

PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF INTERNAL MEDICINE
MEDICAL SCHOOL AND COLLEGE OF ENGINEERING
DEPARTMENT OF BIOMEDICAL ENGINEERING

Omer Berenfeld, Ph.D., associate professor of internal medicine, with tenure, Department of Internal Medicine, Medical School, and associate professor of biomedical engineering, without tenure, Department of Biomedical Engineering, Medical School and College of Engineering, is recommended for promotion to professor of internal medicine, with tenure, Department of Internal Medicine, Medical School, and professor of biomedical engineering, without tenure, Department of Biomedical Engineering, Medical School and College of Engineering.

Academic Degrees:

Ph.D.	1995	Tel Aviv University, Israel
M.S.	1989	Tel Aviv University, Israel
B.S.	1985	Tel Aviv University, Israel

Professional Record:

2011-present	Associate Professor of Internal Medicine, University of Michigan
2011-present	Associate Professor of Biomedical Engineering, University of Michigan
2009-2011	Assistant Professor of Biomedical Engineering, University of Michigan
2008-2011	Assistant Professor of Internal Medicine, University of Michigan
2005-2008	Assistant Professor of Pharmacology, SUNY Upstate Medical University, Syracuse, NY
1999-2005	Research Assistant Professor, Department of Pharmacology, SUNY Upstate Medical University, Syracuse, NY

Summary of Evaluation:

Teaching: Dr. Berenfeld has a strong commitment to teaching that is reflected in all aspects of his academic career. He is heavily involved in the mentoring of biomedical engineering graduate students and post-doctoral fellows in the research laboratory, and many of his former trainees have gone on to successful careers in academia or at research institutes. Dr. Berenfeld is also the director of, and lectures in, the annual Basic Cardiac Electrophysiology lecture series, which is attended by clinical fellows, basic science trainees, and biomedical engineering graduate students. Institutionally, he serves on the steering committee for the T32-funded Training Program in Translational Cardiovascular Research and Entrepreneurship, and extramurally, he lectures extensively on cardiac electrophysiology and arrhythmias. Dr. Berenfeld is also the co-author of a book on basic cardiac electrophysiology for clinicians.

Research: Dr. Berenfeld's research is in the area of cardiac electrophysiology, with a focus on elucidating the mechanisms of electrical cardiac disturbances in arrhythmias. Utilizing his background in physics, mathematics, and physiology, his integrated approach to this research has led to numerous advances in the field, from basic mechanistic concepts, to animal and computational models, to clinical applications. His international reputation is evidenced by his numerous invited presentations and extensive peer-review activity, including serving on the editorial board of *Heart Rhythm*. Dr. Berenfeld

has a strong track record of funding, and is currently the principal investigator on an NIH R01 grant and co-principal investigator on a large grant from Medtronic. He has over 120 peer-reviewed publications, and holds more than 20 patents. The translational value of his research can also be seen in his role as co-founder of a start-up company, Rhythm Solutions, Inc., that develops algorithms and devices in the area of cardiac electrophysiology.

Recent and Significant Publications:

Campbell KF, Calvo CJ, Mironov S, Herron T, Berenfeld O, Jalife J: Spatial gradients in action potential duration created by regional magnetofection of hERG are a substrate for wavebreak and turbulent propagation in a rat cardiomyocyte monolayer model of cardiac fibrillation. *J Physiol* 590:6363-6379, 2012.

Filgueiras-Rama D, Price NF, Martins RP, Yamazaki M, Avula UMR, Kaur K, Kalifa J, Ennis SR, Hwang E, Devabhaktuni V, Jalife J, Berenfeld O: Long-term frequency gradients during persistent atrial fibrillation in sheep are associated with stable sources in the left atrium. *Circ Arrhythm Electrophysiol* 5:1160-1167, 2012.

Guillem MS, Climent AM, Millet J, Arenal A, Fernandez-Aviles F, Jalife J, Atienza F, Berenfeld O: Non-invasive localization of maximal frequency sites of atrial fibrillation by body surface potential mapping. *Circ Arrhythm Electrophysiol* 6:294-301, 2013.

