

Keith Stantz, Ph.D.
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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

2016-present **Director of Medical Physics Program (CAMPEP Accredited)**, Purdue University,
School of Health Sciences and Department of Radiation Oncology and Radiology
& Imaging Sciences, IUSM

2011-present **Associate Professor** Purdue University, West Lafayette, IN; School of Health
Sciences

Dr. Stantz’s lab develops thermodynamic computed tomographic and dynamic contrast-enhanced imaging technology and techniques for the *in vivo* quantification of intra-tumor hemodynamics and dosimetry to enhance cancer therapy. These techniques, in combination with biophysical image fusion models, are being used to characterize hypoxia using photoacoustic CT spectroscopy (PCT-S) and dynamic contrast-enhanced CT (DCE-CT), which are used to investigate the effects of anti-angiogenic therapy on radiation therapy, cancer stem cells prevalence, and metastasis. Recently, a new thermoacoustic scanner dubbed radiation acoustic dosimetric imaging (RACT) is being developed to localize and validate particle dose and range. When combined with advanced imaging methods, the combination has the potential to advance particle beam therapy in the biological targeting of the tumor microenvironment to reduce recurrence of inoperable tumors. Administrative and teaching duties include duties as the Director of the CAMPEP-accredited Purdue Medical Physics program and instructor of courses in the field of Medical Physics and Imaging Sciences, which includes Medical Imaging, Molecular Imaging, Dosimetry, and Clinical Imaging of Radiological Imaging Systems.

2011-2016 **Associate Director of Medical Physics Program (CAMPEP Accredited)**, Purdue
University, School of Health Sciences and Department of Radiation Oncology
and Radiology & Imaging Sciences, IUSM

2005-2011 **Assistant Professor** Purdue University, West Lafayette, IN; School of Health
Sciences

2005-present **Assistant Adjunct Professor** Indiana University School of Medicine; Department of
Radiology and Imaging Sciences

2003-2005 **Assistant Research Professor** Indiana University School of Medicine; Department of
Radiology

2002-2003 **Post-Doc** Indiana University School of Medicine, Department of
Radiology, Indianapolis

2001-2002 **Research Scientist** OptoSonics, Inc., Indianapolis, IN (now Oriental, NC)

2000-2001 **Post-Doc** Indiana University School of Medicine, Department of
Radiology, Indianapolis

1999-2000 **Project Scientist/Consultant** Wavefront Sciences, Inc., Albuquerque, NM

1997-1999 *Post-Doc* Sandia National Laboratories; Albuquerque, NM

PROFESSIONAL ACTIVITIES

Honors and Awards

Editor's Choice, Manuscript, Medical Physics Journal (2015) ♦ Robert R. Landolt Teaching Award (2007, 2012, 2014) ♦ 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 (2003-2008) ♦ Academy of Molecular Imaging (2004-2006) ♦ World Molecular Imaging Congress (2008-present) ♦ Radiological Research Society (2009-2014)

Manuscript and Grant Review

Medical physics ♦ Radiation Research ♦ Physics of Medicine and Biology ♦ Radiation Research ♦ Physics Review D ♦ Journal of Biomedical Optics ♦ Nanotechnology ♦ Applied Physics ♦ Nanoparticles ♦ AAPM Conf. Abstract Review ♦ WMIC Conf. Abstract Review ♦ IEEE Transactions in Medical Imaging ♦ BMC Cancer

NIH SBIB Grant (ZRG1 SBIB-T10, 2012-2014) ♦ DOD, Breast Cancer, CET-1 (2013) ♦ Cancer Center Grants/Purdue ♦ CTSI Pilot and Core Grant (2010-2012)

Patents

Patent 6,607,274; 2002; **Stantz KM**, Neal DR, Rammage R; Method for computing visual performance from objective ocular aberration measurements ♦ Patent 9,789,339; **Stantz KM** and Moskvina V; Methodology and system design for 3D dosimetric imaging of charged particles in media.

