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Citations	2689	1929
h-index	28	23
i10-index	48	39

https://scholar.google.com.sg/citations?user=8Xjr8B8AAAAJ&hl=en&oi=ao

(1) Education

2002-2005: Postdoc, Biomedical Engineering, Massachusetts Institute of Technology

1998-2002: PhD, Bioengineering, Rice University

1994-1998: BS, Electrical Engineering, The University of Texas at Austin

(2) Research Area

Biomedical Imaging and Instrumentation

(3) Research Focus

Biomedical optical spectroscopy and imaging; early cancer detection; laser-tissue interactions; nanotechnology; nano-photonics

(4) Research Interests

Our research focuses on developing minimally invasive optical technologies for the diagnosis and treatment of disease, particularly for early cancer. It is widely believed that the greatest achievement that can be made in cancer management is the early detection and subsequent treatment of disease. The next generation cancer management strategies require technologies that combine sensing, targeting, and treating of the earliest stage disease. Our approach combines optical imaging, spectroscopy, and nanotechnology to develop systems capable of combined diagnosis and treatment of early cancer. In addition, the lab actively studies the basic mechanisms of light-tissue interactions to understand light transport and develop novel imaging strategies.

(5) Partial publications

[1]. Hessel, Colin M., Varun P. Pattani, Michael Rasch, Matthew G. Panthani, Bonil Koo, **James W. Tunnell**, and Brian A. Korgel. "Copper selenide nanocrystals for photothermal therapy." Nano letters 11, no. 6 (2011): 2560-2566. (Cited by 435)

[2]. Jaesook Park, Arnold Estrada, Kelly Sharp, Krystina Sang, Jon A Schwartz, Danielle K Smith, Chris Coleman, J Donald Payne, Brian A Korgel, Andrew K Dunn, **James W Tunnell**. "Two-photon-induced photoluminescence imaging of tumors using near-infrared excited gold nanoshells." Optics Express 16, no. 3 (2008): 1590-1599. (Cited by 205)

[3]. Parmeswaran Diagaradjane, Anil Shetty, James C Wang, Andrew M Elliott, Jon Schwartz, Shujun Shentu, Hee C Park, Amit Deorukhkar, R Jason Stafford, Sang H Cho, **James W Tunnell**, John D Hazle, Sunil Krishnan. "Modulation of in vivo tumor radiation response via gold nanoshell-mediated vascular-focused hyperthermia: characterizing an integrated antihypoxic and localized vascular disrupting targeting strategy." Nano letters 8, no. 5 (2008): 1492-1500. (Cited by 185)

[4]. Rajaram, Narasimhan, Tri H. Nguyen, and **James W. Tunnell.** "Lookup table–based inverse model for determining optical properties of turbid media." *Journal of biomedical optics* 13, no. 5 (2008): 050501-050501. (Cited by 132)

[5]. Lim, Liang, Brandon Nichols, Narasimhan Rajaram, and **James W. Tunnell**. "Probe pressure effects on human skin diffuse reflectance and fluorescence spectroscopy measurements." *Journal of biomedical optics* 16, no. 1 (2011): 011012-011012. (Cited by 74)

[6]. Pikkula, Brian M., Jorge H. Torres, **James W. Tunnell**, and Bahman Anvari. "Cryogen spray cooling: effects of droplet size and spray density on heat removal." *Lasers in surgery and medicine* 28, no. 2 (2001): 103-112. (Cited by 72)

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[8]. Puvanakrishnan, Priyaveena, Jaesook Park, Deyali Chatterjee, Sunil Krishnan, and **James W. Tunnell**. "In vivo tumor targeting of gold nanoparticles: effect of particle type and dosing strategy." *International journal of nanomedicine* 7 (2012): 1251. (Cited by 66)

[9]. Raiyan T Zaman, Parmeswaran Diagaradjane, James C Wang, Jon Schwartz, Narasimhan Rajaram, Kelly L Gill-Sharp, Sang H Cho, Henry Grady Rylander III, J Donald Payne, Sunil Krishnan, **James W Tunnell**. "In vivo detection of gold nanoshells in tumors using diffuse optical spectroscopy." *Ieee Journal of Selected Topics in Quantum Electronics* 13, no. 6 (2007): 1715-1720. (Cited by 63)

[10]. McBride, Susan A., Robert G. Munday, and **James Tunnell**. "Community college faculty job satisfaction and propensity to leave." *Community/Junior College Quarterly of Research and Practice* 16, no. 2 (1992): 157-165. (Cited by 62)

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[12]. Rajaram, Narasimhan, Timothy J. Aramil, Kelvin Lee, Jason S. Reichenberg, Tri H. Nguyen, and **James W. Tunnell**. "Design and validation of a clinical instrument for spectral diagnosis of cutaneous malignancy." Applied optics 49, no. 2 (2010): 142-152. (Cited by 59)

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spectral diagnosis of non- melanoma skin cancer." *Lasers in surgery and medicine* 42, no. 10 (2010): 876-887. (Cited by 58)

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[16]. Hennessy, Ricky, Sam L. Lim, Mia K. Markey, and **James W. Tunnell**. "Monte Carlo lookup table-based inverse model for extracting optical properties from tissue-simulating phantoms using diffuse reflectance spectroscopy." *Journal of biomedical optics* 18, no. 3 (2013): 037003-037003. (Cited by 52)

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[23]. Park, Jaesook, Arnold Estrada, Jon A. Schwartz, Parmeswaran Diagaradjane, Sunil Krishnan, Andrew K. Dunn, and **James W. Tunnell**. "Intra‐organ biodistribution of gold nanoparticles using intrinsic two‐photon‐induced photoluminescence." Lasers in surgery and medicine 42, no. 7 (2010): 630-639. (Cited by 38)

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determination of tissue optical properties using least-squares support vector machines." Biomedical optics express 2, no. 3 (2011): 592-599. (Cited by 28)

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