

PROMOTION RECOMMENDATION

The University of Michigan  
School of Public Health  
Department of Epidemiology

Alexander H. Rickard, assistant professor of epidemiology, Department of Epidemiology, School of Public Health, is recommended for promotion to associate professor of epidemiology, with tenure, Department of Epidemiology, School of Public Health.

Academic Degrees:

Ph.D.	2001	School of Biological Sciences, University of Manchester, UK
M.Sc.	1997	School of Biological Sciences, University of Birmingham, UK
B.Sc.	1996	School of Biological Sciences, University of Birmingham, UK

Professional Record:

2010 – Present	Assistant Professor, Department of Epidemiology, School of Public Health, University of Michigan
2007 – 2010	Assistant Professor, Department of Biological Sciences, Binghamton University, Binghamton, NY
2006 – 2007	Visiting Assistant Professor, Department of Biological Sciences, Binghamton, University, Binghamton, NY
2004 – 2006	NIH Intramural Visiting Fellow, National Institutes of Health, National Institute of Dental and Craniofacial Research, Bethesda, MD
2001 – 2004	Post-Doctoral Research Associate, Manchester Pharmacy School, University of Manchester, UK

Summary of Evaluation:

Teaching: Professor Rickard is an exceptional teacher as evident from his teaching evaluations. Since 2013 his Q1 has ranged from 4.6 to 4.8 and his Q2 has ranged from 4.8 to 5.0. He has developed three courses and updated one during his tenure at UM. Two are lecture courses, one on polymicrobial communities in health and disease and the other on antimicrobials used in domestic, medical and industrial situations. Two are laboratory courses on polymicrobial communities and molecular biology. These lab courses are the cornerstone of our hospital molecular epidemiology (HME) MPH program. Professor Rickard advises up to twelve MPH students per year, many of whom work in his lab for academic credit.

Research: Professor Rickard has published several significant papers that have contributed dramatically to our understanding of oral microbiology. One describes a unique plaque flow system to allow rapid assessment of bacterial communities to determine the effectiveness of various treatments, and has received much attention in industry. In addition, he is a respected authority on oral microbial pathogenesis and therapeutics. His work on co-aggregation in biofilms is heavily cited and his translational work in therapeutics promises to lead to viable treatment approaches. One of his major accomplishments in this area is the development of an in vitro model system that bridges the gap between more clinical focused studies and more reductionist experimental studies.

Professor Rickard has an excellent publication record both in quality and quantity. He has published 49 peer-reviewed articles and 23 have been credited to UM since joining as an assistant professor in September 2010. He has also published 15 non-peer reviewed articles (book chapters and learned society articles), five of which have been credited to UM while at the rank of assistant professor. These works as a whole have been highly impactful including his creation of an in vitro model system of biofilm growth to study multi-species biofilms under relevant biological conditions.

Since arriving at UM, Professor Rickard has developed a translational research program that has gained the interest of a large number of industry partners, demonstrating that his translatable research agenda is viable and sustainable. He has leveraged approximately \$1.7 million in funding from federal and industrial sponsors as well as from institutions and learned societies. At present, he has approximately \$1.2 million in grants support projects for which he is the PI. As evidence of the importance of Professor Rickard's translational research, he is working with the UM Business Engagement Center and UM Technology Transfer to evaluate the technologies he has developed for licensing. His funding is non-traditional in that it largely comes from industry, as opposed to the more traditional federal funding sources. Given the level of Professor Rickard's applied translational work, funding from industry demonstrates the quality of his work. Furthermore, that fact that Professor Rickard receives funding from a number of different companies demonstrates the wide interest of his work. His funding portfolio demonstrates his leadership capacity and ability to gather sustained funding for his research scholarship. It also provides a unique opportunity for his research to be translated into a larger direct impact on the public's health than traditional NIH funding typically portends.

Consistent with Professor Rickard's funding stream, to date, he is a co-inventor on five published patent applications (three patents pending since joining UM). Through his patenting efforts, he has been recognized as a UM Inventor by the UM Technology Transfer Office and invited to their "Celebrate Invention" events (2013, 2014, and 2015).

Professor Rickard has been an invited speaker at applied and translatable research conferences including the Montana Biofilm Science and Technology Meetings organized by the Center for Biofilm Engineering as well as an Avant symposium organized by Ashland Specialty Chemicals. Most recently, he was an invited speaker at a Center for Biofilm Engineering regulatory pre-meeting workshop in Washington, DC, where the FDA and EPA were in attendance

#### Recent and Significant Publications:

Kolderman, E., Bettampadi, D., Samarian, D.S., Dowd, S.E., Foxman, B., Jakubovics, N.S., Rickard, A.H. (2015) L-Arginine destabilizes oral multi-species biofilm communities developed in human saliva. *PLOS One*, 10(5): e0121835. Doi:10.1371/journal.pone.0121835.

