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CURRICULUM VITAE

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EDUCATION

Harvard University - Massachusetts Institute of Technology, Cambridge, MA
Division of Health Sciences and Technology,
Ph.D. in Medical Engineering and Medical Physics, 2001.

Massachusetts Institute of Technology, Cambridge, MA.
M.S. in Physics, 1998.

St. Petersburg Polytechnic Institute, St. Petersburg, Russia.
M.S. in Physics, 1996, B.S. in Physics, With Highest Honors, 1994.

PROFESSIONAL EXPERIENCE

Northwestern University, Evanston, IL. September 2012 – present
Walter Dill Scott Professor of Biomedical Engineering,
Biomedical Engineering Department.

Northwestern University, Evanston, IL. September 2006 – August 2012
Professor, Biomedical Engineering Department.

Robert H. Lurie Comprehensive Cancer Center, December 2008 – present
Northwestern University, Evanston, IL.
Program Leader, Cancer and Physical Sciences Program

Nanocytomics, LLC, Evanston, IL April 2012 – present
Chairman and Co-Founder

American BioOptics, LLC, Evanston, IL June 2006 – present
Chairman and Co-Founder

Evanston Northwestern Hospital, Evanston, IL. September 2002 – 2013
Member of Professional Staff, Department of Medicine, Section of Gastroenterology

Northwestern University, Evanston, IL. September 2001 – August 2006
Assistant Professor, Biomedical Engineering Department.

HONORS

Cozzarelli Prize, National Academy of Sciences (2017).
Fellow, Farley Center for Entrepreneurship and Innovation (2016, 2013).

Liz and Eric Lefkofsky Scholar (2015).
 Dorothy Ann and Clarence L. Ver Steeg Distinguished Research Fellow (2015).
 Faculty Honor Roll, Northwestern University Associated Student Government (2011).
 Faculty Honor Roll, Northwestern University Associated Student Government (2010).
 Fellow, American Institute for Medical and Biological Engineering (AIMBE) (2009).
 Faculty Honor Roll, Northwestern University Associated Student Government (2008).
 Faculty Honor Roll, Northwestern University Associated Student Government (2007).
 Phi Beta Psi Cancer Research Award (2006).
 Faculty Honor Roll, Northwestern University Associated Student Government (2005).
 The Wallace H. Coulter Foundation Early Career Translational Research Award in Biomedical Engineering (2005, 2007).
 Citation for “Research Excellence”, Northwestern University (2005).
 Selected as one of the Top 100 Young Innovators in the World by MIT's Technology Review Magazine (2004).
 NSF CAREER Award (2003).
 NSF Young Investigator Best Paper Award in New Techniques in Biomedical Optics and Medical Imaging (2002).
 General Motors Cancer Research Scholar Award (2002).
 Phi Beta Psi Cancer Research Award (2002).
 Poitras Pre-doctoral Fellowship in Biomedical Engineering and Biophysics (2000).
 Lester Wolfe Fellowship in Biomedical Optics (1999).
 Becton Dickenson Fellowship in Medical Engineering (1998).
 George Soros International Science Foundation Fellowship in Physics (1995, 1996).
 National Contest for Outstanding M.S. Thesis in Physics (second prize, 1996).
 Informatics Olympiad (second prize, 1990).

PUBLICATIONS

A. Peer-reviewed Journal Publications

1. J. Winkelmann, A. Eid, T.Q. Nguyen, T. Bui, J. Yi, and V. Backman, “In Vivo broad-band visible light optical coherence tomography probe enables inverse spectroscopic analysis”, *Optics Letters*, submitted (2017)
2. S. Datta, R.M Sherva, M. De La Cruz, M.T. Long, P. Roy, V. Backman, S. Chowdhury and H.K. Roy, “Single nucleotide polymorphism facilitated downregulation of the cohesin stromal antigen-1: implications for colorectal cancer racial disparities”, *Neoplasia*, submitted (2017).
3. W. Wu, L.M. Almassalha, D. Zhang, H.K. Roy, I. Szleifer, and V. Backman, “Unraveling supra-nucleosomal physical interactions governing global transcription activity”, *PLOS Computational Biology*, submitted (2017).
4. T.D. Swain, S. Lax, N. Lake, H. Grooms, V. Backman, L. Marcelino, “Relating coral skeletal structures at different length scales to growth, light availability to Symbiodinium, and thermal bleaching”, *Frontiers in Marine Science*, submitted (2017).

5. A.D. Stephens, P.Z. Liu, L.M. Almassalha, A. Erbas, S.A. Adam, R.D. Goldman, V. Backman, E.J. Banigan, J.F. Marko, “Chromatin compaction state is a major determinant of nuclear blebbing and deformations”, *PNAS*, submitted (2017).
6. R. Kalman, A. Stawarz, D. Nunes, D. Zhang, M. Delacruz, R. Wali, H. Subramanian, V. Backman, H.K. Roy, “Biophotonic detection of high order chromatin alterations in field carcinogenesis predicts risk of future hepatocellular carcinoma: a pilot study”, *PLOS One*, submitted (2017)
7. S. Gladstein, D. Damania, L.T. Smith, V. Gupta, H. Subramanian, D.K. Rex, H.K. Roy, and V. Backman, “Correlating colorectal cancer risk with field carcinogenesis progression using Partial Wave Spectroscopic microscopy”, *Cancer Medicine*, submitted (2017).
8. G.M. Bauer, L.M. Almassalha, L. Cherkezyan, A. Kendra, S. Gladstein, J.E. Chandler, B. Seagle, T.V. O’Halloran, H.K. Roy, I. Szleifer, S. Shahabi, and V. Backman, “Chromatin protection therapies: systems therapeutics for increased chemotherapeutic efficacy”, *Cancer Research*, submitted (2017).
9. V. Konda, S. Ruderman, M. Gonzalez-HabaRuiz, V. Valucka, U. Dougherty, V. Becker, R. Mustafi, A. Singh, A. Skakdagr, D. Almoghrabi, I. Waxman, H.K. Roy, J. Hart, V. Backman, M. Bissonnette, “Effects of Western diet and carcinogenesis on angiogenesis in AOM/DSS-induced colon cancer”, *Clinical Cancer Research*, submitted (2017).
10. P. Liu, D. Banigan, L. Almassalha, V. Backman, S. Adam, R. Goldman and J. Marko, “Chromatin histone modifications and rigidity affect nuclear morphology independent of lamins”, *Molecular Biology of the Cell*, in press (2017).
11. L.M. Almassalha, G.M. Bauer, W. Wu, L. Cherkezyan, D. Zhang, A. Kendra, S. Gladstein, J.E. Chandler, D. VanDerway, B. Seagle, A. Ugolkov, D.D. Billadeau, T.V. O’Halloran, A.P. Mazar, H.K. Roy, I. Szleifer, S. Shahabi, and V. Backman, “Macrogenomic engineering via modulation of the scaling of chromatin packing density”, *Nature Biomedical Engineering*, doi: 10.1038/s41551-017-0153-2 (2017).
12. Y. Li, L.M. Almassalha, J.E. Chandler, X. Zhou, Y.E. Stypula-Cyrus, K.A. Hujsak, E.W. Roth, R. Bleher, H. Subramanian, I. Szleifer, V.P. Dravid, V. Backman, “The effects of chemical fixation on the cellular nanostructure”, *Experimental Cell Research*, doi: 10.1016/j.yexcr.2017.06.22 (2017).
13. B. Dong, B. Soetikno, X. Chen, V. Backman, C. Sun, H. Zhang, “Parallel three-dimensional tracking of quantum rods using polarization-sensitive spectroscopic photon localization microscopy”, *ACS Photonics*, 4(7), 1747-1752 (2017).

14. D.A. Drew, S.M. Chin, K.K. Gilpin, M. Parziale, E. Pond, M.M. Schuck, K. Stewart, M. Flagg, C.A. Rawlings, V. Backman, P.J. Carolan, D.C. Chung, F.P. Colizzo III, M. Freedman, M. Gala, J.J. Garber, C. Huttenhower, D. Kedrin, H. Khalil, D.S. Kwon, S.D. Markowitz, G.L. Milne, N.S. Nishioka, J.M. Richter, H.K. Roy, K. Staller, M. Wang, A.T. Chan, “Aspirin intervention for the reduction of colorectal cancer risk (ASPIRED): a study protocol for a randomized controlled trial”, *Trials*, **18**(50) doi: 10.1186/s13063-016-1744-z (2017). PMC5286828
15. Y. Li, D. Zhang, I. Capoglu, D. Damania, K. Hujsak, L. Cherkezyan, E. Roth, R. Bleher, H. Wu, H. Subramanian, V.P. Dravid, V. Backman, “Measuring the autocorrelation function of nanoscale three-dimensional mass-density distribution in individual cells using scanning transmission electron microscopy, atomic force microscopy and a new deconvolution algorithm”, *Microscopy and Microanalysis*, **23**(3), 661-667 (2017).
16. G.M. Bauer, Y. Stypula-Cyrus, H. Subramanian, L. Cherkezyan, P. Viswanathan, D. Zhang, R. Iyengar, S. Bagalkar, J. Derbas, T. Graff, S. Gladstein, L.M. Almassalha, J. E. Chandler, H.K. Roy, and V. Backman, “The transformation of the nuclear nanoarchitecture in human field carcinogenesis”, *Future Science*, doi: 10.4155/fsoa-2017-0027 (2017).
17. R. Liu, G. Spicer, S. Chen, H.F. Zhang, J. Yi, and V. Backman, “A theoretical model for optical oximetry at the capillary level: exploring hemoglobin oxygen saturation through backscattering of single red blood cells”, *JBO*, **22**(2), 025002 (2017). PMC5290596
18. M. DeLaCruz, S. Ledbetter, X. Sanjib, A. Tiwari, N. Momi, R. Wali, C. Bliss, C. Huang, D. Lichtenstein, S. Bhattacharya, A. Varma-Wilson, V. Backman, H.K. Roy, “Metabolic reprogramming of the premalignant colonic mucosa is an early event in carcinogenesis”, *Oncotarget*, **8**(13), 20543-20557 (2017). PMC5400525.
19. B. Dong, L. Almassalha, B.T. Soetikno, J.E. Chandler, T.Q. Nguyen, B.E. Urban, C. Sun, H.F. Zhang, and V. Backman, “Stochastic fluorescence switching of nucleic acids under visible light illumination”, *Optics Express*, **25**(7), 7929-7944 (2017).
20. L. Cherkezyan, D. Zhang, H. Subramanian, A. Taflove, and V. Backman, “Review of interferometric spectroscopy of scattered light for the quantification of subdiffractive structure of biomaterials”, *JBO*, **22**(3), 030901 (2017). PMC5348632
21. L.M. Almassalha, A. Tiwari, P.T. Ruhoff, Y. Stypula-Cyrus, H. Matsuda, M.A. Dela Cruz, J.E. Chandler, C. White, C. Maneval, H. Subramanian, I. Szleifer, H. Roy, and V. Backman, “The global relationship between chromatin physical topology, fractal structure, and gene expression”, *Scientific Reports*, **7**, 41061 (2017). PMC5259786

