

Approved by the  
Regents  
May 21, 2015

PROMOTION RECOMMENDATION  
THE UNIVERSITY OF MICHIGAN  
MEDICAL SCHOOL  
DEPARTMENT OF RADIOLOGY

Craig J. Galbán, Ph.D., associate professor of radiology, without tenure, Department of Radiology, Medical School, is recommended for the granting of tenure to be held with his title of associate professor of radiology, Department of Radiology, Medical School [also associate professor of biomedical engineering, without tenure, Department of Biomedical Engineering, Medical School and College of Engineering].

Academic Degrees:

Ph.D.	1999	Florida State University
B.S.	1995	Florida State University

Professional Record:

2014-present	Associate Professor of Radiology, without tenure, University of Michigan
2014-present	Associate Professor of Biomedical Engineering, University of Michigan
2011-2014	Assistant Professor of Biomedical Engineering, University of Michigan
2008-2014	Assistant Professor of Radiology, University of Michigan
2006-2008	Research Investigator, Department of Radiology, University of Michigan
2007-2011	Research Investigator, Department of Biomedical Engineering, University of Michigan

Summary of Evaluation:

Teaching: Dr. Galbán provides teaching in both informal (small group) and formal (large group) settings. As a faculty in the Center for Molecular Imaging (CMI), Dr. Galbán teaches graduate students and post-doctoral fellows rotating in the CMI, including both local and international students. On the average, two or three undergraduates work in Dr. Galbán's laboratory each year. Students working under Dr. Galbán's guidance have an excellent record of publication. Dr. Galbán has also served on the dissertation committees of two graduate students, one from the College of Pharmacy and the second from the College of Engineering. In large group teaching, Dr. Galbán provides lectures on the basic physics of magnetic resonance imaging, critical thinking with an emphasis on diagnostic imaging, and tumor imaging. He has taught in formal courses in the Department of Nuclear Engineering (NERS 852), the Department of Biological Chemistry (BC 597) and the Comprehensive Cancer Center (CB 554). Dr. Galbán's knowledge of the field and excellent communication skills have contributed to his effectiveness as an educator. Comments from the students include "Excellent presentation of overview of physics involved," "Great talk of key technology options," and "Great lecture. Just the right amount of detail."

Research: Dr. Galbán is a faculty member in the Center for Molecular Imaging where techniques which interrogate at the cellular level enable a prediction of tissue behavior and

specifically, response to therapy, long before clinical manifestations become apparent. Dr. Galbán is developing quantitative imaging techniques to more accurately enable us to make these assessments and expanding the application to other clinical challenges. He is applying a novel, voxel-based imaging analysis algorithm called Parametric Response Mapping (PRM) to lung CT images to not only image but also quantify the previously invisible component of chronic obstructive pulmonary disease (COPD). This work is a major advance in the field and has resulted in two publications in *Nature Medicine* in which Dr. Galbán is the first-author. (The accompanying commentary in the journal attests to its overall significance.) With the success of parametric response mapping for COPD, Dr. Galbán is working to develop a unified analytic technique for diagnosing and monitoring pulmonary diseases. An example of this approach is the development of a CT based biomarker for the early detection of bronchiolitis obliterans syndrome (BOS) in patients who develop graft versus host disease following bone marrow transplantation or lung transplantation. Currently, patients with BOS are diagnosed too late for treatment to be effective. Further expansions of paramagnetic response mapping to differentiate pulmonary diseases such as infection or fibrosis from BOS are needed. The initial results of his work are encouraging and publication of this technique is planned. The quality of Dr. Galbán's research is outstanding. It is documented not only in his numerous high quality publications in journals with a high impact factor, including *Nature Medicine*, but also by his outstanding external funding. He is the core B director of a \$10-million grant on "Brain Tumor Therapeutic Efficacy by Quantitative Magnetic Resonance Imaging." He is also the core B director in the grant "*In vivo* Imaging of Neoplasia" which has almost ten million dollars in NIH funding. He is the principal investigator on smaller grants from the NIH and the Pierce Fund for Breast Cancer Research.

#### Recent and Significant Publications:

Galbán CJ, Han MK, Boes JL, Chughtai KS, Meyer CR, Johnson TD, Galbán S, Rehemtulla A, Kazerooni EA, Martinez FJ and Ross BD: CT-based biomarker provides unique signature for Diagnosis of COPD Phenotypes and Disease Progression. *Nature Medicine* 18:1711-1715, 2012.

Hoff BA, Bhojani MS, Rudge J, Chenevert TL, Meyer CR, Galbán S, Johnson TD, Leopold JS, Rehemtulla A, Ross BD, Galbán CJ: DCE and DW-MRI monitoring of vascular disruption following VEGF-Trap treatment of a rat glioma model. *NMR Biomed* 25:935-942, 2012.

