

*Medical Imaging 2016*

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# **Biomedical Applications in Molecular, Structural, and Functional Imaging**

**Barjor Gimi  
Andrzej Krol**  
*Editors*

**1–3 March 2016  
San Diego, California, United States**

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SPIE

**Volume 9788**

Proceedings of SPIE, 1605-7422, V. 9788

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Medical Imaging 2016: Biomedical Applications in Molecular, Structural, and Functional Imaging,  
edited by Barjor Gimi, Andrzej Krol, Proc. of SPIE Vol. 9788, 978801 · © 2016 SPIE  
CCC code: 1605-7422/16/\$18 · doi: 10.1117/12.2240426

The papers in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. Additional papers and presentation recordings may be available online in the SPIE Digital Library at [SPIDigitalLibrary.org](http://SPIDigitalLibrary.org).

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Please use the following format to cite material from these proceedings:

Author(s), "Title of Paper," in *Medical Imaging 2016: Biomedical Applications in Molecular, Structural, and Functional Imaging*, edited by Barjor Gimi, Andrzej Krol, Proceedings of SPIE Vol. 9788 (SPIE, Bellingham, WA, 2016) Six-digit Article CID Number.

ISSN: 1605-7422

ISSN: 2410-9045 (electronic)

ISBN: 9781510600232

Published by

**SPIE**

P.O. Box 10, Bellingham, Washington 98227-0010 USA

Telephone +1 360 676 3290 (Pacific Time) · Fax +1 360 647 1445

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## Introduction

The 2016 SPIE Biomedical Applications in Molecular, Structural and Functional Imaging Conference was held at Town and Country Resort & Convention Center in San Diego, California. We maintained the high participation we saw last year, both in the number of abstracts submitted and in conference attendees. Chairs Barjor Gimi and Andrzej Krol welcomed keynote speaker Joseph J. H. Ackerman from Washington University in St. Louis. The outstanding, thoughtful keynote address provided insights on the source of magnetic resonance signal for a range of experiments and conditions, and suggested how these insights may be used to better characterize pathophysiology.

The diverse sessions included Keynote and Neurological Imaging, Novel MR Techniques and Applications, Innovations in Image Processing, Bone and Skeletal Imaging, Biomechanics, fMRI, Optical, Lung, Fluids and Cardiovascular, Cancer Imaging and Novel Imaging Methods. We are grateful to the session chairs: Armando Manduca, Axel Wismüller, Changqing Li, and Baohong Yuan.

The following researchers were awarded the conference fee waivers for outstanding papers: Karl G. Helmer, Athinoula A. Martinos Center for Biomedical Imaging (United States), Wyke Huizinga, Erasmus MC (Netherlands), and Dakai Jin, The University of Iowa (United States).

The poster session comprised vibrant discussions. A panel of five judges selected Elizabeth Duncan's, "Application of probabilistic fiber tracking method of MR imaging to measure impact of cranial irradiation on structural brain connectivity in children treated for medulloblastoma," St. Jude Children's Research Hospital (United States), for the Cum Laude Award.

The following posters were selected as honorable mentions: Manjiri Dighe's, "Regional placental BOLD changes with gestational age in normally developing pregnancies using long duration R2\* mapping in utero," University of Washington (United States); Brendan L. Eck's "Comparison of quantitative myocardial perfusion imaging CT to fluorescent microsphere-based flow from high resolution cryo-images," Case Western Reserve University (United States); and David Prabhu's, "3D registration of intravascular optical coherence tomography and cryo-image volumes for microscopic-resolution validation," Case Western Reserve University (United States).

**Barjor Gimi**  
**Andrzej Krol**



## 2016 Medical Imaging Award Recipients

### Robert F. Wagner Best Student Paper Award

Robert F. Wagner was an active scientist in the SPIE Medical Imaging meeting, starting with the first meeting in 1972 and continuing throughout his career. He ensured that the BRH, and subsequently the CDRH, was a sponsor for the early and subsequent Medical Imaging meetings, helping to launch and ensure the historical success of the meeting. The Robert F. Wagner All-Conference Best Student Paper Award (established 2014) is acknowledgment of his many important contributions to the Medical Imaging meeting and his many important advances to the field of medical imaging.



This award is cosponsored by:



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# SPIE.

2016 Recipients:

First Place: **MIND Demons for MR-to-CT deformable image registration in image-guided spine surgery** (9786-16)

S. Reangamornrat, T. De Silva, A. Uneri, Johns Hopkins Univ. (United States), J.-P. Wolinsky, Johns Hopkins Hospital (United States), A. J. Khanna, Johns Hopkins Health Care & Surgery Ctr. (United States), G. Kleinszig, S. Vogt, Siemens Healthcare (Germany), J. L. Prince, J. H. Siewerdsen, Johns Hopkins Univ. (United States)

Second Place: **Design, fabrication, and implementation of voxel-based 3D printed textured phantoms for task-based image quality assessment in CT** (9783-76)

Justin Solomon, Duke Univ. School of Medicine (United States), Alexandre Ba, Institut Univ. de Radiophysique Appliquée (Switzerland), Andrew Diao, Duke Univ. (United States), Joseph Lo, Elianna Bier, Duke Univ. School of Medicine (United States), François Bochud, Institut Univ. de Radiophysique Appliquée (Switzerland), Michael Gehm, Duke Univ. (United States), Ehsan Samei, Duke Univ. School of Medicine (United States)

## Conference 9788 Awards

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### Cum Laude Poster Award

First Place: **Application of probabilistic fiber-tracking method of MR imaging to measure impact of cranial irradiation on structural brain connectivity in children treated for medulloblastoma** (9788-98)

Elizabeth C. Duncan, Wilburn E. Reddick, John O. Glass, Jung Won Hyun, Qing Li, Yimei Li, Amar Gajjar, St. Jude Children's Hospital (United States)

