

PROMOTION RECOMMENDATION
The University of Michigan
College of Pharmacy

James J. Moon, associate professor of pharmaceutical sciences, with tenure, College of Pharmacy, and associate professor of biomedical engineering, without tenure, Medical School and College of Engineering, is recommended for promotion to professor of pharmaceutical sciences, with tenure, College of Pharmacy, and professor of biomedical engineering, without tenure, Medical School and College of Engineering.

Academic Degrees:

PhD 2008 Rice University, Houston, TX
BS 2002 University of California at Berkeley, CA

Professional Record:

2018 – present John G. Searle Associate Professor, Associate Professor of Pharmaceutical Sciences, College of Pharmacy, and Associate Professor of Biomedical Engineering, Medical School and College of Engineering, University of Michigan
2012 – 2018 John Gideon Searle Assistant Professor of Pharmaceutical Sciences and Assistant Professor of Pharmaceutical Sciences, College of Pharmacy, and Assistant Professor of Biomedical Engineering, Medical School and College of Engineering, University of Michigan
2008 – 2012 Post-doctoral Fellow, Department of Materials Science and Engineering/Biological Engineering, Massachusetts Institute of Technology/Howard Hughes Medical Institute, Cambridge, MA

Summary of Evaluation:

Teaching: Professor Moon is a very dedicated teacher and an outstanding mentor. Since 2012, he has participated in teaching numerous courses covering subjects in the pharmaceutical sciences, cellular biotechnology, biomedical engineering, and chemical engineering, including a very successful graduate-level course in nanotechnology for drug delivery that he designed and developed. Student ratings of his didactic teaching are excellent, with the majority of ratings ranging 4.3-5.0 on a 5-point scale. Professor Moon is an active and successful mentor, having advised one research scientist, twelve post-doctoral fellows (and visiting scientists), twelve PhD students, six PharmD and master students, and 26 undergraduate students in his laboratory, in addition to serving on numerous dissertation committees. Professor Moon is passionate about recruiting and training students from diverse backgrounds. The achievements of his students and the honors they have received speak to the outstanding guidance provided by Professor Moon.

Research: Professor Moon is an outstanding scientist, who has gained an international reputation for his work in the development of drug delivery systems designed to modulate immune functions in the context of cancer immunotherapy, infectious diseases, and autoimmune diseases. His interdisciplinary research program includes three major areas: 1) Nanomedicine for personalized cancer immunotherapy, which is to develop novel therapeutic strategies for induction of potent anti-tumor T cell responses against cancer; (2) Synthetic nanomaterials for vaccination against infectious pathogens, which is to develop vaccine delivery platforms that can stably deliver subunit antigens and adjuvant molecules to lymphoid tissues and induce potent T and B cell responses against infectious pathogens, including Ebola virus, HIV and SARS-CoV-2; and (3) Targeting the gut

microbiome for immune modulation, which is to oral nanomedicine for modulating the gut microbiome and regulating immune responses.

An excellent collaborator, Professor Moon has been extremely successful in attracting external funding for his research, including several grants from federal and non-federal sponsors totaling more than \$20 million to the University of Michigan (\$8 million directly to his laboratory). Professor Moon's research is well recognized nationally and internationally as evidenced by 87 invited presentations and 82 papers in high quality peer-reviewed journals. His research has high translational potential as evidenced by 14 US patents and two startup companies based on his research. He is the co-founder and chief scientific officer for a startup company (EVOQ Therapeutics), which received the 2019 Michigan Innovation Cup, and he serves as a scientific advisory board member for Vedantra Pharmaceuticals. Professor Moon has received several honors, including the Rice University Outstanding Bioengineering Alumnus Award (2017); University of Michigan Senior Forbes Scholar designation (2017); CMBE Young Innovator (2017); Mid-Career Nanotechnology Scientific Award from the Applied Nanotech and Nanoscience International Conference (2018); and the Emerging Leader Award from the American Association of Pharmaceutical Sciences (2018).

Recent and Significant Publications:

- Kuai R, Ochyl LJ, Bahjat KS, Schwendeman A and Moon JJ. Designer vaccine nanodiscs for personalized cancer immunotherapy. 16, 4, 489-496, 2017, *Nature Materials*.
- Nam J, Son S, Ochyl LJ, Kuai R, Schwendeman A, and Moon JJ. Chemo-photothermal therapy combination elicits anti-tumor immunity against advanced metastatic cancer. 9, 1, 1074, 2018, *Nature Communications*.
- Bazzill JD, Ochyl LJ, Giang E, Castillo S, Law M, and Moon JJ. Interrogation of antigen display on individual vaccine nanoparticles for achieving neutralizing antibody responses against hepatitis C virus. 18, 12, 7832–7838, 2018, *Nano Letters*.
- Fan Y, Stronsky SM, Xu Y, Steffens JT, van Tongeren SA, Erwin A, Cooper CL, Moon JJ. Multilamellar Vaccine Particle Elicits Potent Immune Activation with Protein Antigens and Protects Mice against Ebola Virus Infection. 13, 10, 11087-11096, 2019, *ACS Nano*.
- Lee Y, Sugihara K, Gilliland MG 3rd, Jon S, Kamada N, Moon JJ. Hyaluronic acid–bilirubin nanomedicine for targeted modulation of dysregulated intestinal barrier, microbiome and immune responses in colitis. 19, 1, 118-126, 2020, *Nature Materials*.