Rodrigo M, Guillem MS, Climent AM, Pedrón-Torrecilla J, Liberos A, Millet J, Fernández-Avilés F, Atienza F, Berenfeld O: Body surface localization of left and right atrial high frequency rotors in atrial fibrillation patients: A clinical-computational study. *Heart Rhythm* 11:1584-1591, 2014.

Calvo CJ, Deo M, Zlochiver S, Millet J, Berenfeld O: Attraction of rotors to the pulmonary veins in paroxysmal atrial fibrillation: A modeling study. *Biophys J* 106:1811-1821, 2014. Highlighted in a New and Notable commentary.

Service: Dr. Berenfeld provides institutional service as a member of the Large Animals Working Group and the UMHS Innovation Deployment Team, and he also participates in peer review for the Michigan Institute for Clinical and Health Research. Extramurally, he is a member of the American Heart Association Basic Cardiovascular Science Council, and the advisory board of the International Dead Sea Symposium (IDSS) on arrhythmias. Dr. Berenfeld also serves as an abstract grader and judge for international meetings and young investigator competitions, and is a founding member of the European Cardiac Arrhythmia Society.

External Reviewers:

Reviewer A: “He has contributed significantly to the understanding of the importance of Purkinje fibers in ventricular arrhythmogenesis. He has participated in the seminal works that defined the mechanisms of reentry in cardiac tissue. His contribution to the field of arrhythmia research is enormous.”

Reviewer B: “His work is clearly recognized internationally and supports his promotion to Professor. He has been a highly productive investigator in the field of cardiac arrhythmias, with key recent contributions in the field of atrial fibrillation...Dr. Berenfeld is also actively engaged in both institutional and professional activities....His cumulative accomplishments across all realms are impressive, certainly meeting and exceeding the requirements for promotion to Professor.”

Reviewer C: “He is also a remarkable speaker, invited to various international congresses and symposia and a visiting professor in [the] USA, Europe, Mexico and Israel....Dr. Berenfeld has produced outstanding research innovations, particularly in mapping atrial fibrillation and the role of detected rotors as a possible target. His research with his team gave rise to new techniques in atrial fibrillation ablation...”

Reviewer D: “Dr. Berenfeld is one of the most influential investigators in our field, whose creative and elegant work has greatly shaped our mechanistic understanding of atrial fibrillation and other complex arrhythmias....Omer is also a sought-after speaker worldwide, with an extensive list of invited talks at prestigious academic centers and international meetings globally.”

Reviewer E: “He is a superb biophysicist and mathematician and an expert electrophysiologist, with comprehensive abilities that range from the cell to the organ. He is also one of the world’s leading experts in electrogram signal processing (and has multiple patents to support that claim). ...he is an outstanding mentor who has trained many of the people who have come from the Michigan electrophysiology lab.”

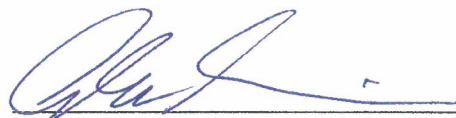
Reviewer F: “Omer has made substantial and novel contributions to the applications of engineering approaches to medicine. Specifically, to cardiac arrhythmia research and clinical practice.... Omer is being recognized as a major contributor in this field, a recognition that has led to invited lectures and panel participation in major international meetings in the cardiovascular field.”

Summary of Recommendation:

Dr. Berenfeld is recognized internationally for his contributions to field of cardiac electrophysiology and arrhythmia research. He is also a committed educator, and is very active in service at the institutional and national levels. Therefore, we enthusiastically recommend Omer Berenfeld, Ph.D. for promotion to professor of internal medicine, with tenure, Department of Internal Medicine, Medical School, and professor of biomedical engineering, without tenure, Department of Biomedical Engineering, Medical School and College of Engineering.



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



Alec D. Gallimore, Ph.D.
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