Jakubovics, N.S., Samarian, D.S., Kolderman, E., Robinson, J.C., Bashton, M., Rickard, A.H. (2015). Critical roles of arginine in growth and biofilm developments by *Streptococcus gordonii*. *Molecular Microbiology*, 97: 281-300.

- Nance, W.C. Sun, Z., Chludzinski, J., Samarian, D. and Rickard, A.H. (2013) A high-throughput microfluidic dental plaque biofilm system to visualize and quantify the effect of antimicrobials. *Journal of Antimicrobial Chemotherapy*, 68: 2550-2560.
- Vornhagen, J., Stevens, M., McCormick, D., Dowd, S.E., Eisenberg, J.A., Boles, B.R., Rickard, A.H. (2013) Coaggregation occurs amongst bacteria within and between domestic showerhead biofilms. *Biofouling*, 29: 53-68.
- Cuadra-Saenz G., Rao D, Underwood A, Belapure SA, Campagna SR, Sun Z, Tammariello S, Rickard AH. (2012) Autoinducer-2 Influences Interactions amongst pioneer colonizing streptococci in oral biofilms. *Microbiology*, 158: 1783-1795.

Service: Professor Rickard is an editor for the *Journal of Applied Microbiology* and the sister journal *Letters in Applied Microbiology*. He is also a member of the editorial board for the journal *Biofouling* and regularly reviews manuscripts for other scientific journals. In addition, Professor Rickard chaired scientific sessions such as the Fall 2014 MAC-EPID symposium at the UM (approximately 100 attendees) and the “Signaling and communication in biofilms” session at the 4th International Biofilm Conference in Winchester, UK (>250 attendees). Professor Rickard was a workshop co-organizer for the American Society for Microbiology 2015 Biofilm Conference workshop on growth and imaging techniques for biofilm research (46 delegates). In addition, he has reviewed research grant proposals for NIH, NASA, and the U.S. military.

Within the university, Professor Rickard has served on three departmental committees and multiple search committees. He is currently a member of the Department of Epidemiology recruitment committee (2013-present). In this capacity, he is responsible for helping prospective MPH students gain information to help them make informed decisions as to whether to join the UM SPH epidemiology program. He has also served as a member of the master’s curriculum committee, tasked with curriculum changes and the introduction of new classes, and served on the doctoral committee where he contributed to the recruitment of PhD candidates and the assessment of their academic performance. In addition to these responsibilities, Professor Rickard continues to be involved in the on-going development of the curriculum for the hospital and molecular epidemiology program that is housed within the epidemiology department.

#### External Reviewers:

Reviewer A: “Dr. Rickard has an excellent publication record that is clearly of sufficient quality and quantity to support his application for promotion and tenure. Alex is an extremely bright and talented scientist, with tremendous potential to succeed as an independent academician.”

Reviewer B: “Alex has made major contributions to the field of Microbiology. He has always had an excellent relationship with both granting agencies and industrial partners. The amount of funding that Dr. Rickard has received since his time at Michigan is exceptional. I would consider him the top scientist in the field at his stage of career development.”

Reviewer C: “This concept is called co-aggregation and was pioneered by Dr. Rickard. Once viewed as both heretical and impenetrable to analysis, it is now accepted as a fundamental field of study. His collective works span both basic and translational sciences and as such he is a role

model for the successful modern biomedical researcher. Dr. Rickard would readily be promoted to associate professor with tenure at [my institution].”

Reviewer D: “...his work in microfluidic systems to examine oral multi-species biofilm development is considered a seminal paper in the area of examining multi-species oral biofilms. Dr. Rickard has developed an optimal *in vitro* model to predict clinical effectiveness of future and novel therapies used in oral health and more broadly medicine.”

Reviewer E: “Alex’s impressive output of papers in recent years shows his skill in managing to deliver projects and obtain original, publishable data. He has done good work in creating *in vitro* model systems of biofilm growth.”

Reviewer F: “Professor Rickard has developed a sophisticated model system to study multi-species biofilms under relevant biological conditions.”

Reviewer G: “Through Dr. Rickard’s work, coaggregation should be considered as a fundamental aspect of polymicrobial biofilms. Overall, Dr. Rickard’s track record...would be considered strong relative to others in his peer group in the field.”

Reviewer H: “His work on bacterial cell-cell interactions, especially the AI-2 mediated signaling...is in the very front of the field and has attracted the attention of oral microbiologists and clinicians worldwide. I strongly support Dr. Richard’s promotion to Associate Professor with tenure.”

Reviewer I: “Dr. Rickard has developed a national and emerging international presence in the area of biofilms. I found his two studies regarding L-arginine impacts on biofilm communities’ outstanding contributions to this field.”

#### Summary of Recommendations:

Professor Rickard is an exceptionally creative and productive researcher and teacher. With the support of the Executive Committee, I am pleased to recommend Professor Alexander H. Rickard for promotion to associate professor of epidemiology, with tenure, Department of Epidemiology, School of Public Health.



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Martin A. Philbert, Ph.D.  
Dean, School of Public Health

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