

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

Omer Berenfeld, Ph.D., assistant professor of internal medicine, Department of Internal Medicine, Medical School, and assistant professor of biomedical engineering, Department of Biomedical Engineering, College of Engineering, is recommended for promotion to 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, College of Engineering.

Academic Degrees:

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

Professional Record:

2009-present	Assistant Professor of Biomedical Engineering, University of Michigan
2008-present	Assistant Professor of Internal Medicine, University of Michigan
2005-2008	Assistant Professor, Department of Pharmacology, State University of New York
1999-2005	Research Assistant Professor, Department of Pharmacology, State University of New York
1998-1999	Instructional Support Specialist, Department of Pharmacology, State University of New York
1994-1998	Postdoctoral Research Associate, Department of Pharmacology, State University of New York

Summary of Evaluation:

Teaching: Dr. Berenfeld received excellent teaching ratings while a doctoral and post-doctoral student at Tel Aviv University, where he held a number of teaching assistant positions. More recently, his focus has been on the training and mentoring of graduate students. He has also been involved in lectures to residents and clinical fellows. He has also taught classes in the biomedical engineering graduate program, to the cardiology fellows, and in the Department of Applied Mathematics while at the University of Michigan. He is writing a book on basic cardiac electrophysiology and has developed a student evaluation survey.

Research: Dr. Berenfeld is an international leader in the study of mechanisms of atrial fibrillation (AF). His pioneering work applying optical mapping and frequency-domain analysis of AF waves demonstrated for the first time in experimental animals the existence of gradients of

electrical activation frequency between the left and right atrium during sustained AF. His original spectral analysis approach was subsequently translated into the clinic by the incorporation of dominant frequency mapping capabilities in computer-based single and multiple electrode mapping systems that are now routinely used in the clinical electrophysiology (EP) laboratory. This has enabled clinicians to gain important insights into mechanisms of human AF and increased their ability to identify and effectively terminate the arrhythmia by isolating the electrical sources that maintain the fibrillatory process using radiofrequency ablation. Notably, his approach is rapidly gaining popularity in clinical EP laboratories throughout the world. He lists 64 peer-reviewed publications of which 29 are as first or senior author. He has an 'h-index' of 27 and several of his publications have more than 100 citations. He has current funding from NIH Program Projects, an R01, a St. Jude Medical Grant, and a National Science Foundation Award. He has an additional R01 proposal submitted to the NIH. His national prominence is on the rise and he has gained substantial recognition as indicated by the seven national and international invited lectures in 2010 as well as his involvement at a national level on several conference committees as session chair, poster judge, or abstract grader. Additionally, he serves on the Swiss National Science Foundation Study Section. Dr. Berenfeld also has 10 patents with one additional patent pending.

Service: As a member of the Center for Arrhythmia Research (CAR) of the University of Michigan, Dr. Berenfeld actively supports the interest and welfare of the entire group, including its more junior faculty, post-doctoral fellows and graduate students. He is a project leader in the CAR's two actively funded program project grants and has been instrumental in the Center's ability to create and continually maintain a positive, productive environment conducive to continued growth and success. Among his many leadership roles at CAR, he has been appointed director of the Signal Processing Laboratory, which is a joint venture of CAR investigators and clinical electrophysiologists from the Division of Cardiology. His responsibilities are to lead a group of biophysicist, engineers, computer scientist and EP fellows in translating basic knowledge of cardiac electrical signals derived from experiments conducted at the CAR into diagnosis and therapy in the clinical EP laboratory. He also participates as a graduate program candidate interviewer for Biomedical Engineering and as a faculty candidate interviewer for his division within Internal Medicine. At the national level, he is a member of professional societies in his field, and has served on editorial boards and as reviewer for a number of journals.

Recent and Significant Publications:

Grzęda KR, Noujaim SF, Berenfeld O and Jalife J: Making Sense of Complex Fractionated Atrial Electrograms: Properties of Time-domain vs. Frequency-domain Methods. *Heart Rhythm* 6:1475-1482, 2009.

Swartz MF, Fink GW, Lutz CJ, Berenfeld O, Vikstrom KL, Kasprowicz K, Puskas F, Bhatta L, Kalifa J and Jalife J: Left-versus-Right Atrial Difference in Dominant Frequency, K⁺ Channel Transcripts, and Fibrosis in Patients Developing Atrial Fibrillation Following Cardiac Surgery. *Heart Rhythm*, 6:1415-1422, 2009.