EDUCATIONAL ACTIVITIES

Teaching Responsibilities: **HSCI 570** Diagnostic Medical Imaging (2005-present) ♦ **HSCI 526** Principles of Health Physics and Dosimetry (2005-present) ♦ **HSCI 590** Molecular Imaging (2013-present) ♦ **HSCI 690** Clinical Radiological Imaging and QA I (2015-present) ♦ **HSCI 690** Clinical Radiological Imaging and QA II (2016-present) ♦ **Guest Lecturer to HSCI 101** Intro to Health Sciences; **HSCI 202** Essentials of Environmental, Occupational, and Radiological Health Sciences; **HSCI 540** Radiation Biology

Graduate Training: Primary Advisor to 8 Ph.D. and 4 M.S. thesis students (15+ awards including from national and international organizations) ♦ 6 undergraduate students ♦ Co-Primary Advisor to 4 Ph.D. students ♦ Thesis committee member/advisor to over 25+ Ph.D. and M.S. students

RESEARCH ACTIVITIES

Published Articles

1. Miles D, Cao N, Sandison G, Stewart RD, Moffitt G, Pulliam T, Parvathaneni U, Nghiem P, Stantz K. Differential effects of high versus low linear energy transfer (LET) radiation on type-I interferon (IFN β) and TREX1 responses. bioRxiv 2021.07.07.451516; doi:<https://doi.org/10.1101/2021.07.07.451516>.

2. Sick J, Rancilio NJ, Fulkerson CV, Plantenga JM, Knapp DW, Stantz KM. An ultrasound based platform for image-guided radiotherapy in canine bladder cancer patients. *Physics and Imaging in Radiation Oncology*. 2019; 12:10-16. doi.org/10.1016/j.phro.2019.10.003
3. B. S. Coventry, J. T. Sick, T. M. Talavage, K. M. Stantz and E. L. Bartlett, "Short-wave Infrared Neural Stimulation Drives Graded Sciatic Nerve Activation Across A Continuum of Wavelengths," *2020 42nd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, 2020, pp. 3581-3585, doi: 10.1109/EMBC44109.2020.9176177.
4. Verleker A, Shaffer M, Fang Q, Choi MR, Clare S, **Stantz KM**. Optical dosimetry probes to validate Monte Carlo and empirical-methods-based NIR dose planning in the brain. *Applied Optics* 55(34):9875-, 2016
5. Lee CW and **Stantz KM**. Development of a mathematical model to estimate intra-tumor oxygen concentrations through multi-parametric imaging. *BioMedical Engineering Online* 15:114-133, 2016.
6. Cao N, Song SH, Maleki T, Shaffer M, **Stantz KM**, Cao M, Kao C, Mendonca M, Ziaie B, Ko S-C. Radiosensitizing Pancreatic Cancer Xenografts by an Implantable Micro-Oxygen Generator, *Radiation Research* 185(4):431-437, 2016.
7. Lee CW, Guo L, Matei D, **Stantz K**. Development of Follicle-Stimulating Hormone Receptor Binding Probes to Image Ovarian Xenografts. *J Biotechnol Biomater* 5:198., 2015. doi:10.4172/2155-952X.1000198
8. Alsanea F, Moskvin V, **Stantz KM**. Feasibility of RACT for 3D dose measurement and range verification in a water phantom. *Med. Phys* 42(2):937-946, 2015. (*Editor's Pick*)
9. Verleker AP, Fang Q, Choi M-R, Clare S, **Stantz KM**. An empirical approach to estimate near-infrared photon propagation and optically induced drug release in brain tissues. *Proc SPIE BiOS* 9308-29: 1-8, 2015 (doi: 10.1117/12.2079991)
10. Cao N, Cao M, Chin-Sinex H, Mendonca M, Ko S-C, **Stantz KM**. Monitoring the Effects of Anti-angiogenesis on the Radiation Sensitivity of Pancreatic Cancer Xenografts Using Dynamic Contrast-Enhanced CT. *International Journal of Radiation Oncology, Biology, and Physics* 88(2):412-8, 2014.
11. Akshay Prabhu Verleker, Qianqian Fang, Mi-Ran Choi, Susan Clare and **Keith M. Stantz**. An Optical Therapeutic Protocol to treat brain metastasis by mapping NIR activated drug release: A Pilot Study. *Proc. IEEE NSS/MIC Conference M19-96*:1-7, 2014 (in press).
12. Yip Schneider MT, Wu H, **Stantz K**, Agaram N, Crooks PA, Schmidt CM. Dimethylaminoparthenolide and gemcitabine: a survival study using genetically engineered mouse model of pancreatic cancer. *BMC Cancer* 13:194-207, 2013.
13. Choi M-R, Bardhan R, Stanton-Maxey KJ, Badve S, Nakashatri H, **Stantz KM**, Cao N, Halas NJ, Clare SE, Delivery of nanoparticles to brain metastases of breast cancer using a cellular Trojan Horse. *Cancer Nanotechnology* 3: 47-54, 2012.
14. **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. (IF: 3.1)
15. **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.
16. **Stantz KM**. Imaging hypoxia using 3D photoacoustic spectroscopy, *Proc SPIE BIOS* 7564: 7564419-7564419-6, 2010.
17. Cheong YJ, **Stantz KM**. Photon propagation correction in 3D photoacoustic image reconstruction using Monte Carlo Simulation, *Proc SPIE BIOS* 7564: 75640G-75640G-10, 2010.
18. **Stantz KM**, Cao M, Liu B, Miller KD, Guo L. Molecular Imaging of Neutropilin-1 receptor using photoacoustic spectroscopy *Proc SPIE BIOS* 7564: 75641O-75641O-7, 2010.
19. Shaffer M, Kruger R, Reinecke D, Chin-Sinex H, Mendonca M, **Stantz KM**. Evaluation of Her2 status using photoacoustic spectroscopic CT techniques *Proc SPIE BIOS* 7564:756435-756435-5, 2010.

