grace Biomedical, Lexington, MA
1990	Engineer, Engineering Research and Development, Lurgi GmbH, Frankfurt, Germany
1989	Researcher, Medical Biophysics, Ontario Cancer Institute, Toronto Canada

Summary of Evaluation:

Teaching: Professor Stegemann's teaching record is outstanding. He moved from Rensselaer Polytechnic Institute (RPI) in the summer of 2008 and, while most of his teaching has been at RPI, he has taught two courses at University of Michigan. Overall, his teaching evaluations have been very strong: at RPI his average Course Rating was 4.16, and Instructor Rating 4.09 (both out of 5), and his scores have trended higher over time. The first course Professor Stegemann taught at the University of Michigan, "Cells in their Environment" (BME 599), was also very well received, achieving scores of 4.8 for both Q1 and Q2 of the course evaluations. Evaluations for his second course have also been noteworthy, evidencing his excellent record in classroom teaching.

Professor Stegemann's record as a graduate advisor is also exemplary; at RPI he chaired the committees of two doctoral students who received their doctorates in 2006 and 2007, and co-chaired for a student receiving their doctorate in 2009. At Michigan, he currently mentors four doctoral students. At RPI six students received their master's degrees under his supervision, and he currently advises two master's students. Professor Stegemann has been very active mentoring undergraduate research projects, hosting a total of 25 student projects in his labs at RPI and Michigan. His students have uniformly praised his teaching and mentoring skills.

Research: Professor Stegemann has established a vibrant research program that has advanced the biomedical engineering areas of biomaterials, tissue engineering, stem cells, and cell-matrix interactions with relevance to bone repair, heart repair, cardiac fibrosis, and neuronal cell guidance and regulation. He

has 28 peer-reviewed full-length publications and numerous proceedings and abstracts, which is a substantial number for having received his Ph.D. in 2002. His papers are garnering significant citations, including the 2005 work on collagen-carbon nanotube composite materials and the 2004 work on engineered vascular constructs made from collagen, fibrin, and collagen-fibrin mixtures. Professor Stegemann's work is supported by a diverse array of federal, foundation, and state funding. Specifically, he has successfully generated funding for his work from the NIH (R01 and R21), American Heart Association (Scientist Development Grant), NSF (NSEC), New York State Office of Science, Technology and Academic Research (NYSTAR), as well as other sources.

Professor Stegemann's national and international visibility can also be appreciated by the many invited presentations he has given at international conferences and at various universities within the US as well as abroad. Professor Stegemann's research accomplishments and contribution to the field of Biomedical Engineering have been recognized by his receipt of the premier young investigator award in BMES, the 2005 Rita Schaffer Young Investigator Award.

Recent and Significant Publications:

- DeWitt D., Kaszuba S.N., Thompson, D.M. and Stegemann, J.P., "Collagen I-Matrigel Scaffolds for Enhanced Schwann Cell Survival and Control of 3D Cell Morphology," *Tissue Engineering Part A*, 15(10):2785-93, 2009.
- Lund, A.W., Stegemann, J.P. and Plopper, G.E., "Inhibition of ERK Promotes Collagen Gel Compaction and Fibrillogenesis to Amplify the Osteogenesis of Human Mesenchymal Stem Cells in Three-Dimensional Collagen I Culture," *Stem Cells and Development*, 18(2):331-41, 2009.
- Hong, H. and Stegemann, J.P., "2D and 3D Collagen and Fibrin Biopolymers Promote Specific ECM and Integrin Gene Expression by Vascular Smooth Muscle Cells," *Journal of Biomaterials Science: Polymer Edition*, 19(10):1279-1293, 2008.
- Hong, H., McCullough, C.M. and Stegemann, J.P., "The role of ERK signaling in protein hydrogel remodeling by vascular smooth muscle cells," *Biomaterials*, 28(26):3824-3833, 2007.
- MacDonald, R.A., Laurenzi, B.F., Viswanathan, G., Ajayan, P.M. and Stegemann, J.P., "Collagen-Carbon Nanotube Composite Materials as Scaffolds in Tissue Engineering," *Journal of Biomedical Materials Research A*, 74(3):489-496, 2005.
- Cummings, C.L., Gawlitta, D., Nerem, R.M. and Stegemann, J.P., "Properties of Engineered Vascular Constructs made from Collagen, Fibrin and Collagen-Fibrin Mixtures," *Biomaterials*, 25(17):3699-3706, 2004.

Service: Professor Stegemann's service contributions to the department and university, both at the University of Michigan and at his previous institution, have included chairing and serving on search committees and serving on graduate and undergraduate committees, a strategic planning committee, and a faculty committee on discipline. His professional service to his research discipline is also significant and well-regarded. We note Professor Stegemann is chair-elect of the Tissue Engineering Special Interest Group of the Society of Biomaterials and he has organized sessions at several national meetings. He is also active in review boards for journals and funding agencies, as well as organization of conferences.

External Reviewers:

Reviewer A: "Jan has made his career working on biologically derived materials (collagen, fibrin, and complex mixtures such as biologically-derived extracellular matrices), their engineering, and their interaction with cells in culture. He has done this work well and published it well in the biomaterials and tissue engineering literature. He has established himself as the expert on collagen/fibrin biomaterials"

Reviewer B: "Dr. Stegemann's laboratory works at the interface of engineering and biology, and he integrates the tools of both fields in a very effective manner in his research. He has published extensively, and both the quantity and quality of his publications are notable, and certainly have established his laboratory as an extremely productive and impactful lab. He routinely publishes in the best biomaterials and tissue engineering journals."

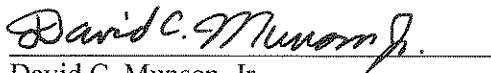
Reviewer C: "Jan is an exceptionally talented and brilliant [junior] investigator, and he clearly has what it takes to continue an important career. ... His papers show application of state of the art molecular and cell biology methods to tissue engineering, with some good materials science too. His appreciation of the importance of the extracellular matrix is admirable and it will certainly lead to important developments."

Reviewer D: "Dr. Stegemann is considered one of the up-and-coming experts in the naturally-derived biomaterials field and is often sought after for reviews and presentations....What is unique about Dr. Stegemann's work is that he is combining two unique fields – the natural materials and conducting materials fields - to create novel matrices that more closely mimic the body but which also have an added stimulus (electrical conductivity)."

Reviewer E: "...Jan has been very active in presenting his research at professional meetings and that he is also developing high visibility through proposal reviews and organizing/chairing meeting sessions. His selection as the Rita Schaffer Young Investigator in 2005 and his recent election as chair of the Tissue Engineering SIG of SFB indicate the growing stature of Jan in the field."

Reviewer F: "There are no weaknesses in this record that would give me concern over a tenure decision. I think that Dr. Stegemann is an excellent addition to your faculty, and I expect that he will continue his development into a leader in the field of tissue engineering."

Summary of Recommendation: The tenured faculty of the biomedical engineering department have carefully evaluated Professor Stegemann's case and believe that his research substantially exceeds expectations for the granting of tenure. Though he has only been at Michigan for one year, he is fully integrated into the department. His teaching is excellent and his mentorship is outstanding. It is with the support of the College of Engineering Executive Committee that I recommend Jan P. Stegemann for the granting of tenure to be held with his title of associate professor of biomedical engineering, Department of Biomedical Engineering, College of Engineering.


David C. Munson, Jr.
Robert J. Vlasic Dean of Engineering
College of Engineering

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