

PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF INTERNAL MEDICINE

Joanne M. Kahlenberg, M.D., Ph.D., assistant professor of internal medicine, Department of Internal Medicine, Medical School, is recommended for promotion to associate professor of internal medicine, with tenure, Department of Internal Medicine, Medical School.

Academic Degrees:

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| M.D. | 2006 | Case Western Reserve University |
| Ph.D. | 2004 | Case Western Reserve University |

Professional Record:

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| 2012- present | Assistant Professor of Internal Medicine, University of Michigan |
| 2011-2012 | Clinical Lecturer, Department of Internal Medicine, University of Michigan |

Summary of Evaluation:

Teaching: Dr. Kahlenberg is an avid teacher, incorporating learning opportunities into all facets of her daily work. Since 2012, Dr. Kahlenberg has served as a small group leader for the rheumatology curriculum sequences. In addition to this, she developed a lecture for second-year medical students titled "Introduction to Autoimmunity." This past June, Dr. Kahlenberg also presented this lecture to first-year medical students. Dr. Kahlenberg is also a regular presenter for the Internal Medicine Morning Report and she has twice been a discussant for the Internal Medicine Ambulatory Morning Report. In addition to this, she developed a lecture for the Internal Medicine Board Review Course in 2016, teaching pathogenesis and management of auto-inflammatory diseases. Each of the past five years Dr. Kahlenberg has been given a clinical rheumatology fellow to train. Dr. Kahlenberg's focus in clinic is to follow evidence-based decision making when possible and to develop mechanistic understanding of diseases so that treatment decisions for rare diseases can be made when evidence is not there. Fellows are given the option to change their clinic attending after the first year of training, to date none of Dr. Kahlenberg's have taken that option. It is noted on student evaluations that Dr. Kahlenberg's clinical skills and fund of knowledge are exceptional. In recognition of her clinical teaching and mentoring of fellows, Dr. Kahlenberg was awarded the University of Michigan Rheumatology Fellow's Teaching Award in 2014 and 2016. Dr. Kahlenberg also serves as a mentor to an immunology Ph.D. graduate student. It was noted on a letter written by the student, "that working in her lab has been truly a life changing event" she also noted that Dr. Kahlenberg is "not just a research mentor, she has been a life mentor as well."

Research: Dr. Kahlenberg's scholarly interest lies in understanding the role of the innate immune system in the mechanisms of autoimmune diseases. While working on her Ph.D., Dr. Kahlenberg began researching a pro-inflammatory protein complex- the inflammasome. This protein complex is an important activator of pro-inflammatory cytokines that can activate the immune system. Dr. Kahlenberg has expanded her research within inflammasomes to further investigate its role in Systemic Lupus Erythematosus (SLE). Dr. Kahlenberg has also created a second research niche- looking at cutaneous disease in SLE. Working in collaboration with Dr. Gudjonsson from Dermatology, they currently have an NIH funded R01 and have another R01 submitted.

Dr. Kahlenberg has 40 peer-reviewed publications, 27 of those are while in rank as an assistant professor, with 20 as either first or senior author. Additionally, she co-authored a book chapter in 2013 and in 2016 she submitted a patent application. Dr. Kahlenberg's work has been funded by a mix of NIH and foundation grants, most recently she was awarded a Doris Duke Charitable Foundation award for which she serves as the principal investigator. Of notable mention, Dr. Kahlenberg submitted an R01 earlier this year and received a 3rd percentile score. This year Dr. Kahlenberg was honored by the American College of Rheumatology and given the Edmund L. Dubois MD Memorial Lectureship. This award is given to young investigators for significant contributions in lupus research.

Recent and Significant Publications:

Clark KL, Reed TJ, Wolf SJ, Lowe L, Hodgins JB, Kahlenberg JM: Epidermal injury promotes nephritis flare in lupus-prone mice. *Journal of Autoimmunity* 65(December):38-48, 2015.

Syed AK, Reed TJ, Clark KL, Boles BL, Kahlenberg JM: *Staphylococcus aureus* phenol-soluble modulins stimulate the release of pro-inflammatory cytokines from keratinocytes and are required for induction of skin inflammation. *Infection and Immunity* 83:3428-3437, 2015.