Service: Professor Moon is an outstanding citizen of the university and his profession. His college service includes membership on the College of Pharmacy Executive Committee and service as the chair of the graduate student admissions and recruitment committee in the Department of Pharmaceutical Sciences, where he has made significant contributions to the graduate admissions processes over several years. In 2017, he led a team of faculty members in the development of a new annual high school outreach program through the Detroit Area Pre-College Engineering Program to connect youth from underrepresented communities to educational experiences in science, technology, engineering, and math at the University of Michigan. As a recognized leader in the scientific community, Professor Moon has been invited to serve as a reviewer for numerous grant sponsors and journals, including high impact *Science* and *Nature* journals. He is currently a member of several professional societies, representing his interests in pharmaceutical sciences, biomedical engineering, and immunology. Professor Moon served as the vice chair (2018-2020) and chair (2020-current) of the Immuno Delivery Focus Group within Controlled Release Society, and he has served on the board of the Korean-American Biomedical Engineering Society since 2013. He has organized numerous symposia and sessions, including his service in 2017 as a conference co-chair and

organizer for the 15th International Nanomedicine and Drug Delivery Symposium (NanoDDS), which was hosted by the University of Michigan and very well received by over 300 participants.

External Reviewers:

Reviewer A: “Dr. Moon has developed and is sustaining a very impressive research program... at the interface of material science, nanotechnology/drug delivery, and immunology...he is a top tier faculty member...Dr. Moon is also an excellent teacher and mentor...”

Reviewer B: “Dr. Moon is an established leader of nanotechnology-based immunotherapy for cancer, infectious diseases and autoimmunity...this is a rare and truly stellar record of citations among his peers as well as all scientists in the area. Dr. Moon is an opinion leader...His past and current lab members have been granted with a number of awards.”

Reviewer C: “He is one of the leaders in the use of nanomaterials for immune-applications... his research development will translate beyond academia and will advance to patient care...his research quality is incredible and puts him in a leadership position in this crucial emerging field...He is a superstar!”

Reviewer D: “...I have a great appreciation for the work done by him which excels both in novelty, quality as well as in quantity...Without doubt Dr. Moon is in the top tier of his [generation] within the field.”

Reviewer E: “...he is an outstanding scientist and an asset to our community...These are innovative concepts that significantly advance the field...His track record in training of PhD and postdocs in his lab is certainly impressive.”

Reviewer F: “James, without any doubt, is one of the top rising stars in the new field of immuno-materials...There is not any doubt that James Moon is the top person in our field in his [generation]...In every sense of the words, James is a well-recognized leader in his field.”

Reviewer G: “The topics he has been focusing on are highly original and innovative. He was among the first to start employing nanomaterials for cancer immunotherapy applications. And among the first to move them further for the treatment of non-cancerous diseases ...Dr. Moon is without a doubt an outstanding scientist in the fields of nanomedicine and immunomodulation.”

Reviewer H: “Prof. Moon is a highly visible faculty...who is internationally recognized in the field...Prof. Moon’s achievements are stellar...Prof. Moon’s research program is well-funded and one of the most impressive that I’ve seen of any investigator at any stage of his/her career...Prof. Moon’s service has also been exemplary...”

Reviewer I: “...he was awarded a prestigious *CAREER* award from NSF, which not only reflects his history of research achievements, but also demonstrates the considerable versatility in his funding sources and impact...he is active in promoting STEM education in the Detroit area pre-college engineering program...There is no question whatsoever that he is an up-and-coming star...his record is exceptional.”

Reviewer J: “His articles...prove him to be one of the most important leaders in the field of drug delivery and immunotherapy...He is one of the most wanted speakers in international conferences...Prof. Moon’s scholarly achievement is outstanding by any standard and clearly at the

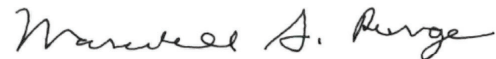
frontier of the drug delivery and immunotherapy field worldwide...Graduate student trainees in his laboratory have received numerous prestigious awards..."

Reviewer K: "His work created tremendous opportunities for developing novel immunotherapies...Dr. Moon has...opened new frontiers for other researchers to follow...Dr. Moon stands out from other researchers with his strength in combining basic understandings with translational research, which has led to a series of technological breakthroughs in immunotherapy...He is a rising leader in the scientific community...His leadership fosters the development of science..."

Summary of Recommendation: Professor Moon is an exemplary scientist and extremely dedicated teacher, mentor, and citizen of his profession. His leadership and innovations are blazing trails in drug delivery and immunology that translate directly to patient care. It is with the support of the College of Pharmacy and Medical School Executive Committees and the College of Engineering that we recommend James J. Moon for promotion to professor of pharmaceutical sciences, with tenure, College of Pharmacy, and professor of biomedical engineering, without tenure, Medical School and College of Engineering.



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