

**Keith Stantz, Ph.D.**  
School of Health Sciences  
College of Human and Health Sciences  
Purdue University

550 Stadium Mall Drive  
West Lafayette, Indiana 47907-2091

## EDUCATION

|           |  |     |                  |
|-----------|--|-----|------------------|
| 1984-1988 | <i>Valparaiso University, Valparaiso, IN</i>   | BS  | EECE & Physics   |
| 1988-1991 | <i>Michigan State University, East Lansing</i> | MS  | Physics          |
| 1991-1998 | <i>Indiana University, Bloomington</i>         | PhD | Particle Physics |

(Thesis: "Search for the lepton-family-number nonconserving decay  $\mu^+ \rightarrow e^+ \gamma$ ", Los Alamos National Laboratories, NM USA)

## PROFESSIONAL EXPERIENCE

|              |  |  |   |
|--------------|--|--|---|
| 2011-present | <i>Associate Professor</i>   | Purdue University, West Lafayette, IN; School of Health Sciences   | Research emphasizes development of photoacoustic computed tomography (PCT) and dynamic contrast-enhanced imaging (DCE-CT) for the <i>in vivo</i> quantification of intra-tumor hemodynamics in mouse models of cancer, the influence of intra-tumor hemodynamics on hypoxia, and effects of anti-angiogenic therapy on cancer stem cells and metastasis. Teaching duties in the fields of Medical Physics and Diagnostic Imaging includes instruction for undergraduate and graduate students in Imaging Sciences and Dosimetry, post-graduate instruction in Medical Physics, and graduate training in the application of PCT-S and DCE-CT in developmental therapy. |
| 2011-present | <i>Associate Director of Medical Physics Program (CAMPEP Accredited)</i> | Purdue University, School of Health Sciences and Department of Radiation Oncology and Radiology & Imaging Sciences, IUSM |   |
| 2010-present | <i>Director of Radiological Health Sciences</i>                          | Purdue University, School of Health Sciences   |   |
| 2005-2011    | <i>Assistant Professor</i>   | Purdue University, West Lafayette, IN; School of Health Sciences   |   |
| 2005-present | <i>Assistant Adjunct Professor</i>                                       | Indiana University School of Medicine; Department of Radiology and Imaging Sciences                                      |   |
| 2003-2005    | <i>Assistant Research Professor</i>                                      | Indiana University School of Medicine; Department of Radiology   |   |
| 2002-2003    | <i>Post-Doc</i>  | Indiana University School of Medicine, Department of Radiology, Indianapolis   |   |
| 2001-2002    | <i>Research Scientist</i>  | OptoSonics, Inc., Indianapolis, IN (now Oriental, NC)  |   |
| 2000-2001    | <i>Post-Doc</i>  | Indiana University School of Medicine, Department of Radiology, Indianapolis   |   |
| 1999-2000    | <i>Project Scientist/Consultant</i>                                      | Wavefront Sciences, Inc., Albuquerque, NM  |   |
| 1997-1999    | <i>Post-Doc</i>  | Sandia National Laboratories; Albuquerque, NM  |   |

## HONORS AND AWARDS

Robert R. Landolt Teaching Award (2007,2012) ♦ Honorable mention Poster Presentation Award SPIE Medical Imaging (2004) ♦ Best Physical Science Lecture/Campbell/Klatte Lecture Series (2001) ♦ Award of Excellence/Sandia National Laboratory (1999) ♦ Outstanding Graduate Student in

Research/Indiana University (1995) ♦ Graduated with High Distinction/Valparaiso University (1988)  
Sigma-Pi-Sigma (1987)

### PROFESSIONAL ORGANIZATIONS

AAPM (2010-present) ♦ SPIE (2001-present) ♦ Society of Molecular Imaging (2003-present) ♦  
Academy of Molecular Imaging (2004-2006;2009-present) ♦ Radiological Research Society (2009-  
present)