22. R.K. Wali, N. Momi, M. Dela Cruz, A.H. Calderwood, Y. Stypula-Cyrus, L. Almassalha, A. Chhaparia, C.R. Weber, A. Radosevich, A.K. Tiwari, B. Latif, V. Backman and H.K. Roy, “Higher-order chromatin modulator cohesion SA1 is an early biomarker for colon carcinogenesis: race-specific implications”, *Cancer Prevention Research*, DOI: 10.1158/1940-6207.CAPR-16-0054 (2016). PMC5093027
23. J. Yi, Z. Puyang, L. Feng, L. Duan, P. Liang, V. Backman, X. Liu, and H. Zhang, “Optical detection of early damages in retinal ganglion cells in a mouse model of partial optic nerve crush injury”, *IOVS*, **57**(13) 5665-5671 (2016). PMC5089219
24. G. Spicer, S. Azarin, J. Yi, S. Young, R. Ellis, G. Bauer, L. Shea, and V. Backman, “Detection of extracellular matrix modification in cancer models with inverse spectroscopic optical coherence tomography”, *Phys Med Biol*. **61**(19) 6892-6904 (2016). PMC5056859
25. W. Wu, A.J. Radosevich, A. Eshein, T.Q. Nguyen, J. Yi, L. Cherkezyan, H.K. Roy, I. Szeleifer, V. Backman, “Using electron microscopy to calculate optical properties of biological samples”, *Biomedical Optics Express* **7**(11), 4749-4762 (2016). PMC5119613
26. L.M. Almassalha, G.M. Bauer, J. Chandler, S. Gladstein, L. Cherkezyan, Y. Stypula-Cyrus, S. Weinberg, D. Zhang, P. Thusgaard Ruhoff, H. Roy, H. Subramanian, N. Chandel, I. Szeleifer, V. Backman, “Label-free imaging of the native, living cellular nano-architecture using partial-wave spectroscopic microscopy”, *PNAS*, **113**(42) E6372-E6381 (2016). PMC5081614.
27. T.D. Swain, J. Chandler, V. Backman, & L. Marcelino, “Consensus thermotolerance ranking for 110 Symbiodinium phylotypes: an exemplar utilization of a novel iterative partial-rank aggregation tool with broad application potential”, *Functional Ecology* **31**, 172-183 (2016).
28. T. Swain, J. Vega-Perkins, W. Oestreich, C. Triebold, E. DuBois, J. Henss, A. Baird, M. Siple, V. Backman, and L. Marcelino, “Coral bleaching response index: a new tool to standardize and compare susceptibility to thermal bleaching”, *Global Change Biology*, **22**(7) 2475-88 (2016). PMC5433437
29. S.S. Rao, G.G. Bushnell, S.M. Azarin, G. Spicer, B.A. Aguado, J.R. Stoehr, E.J. Jiang, V. Backman, L.D. Shea, & J.S. Jeruss, “Enhanced Survival with Implantable Scaffolds That Capture Metastatic Breast Cancer Cells In Vivo” *Cancer Research* **76**, 5209-5218 (2016). PMC5027988
30. H. Subramanian, P. Viswanathan, L. Cherkezyan, R. Iyengar, S. Rozhok, M. Verleye, J. Derbas, J. Czarnecki, H.K. Roy, V. Backman, “Procedures for risk-stratification of lung

- cancer using buccal nanocytology”, *Biomedical Optics Express*, **7**(9) 3795-3810 (2016). PMC5030050.
31. B.E. Urban, B. Dong, V. Backman, C. Sun, H.F. Zhang, “Subsurface super-resolution imaging of unstained polymer nanostructures”, *Scientific Reports*, **6**, 28156; doi: 10.1038/srep28156 (2016). PMC4926209.
 32. D. Zhang, I. Capoglu, Y. Li, L. Cherkezyan, J. Chandler, G. Spicer, H. Subramanian, A. Taflove, and V. Backman, “FDTD-based optical microscopy simulation of dispersive media facilitates the development of optical imaging techniques”, *JBO*, **21**(6): 65004 doi:10.1117/1.JBO.21.6.065004 (2016). PMC4901185.
 33. B. Dong, L. Almassalha, Y. Stypula-Cyrus, B.E. Urban, T.Q. Nguyen, C. Sun, H.F. Zhang, and V. Backman, “Super-resolution intrinsic fluorescence imaging of chromatin using native, unmodified nucleic acids for contrast”, *PNAS*, **113**(35), 9716-9721 (2016). PMC5024634.
 34. J.E. Chandler, Y. Stypula-Cyrus, L. Almassalha, G. Bauer, L. Bowen, H. Subramanian, I. Szeleifer, and V. Backman, “Colocalization of cellular nanostructure using confocal fluorescence and partial wave spectroscopy”, *Journal of Biophotonics*, **10**(3), 377-384 (2016). PMC5112146
 35. P. Pradhan, D.J. Park, I. Capoglu, H. Subramanian, D. Damania, L. Cherkezyan, A. Taflove, V. Backman, “Enhancing the sensitivity of mesoscopic light reflection statistics in weakly disordered media by interface reflections”, *International Journal of Modern Physics B*, **30**(23), 1650155 (2016). MSID: 849492
 36. L.M. Almassalha, G.M. Bauer, J. Chandler, S. Gladstein, I. Szeleifer, H.K. Roy, and V. Backman, “The greater genomic landscape: the heterogeneous evolution of cancer”, *Cancer Research*, **76**(19), 5605-9 (2016). PMC5084919.
 37. B. Dong, L. Almassalha, B.E. Urban, T.Q. Nguyen, S. Khuon, T.L. Chew, V. Backman, C. Sun, H.F. Zhang, “Super-resolution spectroscopic microscopy via photon localization”, *Nature Communications*, **7**:12290 doi: 10.1038/ncomms12290 (2016). PMC4962472.
 38. J. Chandler, L. Cherkezyan, H. Subramanian, V. Backman, “Nanoscale refractive index fluctuations detected via sparse spectral microscopy”, *Biomedical Optics Express*, **7**(3), 883-893 (2016). PMC4866463.
 39. T.D. Swain, E. DuBois, A. Gomes, V.P. Stoyneva, A.J. Radosevich, J. Henss, M.E. Wagner, E. Velazquez, J. Traub, B.J. Kennedy, C.M. Janczak, A.A. Grigorescu, M.W. Westneat, K. Sanborn, S. Levine, M. Schick, G. Parsons, J.D. Rogers, V. Backman, L.A. Marcelino, “Skeletal light scattering accelerates bleaching response in reef-building corals”, *BMC Ecol.*, **16**(1) (2016). PMC4800776

40. Q. Miao, J. Derbas, A. Eid, H. Subramanian, V. Backman, “Automated cell selection using support vector machine for application to spectral nanocytology”, *BioMed Research International*, **2016**(3), 1-10 doi:10.1155/2016/6090912 (2016). PMC4745312
41. H.K. Roy, V. Turzhitsky, R. Wali, A.J. Radosevich, B. Jovanovic, G. DellaZanna, A. Umar, D.T. Rubin, M.J. Goldberg, L. Bianchi, M. De La Cruz, A. Bogojevic, I.R. Helenowski, L. Rodriguez, R. Chatterton, S. Skripkauskas, K. Page, C.R. Weber, X. Huang, E. Richmond, R.C. Bergan, V. Backman, “Spectral biomarkers for chemoprevention of colonic neoplasia: a placebo-controlled double-blinded trial with aspirin”, *Gut*, **66**(2), 285-292 (2015). PMC5108693
42. D. Zhang, L. Cherkezyan, I. Capoglu, H. Subramanian, J. Chandler, S. Thompson, A. Taflove, V. Backman, “Spectroscopic microscopy quantifies the statistics of subdiffractional refractive index fluctuations in media with random rough surfaces”, *Optics Letters*, **40**(21), 4931-4934 (2015). PMC4868404
43. J. Yi, Y. Stypula-Cyrus, C.S. Blaha, H.K. Roy, V. Backman, “Fractal characterization of chromatin decompaction in live cells”, *Biophysical Journal*, **109**(11), 2218-2226 (2015). PMC4675813
44. L. Cherkezyan, D. Zhang, H. Subramanian, A. Taflove, V. Backman, “Reconstruction of explicit structural properties at the nanoscale via spectroscopic microscopy”, *JBO*, **21**(2), 025007 (2016). PMC4756051
45. N. Momi, V. Backman, C. Brendler, H.K. Roy, “Harnessing novel modalities: field carcinogenesis detection for personalizing prostate cancer management”, *Future Oncology*, **11**, 2737-41 (2015). PMC4868392
46. B.E. Urban, B. Dong, Z. Zhang, V. Backman, C. Sun, H.F. Zhang, “Super-resolution two-photon microscopy via scanning patterned illumination”, *Physical Review E*, **91**(4):042703 (2015). PMC4565794
47. A.J. Radosevich, N.N. Mutyal, A. Eshein, T.Q. Nguyen, B. Gould, J. Rogers, M. Goldberg, L. Bianchi, V. Konda, D. Rex, E. Yen, J. Van Dam, H.K. Roy, V. Backman, “Rectal optical markers for *in vivo* risk stratification of premalignant colorectal lesions”, *Clinical Cancer Research*, **21**(19), 4337-55 (2015). PMC4592390
48. X. Wang, R. Bleher, V. Backman, G. Shekhawat, V. Dravid, “Comparison of sample preparation methods for analysis of mucus-secreting colon cancer cells by scanning electron microscopy”, *Microscopy and Microanalysis*, **21**(3), 185-6 (2015).
49. J. Yi, W. Liu, S. Chen, N. Sheibani, C.M. Sorenson, A.A. Fawzi, V. Backman, R.A. Linsenmeier, H.F. Zhang, “Visible-light optical coherence tomography measures retinal

- oxygen metabolic response to systemic oxygenation”, *Light: Science and Application*, **4**, e334 (2015). PMC4674267
50. A.J. Radosevich, A. Eshein, T.Q. Nguyen, V. Backman, “Subdiffusion reflectance spectroscopy to measure tissue ultrastructure and microvasculature: model and inverse algorithm”, *JBO*, **20**(9):97002 (2015). PMC4963470
51. S.M. Azarin, J. Yi, R.M. Gower, B.A. Aguado, M.E. Sullivan, A.G. Goodman, E.J. Jiang, S.S. Rao, Y. Ren, V. Backman, J.S. Jeruss, L. Shea, “*In vivo* capture and label-free detection of early metastatic cells”, *Nature Communications*, **6**:8094 (2015). PMC4563812.
52. S. Chen, J. Yi, W. Liu, V. Backman, H. Zhang, “Monte Carlo investigation of optical coherence tomography retinal oximetry”, *IEEE TBME*, **62**(9), 2308-2315 (2015). PMC4783381
53. B.D. Jovanovic, H. Subramanian, I.B. Helenowski, H.K. Roy, V. Backman, “Clinical trial laboratory data nested with in subject: components of variance, sample size and cost”, *Biometrics & Biostatistics International Journal*, **2**(2):00029 (2015). PMC4596537
54. N.N. Mutyal, A.J. Radosevich, S. Bajaj, V. Konda, U.D. Siddiqui, I. Waxman, M.J. Goldberg, J.D. Rogers, B. Gould, A. Eshein, S. Upadhye, A. Koons, M. Gonzalez, H.K. Roy, V. Backman, “*In vivo* risk analysis of pancreatic cancer through optical characterization of duodenal mucosa”, *Pancreas*, **44**(5), 735-741 (2015). PMC4464933.
55. H.K. Roy, C. Brendler, H. Subramanian, D. Zhang, C. Maneval, J. Chandler, K. Kaul, B. Helfand, C. Wang, M. Quinn, J. Petkewicz, M. Paterakos, V. Backman, “Nanocytological Field Carcinogenesis Detection to Mitigate Overdiagnosis of Prostate Cancer: A Proof of Concept Study”, *PLoS One*, **10**(2): e0115999 (2015). PMC4338151
56. M. Dela Cruz, R.K. Wali, L.K. Bianchi, A.J. Radosevich, S.E. Crawford, L. Jepeal, M.J. Goldberg, J. Weinstein, N. Momi, P. Roy, A.H. Calderwood, V. Backman, H.K. Roy, “Colonic mucosal fatty acid synthase as an early biomarker for colorectal neoplasia: modulation by obesity and gender”, *Cancer Epidemiology, Biomarkers & Prevention*, **23**(11), 2413-2421 (2014). PMC4470400.
57. A. Doronin, A.J. Radosevich, V. Backman, I. Meglinski, “Two electric field Monte Carlo models of coherent back scattering of polarized light”, *Journal of the Optical Society of America*, **31**(11), 2394-2400 (2014).
58. A.J. Radosevich, N.N. Mutyal, J.D. Rogers, B. Gould, T.A. Hensing, D. Ray, V. Backman, H.K. Roy, “Buccal spectral markers for lung cancer risk stratification”, *PLoS One*, **9**(10): e110157 (2014). PMC4192585.