20. Liu B, Kruger RA, Reinecke D, **Stantz KM**. Monitoring hemoglobin concentration and oxygen saturation in living mouse tail using Photoacoustic CT scanner. *Proc SPIE BiOS* **7564**:756439-1-5, 2010.
21. Liu B, Kruger RA, Reinecke D, **Stantz KM**. Ex vivo hemoglobin status using photoacoustic computed tomography small animal scanner. *Proc SPIE BiOS* **7564**:75643A-1-5, 2010.
22. Cao M, Liang Y, **Stantz K**. Response Letter: Developing DCE-CT to Quantify Intra-Tumor Heterogeneity in Breast Tumors with Differing Angiogenic Phenotypes. *IEEE Trans Med Imaging* **29**(4):1089-1092, 2010.
23. 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.
24. 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.
25. **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.
26. 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.
27. 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.
28. **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.
29. **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.
30. Liu B, Gattone VH, Kruger RA, **Stantz KM**. Assessment of photoacoustic computed tomography to classify tissue in a polycystic-kidney disease mouse model. *Proc. SPIE* **6086**:54-61, 2006.
31. Cao M, **Stantz KM**, Liang Y. Myocardial physiology measurements using contrast enhanced dynamic computed tomography: simulation of beam hardening effect. *Proc. SPIE* **6143**:822-830, 2006.
32. 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.
33. 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.
34. 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.
35. Cao M, **Stantz KM**, Liang Y, Krishnamurthi G, Presson RG Jr. Assessment of multislice CT to quantify pulmonary emphysema function and physiology in a rat model. *Proc. SPIE* **5746**: 498-506, 2005.
36. Ganapathy Krishnamurthi, **Keith M. Stantz**, Rosemary Steinmetz, Gary D. Hutchins, Yun Liang: Reproducibility of physiologic parameters obtained using functional computed tomography in mice. *Proc. SPIE* **5369**: 394-405, 2004.

