

PROMOTION RECOMMENDATION
THE UNIVERSITY OF MICHIGAN
MEDICAL SCHOOL
DEPARTMENT OF RADIOLOGY
DEPARTMENT OF MICROBIOLOGY AND IMMUNOLOGY
MEDICAL SCHOOL AND COLLEGE OF ENGINEERING
DEPARTMENT OF BIOMEDICAL ENGINEERING

Gary D. Luker, M.D., associate professor of radiology, with tenure, Department of Radiology, associate professor of microbiology and immunology, without tenure, Department of Microbiology and Immunology, Medical School, and associate professor of biomedical engineering, without tenure, Department of Biomedical Engineering, Medical School and College of Engineering, is recommended for promotion to professor of radiology, with tenure, Department of Radiology, professor of microbiology and immunology, without tenure, Department of Microbiology and Immunology, Medical School, and professor of biomedical engineering, without tenure, Department of Biomedical Engineering, Medical School and College of Engineering.

Academic Degrees:

M.D.	1991	Washington University, St. Louis, MO
B.S.	1987	University of Evansville

Professional Record:

2012-present	Associate Professor of Biomedical Engineering, University of Michigan
2010-present	Associate Professor of Radiology, University of Michigan
2010-present	Associate Professor of Microbiology and Immunology, University of Michigan
2004-2010	Assistant Professor of Radiology, University of Michigan
2004-2010	Assistant Professor of Microbiology and Immunology, University of Michigan
2002-2004	Assistant Professor, Mallinckrodt Institute of Radiology, St. Louis, MO
1996-2002	Instructor in Radiology, Mallinckrodt Institute of Radiology, St. Louis MO

Summary of Evaluation:

Teaching: Dr. Luker participates in all aspects of the radiology teaching program. He provides on the job training on the clinical service for medical students, radiology residents and fellows in pediatric radiology. He gives formal lectures in rotation with other faculty in pediatric radiology to radiology residents. In addition, he participates in research instruction for graduate students and post-doctoral fellows and participates in graduate student dissertation committee meetings. The quality of Dr. Luker's teaching is very good. This year radiology residents gave him a score of 4.83 (out of 5.0) placing him in the second quartile of radiology faculty for the quality of his teaching on the clinical service.

Research: Dr. Luker is a physician scientist and member of the Molecular Imaging Center housed in the Basic Sciences Research Building. His laboratory is on the cutting edge of the imaging of signal transduction pathways in intact cells and living animals. He has identified functions for chemokine receptors CXCR4 and CXCR7 in both regulation of primary tumor growth and progression to metastatic disease. He has developed functional imaging methods to quantify cell signaling pathways and tumor-stromal interactions in primary and metastatic tumor environments in breast cancer and other malignancies. The quality of Dr. Luker's research is outstanding. This is demonstrated not only by his many peer-reviewed publications in high quality journals, but also his grant support. As of July 2016, 74% of his effort is externally funded by nine different grants. Although an active investigator on the many Center for Molecular Imaging grants, Dr. Luker is also the principal investigator on his fourth NIH R01 grant. He is also a co-PI on three multi-PI NIH grants. Dr. Luker has been recognized both locally and nationally for the quality of his research. He is a member of the University of Michigan League of Research Excellence. On a national level, he received the New Investigator Award from the Association of University Radiologist and the Distinguished Investigator Award from the Academy of Radiology Research.

Recent and Significant Publications:

Luker KE, Lewin SA, Mihalko LA, Schmidt BT, Winkler JS, Coggins NL, Thomas DG, Luker GD: Scavenging of CXCL12 by CXCR7 promotes tumor growth and metastasis of CXCR4-positive breast cancer cells. *Oncogene* 31:4750-4758, 2012.

Luker KE, Mihalko LA, Schmidt BT, Lewin SA, Ray P, Shcherbo D, Chudakov DM, Luker GD: In vivo imaging of ligand receptor binding with Gaussia luciferase complementation. *Nat Med* 18:172-177, 2012.

Cavnar SP, Ray P, Moudgil P, Chang SL, Luker KE, Linderman JJ, Takayama S, Luker GD: Microfluidic source-sink model reveals effects of biophysically distinct CXCL12 isoforms in breast cancer chemotaxis. *Integr Biol (Camb)* 6:564-576, 2014.