59. M. Patel, A. Gomes, S. Ruderman, D. Hardee, S. Crespo, M. Raimondo, T. Woodward, V. Backman, H.K. Roy, M. Wallace, “Polarization gating spectroscopy of normal-appearing duodenal mucosa to detect pancreas cancer”, *Gastrointestinal Endoscopy*, **80**(5), 786-793 (2014). PMC4241379.
60. R. K. Wali, T. A. Hensing, D. W. Ray, M. Dela Cruz, A. Tiwari, A. Radosevich, L. Jepeal, H.C. Fernando, V. Little, M. Charlot, N. Momi, V. Backman, H.K. Roy, “Buccal microRNA dysregulation in lung field carcinogenesis: gender-specific implications”, *International Journal of Oncology*, **45**(3), 1209-1215 (2014). PMC4144027.
61. J. Yi, S. Chen, V. Backman, H.F. Zhang, “*In vivo* functional microangiography by visible-light optical coherence tomography”, *Biomedical Optics Express*, **5**(10), 3603-3612 (2014). PMC4206328.
62. L. Cherkezyan, H. Subramanian, V. Backman, “What structural length-scales can be detected by the spectral variance of a microscope image?”, *Optics Letters*, **39**(15), 4290-4293 (2014). PMC4317340.
63. Y. Stypula-Cyrus, N.N. Mutyal, M.A. Dela Cruz, D.P. Kunte, A.J. Radosevich, R.K. Wali, H.K. Roy, V. Backman, “End-binding protein 1 (EB1) up-regulation is an early event in colorectal carcinogenesis”, *FEBS Letters*, **5**(3), 829-835 (2014). PMC4103177
64. H. Matsuda, G.G. Putzel, V. Backman, I. Szleifer, “Macromolecular crowding as a regulator of gene transcription”, *Biophysical Journal*, **106**, 1801-1810 (2014). PMC4008821
65. J. Yi, A.J. Radosevich, Y. Stypula, N. Mutyal, S.M. Azarin, E.L. Horcher, M. Goldberg, L. Bianchi, S. Bajaj, H.K. Roy, V. Backman, “Spatially-resolved optical and ultra-structural properties of colorectal and pancreatic field carcinogenesis observed by inverse spectroscopic optical coherence tomography”, *JBO*, **19**(3), 036013 (2014). PMC4019430
66. L. Cherkezyan, Y. Stypula-Cyrus, H. Subramanian, C. White, M. Dela Cruz, R.K. Wali, M.J. Goldberg, L.K. Bianchi, H.K. Roy, V. Backman, “Nanoscale changes in chromatin organization represent the initial steps of tumorigenesis: a transmission electron microscopy study”, *Biomed Central Cancer*, **14**(189), (2014). PMC3995586
67. A. Gomes, V. Backman, “Monte Carlo model of the depolarization of backscattered linearly polarized light in the sub-diffusion regime”, *Optics Express*, **22**(5), 5325-5340 (2014).
68. K. Phillips, D. Damania, H. Subramanian, V. Backman, E. Anderson, M.H. Wong, O. McCarty, “Network signatures of nuclear and cytoplasmic density alterations in a model of pre- and post-metastatic colorectal cancer”, *JBO*, **19**(1), 016016 (2014). PMC4019418

69. J.D. Rogers, A.J. Radosevich, J. Yi, V. Backman, "Modeling light scattering in tissue as continuous random media using a versatile refractive index correlation function", *IEEE JSTQE*, **20**(02) 7000514 (2013). PMC4289622
70. J. Chandler, H. Subramanian, C.D. Maneval, C.A. White, V. Backman, "High-speed spectral nanocytology for early cancer screening", *J. Biomedical Optics*, **18**(11), 117002 (2013). PMC3817856
71. V. Konda, L. Cherkezyan, H. Subramanian, K. Wroblewski, D. Damania, V. Becker, M. Goldberg, J. Chennat, L. Karl, M. Ferguson, I. Waxman, H. Roy, V. Backman, "Nanoscale markers of esophageal field carcinogenesis: potential implications for esophageal cancer screening", *Endoscopy*, **45**, 983-988, (2013). PMC4195538.
72. S. Ruderman, S. Mueller, A. Gomes, J. Rogers, V. Backman, "Method of detecting tissue contact for fiber-optic probes to automate data acquisition without hardware modification", *Biomedical Optics Express*, **4**(8), 1401-1412 (2013). PMC3756576.
73. J. Yi, Q. Wei, W. Liu, V. Backman, H. Zhang, "Visible-light optical coherence tomography for retinal oximetry", *Optics Letters*, **38**(11), 1796-1798 (2013). PMC3986589
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B. Books and Book Chapters

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CONFERENCE PRESENTATIONS

1. V. Backman, "Convergence of Nanoimaging, Physics and Biology: Can Engineering Lead to a Cancer Cure?", CLEO Conference, San Jose, CA, May 16, 2017.
2. V. Backman, "Low Angle Enhanced Backscattering Spectroscopy", Digestive Disease Week, Chicago, IL, May 9, 2017.
3. G. Bauer, L. Almassalha, L. Cherkezyan, A. Kendra, S. Gladstein, J. Chandler, B. Seagle, H. Roy, I. Szleifer, S. Shahabi, V. Backman, "Chromatin Protective Therapies: Live Cell Partial Wave Spectroscopic Microscopy as a Tool to Identify Adjuvant Compounds for Increased Chemotherapeutic Efficacy", OSA Biophotonics Congress, San Diego, CA, April 2-5, 2017.
4. A. Stawarz, L. Almassalha, G. Bauer, J. Chandler, T. O'Halloran, V. Backman, "Live-cell Partial Wave Spectroscopy: Therapeutic and Biochemical Applications for Chromatin Research", OSA Biophotonics Congress, San Diego, CA, April 2-5, 2017.
5. S. Gladstein, L. Almassalha, L. Cherkezyan, J. Chandler, H. Subramanian, I. Szleifer, V. Backman, "Integrated Imaging of the Cellular Nanoarchitecture and Molecular Motion", OSA Biophotonics Congress, San Diego, CA, April 2-5, 2017.
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26. J. Yi, W. Liu, S. Chen, V. Backman, N. Sheibani, C.M. Sorenson, A.A. Fawzi, R.A. Linsenmeier, H.F. Zhang, "Visible Light Optical Coherence Tomography Measure Retinal Oxygen Metabolic Response to Systemic Oxygenation", SPIE Photonics West, San Francisco, CA, February 13-17, 2016.
27. R. Liu, J. Yi, S. Chen, H.F. Zhang, V. Backman, "A Model for Oxygen-Dependent Backscattering Spectroscopic Contrast from Single Red Blood Cells", SPIE Photonics West, San Francisco, CA, February 13-17, 2016.
28. G. Spicer, S.T. Young, J. Yi, L.D. Shea, V. Backman, "ISOCT Study of Effects of Enzymatic Crosslinking of Collagen in Field Carcinogenesis", SPIE Photonics West, San Francisco, CA, February 13-17, 2016.
29. W. Wu, A.J. Radosevich, A. Eshein, T.Q. Nguyen, V. Backman, "Electric Field Monte Carlo Simulation for Studying the Backscattering Coherence Phenomenon with Diverging Beam Illumination from Fiber", SPIE Photonics West, San Francisco, CA, February 13-17, 2016.
30. D. Zhang, T. Graff, S. Crawford, H. Subramanian, S. Thompson, J.R. Derbas, R. Lyengar, H.K. Roy, C.B. Brendler, V. Backman, "Partial Wave Spectroscopic Microscopy Can Predict Prostate Cancer Progression and Mitigate Over-Treatment", SPIE Photonics West, San Francisco, CA, February 13-17, 2016.
31. S. Rao, S. Azarin, G. Spicer, G. Bushnell, B. Aguado, J. Stoehr, V. Backman, J. Jeruss, L. Shea, "Implantable Micro-porous Poly(ϵ -caprolactone) Scaffolds For Early Detection of Breast Cancer Metastasis", BMES 2015 Annual Meeting, Tampa, FL, October 7-10, 2015 (Poster)
32. G. Bauer, L. Almassalha, J. Chandler, S. Gladstein, Y. Stypula-Cyrus, D. Zhang, L. Cherkezyan, H. Subramanian, I. Szleifer, V. Backman, "BaSIS: Imaging the Native, Living

- Cellular Nanoarchitecture”, BMES 2015 Annual Meeting, Tampa, FL, October 7-10, 2015 (Poster)
33. Q. Miao, J. Derbas, A. Eid, S. Young, H. Subramanian, V. Backman, “Automatic Cell Selection Method for Pap Smear Test”, BMES 2015 Annual Meeting, Tampa, FL, October 7-10, 2015 (Poster)
 34. G. Spicer, J. Yi, S. Azarin, S. Young, J. Winkelmann, A. Eid, R. Liu, L. Shea, V. Backman, “Inverse Spectroscopic Optical Coherence Tomography Study of ECM Interactions in Cancer”, BMES 2015 Annual Meeting, Tampa, FL, October 7-10, 2015 (Poster)
 35. A. Stawarz, R. Kalman, H. Subramanian, D. Zhang, H. Roy, V. Backman, “Detectable Nanoscale Alterations for Prediction of Future Risk of Hepatocellular Carcinoma”, BMES 2015 Annual Meeting, Tampa, FL, October 7-10, 2015 (Poster)
 36. Y. Stypula, S. Gladstein, L. Almassalha, G. Bauer, J. Chandler, L. Cherkezzyan, D. Zhang, H. Subramanian, I. Szeleifer, V. Backman, “A Novel Spectroscopic Technology to Image the Native Chromatin Nanostructure in Live Cells”, AACR Chromatin and Epigenetics in Cancer, Atlanta, GA, September 25, 2015 (Poster)
 37. V. Backman, “In Vitro Nanocytology Test for Highly Accurate Early Cancer Screening and Prognostication in Primary Care Setting”, Point-of-Care Diagnostics Conference, San Diego, CA, June 11, 2015 (Invited Talk)
 38. V. Backman, “Elastic Light Scattering for Early Malignancy Detection in GI Tract”, Digestive Disease Week 2015, Washington, D.C., May 17-19, 2015 (Invited Talk)
 39. T. Gao, M. DeLaCruz, A. Radosevich, B. Gould, V. Backman, H.K. Roy, “Differential Early Metabolic Changes in Colon Carcinogenesis for Health Disparities: Physiological and Molecular Evidence”, Digestive Disease Week 2015, Washington, D.C., May 17-19, 2015. (Poster)
 40. T. Gao, A. Radosevich, B. Gould, C. Bliss, C. Huang, D. Lichtenstein, T. Moore, D. Nunes, V. Backman, H.K. Roy, “Race and Gender Predilection for Spectroscopic Rectal Microvascular Markers in Colonic Field Carcinogenesis Detection: Implications for Colorectal Cancer Screening”, Digestive Disease Week 2015, Washington, D.C., May 17-19, 2015. (Poster)
 41. R. Kalman, H. Subramanian, D. Nunes, M. DeLaCruz, R.K. Wali, L. Jepeal, A. Stawarz, D. Zhang, V. Backman, H.K. Roy, “Biophotonic Detection of High Order Chromatin Alterations in Field Carcinogenesis Predicts Risk of Future Hepatocellular Carcinoma: A Pilot Study”, Digestive Disease Week 2015, Washington, D.C., May 17-19, 2015.
 42. S. Ruderman, V. Valuckaite, A. Almoghrabi, J. Hart, H.K. Roy, M. Bissonnette, V. Konda, V. Backman, “Early Angiogenic Changes Associated with Field Carcinogenesis in Experimental Colon Cancer”, Digestive Disease Week 2015, Washington, D.C., May 17-19, 2015.

43. V. Valuckaite, S. Ruderman, A. Almoghrabi, J. Hart, A. Abdyrakov, H.K. Roy, V. Backman, M. Bissonnette, V. Konda, "A Novel use of Angiotensin II Receptor Blocker (ARB) Losartan to Inhibit AOM Induced Tumorigenesis and Neoangiogenesis in Experimental Colon Cancer", Digestive Disease Week 2015, Washington, D.C., May 17-19, 2015.
44. "Cancer Screening and Nanoscale Cytology", SPIE Photonics West, San Francisco, CA, February 7, 2015 (Invited Talk).
45. W. Wu, A. Radosevich, Q. Nguyen, S. Young, Y. Li, A. Eshein, G. Spicer, H.K. Roy, V. Backman, "Calculating Optical Properties of Specific Structure Inside Tissue Using Transmission Electron Microscopy (TEM)", SPIE Photonics West, San Francisco, CA, February 7-12, 2015.
46. A. Eshein, A. Radosevich, N. Mutyal, Q. Nguyen, W. Wu, B. Gould, H.K. Roy, V. Backman, "In-Vivo Assessment of Ultra-Structural Alterations as an Early Event in Cancer Progression: Implications for Cancer Screening", SPIE Photonics West, San Francisco, CA, February 7-12, 2015.
47. D. Zhang, I. Capoglu, L. Cherkezzyan, H. Subramanian, A. Taflove, V. Backman, "Spectroscopic Microscopy Characterization of Subdiffractive Surface Roughness with FDTD Validation", SPIE Photonics West, San Francisco, CA, February 7-12, 2015.
48. S. Young, A. Radosevich, W. Wu, S. Vogt, L. Almassalha, Q. Jin, S. Chen, T. Paunesku, G. Woloschak, V. Backman, "Investigating Field Carcinogenesis Using X-Ray Fluorescence Microscopy" (Poster), SPIE Photonics West, San Francisco, CA, February 7-12, 2015.
49. S. Gladstein, S. Thompson, L. Almassalha, G. Bauer, J. Chandler, Y. Stypula-Cyrus, H. Subramanian, I. Szleifer, V. Backman, "Label-Free Live Cell Measurement of Nanoscale Cellular Architecture", SPIE Photonics West, San Francisco, CA, February 7-12, 2015.
50. "Transforming Risk Screening in Primary Care Setting", Point of Care Diagnostics World Congress, San Diego, CA, September 19, 2014 (Invited talk).
51. V. Backman, "Polarization gated spectroscopy", Gordon Conference - Lasers In Medicine & Biology Conference, Holderness, NH, July 14-18, 2014 (Invited talk).
52. "Photonics Meets Biology: From Nanoscale Imaging to Winning the War on Cancer", Japan-America Frontiers of Engineering (JAFOE) Conference, Tokyo, Japan, June 9, 2014 (Invited talk).
53. N. Momi, H. Subramanian, L. Bowen, M. DeLaCruz, J. Weinstein, R.K. Wali, V. Backman, H.K. Roy, "Paracrine signaling between pancreatic cancer and small intestinal cells as the biological underpinnings of duodenal alterations in field carcinogenesis: implications for screening", Conference on Digestive Disease Week 2014, Chicago, IL May 3-6, 2014.