37. **Stantz KM**; Liang, Yun; Hutchins, Gary. Kinematic Modeling and Its Implication in Longitudinal Chemotherapy Study of Tumor Physiology: Ovarian Xenograft Mouse Model and Contrast-Enhanced Dynamic CT. *Proc. SPIE Vol. 5369*: 769-779, 2004.
38. **Stantz, Keith M**, Liang, Yun, Meyer, Christopher, Teague, Shawn, Stecker, Michael, Hutchins, Gary; McLennan, Gordon; Persohn, Scott, “In-Vivo Regional Myocardial Perfusion Measurement in a Porcine Model by ECG-Gated Multislice Computed Tomography,” *Proc. SPIE Medical Physics 5031*: 222-233, 2003.
39. Kruger, Robert A., **Stantz, Keith**, Kiser, William L., “Thermoacoustic CT of the breast”, *Proc. SPIE Medical Imaging 4682*: 521-525, 2002.
40. Ahmed M, Amann JF, Barlow D, et al., “Search for the lepton-family-number nonconserving decay $\mu(+)\rightarrow e(+)\gamma$ ”, *Phys Rev D 65*(11): 65-97, 2002.
41. Rouze, N.C., **Stantz KM**, Hutchins GD. Design of IndyPET-II, a high-resolution, high-sensitivity dedicated research scanner. *IEEE Nuclear Science Symposium Conference 3*:1545–1549, 2001.
42. Liang Y, **Stantz KM**, Krishnamurthi G, Chen L, Hutchins G, “Investigation of Contrast-Enhanced In-Vivo Animal Imaging with Micro-CT,” Proceedings of 2002 ASME International Mechanical Engineering Congress and Exposition, 2002.
43. **Stantz KM**, Cameron SM, Robinett RD, Trahan MW, Wagner JS. Dynamical Behavior of Multi-Robot Systems Using Lattice Gas Automata. *Proc. SPIE 3693*: 55-65, 1999.
44. Brooks ML, Chen YK, Cooper MD, et al. New limit for the lepton-family-number nonconserving decay $\mu(+)\rightarrow e(+)\gamma$. *Phys Rev Lett 83*(8): 1521-1524, 1999.
45. Trahan MW, Wagner JS, **Stantz KM**, Gray PC, Robinett R. Swarms of UAVs and Fighter Aircraft, The International Conference on Nonlinear Problems in Aviation and Aerospace, 1998.
46. Cameron SM, Loubriel GM, Robinett RD, **Stantz KM**, Trahan MW, Wagner JS. Adaptive Remote-Sensing Techniques Implementing Swarms of Mobile Agents. *Proc. SPIE 3713*:160-177, 1999.
47. Cooper MD, Armijo V, Black JK, et. al. Construction and performance of MEGA’s low-mass, high-rate cylindrical MWPCs. *Nucl Instrum Meth A417*(1): 24-49, 1998.
48. Piilonen L, Amann JF, Bolton RD, et al. Measurement of the Michel rho parameter in direct muon decay. *AIP Conf Proc 412*: 826-831, 1997.
49. Cooper MD, Brooks M, Hogan GE, et. al. Lepton Flavor Violation,” *AIP Conf Proc 412*:34-48, 1997.
50. Chen YK, Cooper MD Cooper PS, et. al. Architecture of the MEGA detector trigger. *Nucl Instrum Meth A372* (1-2): 195-206, 1996.
51. Szymanski JJ, Amann JF, Baker K, et al. MEGA: A search for the decay $\mu\rightarrow e\gamma$: *AIP Conf Proc 338*:789-792, 1995.
52. Tu X-L, Amann JF, Bolton RD, et al. Measurement of the Michel parameter rho in normal muon decay. *AIP Conference Proceedings 338*(1):763-768, 1995.

Published Abstracts/Presentations

1. Miles D, Cao N, Sandison G, Stewart RD, Moffitt G, Pulliam T, Parvathaneni U, Goff P, Nghiem P, Stantz K. PTCNA-0071 - Effects of particle LET on IFN β and TREX1 expression. Seventh Annual Conference PTCOG North America (Sept, 2021; Seattle, WA, USA). (Presentation)
2. Hatch E, Miles D, Cao N, Goff P, Stewart RD, Nghiem P, Stantz K, Sandison GA. Comparison of Micronuclei Formation by High LET Fast Neutrons and Low LET X-rays. Seventh Annual Conference PTCOG North America (Sept, 2021; Seattle, WA, USA). (Presentation)
3. Miles D, Cao N, Pulliam T, Cherny S, Stewart RD, Moffitt G, Sandison G, Nghiem P, Goff P, Hatch E, Stantz K. WE-D-TRACK 3-6, RBE for STING immunogenic signaling from low LET x-ray and high LET neutrons. *Med Phys* 2020; 47(6):e354.
4. Miles D, Stantz K. Photoacoustic CT to Characterize the Effects of Antiangiogenic Drugs On Acute and Chronic Hypoxia, WE-FG-303-7, Medical Physics, 46 (6), June 2019 e468-e469 (selected for oral presentation)