### MANUSCRIPT AND GRANT REVIEW

Medical physics, Radiation Research, Physics of Medicine and Biology, Physics Review D, Journal of  
Biomedical Optics, and Nanotechnology ♦ CTSI Pilot and Core Grant (2010-present); NIH SBIB Grant  
(ZRG1 SBIB-T10, 2012)

### EDUCATIONAL ACTIVITIES

**Teaching Responsibilities:** **HSCI 570** Diagnostic Medical Imaging (2005-present) ♦ **HSCI 526**  
Principles of Health Physics and Dosimetry (2005-present) ♦ Guest Lecturer (**HSCI 101**  
Introduction to Health Sciences; **HSCI 202** Essentials of Environmental, Occupational, and  
Radiological Health Sciences; **HSCI 540** Radiation Biology; **HSCI 698** Seminars in Health  
Sciences) ♦ Evaluations consistently rated at the very top: 4.2-4.8/5.0

**Graduate Training:** Primary Advisor to 5 Ph.D. and 2 M.S. thesis students (10 awards including from  
national and international organizations) ♦ Co-Primary Advisor to 2 Ph.D. students ♦ Thesis  
committee member/advisor to over 20 Ph.D. and M.S. students and 4 M.S. students

### RESEARCH ACTIVITIES

#### Published Journal and Proceeding Articles (15 out of 40)

1. **Stantz KM**, Cao M, Cao N, Liang Y, Miller KD. Monitoring the Longitudinal Intra-Tumor Physiology Impulse Response to VEGFR2 Blockade in Breast Tumors Using DCE-CT. *Molecular Imaging and Biology* 13(6):1183-95, 2011
2. **Stantz KM**, Cao N, Liu B, Cao M, Chin-Sinex H, Mendonca M, Li JJ. "Effects of Radiation on tumor hemodynamics and NF-kappaB in breast tumors. *Proc SPIE BIOS 7564*: 75641J-75641J-6, 2010.
3. **Stantz KM**. Imaging hypoxia using 3D photoacoustic spectroscopy, *Proc SPIE BIOS 7564*: 7564419-7564419-6, 2010.
4. Cheong YJ, **Stantz KM**. Photon propagation correction in 3D photoacoustic image reconstruction using Monte Carlo Simulation, *Proc SPIE BIOS 7564*: 75640G-75640G-10, 2010.
5. Cao M, Liang Y, Miller K, **Stantz KM**. Developing DCE-CT to Quantify Intra-Tumor Heterogeneity in Breast Tumors with Differing Angiogenic Phenotypes. *IEEE Trans. Med. Imaging* 28(6):861-871, 2009.
6. Kruger RA, Reinecke D, Kruger G, Thornton M, Picot P, Morgan T, **Stantz KM**, Mistretta C. HYPR-spectral photoacoustic CT for preclinical imaging. *Proc SPIE BiOS 7177*:71170F-F9, 2009.
7. **Stantz KM**, Liu B, Kruger RA. Using Monte Carlo Simulations to Understand the Influence of Photon Propagation on Photoacoustic Spectroscopic Imaging. *Proc. SPIE BiOS 6437*:1-10, 2007.
8. Liu B, Reinecke D, Kruger RA, **Stantz KM**. Phantom and *In Vivo* Measurements of Hemoglobin Concentration and Oxygen Saturation Using PCT-S Small Animal Scanner. *Proc SPIE BiOS 6437*:64371X1-9, 2007.
9. Brutkiewicz S, Mendonca M, **Stantz K**, Comerford K, Bigsby R, Hutchins G, Goebel M, Harrington M. "The expression level of luciferase within tumour cells can alter tumour growth upon *in vivo* bioluminescence imaging", *Luminescence* 22(3):221-8, 2007.
10. **Stantz KM**, Liu Bo, Cao M, Reinecke D, Dziedzic M, Liang Y, Kruger RA. Measuring Hypoxic Factors in Solid Tumors Using Photoacoustic and X-Ray CT. *Molecular Imaging* 5(2):362-3, 2006.