54. H.K. Roy, N.N. Mutyal, M.J. Goldberg, A. Radosevich, L.K. Bianchi, S. Bajaj, B.R. Gould, B. Parker, V. Backman, "Spectroscopic *in vivo* quantification of tissue scattering coefficient (uS) as a marker of mass-density fluctuations in colonic field carcinogenesis: implications for screening", Conference on Digestive Disease Week 2014, Chicago, IL May 3-6, 2014.
55. H.K. Roy, D. Damania, D.K. Rex, C.M. Bliss, H. Subramanian, L.K. Bianchi, V. Gupta, M.J. Goldberg, D. Nunes, D. Lichtenstein, R. Lowe, V. Backman, "Nanocytological analysis of field carcinogenesis as a potential guide for post-polypectomy surveillance colonoscopy" (Poster Session), Conference on Digestive Disease Week 2014, Chicago, IL May 3-6, 2014.
56. H.K. Roy, V. Turzhitsky, R.K. Wali, A. Radosevich, B.D. Jovanovic, G. DellaZanna, D.T. Rubin, M.J. Goldberg, L.K. Bianchi, M. DeLaCruz, L.M. Rodriguez, R.T. Chatterton, S. Skripkauskas, E. Poast, E. Richmond, R. Bergan, V. Backman, "Correlation of spectral signatures with rectal prostaglandinE2 levels as biomarkers for aspirin chemoprevention of colon carcinogenesis: results from a placebo-controlled double blinded phase 2B trial", Conference on Digestive Disease Week 2014, Chicago, IL May 3-6, 2014.
57. V. Backman, "Spectral markers in colonic neoplasia: biological insights", 27th EDRN Steering Committee Meeting, Houston, Texas, March 4-6, 2014.
58. J. Yi, Y. Stypula, A.J. Radosevich, N.N. Mutyal, H.K. Roy, V. Backman, "Study of chromatin compaction by inverse spectroscopic optical coherence tomography as one mechanism in colorectal field carcinogenesis", SPIE Photonics West, San Francisco, CA February 1-5, 2014.
59. A. Doronin, A.J. Radosevich, V. Backman, I.V. Meglinski, "Comparison of two Monte Carlo models of propagation of coherent polarized light in turbid scattering media", SPIE Photonics West, San Francisco, CA February 1-5, 2014.
60. J. Chandler, H. Subramanian, K. Vyas, L. Cherkezyan, V. Backman, "Nanoscale disorder of biological samples mapped by whole-slide spectral microscopy", SPIE Photonics West, San Francisco, CA February 1-5, 2014.
61. L. Cherkezyan, I.R. Capoglu, H. Subramanian, J. Chandler, V. Backman, "Subdiffractional length-scale sensitivity of spectroscopic microscopy", SPIE Photonics West, San Francisco, CA February 1-5, 2014.
62. D. Damania, H. Subramanian, V. Backman, E. Anderson, M. Wong, O. McCarty, K.G. Phillips, "Network signatures of nuclear and cytoplasmic density alterations in a model of pre- and post-metastatic colorectal cancer", SPIE Photonics West, San Francisco, CA February 1-5, 2014.
63. J. Chandler, H. Subramanian, C. Maneval, C. White, V. Backman, "High-Throughput Partial Wave Spectroscopic Microscopy for Early Cancer Detection", Biomedical Engineering Society 2013 Annual Meeting, Seattle, WA September 25-28, 2013.

64. M.K. Patel, A. Gomes, D.J. Hardee, S.M. Crespo, M.O. Othman, M. Raimondo, T. A. Woodward, H.K. Roy, V. Backman, M.B. Wallace, “Polarization Gating Spectroscopy to Detect Pancreas Cancer – Final Results of the Pilot Study” (Poster), Conference on Digestive Disease Week 2013, Orlando, FL May 17-21, 2013.
65. M. DeLa Cruz, C. Blaha, A. Radosevich, R.K. Wali, D. Kunte, Y.E. Stypula, V. Backman, H.K. Roy, “Sirt6 as a Regulator for the Metabolic Alterations in Early Colon Carcinogenesis: Further Support for an Early “Warburg-like” Effect” (Poster), Conference on Digestive Disease Week 2013, Orlando, FL May 17-21, 2013.
66. H.K. Roy, A. Radosevich, R.K. Wali, A. Umar, G. Della'Zanna, B. Janovic, M.J. Goldberg, L.K. Bianchi, D.T. Rubin, L.M. Rodriguez, Tat-Kin Tsang, V. Turzhitsky, J. Shklovskaya, S. Skripkauskas, I. Helenowski, R. Bergan, V. Backman, “Phase 2b Randomized Placebo-Controlled Spectral Markers as Biomarkers for Colonic Chemoprevention with Aspirin: Correlation with Rectal Apoptosis but not Proliferation” (Poster), Conference on Digestive Disease Week 2013, Orlando, FL May 17-21, 2013.
67. A.K. Tiwari, H. Subramanian, C.D. Maneval, R.K. Wali, V. Backman, H.K. Roy, “Functional Characterization of SWI/SNF Chromatin Remodelling Complex Genes through Optical Interrogation of Nuclear Chromatin Nanoarchitecture” (Poster), Conference on Digestive Disease Week 2013, Orlando, FL May 17-21, 2013.
68. V.J. Konda, M. Gonzalez-Haba Ruiz, S. Ruderman, V. Valuckaite, U. Dougherty, R. Mustafi, A. Kulkarni, T. Chua, I. Waxman, V. Backman, J. Hart, M. Bissonnette, “Differential effects of tumor-promoting and tumor-inhibiting dietary fats on angiogenesis in normal and tumor-bearing colon” (Poster), Conference on Digestive Disease Week 2013, Orlando, FL May 17-21, 2013.
69. A.K. Tiwari, R.K. Wali, V. Backman, H.K. Roy, “Progressive Loss of ARID1a (P270) Expression During Early Stages of Colorectal Carcinogenesis is a Significant Determinant of the Colonic Epithelium Phenotype” (Poster), Conference on Digestive Disease Week 2013, Orlando, FL May 17-21, 2013.
70. A.K. Tiwari, H. Subramanian, C.D. Maneval, R.K. Wali, V. Backman, H.K. Roy, “Partial Wave Spectroscopic Microscopy: A Novel Tool to Assess Perturbation in the Cellular Transcriptional Activity During Colon Carcinogenesis”, Conference on Digestive Disease Week 2013, Orlando, FL May 17-21, 2013.
71. H.K. Roy, N.N. Mutyal, M.J. Goldberg, J.D. Rogers, L.K. Bianchi, V.J. Konda, A. Radosevich, A. Gomes, V. Backman, “Microvascular Biomarkers in the Endoscopically Normal Rectal Mucosa for Colon Neoplasia Risk Stratification: Results of a Training/Validation Dataset”, Conference on Digestive Disease Week 2013, Orlando, FL May 17-21, 2013.
72. H.K. Roy, N.N. Mutyal, S. Bajaj, J.D. Rogers, V.J. Konda, M.J. Goldberg, A. Radosevich, A. Gomes, J. Van Dam, V. Backman “Duodenal Spectral Markers for Field Carcinogenesis Detection of Pancreatic Cancer: Implications for Interductal Papillary

- Mucinous Neoplasia (IPMNS) Diagnosis and Management”, Conference on Digestive Disease Week 2013, Orlando, FL May 17-21, 2013.
73. Y.E. Stypula, J. Yi, C. Blaha, M. DeLa Cruz, D. Kunte, H.K. Roy, V. Backman, “Histone Deacetylase (HDAC) Expression as a Biomarker for Colorectal Cancer (CRC) Field Carcinogenesis: Role in High Order Chromatin Modulation”, Conference on Digestive Disease Week 2013, Orlando, FL May 17-21, 2013.
 74. V. Backman, “Nanoarchitectural markers of early carcinogenesis”, 8th EDRN Scientific Workshop, Washington, DC, March 13, 2013.
 75. V. Backman, “Optical nanocytology: transforming cancer screening and understanding chromatin modifications in early carcinogenesis”, ASME 2nd Global Congress on NanoEngineering for Medicine and Biology, Boston, MA, February 6, 2013 (Keynote talk)
 76. A. Gomes, V. Backman, “An algorithm for automated selection of application-specific fiber optic probes”, SPIE Photonics West, San Francisco, CA, February 2-7, 2013 (Talk)
 77. J. Yi, H. Roy, V. Backman, “Quantifying the tissue structural changes under the field effect of colorectal cancer by inverse spectroscopic optical coherence tomography”, SPIE Photonics West, San Francisco, CA, February 2-7, 2013 (Talk)
 78. J. Yi, V. Backman, “Imaging the complete set of optical and physical properties of biological tissue using inverse spectroscopic optical coherence tomography”, SPIE Photonics West, San Francisco, CA, February 2-7, 2013 (Talk)
 79. L. Cherkezyan, I.R. Capoglu, H. Subramanian, D. Damania, V. Backman, “Spectroscopic microscopy for quantification of nanoscale refractive index fluctuations”, SPIE Photonics West, San Francisco, CA, February 2-7, 2013 (Talk)
 80. A.J. Radosevich, N.N. Mutyal, J.D. Rogers, V. Backman, “Three models of light transport at subdiffusion lengthscales measured with coherent backscattering spectroscopy”, SPIE Photonics West, San Francisco, CA, February 2-7, 2013 (Talk)
 81. J. Yi, Q. Wei, H. Zhang, V. Backman, “Surpassing the diffraction limited resolution by laser scanning structured illumination microscopy”, Biomedical Engineering Society (BMES) 2012 Annual Meeting, Atlanta, GA October 24-27, 2012 (Talk)
 82. J. Yi, V. Backman, “Inverse spectroscopic optical coherence tomography: quantifying tissue refractive index correlation function with nanoscale sensitivity”, Biomedical Engineering Society (BMES) 2012 Annual Meeting, Atlanta, GA October 24-27, 2012 (Talk)
 83. S. Ruderman, M. Gonzalez_Haba, U. Dougherty, A. Kulkarni, A. Fichera, I. Waxman, T. Pappas, A. Gomes, M. Bissonnette, V. Konda, V. Backman, “Structural and Spatial Image Analysis of Tumor Vascularity in Models of Experimental Colon Cancer”, Biomedical

Engineering Society (BMES) 2012 Annual Meeting, Atlanta, GA, October 24-27, 2012
(Poster)