Lemasson B, Chenevert TL, Lawrence TS, Tsien C, Sundgren PC, Meyer CR, Junck L, Boes J, Galbán S, Johnson TD, Rehemtulla A, Ross BD, Galbán CJ: Impact of perfusion map analysis on early survival prediction accuracy in glioma patients. *Translational Oncology* 6:766-774, 2013.

Galbán CJ, Boes JL, Bule M, Kitko CL, Couriel DR, Johnson TD, Lama V, Telenga ED, van den Berge M, Rehemtulla A, Kazerooni EA, Ponkowski MJ, Ross BD, Yanik GA: Parametric response mapping as an indicator of bronchiolitis obliterans syndrome after hematopoietic stem cell transplantation. *Biology of blood and marrow transplantation. Journal of the American Society for Blood and Marrow Transplantation* 20:1592-1598, 2014.

Boes JL, Hoff BA, Bule M, Johnson TD, Rehemtulla A, Chamberlain R, Hoffman EA, Kazerooni EA, Martinez FJ, Han MK, Ross BD, Galbán CJ: Parametric response mapping monitors temporal changes on lung CT scans in the subpopulations and intermediate outcome measures in COPD study (SPIROMICS) *Academic Radiology* (In Press).

Service: Dr. Galbán provides service on both local and national levels. At the University of Michigan, he serves as the director of the small animal imaging core for the Center for Molecular Imaging (CMI). The core services over two hundred users with six different imaging technologies and a broad range of research applications. Dr. Galbán is responsible for assisting these investigators in determining which techniques would be most appropriate for their research and assuring that the studies are done appropriately. On a national level, he serves as a manuscript reviewer for nine different journals and serves on the editorial board of *Cancer Research*. This is the flagship journal of the American Association for Cancer Research and is arguably the leading cancer research journal. Dr. Galbán has served as a grant reviewer for several granting organizations including the NIH and the Dutch Cancer Society.

#### External Reviewers:

Reviewer A: “Dr. Galbán’s scholarship has thus far been excellent. He has been actively engaged in numerous funded grants and he has published regularly in quality scientific journals, often as first author, for the last twelve-plus years....the area where he seems to be making the greatest contributions, is in the field of developing and evaluating imaging biomarkers and parametric response mapping. He works in multiple modalities and with a variety of teams, allowing his particular expertise to bring benefits to a wide audience. As such, his results have been able to have a significant and broad impact in the imaging field.”

Reviewer B: “Dr. Galbán’s parametric response approach, specifically applied to COPD, resulted in a clear paradigm shift in our approach to this condition. In the short time since the Nature Medicine publication, almost every major COPD imaging research group, including a group I met with today, have adopted or adapted his group’s approach. He himself is adapting the method for use in evaluation of bronchiolitis obliterans and bone loss, as well as his previous work with gliomas. He has several pending patents in this area. This clearly represents a major advance.”

Reviewer C: “He certainly has achieved national recognition, as required by your promotion process. This is evidenced by invitation and participation on NIH study sections, by his inclusion as a peer-reviewer for several high profile journals/conferences, by his service on the Editorial Board of Cancer Research, and by his 11 invited extramural lectures...”

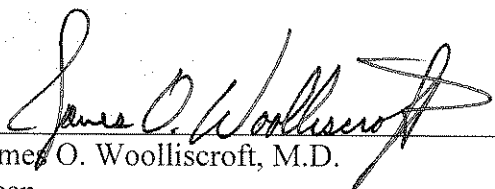
Reviewer D: “Dr. Galbán has been productive. He has on the order of 60 total publications, with the majority of them having been completed while at Michigan. He has several high impact publications as first author. He has a few publications as senior author. He has been co-PI on one NIH grant, an R44 that has been recently awarded, and has several other NIH grants as PI, pending review....His techniques are not engineering curiosities, but have been applied to clinical medicine – including chest CT – to the point that he has helped to define better the pathology of certain lung diseases by virtue of the algorithms he has written. For example, PRM

is becoming a validated biomarker for COPD. He is clearly an integral member of the Center for Molecular Imaging, and has carved out an important niche in that environment with respect to developing and implementing image analysis platforms.”


Reviewer E: “Dr. Galbán's C.V. demonstrates his ability to translate basic bioengineering research into a more patient orientated image analysis project. This work, which is based upon relatively novel analytic tools, enables Radiologists to better identify and quantify disease states. This work is absolutely essential in pushing imaging as a biomarker, which will benefit both research, development of new pharmaceuticals, and patient care long term.”

Summary of Recommendation:

Dr. Galbán has made many contributions to the Department of Radiology, the University of Michigan, and the field of medicine through his innovative research. I enthusiastically recommend Craig J. Galbán, Ph.D. for the granting of tenure to be held with his title of associate professorship of radiology.



James O. Woolliscroft, M.D.  
Dean  
*Lyle C. Roll Professor of Medicine*



David C. Munson, Jr.  
Robert J. Vlasic Dean of Engineering  
College of Engineering

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