5. Klem M and Stantz K. Feasibility of a prototype RACT scanner to Image Proton Beam in the Brain, Annual Medical Physics, SU-E-202-1, Medical Physics 45(6): 2722, 2018 (selected for Oral presentation) <https://doi.org/10.1002/mp.12968>
6. Klem M, Moskvin V, Hecksel D, Pankuch M, Stantz K. Design and Construction of a prototype RACT scanner, SU-F-KDBR1-05, Medical Physics 45(6):2724, 2018 (selected for Oral presentation)
7. Miles D, Moskvin V, Stantz K. A Monte Carlo study of STING induction in radiation therapy, THEF-KDRBRA1-01, Medical Physics 45(6):2792, 2018 (selected for Oral presentation)
8. Miles D, Nguyen T, Moustaki A, Stirn F, Youngblood B, Stantz K. Photoacoustic CT to characterize acute and chronic hypoxia, TU-K-207-06, Medical Physics 45(6):2774, 2018 (selected for oral presentation)
9. Castanares M, Chavali B, Meyer C, Babur M, Little RA, Cheung S, Watson Y, Steart JA, Falcon BL, Williams K, Plowman GD, **Stantz KM**, O'Connor JP, Chintharlapalli S, Collins EC. Investigations on the temporal evolution of antivasular effects induced by anti-angiogenic therapy using multiple imaging modalities in an orthotopic syngeneic mouse model (2733550).. *Mol Imaging Biol* 19 (Suppl 1):S190, 2017. (Abstract)
10. Miles D, Stantz K, Moskvin V, Farr J. An Auxiliary Minibeam Collimator for Preclinical Proton Radiotherapy. Medical Physics 44(6): 3179-80, 2017. (Selected for CAMPUS Therapy ePoster Presentation)
11. Klem M, Moskvin V, Farr J, Stantz K. Fourier Space Guided RACT Design and Simulation. Medical Physics 44(6):3259, 2017. (Selected for Oral presentation)
12. Holloway C, Ai H, Dziedzic M, Mendonca M, Nakshatri H, **Stantz KM***. Influence of anti-angiogenic therapy on the prevalence of breast cancer stem cells. *Cancer Research* 76(14 Supp): 4227, 2016.
13. Sick J, Rancilio N, Fulkerson C, LaPetina P, Poulson J, Knapp D, Stantz KM. Construction of An Ultrasound Guidance Platform for Image-Guided Radiotherapy with the Intent to Treat Transitional Cell Carcinoma. *Medical Physics* 43(6):3812-3812 (2016).
14. Burnett J, Sick J, Cao N, Liu B, Nakshatri H, Mendonca M, **Stantz KM**. Validating Hemoglobin Saturation and Dissolved oxygen in Tumors Using Photoacoustic Computed Tomographic Imaging. *Medical Physics* 43(6):3864-3864 (2016).
15. Coventry BS, Sick JT, Sommer AL, Haddix CA, Talavage TM, **Stantz KM**, Bartlett EL. Light gated neurons: The co-varying roles of laser wavelength, power level, and membrane conductance in infrared neural stimulation. Society of Neuroscience, 2016.
16. **Stantz K***, Moskvin V. Simulation Study Using Thermoacoustics to Image Proton Dose and Range in Water and Skull Phantom. *Med. Phys.* 42, 3297 (2015); <http://dx.doi.org/10.1118/1.4924226>
17. Alsanea F, Moskvin V **Stantz KM**. Exploring Radiation Acoustics CT Dosimeter Design Aspects for Proton Therapy. *Med. Phys.* 41:382, 2014. (THERAPY CAMPUS POSTER Award)
18. Roth A, Krutulis M, Verleker A, **Stantz K**. Verification of Photoacoustic Computed Tomography Perfusion Imaging Using DCE-CT. *Med. Phys.* 41, 449, 2014 (Oral)
19. Sick J, Alsanea F, Rancilio N, **Stantz K**. Design a Platform and Phantom Model for Photoacoustic Imaging in Combination with CT. *Med. Phys.* 41:165, 2014
20. Jenna Burnett, Justin Sick, Marc Mendonca; and **Keith Stantz**, Validating Hemoglobin Saturation and Dissolved Oxygen in Tumors using the OxyLab Probe and Photoacoustic Imaging (August 7, 2014). *The Summer Undergraduate Research Fellowship (SURF) Symposium*. Paper 115. (Poster)
21. Justin Sick, et. al., "Image-guided Radiotherapy and the use of Photoacoustic Ultrasound for Imaging the Canine Urinary Bladder", Office of Interdisciplinary Graduate Programs, Purdue University
22. Akshay Prabhu Verleker, Qianqian Fang, Mi-Ran Choi, Susan Clare and **Keith M. Stantz**. A therapeutic protocol for treatment of brain metastasis through optically stimulated drug release. (Certificate of Excellence Award), Office of Interdisciplinary Graduate Programs, Purdue University (Poster)
23. **Stantz K**, Alsanea F, Moskvin V. Use of Radiation-Induced Ultrasound to Image Proton Dosimetry. *Medical Physics* 40:546, 2013. (BEST IN PHYSICS Award)