84. D. Damania, R. Bleher, J. Wu, J. Rogers, H. Subramanian, H.K.Roy, V. Backman, V. Dravid, "Visualizing Native Cell Nano-architecture during Early Carcinogenesis using Scanning Transmission Electron Microscopy", Microscopy & Microanalysis Conference, Phoenix, AZ, July 31-August 2, 2012 (Poster)
85. Y.E. Stypula, A. Radosevich, D. Kunte, N.N. Mutyal, M. Dela Cruz, T.P. Gibson, W. Qi, H.K. Roy, V. Backman, "Ultrastructural Alterations in Microscopically Normal Duodenal Mucosa as a Biomarker for Pancreatic Cancer Field Carcinogenesis", Conference on Digestive Disease Week 2012, San Diego, CA, May 19-22, 2012 (Poster).
86. Y.E. Stypula, D. Damania, D. Kunte, H. Subramanian, M. Dela Cruz, A.C. Patel, H.K. Roy, V. Backman, "Nanoarchitectural Changes of Chromatin by Histone Deacetylase (HDAC) Dysregulation occurs in Colorectal Field Carcinogenesis", Conference on Digestive Disease Week 2012, San Diego, CA, May 19-22, 2012 (Poster).
87. M.K. Patel, A.J. Gomes, S.M. Crespo, D.J. Hardee, M.O. Othman, A. Lankarani, S. Ruderman, H.K. Roy, V. Backman, M.B. Wallace, "Polarization Gating Spectroscopy of Apparently Normal Duodenal Mucosa to Detect Pancreatic Cancer", Conference on Digestive Disease Week 2012, San Diego, CA, May 19-22, 2012.
88. S. Bajaj, J. Yi, A. Radosevich, M.J. Goldberg, J.D. Rogers, L.K. Bianchi, E.F. Yen, S. Upadhye, T.K. Tsang, B. Parker, H.K. Roy, V. Backman, "Development of Novel Optical Technologies For Early Colon Carcinogenesis Detection Via Nanoscale Mass Density Fluctuations: Potential Implications for Endoscopic Diagnostics", Conference on Digestive Disease Week 2012, San Diego, CA, May 19-22, 2012 (Talk).
89. H.K. Roy, N.N. Mutyal, M.J. Goldberg, H. Du, A. Radosevich, L. K. Bianchi, J.D. Rogers, E.F. Yen, T.K. Tsang, N. Krosnjar, B. Jancan, S. Upadhye, B. Parker, V. Backman, "*In Situ* Rectal Spectral Markers for Colonic Neoplasia Risk Stratification-A Blinded Validation Study", Conference on Digestive Disease Week 2012, San Diego, CA, May 19-22, 2012 (Talk).
90. H.K. Roy, D. Damania, D. Kunte, H. Subramanian, M. DeLaCruz, M.J. Goldberg, J.D. Rogers, R.K. Wali, V. Backman, "Development of a Novel Biophotonic Assay for Colonic Field Carcinogenesis Detection: Implications for Colorectal Cancer Risk Stratification", Conference on Digestive Disease Week 2012, San Diego, CA, May 19-22, 2012 (Poster).
91. H.K. Roy, N.N. Mutyal, A. Radosevich, S. Bajaj, J. Van Dam, V.J. Konda, J.D. Rogers, S. Upadhye, M.J. Goldberg, V. Backman, "Development and Clinical Performance of a Novel Low Coherence Enhanced Backscattering Spectroscopy (LEBS) Fiberoptic Probe for Duodenal Sensing of Pancreatic Cancer Risk", Conference on Digestive Disease Week 2012, San Diego, CA, May 19-22, 2012 (Talk)

92. A.J. Gomes, S. Ruderman, M. Delacruz, Mart, R. Wali, H.K. Roy, V. Backman, "In Vivo Measurement of Carcinogenesis-Associated Shape Alterations of the Refractive Index Correlation Function", Optical Society of America Biomedical Optics (BIOMED) conference, Miami, FL, April 29-May 2, 2012.
93. N.N. Mutyal, A.J. Radosevich, S. Bajaj, S. Upadhye, J.D. Rogers, H.K. Roy, V. Backman, "In-vivo risk stratification of pancreatic cancer by evaluating optical properties in duodenal mucosa" Optical Society of America Biomedical Optics (BIOMED) conference, Miami, FL, April 29-May 2, 2012.
94. L. Cherkezyan, H. Subramanian, S. Yang, D. Damania, V. Backman, "Targeted Alteration of Real and Imaginary Refractive Index of Biological Cells by Histological Staining", Optical Society of America Biomedical Optics (BIOMED) conference, Miami, FL, April 29-May 2, 2012.
95. J. Yi, A. Radosevich, J.D. Rogers, V. Backman, "Inverse spectroscopic Optical Coherence Tomography (ISOCT): non-invasively quantifying the complete optical scattering properties from weak scattering tissue", Optical Society of America Biomedical Optics (BIOMED) conference, Miami, FL, April 29-May 2, 2012.
96. A.J. Radosevich, N.N. Mutyal, J.D. Rogers, S. Upadhye, A. Bogojevic, H.K. Roy, V. Backman, "Measurement of the spatial backscattering impulse-response in colon field carcinogenesis using enhanced backscattering (EBS) spectroscopy", Optical Society of America Biomedical Optics (BIOMED) conference, Miami, FL, April 29-May 2, 2012.
97. H. Roy & V. Backman, "Lung Cancer Risk Determination with Low Coherence Enhanced Backscattering Spectroscopy (LEBS) Analysis of Buccal Mucosa", European Lung Cancer Conference, Geneva, Switzerland, April 19, 2012 (Talk).
98. Y.E. Stypula, D. Damania, H. Subramanian, L. Cherkezyan, H.K. Roy, J. Marko, V. Backman, "Nanoarchitectural Alterations of Chromatin by Histone Deacetylase (HDAC) Dysregulation Measured using Partial Wave Spectroscopic (PWS) Nanocytology", Physical Sciences - Oncology Center (PS-OCs) Network Investigators' Meeting, Tampa Bay, FL, April 16-18, 2012 (Poster).
99. L. Cherkezyan, V. Konda, H. Subramanian, K. Wroblewski, D. Damania, L. Karl, M. J. Goldberg, I. Waxman, H. K. Roy, V. Backman "Subdiffractive differences in macromolecular density distribution detected in the field of esophageal cancer" SPIE Photonics West, San Francisco, CA, January 24-26, 2012 (Talk).
100. W. Yip, A. Gomes, V. Backman, A. Sahakian, "Polarized Monte Carlo simulation of blood vessel structure in colon tissue", SPIE Photonics West, San Francisco, CA, January 24-26, 2012 (Poster).
101. J. Yi, J.D. Rogers, I.R. Capoglu, A. Radosevich, Y. Stypula, H.K. Roy, A. Taflove, and V. Backman, "Quantifying sub-diffractive tissue mass density correlation function by Spectroscopic Optical Coherence Tomography", SPIE Photonics West, San Francisco, CA, January 24-26, 2012 (Talk).

102. A.J. Radosevich, N.N. Mutyal, J.D. Rogers, V. Turzhitsky, V. Backman, “Experimental measurement of the optical properties of biological tissue using polarized enhanced backscattering (EBS) spectroscopy”, SPIE Photonics West, San Francisco, CA, January 24-26, 2012 (Talk).
103. P. Pradhan, D. Park, H. Subramanian, D. Damania, L. Cherkezyan, V. Backman, “Delay time spectroscopy: a novel method for measuring nanoscale disorder in a biological cell and its application to early cancer detection”, SPIE Photonics West, San Francisco, CA, January 24-26, 2012 (Talk).
104. D. Damania, H. Subramanian, L. Cherkezyan, Y. Zhu, C. White, P. Pradhan, H. Roy, V. Backman, “Measuring nanoscale refractive-index alterations in the field of ovarian cancer using partial wave spectroscopic microscopy”, SPIE Photonics West Conference, San Francisco, CA, January 21-26, 2012 (Talk).
105. A.J Radosevich, J.D. Rogers, A. Taflove, V. Backman, “Jones Matrix Monte Carlo Simulation of Coherent Backscattering in Biological Media”, National Radio Science Meeting (NRSM), Boulder, CO, January 4-7, 2012.
106. I.R. Capoglu, A. Taflove, and V. Backman, “Angora: An open-source finite-difference time-domain software package,” National Radio Science Meeting, Boulder, CO, January 4-7, 2012.
107. V. Backman, “Cell imaging at the nanoscale: Detecting nuclear chromatin alterations in field carcinogenesis”, AACR 2011 Frontiers in Cancer Prevention Research, Boston, MA, October 22, 2011 (Talk).
108. V. Backman, "Partial wave spectroscopic microscopy: detecting alterations in cell nanoarchitecture in early carcinogenesis", IEEE Photonics 2011, Arlington, VA, October 13, 2011 (Talk).
109. D. Damania, H. Subramanian, Y. Zhu, L. Cherkezyan, Y. Stypula, M.De La Cruz, C. White, P. Pradhan, H. Roy, V. Backman, “Optical sensing of cell nano-architecture during early carcinogenesis: implications to colorectal cancer screening”, Biomedical Engineering Society Annual Meeting, Hartford, CT, October 12-15, 2011 (Talk).
110. T. Tan, A. Taflove, V. Backman, “A proposed perfectly matched stratified medium FDTD TFSF sourced by inhomogeneous plane waves”, International Conference on Electromagnetics in Advanced Applications, Torino, Italy, September 12-16, 2011 (Talk).
111. I.R. Capoglu, A. Taflove, V. Backman, “FDTD simulation of a partially-coherent Gaussian Schell-model beam”, IEEE International Symposium on Antennas and Propagation, Spokane, WA, July 3-8, 2011.
112. V. Backman, “Sensing Nanostructure of Biological Cells: A Journey from a Fundamental Technology to Cancer Screening”, 17th Annual CNSF Exhibition, Washington D.C., May 11, 2011 (Poster).

113. V. Konda, L. Cherkezyan, H. Subramanian, V. Becker, M. Goldberg, J. Chennat, K. Leah, I. Waxman, H. Roy, V. Backman, “*In situ* low coherence enhanced backscattering spectroscopy (LEBS) for risk-stratification of colon carcinogenesis: implications for screening and surveillance”, Conference on Digestive Disease Week 2011, Chicago, IL, May 7–10, 2011. (Talk).
114. Y. Stypula, S. Crawford, H. Subramanian, A. Tiwari, D. Kunte, M. Cornwell, H. Roy, V. Backman, "Understanding biological mechanisms of nuclear disorder strength in early carcinogenesis", Conference on Digestive Disease Week 2011, Chicago, IL, May 7-10, 2011. (Poster).
115. H.K. Roy, D. Damania, H. Subramanian, M.J. Goldberg, D. Weinberg, E.F. Yen, L.K. Bianchi, D. Shah, M.S. Borkar, T.K. Tsang, M. Utrecht, N. Krosnjar, B. Jancan, V. Backman, “Nanocytological Detection of Field Carcinogenesis With Partial Wave Spectroscopy: A Novel, Highly Accurate Modality for Prediction of Concurrent and Future Neoplastic Risk”, Conference on Digestive Disease Week 2011, Chicago, IL, May 7 – 10, 2011.
116. Y. Stypula, N. Mutyal, A. Radosevich, S. Joshi, A. Tiwari, D. Kunte, M. De La Cruz, H. Roy, V. Backman, "End binding protein (EB1) up-regulation in field carcinogenesis: implications for alterations measured by low-coherence enhanced backscattering (LEBS)", Conference on Digestive Disease Week 2011, Chicago, IL, May 7-10, 2011. (Poster of Distinction).
117. V. Backman, “Alterations in nuclear nanoscale architecture: optical imaging and the role in early carcinogenesis”, PS-OC Network Investigators’ Meeting, April 10-12, 2011, La Jolla, CA (Talk).
118. V. Backman, “Physical principles of genomic regulation through cellular nanoscale structure and implications for initiation of carcinogenesis:”, American Physical Society March Meeting, March 21, 2011, Dallas, TX (Invited Talk).
119. L. Cherkezyan, H. Subramanian, V. Konda, C. Chang, D. Damania, I. Waxman, V. Backman, “Evaluating changes in optical properties of biological cells due to histological staining”, SPIE Photonics West Conference, San Francisco, CA, January 22-27, 2011.
120. D. Damania, H. Roy, H. Subramanian, M. De La Cruz, Y. Zhu, V. Backman “Quantification of field carcinogenesis in isolated colonocytes via partial wave spectroscopic microscopy: novel means of colorectal cancer (CRC) screening”, SPIE Photonics West Conference, San Francisco, CA, January 22-27, 2011.
121. H. Subramanian, H. Roy, D. Damania, M. Shah, L. Cherkezyan, P. Pradhan, V. Backman, “Optical screening for lung cancer using epithelial cells obtained from buccal mucosa (cheek cells)”, SPIE Photonics West Conference, San Francisco, CA, January 22-27, 2011.
122. S. Ruderman, S. Mueller, J.D. Rogers, V. Backman, “Design and implementation of an optical contact sensor to automate in-vivo data acquisition upon mucosa contact with a

