Approved by the Regents
May 19, 2022

PROMOTION RECOMMENDATION
The University of Michigan
School of Dentistry

Kenichi Kuroda, associate professor of dentistry, with tenure, School of Dentistry, associate professor of chemistry, without tenure, College of Literature, Science, and the Arts, and associate professor of macromolecular science and engineering, without tenure, College of Engineering, is recommended for promotion to professor of dentistry, with tenure, School of Dentistry, professor of chemistry, without tenure, College of Literature, Sciences, and the Arts, and professor of macromolecular science and engineering, without tenure, College of Engineering.

Academic Degrees:

PhD	2003	Massachusetts Institute of Technology, Cambridge, MA
MS	1997	Kyoto University, Kyoto, Japan
BS	1995	Kyoto University, Kyoto, Japan

Professional Record:

2014-Present	Associate Professor, Macromolecular Science and Engineering, College of Engineering, University of Michigan
2014-Present	Associate Professor, Chemistry, College of Literature, Sciences, and the Arts, University of Michigan
2014-Present	Associate Professor, Biologic and Materials Sciences, School of Dentistry, University of Michigan
2014-2016	Associate Professor, Biomedical Engineering, College of Engineering, University of Michigan
2013-2014	Assistant Professor, Macromolecular Science and Engineering, College of Engineering, University of Michigan
2006-2014	Assistant Professor, Biologic and Materials Sciences, School of Dentistry, University of Michigan
2006-2014	Assistant Professor, Biomedical Engineering, College of Engineering, University of Michigan
2006-2014	Assistant Professor, Chemistry, College of Literature, Sciences, and the Arts, University of Michigan

Summary of Evaluation:

Teaching: Professor Kuroda teaches extensively at multiple levels including pre-doctoral dental students, dental hygiene students, undergraduate students in the College of Literature, Sciences, and the Arts, and graduate students in the College of Engineering. His teaching philosophy is to enhance appropriate dental material selection in the clinic, by explaining the science behind the materials to dental professionals in training. He is the course director in the pre-doctoral course DENT 610, Applied Biomaterials, and lectures in DENTHY 335, Biomaterials. On campus, Professor Kuroda has taught Chem 454, Biophysical Chemistry to undergraduate students in the College of Literature, Sciences, and Arts, and Macromolecular Sci 800, Research Seminar in the graduate program in the College of Engineering. He has strong student evaluations and is receptive to feedback, evidenced by Professor Kuroda responding to student feedback by inviting clinicians as guest lecturers to enhance the clinical relevance to the subject taught. Professor Kuroda's peer evaluations are equally strong with feedback indicating that his lectures are well organized and clear. Professor Kuroda interjects humor into his lectures while presenting topics with clarity and scientific impact.

Professor Kuroda has mentored a diverse group of student scientists in terms of gender and ethnicity. In rank, he has mentored four PhD students, one graduate student, six post-doctoral trainees, two pre-

doctoral DDS students, two undergraduate students, eight visiting scholars, and nine research fellows. Professor Kuroda has made substantial teaching contributions to the School of Dentistry and other colleges at the University of Michigan. It is evident that Professor Kuroda will continue to make valuable teaching contributions at the University of Michigan. He is a superb educator and mentor. He has been a strong advocate for recruiting minority and underrepresented students in his research program and his lab culture has been an encouraging environment for female STEM students.

Research: Professor Kuroda's scholarly contributions have been in the field of anti-microbial and anti-cancer polymeric biomaterials. Specifically, he has focused on the creation of new synthetic materials that mimic biological functions of natural proteins in order to address bacterial infections. Importantly, the emergence of bacterial infections resistant to antibiotics, and their threats to public health, has created an urgent need to develop new antimicrobials. His collective efforts, while in rank, have led to 28 peer-reviewed publications in high-profile journals such as *Biomacromolecules*, *Soft Matter*, and *Science Reports*. He is the corresponding author for 17 publications (eight as sole corresponding, nine as co-corresponding), and 10 as contributing author. Professor Kuroda is engaged in research collaborations which have resulted in a patent being filed in 2019 with co-investigators from Colgate-Palmolive and another filed in 2021 with Yonsei University. As a testament of his vast knowledge and national/international reputation, Professor Kuroda has been regularly invited to give seminars at the American Chemical Society National Meeting and Exposition annual meetings. He has been an invited speaker at the national and international levels. He has also presented at several professional and research meetings at the University of Michigan and other esteemed institutions such as California Institute of Technology (Caltec) and the University of California Los Angeles.

Professor Kuroda is the principal investigator for two federal grants, one from the National Science Foundation (NSF) and another from the National Institutes of Health/National Institute of Dental and Craniofacial Research (NIH/NIDCR), and he is a co-principal investigator on another federal grant from the NIH. Professor Kuroda has one book chapter in rank and lists 29 regional, national and international invited presentations. Professor Kuroda has continually demonstrated strong scholarship and an upward trajectory, indicating that he will continue to be among the leaders in his field.