24. Ning Cao, Minsong Cao, Helen J. Chin-Sinex, Marc S. Mendonca, Song-Chu Ko, **Keith Stantz**, Identifying Prognostic Factors in Combined Anti-angiogenesis and Radiotherapy for Pancreatic Cancer, *Molecular Imaging and Biology*, **14**(2), Supplemental, 2012.
25. Ning Cao, Seung Hyun Song, Michael Shaffer, Minsong Cao, Teimour Maleki, Helen J. Chin-Sinex, Marc S. Mendonca, Babak Ziaie, Song-Chu Ko, Keith M. Stantz. Re-oxygenation of Pancreatic Cancer in Radiotherapy: Integrating Photoacoustic Imaging and IMOG Medical Device, *Molecular Imaging and Biology*, **14**(2), Supplemental, 2012
26. N Cao, S Song, M Cao, M Shaffer, T Maleki, B Ziaie, S Ko, **K Stantz** *In Vivo* Imaging to Monitor the Effects of Anti-Angiogenesis and Re-Oxygenation on Pancreatic Tumor Radiosensitivity., *Med Phys* **39**:3936, 2012.
27. Cao N, Shaffer M, Cao M, Song SH, Maleki T, Chin-Sinex HJ, Mendonca MS, Ziaie B, Ko S-C, **Stantz K**. Monitoring the Effects of Anti-angiogenesis and Re-oxygenation on Radiotherapy in Pancreatic Cancer Xenografts *Molecular Imaging and Biology*, 2011.
28. **Stantz K**, Shaffer M, Cao N, Zhou Y, Liu S. Spectroscopic and Dynamic PCT Imaging: From Hemodynamics to Metastasis, *Molecular Imaging and Biology*, 2011.
29. Cao N, Cao M, Liu B, Miller KD, **Stantz KM**. Tracking the longitudinal physiological and vascular morphology changes in response to anti-angiogenesis treatment in breast tumors. *Cancer Research* **70**(8 supp): 5224, 2011.
30. Lee C-W, Guo L, **Stantz KM**. Development of short peptide probe to detect ovarian tumors in mouse xenograph model. *Cancer Research* **70**(8 supp): 4340, 2010.
31. **Stantz KM**, Cao N, Shaffer M, Liu B, Chen L, Miller K, Ko C-H, *In Vivo* Imaging of Hypoxia: Hemodynamic Model of Tumor Oxygenation, *Molecular Imaging and Biology*, 2010.
32. Cao N, Chen L, Maleki T, Shaffer M, Liu B, Ziaie B, Ko Sung-chu, **Stantz KM**, “*In vivo* Imaging to Monitor Anti-angiogenesis and Re-oxygenation on Radio-sensitivity in Pancreatic Cancer Xenografts”, *Molecular Imaging and Biology*, 2010.
33. Liu B, Michael Shaffer, Minsong Cao, **Stantz KM**. “Quantification of hemoglobin status using Photoacoustic Computed Tomography Imaging: from phantom to tumor study”, *Molecular Imaging and Biology*, 2010.
34. **Stantz KM**, Cao N, Shaffer M. Assessing Intra-Tumor Hemodynamics and Oxygen Concentration Using Photoacoustic Computed Tomography. *Med Phys* **38**(6):3717, 2010.
35. **Stantz K**, Cao M, Liu B, Miller KD, Kruger R, Guo L. Molecular Imaging of Neutropilin-1 Receptor using photoacoustic spectroscopy in breast tumors. *Molecular Imaging and Biology* **12**(S1):S90-S91, 2009.
36. Morgan T, Kruger R, Picot P, **Stantz K**. *In Vivo* Molecular Imaging Applications of Volume Photoacoustic Tomography for Small Animals. *Molecular Imaging and Biology* **12**(S1):S406, 2009.
37. Stantz K, Cao M, Cao N, Liu B, Miller KD. Monitoring Hypoxic Factors in Response to VEGFR2 Blockade in Breast Tumors. *Molecular Imaging and Biology* **12**(S1):S434, 2009.
38. Wang P, Minner DE, **Stantz KM**, Naumann C, Weiming Y. Biocompatible Quantum Dots for Intravital Kidney Imaging. *Biophysical Journal* **96**(3): 34a-35a, 2009.
39. **Stantz KM**, Cao M, Liu B, Kruger RA. Molecular Imaging of Neutropilin-1 Receptor in Breast Tumors. *Molecular Imaging*, 2007.
40. **Stantz KM**, Cao M, Liu B, Guo L. Molecular Imaging of Follicle Stimulating Hormone Receptor in Ovarian Tumors. *Molecular Imaging*, 2007.
41. Liu B, Kruger R, Reineke D, **Stantz KM**, “Determination of Blood Oxygen Saturation by PCT Small Animal Scanner”, *Molecular Imaging and Biology* **8**(2):92, 2006.
42. Cao M, Liang Y, Miller K, **Stantz K**. Effects of VEGF on Intra-Tumor Physiological Heterogeneity and Anti-Angiogenic Therapy as Measured by Dynamic Contrast Enhanced CT. *Molecular Imaging* **5**(3):357-8, 2006.
43. **Stantz KM**, Liu Bo, Cao M, Reinecke D, Dzemidzic M, Liang Y, Kruger RA. Measuring Hypoxic Factors in Solid Tumors Using Photoacoustic and X-Ray CT. *Molecular Imaging* **5**(2):362-3, 2006.