- fiber optic light scattering probe”, SPIE Photonics West Conference, San Francisco, CA, January 22-27, 2011.
123. N.N. Mutyal, A. Radosevich, A. Tiwari, Y. Stypula, V. Turzhitsky, J.D. Rogers, R. Wali, H. Roy, V. Backman, “Influence of cellular precancerous structural changes on macroscopic light scattering optical properties”, SPIE Photonics West Conference, San Francisco, CA, January 22-27, 2011.
 124. A.J. Radosevich, V.M. Turzhitsky, N.N. Mutyal, J.D. Rogers, V. Backman, “Depth-resolved measurement of blood supply using low-coherence enhanced backscattering spectroscopy (LEBS)” SPIE Photonics West Conference, San Francisco, CA, January 22-27, 2011.
 125. I.R. Capoglu, A. Taflove, V. Backman, “Numerical electromagnetic simulation of spectroscopic microscopy: Applications in early-stage cancer detection,” USNC-URSI National Radio Science Meeting, Boulder, CO, January 2011.
 126. N.N. Mutyal, V. Turzhitsky, J. Rogers, A. Radosevich, H. Roy, M. Goldberg, M. Jameel, A. Bogojevich, V. Backman, “Fiber optic probe for measuring changes in rectal micro architecture and vasculature in field of carcinogenesis: Implications for colon cancer risk stratification”, Biomedical Engineering Society Annual Meeting, Austin, Texas, October 6-9 2010.
 127. H.K. Roy, D. Damania, M. Goldberg, H. Subramanian, D. Kunte, M. De La Cruz, V. Backman “A novel fecal assay for colorectal cancer screening utilizing detection of nanoscale alterations in colonocytes via partial wave spectroscopy microscopy”, 12th World Congress on Gastrointestinal Cancer, Barcelona, Spain, 30 June-3 July, 2010 (Talk).
 128. D. Damania, Y. Stypula, C. Will, H. Subramanian, J. Licht, J. Marko, V. Backman “Quantification of cellular nanoarchitecture during early carcinogenesis using partial wave spectroscopic microscopy”, Cell-line Exercise meeting of NCI, Los Angeles, CA, June 19, 2010.
 129. L.A. Marcelino, J. Henss, V. Turzhitsky, A. Fang, J. Fung, M. Siple, H. Wolfman, K.W. Marks, V. Stoyneva, M. Westneat, J. Rogers, V. Backman, “The role of coral skeleton in enhancing light absorption by symbiont algae – Implications for coral bleaching”, American Society for Microbiology (AMS) 110th General Meeting, San Diego, CA, May 23-27, 2010.
 130. S.D. Strasser, A. Taflove, V. Backman, "dpNSOM: A Novel Nanoscale Refractive Index Measurement Technique", Northwestern University Undergraduate Research Symposium, Evanston, Illinois, May 24, 2010.
 131. H.K. Roy, N. Mutyal, M.J. Goldberg, J.D. Rogers, A.K. Tiwari, A. Radosevich, R.K. Wali, L. K. Bianchi, E.F. Yen, M. Jameel, A. Bogojevic, V. Backman, “Microvascular and Micro-Architectural Spectral Markers Having Synergistic Diagnostic Capabilities for Colon Neoplasia Risk Stratification”, Digestive Disease Week (DDW), New Orleans, LO, May 1-5, 2010.

132. H.K. Roy, N. Mutyal, A. Radosevich, M.J., Goldberg, A.K. Tiwari, V. Turzhitsky, R.K. Wali, L.K. Bianchi, E.F. Yen, M. Jameel, A. Bogojevic, V. Backman, “*In situ* Rectal Low-Coherence Enhanced Backscattering Spectroscopy (LEBS) With a Fiber-Optic Probe Provides Accurate Risk Stratification for Colorectal Neoplasia”, Digestive Disease Week (DDW), New Orleans, LO, May 1-5, 2010.
133. V.J. Konda, I. Waxman, L. Cherkezyan, H. Subramanian, F. Caira, K. Wroblewski, M. Bissonnette, J.S. Chennat, H.K. Roy, V. Backman, “Spectral Marker Differences in the Field of Esophageal Cancer”, Digestive Disease Week (DDW), New Orleans, LO, May 1-5, 2010.
134. H.K. Roy, D. Damania, R.K. Wali, H. Subramanian, D. Kunte, M. De La Cruz, A.K. Tiwari, V. Backman, “Wave Spectroscopy Microscopic (PWS) Analysis of Fecal Colonocytes for Field Carcinogenesis Detection: A Novel Modality for Colorectal Cancer (CRC) Screening”, Partial Digestive Disease Week (DDW), New Orleans, LO, May 1-5, 2010.
135. Y. Stypula, D. Damania, H. Subramanian, S. Joshi, A.K. Tiwari, T.P. Ward, D. Kunte, S.R. Gandhi, M. De La Cruz, R.K. Wali, H.K. Roy, V. Backman, “Nanoscale Alterations in Early Colon Carcinogenesis are Determined by Cytoskeletal Dysregulation in Microscopically Normal Mucosa”, Digestive Disease Week (DDW), New Orleans, LO, May 1-5, 2010.
136. Y. Stypula, N. Mutyal, V. Turzhitsky, M.L. Cornwell, R.K. Wali, A.K. Tiwari, S. Crawford, V. Backman, H.K. Roy, “Biophotonic Detection of Colonic Field Carcinogenesis: Spectral Slope Represents Fundamental Alterations in Crypt Architecture”, Digestive Disease Week (DDW), New Orleans, LO, May 1-5, 2010.
137. H. Subramanian, D. Damania, K. Solanki, Y. Stypula, L. Cherkezyan, A. Tiwari, P. Pradhan, D. Kunte, H.K. Roy, V. Backman, “Partial Wave Spectroscopy and Its Relation to Nanoscale Disorder in Nuclear Architecture”, Optical Society of America Biomedical Optics (BIOMED) conference, Miami, FL, April 11-14, 2010.
138. N.N. Mutyal, V. Turzhitsky, J.D. Rogers, A. Radosevich, H. Roy, M.J. Goldberg, M. Jameel, A. Bogojevich, V. Backman, “Design and Implementation of Fiber Optic Probe for measuring Field Effect of Carcinogenesis with Low-Coherence Enhanced Backscattering Spectroscopy (LEBS)”, Optical Society of America Biomedical Optics (BIOMED) conference, Miami, FL, April 11-14, 2010.
139. A. Radosevich, V. Turzhitsky, N.N. Mutyal, J.D. Rogers, H.K. Roy, V. Backman, “Reconstructing the Low-coherence Enhanced Backscattering Spectroscopy (LEBS) Peak Using $p(r)$ ”, Optical Society of America Biomedical Optics (BIOMED) Conference, Miami, FL, April 11-14, 2010.
140. J.D. Rogers, I.R. Capoglu, V. Stoyneva, V.M. Turzhitsky, V. Backman; “Modeling Spectral Dependence of Reduced Scattering Coefficient for Continuous Random Media with the Born Approximation”, Optical Society of America Biomedical Optics (BIOMED) conference, Miami, FL, April 11-14, 2010.

141. V. Turzhitsky, A. Fang, J. Fung, J. Henss, M. Siple, V. Stoyneva, J. D. Rogers, H. Wolfman, A. Radosevich, V. Backman, L.A. Marcelino, "Optical Characterization of Coral Skeleton with Low-Coherence Enhanced Backscattering Spectroscopy", Optical Society of America Biomedical Optics (BIOMED) Conference, Miami, FL, April 11-14, 2010.
142. S.D. Strasser, A. Taflove, V. Backman, "Nanoscale Refractive Index Measurement via Near-field Scanning Optical Microscopy", Chicago Area Undergraduate Research Symposium, Chicago, Illinois, April 10, 2010.
143. H.K. Roy, A. Gomes, M.J. Goldberg, S. Ruderman, L.K. Bianchi, J. Rogers, E. Yen, V. Backman, "Field Effect Identification Via Spectroscopic Rectal Microvasculature Enables Accurate Proximal Neoplasia Detection by Flexible Sigmoidoscopy", Annual General Meeting of the British-Society-of-Gastroenterology, Liverpool, U.K., March 22-25, 2010.
144. P. Pradhan, D. Damania, H. Joshi, A. Taflove, H. Roy, V. Dravid, V. Backman, "Quantification of Nanoscale Density Fluctuations in Biological Cells/Tissues: Inverse Participation Ratio (IPR) Analysis of Transmission Electron Microscopy Images and Implications for Early-Stage Cancer Detection," American Physical Society March Meeting, Portland, Oregon, March 15–19, 2010.
145. I.R. Capoglu, J.D. Rogers, A. Taflove, V. Backman, "A statistical model of light scattering in biological continuous random media based on the Born approximation", SPIE Photonics West Conference, San Francisco, CA, January 22-28, 2010.
146. D. Damania, H. Subramanian, A.K. Tiwari, Y. Stypula, P. Pradhan, H.K. Roy, V. Backman, "Detecting the role of cytoskeleton in nanoscale alterations of biological cells using partial wave spectroscopic microscopy", SPIE Photonics West Conference, San Francisco, CA, January 22-28, 2010.
147. A.J. Gomes, V. Turzhitsky, S. Ruderman, J. Rogers, V. Backman, "Influence of polarization-gated probe geometry and scattering properties on penetration depth distributions in turbid media: a Monte Carlo and experimental analysis", SPIE Photonics West Conference, San Francisco, CA, January 22-28, 2010.
148. P. Pradhan, D. Damania, H. Roy, V. Backman, "Quantification of optical disorder due to nanoscale density fluctuations in biological tissue: inverse participation ratio (IPR) analysis of transmission electron microscopy images for early-stage cancer detection", SPIE Photonics West Conference, San Francisco, CA, January 22-28, 2010.
149. P. Pradhan, D. Damania, V. Turzhitsky, H. Roy, V. Backman, "Quantification of the Disorder Strength of Nanoscale Refractive Index Fluctuations of Biological Tissue: Inverse Participation Ratio (IPR) Analysis", SPIE Photonics West Conference, San Francisco, CA, January 22-28, 2010.
150. J.D. Rogers, V. Stoyneva, N.N. Mutyal, V.M. Turzhitsky, V. Backman, "Lensless LEBS: a simplified geometry for low-coherence enhanced backscattering (LEBS)", SPIE Photonics West Conference, San Francisco, CA, January 22-28, 2010.

151. S. Ruderman, V. Stoyneva, J.D. Rogers, A.J. Gomes, V. Backman, "Development and validation of multilayered scattering and absorbing polyurethane phantoms", SPIE Photonics West Conference, San Francisco, CA, January 22-28, 2010.
152. S. Ruderman, V. Stoyneva, A.J. Gomes, J.D. Rogers, V. Backman, "Assessment of pressure, angle and temporal effects on polarization-gated spectroscopic probe measurements", SPIE Photonics West Conference, San Francisco, CA, January 22-28, 2010.
153. H. Subramanian, D. Damania, P. Pradhan, L. Cherkezyan, I. Capoglu, A. Taflove, V. Backman, "Origin of Partial Wave Spectroscopic Signals in a weak refractive index medium", SPIE Photonics West Conference, San Francisco, CA, January 22-28, 2010.
154. V. Turzhitsky, N.N. Mutyal, J.D. Rogers, V. Backman, "Characterization of tissue scattering with speckle measurements under partial spatial coherence illumination", SPIE Photonics West Conference, San Francisco, CA, January 22-28, 2010.
155. V.M. Turzhitsky, A.J. Radosevich, J.D. Rogers, N.N. Mutyal, V. Backman, "Measuring the transport mean free path, anisotropy coefficient, and shape of the phase function with low-coherence enhanced backscattering spectroscopy" SPIE Photonics West Conference, San Francisco, CA, January 22-28, 2010.
156. A.J. Gomes, S. Ruderman, J.D. Rogers, V. Backman, "Early increase in blood supply associated with premalignant colonic lesions detected by fiber optic polarization-gated spectroscopy", SPIE Photonics West Conference, San Francisco, CA, January 22-28, 2010.
157. I.R. Capoglu, A. Taflove, V. Backman, "Microscope in a computer: numerical imaging using the finite-difference time-domain method", USNC-URSI National Radio Science Meeting, Boulder, CO, January 6-9, 2010.
158. J.D. Rogers, V. Turzhitsky, H. Subramanian, I.R. Capoglu, V. Backman, "Enhanced Backscattering Simulation using Monte Carlo to Simulate Short-range Light Transport in Weakly Scattering Media." USNC-URSI National Radio Science Meeting, Boulder, CO, January 6-9, 2010.
159. H.K. Roy, V. Backman, "Field Carcinogenesis", Early Detection Research Network, 6th. EDRN Scientific Workshop (NCI), Bethesda, MD, September 1, 2009.
160. H.K. Roy, V. Backman, "Biophotonics Screening for Lung Cancer", 49th. Japanese Respiratory Society Scientific Meeting, Tokyo, Japan, June 7, 2009.
161. H.K. Roy, V. Turzhitsky, Y.L. Kim, M. J. Goldberg, J.D. Rogers, A. Gomes, M. Jameel, N. Hasabou, T.K. Tsang, V. Backman, "Field Carcinogenesis Detection by Rectal Spectral Markers Accurately Identifies Patients Harboring Proximal Advanced Adenomas", Digestive Disease Week 2009: Distinguished Abstract Plenary Session, Chicago, IL, June 2, 2009.
162. H.K. Roy, A. Gomes, S. Ruderman, M.J. Goldberg, L.K. Bianchi, E.F. Yen, J.D. Rogers, M. Jameel, A.N. Bogojevic, V. Stoyneva, J.-S. Chang, V. Backman, "Spectroscopic