Ray P, Stacer AC, Fenner J, Cavnar SP, Meguiar K, Brown M, Luker KE, Luker GD: CXCL12- γ in primary tumors drives breast cancer metastasis. *Oncogene* 34:2043-2051, 2015.

Stacer AC, Fenner J, Cavnar SP, Xiao A, Zhao S, Chang SL, Salomonson A, Luker KE, Luker GD: Endothelial CXCR7 regulates breast cancer metastasis. *Oncogene* 35:1716-1724, 2016.

Service: Dr. Luker is a fellowship trained pediatric radiologist. All of his clinical assignments are in pediatric radiology where he is active on the clinical service. Dr. Luker provides service on both a local and national level. Within the Department of Radiology, Dr. Luker is a member of the Resident Selection Committee. This committee is expected to review applicant materials the day before interviews are conducted. Interviews take the entire day and include an evaluation meeting at the end of the day. It is one of our most time consuming committees. Dr. Luker is assigned applicants who expressed interest in laboratory research. On a national level, Dr. Luker serves on several NIH study sections and the NIH Provocative Questions Review committee. He serves the American Board of Radiology as a member of the Molecular Imaging committee and has served the Radiological Society of North America in a similar capacity. He has served the

Society for Molecular Imaging as a member of the council and the World Molecular Imaging Society as a member of the board of trustees.

External Reviewers:

Reviewer A: “Dr. Luker is a leader in the field of cancer biology and molecular imaging, and is highly productive, with over 120 peer-reviewed publications. He has made great strides towards unraveling the role of chemokines in cancer, and the imaging of cell signaling processes using bioluminescence. His research is highly collaborative and he has contributed towards several important papers in areas that include nanomaterials, microfluidics and cancer therapeutics. His publications in the area of chemokines are of particular note, as he has capitalized on his expertise as a cancer biologist with that in molecular imaging. Dr. Luker’s funding is also impressive, as he is a PI on two R01 grants and Co-I on several others, demonstrating his many collaborations.”

Reviewer B: “I hold Dr. Luker’s distinguished achievement in the highest regard and have closely followed his achievements, as he is a widely acknowledged international leader in the field of molecular imaging of cancer. Dr. Luker has clearly demonstrated continued excellence of achievement in research, scholarly and creative activity, teaching, and service. Dr. Luker’s research work on CXCR4, CXCL12, and CXCR7 has had major national and international impact.”

Reviewer C: “...Dr. Luker is an innovative and highly prolific scientist whose work spans biology and engineering. He is on a continuing upward trajectory since his last promotion, in terms of publications and extramural funding.”

Reviewer D: “...he has created a unique niche for himself and developed beautiful imaging tools to ask really important fundamental questions of in vitro and in vivo chemokine biology that are challenging to address otherwise, and that no-one else is asking...The quality of his science is top tier and there is not one of his chemokine related papers that I do not consider to be a gem.”

Reviewer E: “He certainly has a very active and impressive publication record, particularly in recent years, on what appear to me to be timely topics in cancer research and on in vitro imaging technology. He also publishes in top journals.”

Reviewer F: “Dr. Luker can serve as an inspiration to those entering the field being one of the few who have succeeded in both practicing radiology and running a laboratory. He has made significant contributions including in imaging of protein-protein interactions using a split luciferase system and imaging of infections including viral infections.”

Summary of Recommendation:

Dr. Luker is a well-trained diagnostic radiologist with fellowship training in pediatric radiology. He has developed molecular and functional imaging methods to quantify cell signaling pathways in both primary and metastatic tumor environments in breast cancer and other malignancies. These imaging methods span scales of resolution from intravital microscopy to mouse models and clinical imaging of patients. He has identified critical functions of the chemokine signaling axis

of CXCL12/CXCR4/CVCR7 in growth and metastasis in breast cancers. His work often forms the basis of ongoing efforts by pharmaceutical companies to target these molecules for cancer therapy. He has received awards for the quality of his research from the Association of University Radiologists and the Academy of Radiology Research. We are pleased to recommend Gary D. Luker, M.D. for promotion to professor of radiology, with tenure, Department of Radiology, professor of microbiology and immunology, without tenure, Department of Microbiology and Immunology, Medical School, professor of biomedical engineering, without tenure, Department of Biomedical Engineering, Medical School and College of Engineering.