44. Cao M, Liang Y, Miller KD, **Stantz KM**, “Quantification of Intra-Tumor Physiological Heterogeneity and Therapeutic Response in Xenograft MCF-7 Breast Cancer Model by Dynamic Contrast Enhanced Computed Tomography”, *Molecular Imaging and Biology* 8(2):71, 2006.
45. **Stantz KM**, Cao M, Liang Y, Miller KD, “Evaluating the Therapeutic Response of PS-341 in Xenograft SKOV3x Ovarian Mouse Model by Dynamic Contrast-Enhanced CT”, *Molecular Imaging and Biology* 8(2):73-74, 2006.
46. Gattone V, Krishnamurthi G, **Stantz K**, Cao M, Phillips C, Liang Y, Renal Microvasculature in Murine Nephronphthisis, *J Am Soc Neph* 16:138A, 2005.
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48. Novikov M, Molitoris B, Campos S, Hosford M, **Stantz K**, Liang Y, Hutchins G, Hellman R, “Renoprotective properties of acetazolamide (Az) in a rat model of contrast media (CM) induced renal failure (CMIRF).” *Journal of the American Society of Nephrology* Vol 14, pp. 354A-355A, Suppl. S, (2003).
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50. **Stantz KM**, Liang Y, Meyer CA, Teague SD, Persohn S, March K, “In Vivo Regional Myocardial Perfusion Measurements by ECG-Gated Multi-Slice Computed Tomography,” *Radiology* 225, p308-309, Suppl. S, (2002).
51. Cameron SM, Loubriel GM, Robinett RD, **Stantz KM**, Trahan MW, Wagner JS, “Adaptive Remote-Sensing Techniques Implementing Swarms of Mobile Agents,” *Proceedings of SPIE’s 13th Annual International Symposium on AeroSpace/Defense Sensing, Simulation, and Controls*, 3713, (1999).

Funding

1. TRASK Grant, OTC, Purdue University 03/01/2016 – 02/27/2016
3-D Dosimetric Imaging OF Particle Beams for Radiation Therapy
 PI: Keith Stantz (0%)
 A grant to build and test a radioacoustic computed tomographic scanner design capable of providing 3D dosimetric images from therapeutic particle beams.
2. NIH/NIBIB R21 EB012849 9/1/2011-10/30/2014 (NC Extension)
Noninvasive imaging and therapeutic targeting of the hypoxic-niche associated with CSCs
 PI: Keith Stantz (30%)
 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.”
3. DoD/BCRP 01/01/13-12/31/2014
Delivery of Nano-Tethered Therapies to Brain Metastases of Primary Breast Cancer Using a Cellular Trojan Horse
 PI: Dr. Susan Clare
 Co-I: Dr. Keith Stantz (5%)
 Description: The objective of this proposal is to use gold nanorod loaded with Her2 drug to be delivered using Macrophage, and released under the control of NIR laser source.
4. Purdue Research Foundation Grant 5/1/2014-5/1/2015
A therapeutic protocol for treatment of brain metastasis through optically stimulated drug release

PI: Keith Stantz

Description: The goal of this study is to deliver lapatinib-gold nanocomplex laden macrophages to brain metastasis and design a therapeutic protocol to optically stimulate drug release in target brain tissues.