- Assessment of Microvascular Blood Content to Improve Flexible Sigmoidoscopy: Gender-Related Implications”, Digestive Disease Week 2009, Chicago, IL, June 2, 2009.
163. I.R. Capoglu, V. Backman, “Validation of the Born Approximation in 2-D weakly-scattering biological random media using the FDTD Method”, 2009 IEEE Antennas and Propagation Society International Symposium, North Charleston, SC, June 1-5, 2009.
 164. H.K. Roy, V. Backman, “Spectroscopy in Colorectal Cancer Screening”, Digestive Disease Week, Chicago, IL, June 1, 2009.
 165. H. Subramanian, P. Pradhan, D. Damania, D. Balikov, S. Maheshwari, V. Backman, "Detecting nanoscale refractive index fluctuations using Partial wave spectroscopic microscopy", OSA Optics and Photonics Congress, Vancouver, BC, Canada, April 2009.
 166. P. Pradhan, H. Subramanian, D. Damania, H. Roy, V. Backman, "Mesoscopic light reflection spectroscopy of weakly disordered dielectric media: Nanoscopic to mesoscopic light transport properties of a single biological cell and ultra-early detection of cancer", American Physical Society March Meeting, Pittsburgh, PA, March, 16-20, 2009.
 167. J. J. Simpson, I. Capoglu, V. Backman, “Using FDTD to Improve Our Understanding of PWS for Advancing Ultra Early-Stage Cancer Detection Techniques”, International Symposium on Antenna Technology and Applied Electromagnetics and the Canadian Radio Sciences Meeting, Banff, Canada, February 15 – 18, 2009.
 168. H. Subramanian, H.K. Roy, P. Pradhan, D. Damania, J. Mohammed, Z. Bogojevic, V. Backman, "Optical methodology for detecting sub-wavelength refractive index variations in cells present in the field of carcinogenesis ", BiOS 2009, SPIE Photonics West, San Jose, CA, January 24-29, 2009.
 169. P. Pradhan, D.P. Damania, V.M. Turzhitzsky, V. Backman, H.K. Roy, “Quantification of optical disorder in nanoscale mass density fluctuations in biological tissue: inverse participation ratio (IPR) analysis of transmission electron microscopy (TEM) images,” SPIE Photonic West, San Jose, CA. January 24-29 (2009).
 170. J.D. Rogers, H. Subramanian, V. Turzhitsky, V. Backman, "Relationship of low-coherence enhanced backscattering spectroscopy measurements to optical properties of scattering media", Invited talk, BiOS 2009, SPIE Photonics West, San Jose, January 24-29, 2009.
 171. A.J. Gomes, H.K. Roy, V. Turzhitsky, Y. Kim, J.D. Rogers, S. Ruderman, V. Stoyneva, M.J. Goldberg, L.K. Bianchi, E. Yen, A. Kromine, M. Jameel, V. Backman, "Measuring Mucosal Microvascular Blood Supply in Vivo using Polarization-Gated Spectroscopy to predict Risk of Colonic Neoplasia", SPIE Photonics West, San Jose, CA, January 24-29, 2009.
 172. V. Backman, “Detecting alterations in cell nanoarchitecture with optical imaging: Implications for cancer detection”, Invited talk, Annual Optical Society of America Meeting, Frontiers in Optics (FiO)/Laser Science XXIV (LS) Conference, Rochester, NY, October 23, 2008.

173. H. Subramanian, P. Pradhan, J. Mohammed, Z. Bogojevic, H.K. Roy, R.E. Brand, C. Sturgis, V. Backman, "Detection of nanoscale alterations of field carcinogenesis using Partial wave spectroscopic microscopy", Biomedical Engineering Society (BMES) 2008 Annual Meeting, St. Louis, MO, October 2-4, 2008.
174. V. Backman, "Cancer screening: a remote sensing approach", Coulter Foundation Meeting, Fort Lauderdale, FL, August 6-8, 2008.
175. V. Backman, "Probing tissue architecture at submicron scale: seeing beyond histology", Gordon Conference - Lasers In Medicine & Biology Conference, Holderness, NH, July 20-25, 2008.
176. V. Backman, M. Siple, E. Daly, A. Fang, M. Westneat, V. Turzhitsky, J. Rogers, L. Marcelino, "Novel optical technique for characterization of light absorption and distribution in reef-building corals", 11th. International Coral Reef Conference, Fort Lauderdale, FL, July 7-15, 2008.
177. V. Backman, M. Siple, E. Daly, A. Fang, M. Westneat, V. Turzhitsky, J. Rogers, L. Marcelino, "Characterization of optical properties of reef-building coral skeletons", 11th. International Coral Reef Conference, Fort Lauderdale, FL, July 7-15, 2008.
178. J.J. Simpson, X. Li, A. Heifetz, V. Backman, "FDTD computational synthesis and analysis of the partial wave spectroscopy image of the inhomogeneous dielectric sphere", APS/USNC/URSI 2008, San Diego, CA, July 5-11, 2008.
179. J.D. Rogers, H. Subramanian, V. Turzhitsky, P. Pradhan, Y.L. Kim, A. Taflove, V. Backman, "Enhanced Backscattering for tissue characterization and diagnosis", Invited talk, APS/USNC/URSI 2008, San Diego, CA, July 5-11, 2008.
180. I.R. Capoglu, A. Taflove, V. Backman, "Theory and simulation of electromagnetic wave propagation in 1-D random media", APS/USNC/URSI 2008, San Diego, CA, July 5-11, 2008.
181. T.A. Hensing, H. Subramanian, H.K. Roy, D. Breault Z. Bogojevic, D. Ray, N. Hasabou, V. Backman, "Identification of malignancy-associated change in buccal mucosa with Partial Wave Spectroscopy (PWS): A potential biomarker for lung cancer risk", American Society of Clinical Oncology Annual Meeting, Chicago, IL, May 30-June 3, 2008.
182. A. Heifetz, H. Subramanian, P. Pradhan, Y. Liu, X. Li, J. Rogers, D. Kunte, H.K. Roy, A. Taflove, R. Brand, V. Backman, "Partial Wave Spectroscopy (PWS) screening for pancreatic cancer", Canary Foundation Annual Meeting, Palo Alto, CA, May 20-22, 2008.
183. R. Brand, H. Subramanian, H.K. Roy, N. Hasabou, V. Backman, "Pilot study examining changes induced in duodenal epithelial cells by different pancreatic diseases as measured by a novel optical Imaging modality, single-cell partial wave Spectroscopy Microscopy", Digestive Disease Week (DDW), San Diego, CA, May 17-22, *Gastroenterology*, **134**(4), A93-A93 (2008).
184. H.K. Roy, V. Turzhitsky, A. Gomes, M.J. Goldberg, J.D. Rogers, Y.L. Kim, T.K. Tsang, D. Shah, M.S. Borkar, M. Jameel, N. Hasabou, R. Brand, Z. Bogojevic, V. Backman,

- “Prediction of colonic neoplasia through spectral marker analysis from the endoscopically normal rectum: An ex vivo and in vivo study”, Digestive Disease Week (DDW), San Diego, CA, May 17-22, *Gastroenterology*, **134**(4), A109-A109 (2008).
185. H.K. Roy, H. Subramanian, P. Pradhan, H.T. Lynch, D. Weinberg, Z. Bogojevic, N. Hasabou, J. Koetsier, R.K. Wali, S.J. Lanspa, M.J. Goldberg, D. Kunte, V. Backman, “Identification of inherited predisposition to colonic neoplasia through partial wave spectroscopic analysis of the microscopically normal colonic epithelium”, Digestive Disease Week (DDW) Conference, San Diego, CA, May 17-22, 2008.
 186. D. Breault, H. Subramanian, D. Ray, N. Deep, T. Hensing, P. Pradhan, Z. Bogojevic, N. Hasabou, H. Roy, V. Backman, “Bio-Optical assessment of buccal mucosa: A novel risk marker for lung cancer”, American Thoracic Society, Toronto, Canada, May 16-21, 2008.
 187. V. Backman, “Cancer Screening via Biophotonics: A “Remote Sensing” Approach”, (Invited Talk), Food and Drugs Administration (FDA), Washington, D.C., April 29, 2008.
 188. V. Turzhitsky, Y.L. Kim, H.K. Roy, J.D. Rogers, A. Gomes, R.E. Brand, J.L. Hoogheem, M.J. Jung, M. Jameel, N. Hasabou, Z. Bogojevic, V. Backman, “Low-Coherence Enhanced Backscattering as a colon cancer screening technology”, Invited talk, Midwest Biomedical Engineering Conference (MBEC), Chicago, IL, April 4, 2008.
 189. A.J. Gomes, Y. Kim, V. Turzhitsky, J. Rogers, V. Backman, “*In vivo* assessment of microvascular blood content in the rectal mucosa using Polarization-Gated Spectroscopy: Applications for colon cancer screening”, The Optical Society of America (OSA) - Biomedical Optics Topical Meeting (BIOMED), St. Petersburg, FL, March 16-19, 2008.
 190. P. Pradhan, V. Turzhitsky, A. Heifetz, D. Damania, H. Subramanian, H.K. Roy, V. Backman, “Measurement of optical disorder strength due to the nanoscale refractive index fluctuations of tissues/cells: Inverse Participation Ratio (IPR) analysis of Transmission Electron Microscopy (TEM) images”, The Optical Society of America (OSA) - Biomedical Optics Topical Meeting (BIOMED), St. Petersburg, FL, March 16-19, 2008.
 191. J.D. Rogers, V.M. Turzhitsky, N.N. Mutyal, A. Gomes, A. Kromin, V. Backman, “An endoscope compatible Low-Coherence Enhanced Backscattering Spectroscopy probe for cancer screening”, The Optical Society of America (OSA) - Biomedical Optics Topical Meeting (BIOMED), St. Petersburg, FL, March 16-19, 2008.
 192. H. Subramanian, P. Pradhan, D. Kunte, N. Deep, H.K. Roy, V. Backman, “Single-Cell Partial Wave Spectroscopic microscopy”, The Optical Society of America (OSA) - Biomedical Optics Topical Meeting (BIOMED), St. Petersburg, FL, March 16-19, 2008.
 193. V. Turzhitsky, Y.L. Kim, P. Pradhan, H.K. Roy, R.E. Brand, J.L. Hoogheem, M.J. Jung, M. Jameel, N. Hasabou, V. Backman, “Quantifying the Field Effect of carcinogenesis with Low-Coherence Enhanced Backscattering Spectroscopy (LEBS)”. The Optical Society of America (OSA) - Biomedical Optics Topical Meeting (BIOMED), St. Petersburg, FL, March 16-19, 2008.
 194. P. Pradhan, V. Turzhitsky, H. Subramanian, A. Heifetz, D. Damania, J. L. Hoogheem, M. J. Jung, H. K. Roy, V. Backman, “Inverse Participation Ratio (IPR) analysis of transmission

electron microscopy (TEM) images: Quantification of optical disorder strength due to nanoscale refractive index fluctuations of tissues/cells”, American Physical Society March Meeting, New Orleans, LA, March 10-14, *Bulletin of the American Physical Society*, **53**(2): V16.7, 2008.