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



Alec D. Gallimore, Ph.D.
Robert J. Vlasic Dean of Engineering
College of Engineering

May 2017

February 1, 2017

Paul N. Courant, Ph.D.
Interim Provost and Executive Vice President for Academic Affairs
3074 Fleming, Box 1340

Subject: Gary D. Luker, M.D., Associate Professor, Empl. ID: 83181970; Radiology (100%), Microbiology and Immunology (0%) Biomedical Engineering; Date of Hire: 4/19/2004

Dear Dr. Courant:

We would like to recommend Gary D. Luker, M.D., for promotion to Professor, with tenure, in the Department of Radiology, and to Professor, without tenure, in the Departments of Microbiology and Immunology, and Biomedical Engineering. Dr. Luker received his M.D. degree from Washington University in 1991. He completed a residency in diagnostic radiology from 1991-1995 at that institution, and a fellowship in pediatric radiology at the Mallinckrodt Institute of Radiology in St. Louis from 1995-1996. Dr. Luker was appointed Instructor in Radiology there in 1996. He was promoted to Assistant Professor in 2002. Dr. Luker joined the faculty at the University of Michigan in 2004 as Assistant Professor in Radiology and Microbiology and Immunology. He was promoted to Associate Professor, with tenure, in Radiology, and to Associate Professor, without tenure, in Microbiology and Immunology in 2010. Dr. Luker was jointly appointed Associate Professor, without tenure, in Biomedical Engineering in 2012. This is his fifth year in rank.

Dr. Luker's *instructional* activities include mentoring, didactic and clinical teaching of undergraduate and medical students, residents and fellows. He teaches at C.S. Mott Children's Hospital as an attending physician in pediatric radiology. Dr. Luker has mentored 12 undergraduate students, two medical students, six graduate students, one resident, two fellows and one faculty member. He has served on eight dissertation committees. Teaching evaluations from residents were very good. In 2011, Dr. Luker was inducted into the League of Research Excellence in the Medical School.

Dr. Luker's *research* activities focus on the imaging of signal transduction pathways in living cells and animals. He works on developing molecular and functional imaging methods to quantify cell signaling pathways and tumor stromal interactions in primary and metastatic tumor environments. Dr. Luker is principal investigator of one NIH R01 grant, and co-principal investigator of one NIH R01 grant. He is co-investigator of one NIH R01 grant, two NIH P01 grants, one NIH R21 grant, one NIH U01, and one Department of Defense grant. Dr.

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Luker has published 124 peer-reviewed articles, and has been invited to present his research ten times regionally, nationally and internationally. He holds one patent. Dr. Luker received the Distinguished Investigator Award from the Academy of Radiology Research in 2012, and the New Investigator Award from the Association of University Radiologists in 2013 for his excellence in research.

Dr. Luker's *organizational* service includes his role as a member of the editorial board for *Tomography*, and as a member of an NIH study section. He is a reviewer for 14 journals. He was Co-Director of the University of Michigan Center for Systems Biology. Dr. Luker serves as a member of the Molecular Imaging Committee for the American Board of Radiology, of three committees for the NIH, and on the Molecular Imaging Committee for the American College of Radiology. He is a member of four institutional committees, including the Department of Radiology Resident Selection Committee, and the MCubed Executive Committee.

Dr. Luker is a leader in the field of cancer biology and molecular imaging. His work is interdisciplinary in nature, as is evidenced by his productive collaborations. The Advisory Committee for Appointments, Promotions and Tenure (ACAPT) voted unanimously to approve the promotion recommendations, 7-0-2. The abstentions were due to departmental affiliations. The Executive Committee voted to confirm the promotion recommendations 8-0-1. The abstention was due to departmental affiliation.

Sincerely,



Marschall S. Runge, M.D., Ph.D.

Executive Vice President for
Medical Affairs and
Dean, Medical School



Alec D. Gallimore

Robert J. Vlasic Dean of Engineering

Arthur F. Thurnau Professor

Richard F. and Eleanor A. Towner Professor of Engineering
College of Engineering