5. NIH / Research Infrastructure Offices (ORIP) S10-HEI 07/01/2014 - 06/30/2015

3T MRI Scanner dedicated to Life Sciences Research

PI: Dr. Ulrike Dydak

Role: Co-Investigator

Total sum: \$2,000,000

6. NIH/NCI SBIR 2R44CA102891-05 4/01/2009-9/31/2012

Photoacoustic CT for Preclinical Molecular Imaging

PI: Dr. Robert Kruger

Co-I: Dr. Keith Stantz (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.

7. Ovarian Cancer Research Foundation 1/01/11-12/31/2013

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

PI: Dr. Daniela Matei

Co-I: Dr. Keith Stantz (2.5%)

Description: 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.

8. Purdue Cancer Center Pilot Grant 7/2012-8/2013

Targeting the Functional Ovarian Cancer Stem Cell Niche as a Means of OC Chemosensitization

PI: Dr. Keith Stantz (0%)

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

9. Purdue Research Foundation Grant 6/2011 – 5/2012

***In Vivo* Imaging to Monitor Anti-angiogenesis and/or Re-oxygenation on Radio-sensitivity in Pancreatic Cancer Xenografts**

PI: Dr. Keith Stantz (0%)

Description: The goal of this study is to develop techniques to sensitize pancreatic cancer to radiation therapy either implementing anti-angiogenic therapy or the implantable micro oxygen generator device.

10. NIH/NCI SBIR 2R44CA102891-05 4/01/2009-9/31/2012

Photoacoustic CT for Preclinical Molecular Imaging

PI: Dr. Kruger

Co-I: Dr. KM Stantz (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, with an emphasis on hemodynamic imaging via hemoglobin spectroscopy and ICG dynamic contrast-enhanced PCT imaging. Scanner sited in Dr. Stantz's Lab.

11. Endra, Inc.

Test PCT-S Scanner in Response to Anti-Angiogenic Therapy 5/1/2010 – 4/30/2011
 PI: Keith Stantz, PhD (0%)
 Award: \$7,876
 Description: Using the new design of the PCT scanner, a study was performed to demonstrate the capability of this scanner to non invasively monitor the therapeutic response to Avastin.

12. NIH/NCI SBIR R44-CA114839 08/01/07-6/30/09
In Vivo Thermoacoustic Imaging of Her2 Status
 PI: Dr. Robert Kruger
 Co-Investigator (25%)
 Award: \$170,000
 Description: The goal of this proposal is to image *in vivo* the uptake of Herceptin in breast cancer xenografts of breast cancer using a new scanner modality photoacoustic spectroscopy. NIR dyes are conjugated to Herceptin in increasing degrees of labeling and spectroscopic photoacoustic imaging to identify HER2 breast cancer.

13. NIH/NCI STTR R44CA102891 06/01/04-12/30/06 (NCE/07)
3-D Thermoacoustic Computed Tomography in Molecular Imaging
 PI: Dr. Robert Kruger
 Co-Investigator: Dr. Keith Stantz (25%)
 Award: \$222,261
 Description: This project will study the spectroscopic alterations of the endogenous molecular structure between normal and diseased tissue and of the potential development of new molecular probes for 'histological'-imaging.

14. Info & Images, Inc. 06/01/04-12/01/04
Development of functional microCT applications for rodents
 PI: Dr. Yun Liang
 Co-Investigator: Dr. Keith Stantz (0%)
 Award: \$50,000 awarded to Dr. Stantz
 Description: This project will develop a new functional microCT application for detection and characterization of vascular physiology in rodent animal models.

15. Philips Medical Systems 11/22/02-03/01/04
MDCT in the Evaluation of Cardiac Perfusion in a Porcine Model
 PI: Dr. Keith Stantz (5%)
 Award: \$50,000
 Description: This is a pilot study to study exploring the correlation between coronary heart disease and (the lack of) myocardial perfusion implementing ECG-gated high-speed multi-slice CT system (Philips 16-slice MX8000IDT).