Stannard J, Meyers E, Reed TJ, Lowe L, Sarkar M, Xing X, Gudjonsson JE, Kahlenberg JM: Lupus skin is primed for IL-6 inflammatory responses through a keratinocyte-mediated autocrine type I interferon loop. *Journal of Investigative Dermatology* 137:115-122, 2017.

Liu J, Berthier CC, Kahlenberg JM: Enhanced inflammasome activity in systemic lupus erythematosus is mediated via type I interferon upregulation of interferon regulatory factor 1. *Arthritis and Rheumatology* 2017: epub ahead of print. PMID: 28564495.

McCoy SS, Reed TJ, Berthier CC, Tsou PS, Liu J, Gudjonsson JE, Khanna D, Kahlenberg JM: Scleroderma keratinocytes promote fibroblast activation independent of transforming growth factor-beta. *Rheumatology* 2017, in press.

Service: Dr. Kahlenberg's clinical area of expertise is two-fold. She treats patients with dysregulated innate immunity as well as complicated lupus patients, those in particular with refractory skin disease. Institutionally, Dr. Kahlenberg sits on various committees such as the Clinical Innovations Committee, the Division of Rheumatology Fellowship Selection Committee and she chairs the Fellowship Recruitment Group for the Division of Rheumatology. Recognition of her standing in the field is evidenced by her service to the American College of Rheumatology whereby she has served as an abstract reviewer, a moderator at their national meetings, as a participant on the Rheumatology Research Foundation Study Section and through her work with the Early Investigators Committee. Membership on this committee entails training the next generation of rheumatologists. She has provided her services as an ad hoc reviewer for top tier journals including *Arthritis and Rheumatology*, *Plos One*, and *Journal of Investigative Dermatology* just to name a few. In 2016, Dr. Kahlenberg was appointed as a member to the Lupus Clinical Investigator Network Candidate Drug Vetting Committee. Internationally, Dr. Kahlenberg sits as an ad hoc member on the following advisory boards- Lupus and Lupus Nephritis- Celgene, GlaxoSmithKline- Lupus Complications, AstraZeneca and MedImmune- Interferons in Autoimmunity and Periodic Fever Syndromes- Novartis.

External Reviewers:

Reviewer A: "...Dr. Kahlenberg has done an excellent job of establishing herself as an independent investigator and has reached out to the dermatology investigator community to develop novel studies that investigate the role of keratinocytes and other skin cells in host defense and autoimmunity. Her recent work is highly relevant to at least two significant systemic autoimmune diseases, systemic lupus erythematosus and systemic sclerosis."

Reviewer B: "She has established collaborations with the Department of Dermatology in order to be able to better study lupus skin as a window into the mechanisms of inflammation in this disease and she has continued to develop her interests in innate immune mechanisms."

Reviewer C: "The world of investigative rheumatologists is relatively small and she is a star....I am quite confident that Michelle would be judged worthy for this promotion at any institution. You have a gem, treat her accordingly."

Reviewer D: "Finally, Dr. Kahlenberg has garnered sufficient extramural funding to support her research efforts, as well as that of her laboratory and associated trainees. During these times of extreme competition for extramural research awards, she has been quite successful. Through the National Institutes of Health, she has secured the gold standard for academic investigators – the R01- that has provided her with nearly \$1.5 million of ongoing support."

Reviewer E: "There is no question that at a very early stage in her career, she already is regarded as both a scientific and clinical expert in the area of premature atherosclerosis in autoimmune diseases."

Reviewer F: "The surprising finding that anifrolumab has been more effective than antibodies to IFN α for the treatment of cutaneous lupus may be explained by her observations that IFN κ and not IFN α predominately mediates the skin inflammation. I would consider these two papers, which were published in Arthritis and Rheumatology and Journal of Investigative Dermatology, respectively, to be outstanding contributions to the lupus field."

Summary of Recommendation:

Dr. Kahlenberg is an accomplished physician scientist who has excelled in the area of scholarship and clinical research in the field of systemic lupus. She has also made significant contributions to clinical care, teaching and service. Therefore, I enthusiastically recommend that Joanne M. Kahlenberg, M.D., Ph.D. be promoted to associate professor of internal medicine, with tenure, Department of Internal Medicine, Medical School.



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

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