Recent and Significant Publications:

Lee SB, González-Cabezas C, Kim KM, Kim KN, Kuroda K.* Catechol-functionalized synthetic polymer as a dental adhesive to contaminated dentin surface for a composite restoration. *Biomacromolecules.* 16(8): 2265-2275, 2015. PMCID: PMC4534835

Takahashi H, Nadres ET, Kuroda K.* Cationic Amphiphilic Polymers with Antimicrobial Activity for Oral Care Applications: Eradication of S. mutans Biofilm. *Biomacromolecules.* 18(1): 257–265, 2017. PMCID: PMC5222733

Takahashi H, Yumoto K, Yasuhara K, Nadres E, Taichman RS,* Kuroda K.* Anticancer polymers designed for killing dormant prostate cancer cells. *Sci. Rep*. 9: 1096-1111, 2019. PMCID: PMC6355926

Mortazavian H, Picquet GA, Lejnieks J, Zaidel LA, Myers CP,* Kuroda K.* Understanding the role of shape and composition of star-shaped polymers and their ability to both bind and prevent bacteria attachment on oral relevant surfaces. *J. Funct. Biomater.* 10(4): 56-71, 2019. PMCID: PMC6963222

Bhat R, Foster LL, Rani G, Vemparala S,* Kuroda K.* The Function of Peptide-Mimetic Anionic Groups and Salt Bridges in the Antimicrobial Activity and Conformation of Cationic Amphiphilic Copolymers, *RCS Advances.* 11(36): 22044-22056, 2021.

Service: Professor Kuroda's national and international distinction is demonstrated by his active participation in professional organizations (e.g., American Chemical Society) and in the peer-review process, in which he serves as a reviewer for dozens of high-profile scientific journals. He also serves on

guest panels for the National Science Foundation and the National Institutes of Health. Professor Kuroda played a major part in establishing international partnerships, student exchange programs and research collaborations for several programs, departments, and units at the University of Michigan. He has significantly contributed to service activities in the school and other colleges at the university. At the School of Dentistry, he has served on the strategic planning committee where his research background was integral to provide an ample view of insights into each of the strategic domains, including but not limited to the research domain. Professor Kuroda served as a member of the Oral Health Sciences Committee and contributed significantly to the launching of the new Oral Health Sciences master's degree program. External to the school, he is currently a member of the Executive Committee at the Michigan Materials Research Institute. Professor Kuroda's most impressive service to the school has been his assumption of the research responsibilities for a faculty colleague including mentorship of students and postdoctoral fellows, and grant management. His work was very successful and it increased his knowledge and perspective of the biomaterials opportunities in the fields of dentistry and medicine. Professor Kuroda has been an influential presence around campus, most notably with the Macromolecular Science and Engineering Program, where he has served as a member of the Executive Committee, symposia chair, and on the qualifying exam and admissions committees.

External Reviewers:
Reviewer A: "It is noteworthy that he has been invited to give over 50 lectures outside of his institution, many of which have been at excellent chemical engineering and materials science institutions, such as U. Illinois, Purdue, Caltech, UCLA, Case Western, and Virginia Tech…He also cites numerous collaborative research efforts, both at Michigan and at other institutions (Yonsei University in South Korea). He has appointments with other departments at the University of Michigan, which is further recognition of his diverse talents and contributions."

Reviewer B: "Kuroda has been a pioneer in using principles from natural antibacterial peptides to guide the development of synthetic polymers with antimicrobial activity…I was drawn to Kuroda's publications, particularly those emanating from his independent laboratory at the University of Michigan, because of his thorough approach."

Reviewer C: "The funding climate is very challenging now and the antibacterial field is very competitive to obtain funding, hence his funding in this field is commendable…His involvement in developing international collaborations is very commendable. He is leveraging his lived experience in Japan to build collaborations with institutions in Japan and South Korea. These initiatives can become very advantageous for Univ. Michigan in an increasingly competitive global economy, where creative policies of educational institutions can serve to attract global and local talent."

Reviewer D: "Collectively, these and other products of Professor Kuroda's research are significant in terms of global health, as his polymers are extremely cost-effective and have potential applications that include topical disinfectants, antimicrobial tooth coatings and restorations, and disposable clinical products. ...I can see from his teaching statement that he fulfills an important role for the dental school as course director for Dent 610 Applied Biomaterials II. I enjoyed his thoughtful perspective on teaching his students the scientific underpinnings of dental materials in an accessible way, in order to foster critical thinking and planning of treatment plans."

Reviewer E: "Professor Kuroda's work is of exceptional quality. I find the problems he works on to be important and fascinating. Professor Kuroda excels at matching innovative yet practical materials to the appropriate application in dentistry…Professor Kuroda's strength is his multidisciplinary ability in going from early stage materials development to basic structure-function studies to developing translational antimicrobial approaches for dental applications. I can't think of others who have this ability…I have

served on our college and campus promotion and tenure committees and confidently say that his record surpasses the bar in every manner."

Reviewer F: "Professor Kuroda's scholarship and research contributions are excellent. His accomplishments are well above the bar for promotion to Professor at the University of Michigan or any other prominent research university in the world. The candidate's quality of research, effectiveness of teaching, mentoring, and professional activities on and off campus are excellent...In addition to his peer-reviewed publications, Professor Kuroda continues to be invited to national and international lectures. He has maintained a funded laboratory for many years including two current NIH and one current NSF grant. He has been invited to publish several reviews, highlighting his reputation in the field as a well-known expert."

Summary of Recommendation:
Professor Kuroda is a fearless scientist and teacher. His research is timely, as the emergence of bacterial infections resistant to antibiotics, and their threats to public health has created an urgent need to develop new antimicrobials. The field is in desperate need of new ideas for antimicrobial polymers that are not susceptible to the resistance of mechanisms of bacteria, and Professor Kuroda is one of the few investigators providing them. He has developed strong collaborations at the University of Michigan that have led to successful funding and highly cited publications. Professor Kuroda's commitment aligns with the School of Dentistry's mission statement in every way, "Advancing health through education, service, research and discovery."

We recommend Kenichi Kuroda for promotion to professor of dentistry, with tenure, School of Dentistry, professor of chemistry, without tenure, College of Literature, Science, and the Arts, and professor of macromolecular science and engineering, without tenure, College of Engineering.

Laurie K. McCauley
Dean, School of Dentistry

Anne Curzan, Dean
Geneva Smitherman Collegiate Professor of
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May 2022