11. **Stantz KM**, Liu B, Cao M, Reinecke D, Miller K, Kruger R, “Photoacoustic spectroscopic imaging of intra-tumor heterogeneity and molecular identification”, *Proc. SPIE BIOS* **6086**:36-47, 2006.
12. **Stantz KM**, Liu B, Cao M, Reinecke D, Dziedzic M, Liang Y, Kruger R. “Evaluating Dynamic Contrast-Enhanced and Photoacoustic CT to Assess Intra-Tumor Heterogeneity in Xenograft Mouse Models”, *Proc. SPIE Medical Imaging* **6143**:489-500, 2006.
13. Wang J-Q, Pollok KE, Cai S, **Stantz KM**, Hutchins GD, Zheng Q-H, PET Imaging and Optical Imaging with D-luciferin [11C]methyl ester and D-luciferin [11C]methyl ether of luciferase gene expression in tumor xenografts of living mice, *Bioorganic & Medicinal Chemistry Letters* **16**:331-337, 2006.
14. Xiong Li, Yan-Ping Zhang, Kyung-Hee Bae, **Keith M Stantz**, Sang-Jin Lee, Chaeyong Jung, Juan A Jimenez, Thomas A Gardner, Meei-Huey Jeng, Chinghai Kao, “Gene Therapy for Prostate Cancer by Controlling Adenovirus E1A and E4 Gene Expression with PSES Enhancer”, *Cancer Research* **65**(5):1941-1951, 2005.
15. Ganapathy Krishnamurthi, **Keith M. Stantz**, Rosemary Steinmetz, Gary D. Hutchins, Yun Liang, “Functional imaging in small animals using X-ray computed tomography – Study of physiological measurement reproducibility”, *IEEE Transactions on Medical Imaging* **24**(7): 832-843, 2005.

**Published Abstracts (20+ published)** Provided upon request

**Scientific Presentations, selected list of Oral/Poster (and students) (over 45)** Provided upon request

#### **Current Funding**

NIH/R21 EB012849

12/01/2011-11/30/2013

Percent Effort: 30%

Noninvasive imaging and therapeutic targeting of the hypoxic-niche associated with CSCs” (PI: Stantz)

Description: The objective is to demonstrate a new method to non invasively image tumor hypoxia and its type, and to correlation these regions of a tumor with cancer stem cell prevalence and phenotype.”

NIH/NCI SBIR 2R44CA102891-05

4/01/2009-9/31/2012

“Photoacoustic CT for Preclinical Molecular Imaging”

(PI: Dr. Kruger)

Percent effort: 25%

Description: A collaborative grant with industry (Optosonics and Endra) with the goal to design, build, calibrate, and validate *in vivo* molecular imaging study using photoacoustic spectroscopic imaging.

Ovarian Cancer Research Foundation

01/01/11-12/31/2013

“Determine the *in vivo* of DNA methylation inhibitors against relapsed ovarian cancer and mechanisms of EMT”

(PI: Dr. Daniela Matei)

Percent effort: 2.5%

The objective of this proposal is based on the hypothesis that tumor progression, recurrence, and metastasis are associated with methylation of transcripts (genes and microRNAs) that inhibit EMT. The objective is to investigate the effects of demethylating agents on markers and mechanisms of EMT.

Purdue Cancer Center Pilot Grant

7/2012-8/2013

“TARGETING THE FUNCTIONAL OVARIAN C ANGER STEM CELL NICHE AS A MEANS OF OC CHEMOSENSITIZATION”

(PI: Dr. Keith Stantz)

Salary Component: 0% AY

The objective is to demonstrate anti-angiogenic therapy can mitigate OCSC niche and sensitize OC to chemotherapy.

Overlap: None