Atienza F, Almendral J, Jalife J, Zlochiver S, Ploutz-Snyder R, Torrecilla EG, Arenal A, Kalifa J, Aviles FF and Berenfeld O: Real-time Dominant Frequency Mapping and Ablation of High-

Frequency Sites in Atrial Fibrillation with Left-to-Right Frequency Gradients Predicts Long-Term Maintenance of Sinus Rhythm. *Heart Rhythm*, 6:33-40, 2009.

Zlochiver S, Kalifa J, Yamazaki M and Berenfeld O: Rotor Meandering Contributes to Complex Fractionated Atrial Electrograms in Atrial Fibrillation. *Heart Rhythm*, 5:846-854, 2008.

Zlochiver S, Muñoz V, Vikstrom KL, Taffet SM, Berenfeld O and Jalife J: Electrotonic myofibroblast-to-myocyte coupling increases propensity to reentrant arrhythmias in two-dimensional cardiac monolayers. *Biophys J* 95:4469-4480, 2008.

External Review:

Reviewer A: "...researchers like Omer are critical to the further development of the field of catheter ablation...I feel that Omer has great potential in his future research efforts...he has lectured extensively throughout the world...Omer would merit promotion to an Associate Professor of Medicine at [my institution]."

Reviewer B: "He is [sic] has contributed significantly and steadily to the medical literature....has recently published an important paper in 2009 in the *Heart Rhythm Journal*....He is actively involved in the peer-review process serving 17 different journals as a peer reviewer....Dr. Berenfeld has more than satisfied the requirements for appointment to Associate Professor."

Reviewer C: "Dr. Berenfeld has been highly productive...he has authored or co-authored 64 peer-reviewed publications...His achievements here, as evidenced in his publications, put him in the forefront of his peer group....It is to be noted that Project Heads on Program Project grants must be mature, independent and respected scientists: a status that Dr. Berenfeld has, in fact achieved."

Reviewer D: "...I believe Dr. Berenfeld is more than qualified for the position of Associate Professor....Dr. Berenfeld's research has had a major impact on the field of cardiac electrophysiology. I can think of several areas where he has made significant advances....The citation statistics clearly indicate that Dr. Berenfeld has made an important contribution to his field....I have no doubt whatsoever that Dr. Berenfeld's research is more that [sic] sufficient to be promoted to Associate Professor with tenure at [my institution]."

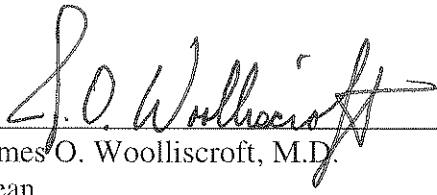
Reviewer E: "He has made major contributions to our understanding of the mechanisms and properties of cardiac arrhythmias...Since the move to Michigan, Omer has been very productive and extended his scientific expertise and research activities to experiments...The topics of his studies are at the forefront of cardiac research and have important clinical implications..."

Reviewer F: "Dr. Berenfeld is an outstanding investigator in mathematical modeling of cardiac arrhythmias...There is no question that he makes independent creative contributions to the work of this group, as indicated by his robust publication record as senior author, as well as his serving as the Project Leader on two NIH Program Projects...Dr. Berenfeld's recent work on atrial

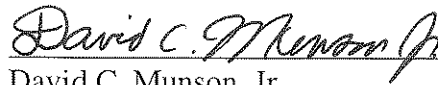
fibrillation has been particularly influential, and is being translated directly into improved clinical treatments.”

Summary of Recommendation:

Dr. Berenfeld has focused his research in the area of mechanisms involved in the initiation and perpetuation of atrial fibrillation. His national and international reputation as a leading expert in the field is widely regarded. His contribution to the educational goals of Internal Medicine and Biomedical Engineering surpasses expectations. I am pleased to recommend Omer Berenfeld, Ph.D., for promotion to associate professor, with tenure, in the Department of Internal Medicine, Medical School, and associate professor, without tenure, in the Department of Biomedical Engineering, College of Engineering.



James O. Woolliscroft, M.D.
Dean
Lyle C. Roll Professor of Medicine



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

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