195. V. Turzhitsky, H. Roy, Y.L. Kim, Y. Liu, R. Brand, J. Hoogheem, M. Jameel, N. Hasabou, Z. Bogojevic, V. Backman, “Rectal Coherent Backscattering Spectroscopy to screen for colon cancer”, Invited talk, American Institute for Medical and Biological Engineering (AIMBE) 17th. Annual Event, Washington D.C, February 20-22, 2008.
196. H. Subramanian, P. Pradhan, N. Deep, V. Parikh, D. Kunte, H. Roy, V. Backman, “Single-cell partial-wave spectroscopic microscopy: early detection of cancer”, Invited talk, SPIE - Photonics West, Symposium on Biomedical Optics, 2008, San Jose, CA, January 18-24, 2008.
197. A. Heifetz, K. Huang, A. Taflove, V. Backman, “Near-field subdiffractive confinement of light by a dielectric microsphere at Mie resonance”, SPIE - Photonics West, Symposium on Biomedical Optics, San Jose, CA, January 18-24, 2008.
198. H. Subramanian, “Partial wave spectroscopy”, SPIE Chicago, Midwest Conference, Evanston, IL, November 11, 2007.
199. H. Subramanian; P. Pradhan Y. Liu, V. Parikh, N. Deep, V. Backman, "Alteration of nano-architecture of cell in early stages of carcinogenesis demonstrated by single cell Partial Wave Spectroscopy: Ultra-early detection of cancer”, SPIE Chicago, Midwest Conference, Evanston, IL, November 11, 2007.
200. V. Turzhitsky, Y.L. Kim, Y. Liu, R.K. Wali, H.K. Roy, V. Backman, “Low-coherence Enhanced Backscattering (LEBS) Spectroscopy for Colon Cancer Detection”, SPIE Chicago, Midwest Conference, Evanston, IL, November 11, 2007.
201. H. Subramanian, R. Brand, P. Pradhan, N. Deep, V. Parikh, N. Hasabou, D. Polidoro, C. Sturgis, V. Backman, "Pilot study determining the feasibility of diagnosing pancreatic cancer using single cell partial wave spectroscopy of the duodenal mucosa", American Pancreatic Association 2007 Annual Meeting, Chicago, IL, November 1-3, 2007.
202. H. Subramanian, P. Pradhan, V. Backman, "Partial wave spectroscopy: Understanding cell nano-architecture and its alteration in carcinogenesis", Biomedical Engineering Society (BMES) 2007 Annual Meeting, Los Angeles, CA, September 26-29, 2007.
203. V. Turzhitsky, Y.L. Kim, Y. Liu, H. Roy, R. Brand, A. Gomes, V. Backman, “Low-Coherence Enhanced Backscattering Spectroscopy: Less Invasive Early Cancer Detection,” Biomedical Engineering Society (BMES) 2007 Annual Meeting, Los Angeles, CA, September 26-29, 2007.
204. H. Subramanian, P. Pradhan, V. Backman, "Understanding cell nano-architecture and its alteration in carcinogenesis via Partial-wave spectroscopy", Frontiers in Optics - 2007, San Jose, CA, September 16-20, 2007.

205. A. Heifetz, K. Huang, A.V. Sahakian, X. Li, A. Taflove, V. Backman, "Experimental confirmation of enhanced backscattering induced by a photonic jet," *Frontiers in Optics / OSA Annual Meeting*, San Jose, CA, September 16-20, 2007.
206. V. Backman, "Analysis of nanoarchitecture of buccal epithelium for lung cancer screening", 15th. EDRN Steering Committee Meeting, Ann Arbor, Michigan, September 17-19, 2007.
207. V. Backman, "Low coherence Enhanced Backscattering", EMBS Annual Meeting, Lyon, France, August 23-26, 2007.
208. V. Backman, H. Roy, Y. Liu, H. Subramanian, P. Pradhan, "Partial wave microscopy: seeing beyond histopathology", Invited talk, Clinical Pathology Meeting, Rosemont, IL, June 9-10, 2007.
209. H.K., Roy, V. Turzhitsky V, Y.L. Kim, *et al.*, "Rectal spectral markers: A novel, accurate modality to risk-stratify for colorectal cancer (CRC)", *Digestive Disease Week*, Washington, DC, May 19-24, 2007, *Gastroenterology*, **132**(4): A88-A88 Suppl. 2 (2007).
210. H.K., Roy, V. Turzhitsky, M.J. Goldberg, *et al.*, "Improving colonoscopic polyp detection through microvascular blood content analysis with four dimensional elastic light scattering fingerprinting (4d-Elf)", *Digestive Disease Week*, Washington, DC, May 19-24, 2007, *Gastroenterology*, **132**(4): A95-A96 Suppl. 2 (2007).
211. R.E. Brand, H. Subramanian, C. Sturgis, *et al.*, "A novel highly accurate bio-optical approach for improving the cytologic diagnosis of pancreatic adenocarcinoma (PC)", *Digestive Disease Week*, Washington, DC, May 19-24, 2007, *Gastroenterology*, **132**(4): A119-A119 Suppl. 2 (2007).
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251. V. Backman, "Detecting Pre-Neoplastic Events in Colon Carcinogenesis by Means of Low-coherence Enhanced Backscattering Spectroscopy", Engineering Conferences International, Advances in Optics for Biotechnology, Medicine and Surgery, Copper Mountain, Colorado, July 24-28, 2005.
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Digestive Disease Week (The American Gastroenterological Association Annual Meeting), Chicago, Illinois, May 14-19, 2005.

261. V. Backman, "Detecting Invisible Precursors of Cancer with Scattered Light", Biomedical Engineering Seminar, University of Illinois, Urbana-Champaign, April 2005.
262. V. Backman, "Detecting Invisible Precursors of Cancer with Low-coherent Backscattering Spectroscopy", Biomedical Engineering Seminar, Tufts University, March 2005.
263. V. Backman, "Coherent Backscattering Spectroscopy: A new Technique for Tissue Diagnosis", Biomedical Engineering Seminar, Duke University, March 2005.
264. V. Backman, "Understanding Pre-Neoplastic Events in Colon Carcinogenesis Using Elastic Light Scattering", Biomedical Engineering and Electrical Engineering Colloquium, Boston University, February 2005.
265. V. Backman, "Early Detection, Diagnosis, and Therapy of Cancer", Keynote Presentation, BiOS Hot Topics Session, BiOS Symposium at Photonics West, January 22, 2005.
266. A. Kromine, V. Backman, "Endoscopically compatible fiber optic probe for early detection of colon cancer", SPIE Symposium on Biomedical Optics, San Jose, January 2005.
267. Y.L. Kim, Y. Liu, R.K. Wali, H.K. Roy, and V. Backman, "Low-coherent backscattering spectroscopy for tissue characterization", SPIE Symposium on Biomedical Optics, San Jose, January 22-27, 2005.
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 16. V. Backman, H. Roy, A. Gomes, S. Ruderman, J. Rogers, “Method of screening for cancer using parameters obtained by the detection of early increase in microvascular blood content”, U.S. patent application No. 20090203977 (Serial No. 12/350,955), US Class 600/325, International Class A61B 5/1459, Submission date: August 13, 2009.

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INVITED TALKS

(For list of all talks, see *Conference Presentations*)

1. “Convergence of Nanoimaging and Biology: From Decoding Chromatin Packing to Cancer Diagnostics and Therapeutics”, Robert H. Lurie Comprehensive Cancer Center, Chicago, IL, October 12, 2017.
2. “Convergence of Nanoimaging, Physics and Biology: Can Engineering Lead to a Cancer Cure?”, University of Chicago Department of Pathology, Chicago, IL, September 14, 2017.
3. “Convergence of Nanoimaging, Physics and Biology: Can Engineering Lead to a Cancer Cure?”, CLEO Conference, San Jose, CA, May 16, 2017.

4. “Convergence of Nanoimaging, Physics and Biology: Can Engineering Lead to a Cancer Cure?”, Imperial College London, March 22, 2017.
5. “Label-Free Nanoscale Imaging: Uncovering a New Biological Code”, Massachusetts Institute of Technology, Cambridge, MA, November 22, 2016.
6. “Label-Free Nanoscale Imaging”, Columbia University, October 12, 2016
7. “Insights into hallmarks of early carcinogenesis using nanoscale-sensing optical microscopy”, BMES Annual Meeting, Minneapolis, MN, October 6, 2016.
8. “Convergence of Engineering, Physics and Biology: Insights into Hallmarks of Early Carcinogenesis, Early Cancer Detection and Therapeutics”, National Science Foundation Directorate of Engineering, Arlington, VA, July 19, 2016.
9. “Label-Free Nanoscale Imaging”, Massachusetts Institute of Technology, May 31, 2016.
10. “Nanocytology: Personalizing Cancer Risk Assessment in Primary Care Setting”, Midwestern Medical Director’s Association Annual Meeting, Chicago, IL, May 13, 2016.
11. “How To Win The War On Cancer”, Milken Global Conference, Los Angeles, CA, May 4, 2016.
12. “Insights into Hallmarks of Early Carcinogenesis Using Nanoscale-sensing Optical Microscopy”, Oregon Health Science University, Portland, OR, April 14, 2016.
13. “Insights into Hallmarks of Early Carcinogenesis Using Nanoscale-sensing Optical Microscopy”, University of Pennsylvania, Philadelphia, PA, April 7, 2016.
14. “Understanding Initial Stages of Carcinogenesis Using Label-Free Optical Nanoimaging and Nanosensing”, University of Wisconsin – Madison, Madison, WI, February 29, 2016.
15. “Understanding Hallmarks of Early Carcinogenesis Using Optical Nanoimaging and Nanosensing”, Northwestern University Feinberg School of Medicine, Department of Neurology, Chicago, IL, January 11, 2016.
16. “Optical Imaging Techniques in Early Cancer Detection”, 12th Annual Life Settlement and Longevity Conference, Washington DC, November 2, 2015.
17. “Improving Cancer Detection Methods”, Medical Breakthroughs at Chicago Ideas Week, Chicago, IL, October 17, 2015.
18. “Nanocytology: New Approaches to Cancer Screening”, University of Illinois-Chicago Department of Pathology, Chicago, IL, October 12, 2015.
19. “Partial Wave Spectroscopy Prostate Cancer Project: Update and Future Goals”, NorthShore University HealthSystem, Evanston, IL, October 9, 2015.

20. “In Vitro Nanocytology Test for Highly Accurate Early Cancer Screening and Prognostication in Primary Care Setting”, Point of Care Diagnostics Conference, San Diego, CA, June 12, 2015.
21. “Nanosensing and Functional Biophotonics to Study Initial Stages of Carcinogenesis”, LAAMP Seminar, Beckman Laser Institute, Irvine, CA, April 28, 2015.
22. “Nanoscale and Functional Optical Imaging for Colon Cancer Diagnostics and Risk-Stratification”, University of Southern California, Los Angeles, CA, April 27, 2015.
23. “Cancer Screening and Nanoscale Cytology”, SPIE Photonics West Hot Topics, San Francisco, CA, February 6, 2015.
24. “Nanocytology: Transforming Cancer Screening and Risk-Stratification”, NorthShore University HealthSystem Urological Research Group, Evanston, IL, December 5, 2014.
25. “Transforming Risk Screening in Primary Care Setting”, Point of Care Diagnostics World Congress, San Diego, CA, September 19, 2014.
26. V. Backman, “Polarization Gated Spectroscopy”, Gordon Conference - Lasers In Medicine & Biology, Holderness, NH, July 14-18, 2014.
27. “Partial Wave Spectroscopy”, Olympus Corporation, Tokyo, Japan, June 10, 2014.
28. “Photonics Meets Biology: From Nanoscale Imaging to Winning the War on Cancer”, Japan-America Frontiers of Engineering (JAFOE) Conference, Tokyo, Japan, June 9, 2014.
29. “Elastic Light Scattering for Early Malignancy Detection in GI Tract”, Digestive Disease Week 2015, Washington, D.C., May 19, 2015.
30. “Optical Imaging Detects Nanoscale Alterations in Early Carcinogenesis: Cost-Effective Risk-Stratification, Screening and Prognosis of Cancer”, NCI-NIBIB Point of Care Technologies for Cancer Conference, Bethesda, MD, January 8, 2014.
31. “New Optical Imaging for the Detection of Nanoscale Biomarkers of Field Carcinogenesis: Risk-Stratification, Screening and Prognosis of Cancer”, 26th EDRN Steering Committee Meeting, Seattle, WA, September 10, 2013.
32. “Nanoarchitectural Markers of Early Carcinogenesis”, 8th EDRN Scientific Workshop, Bethesda, MD, March 13, 2013.
33. “Optical Nanocytology: Transforming Cancer Screening and Understanding Chromatin Modifications in Early Carcinogenesis”, ASME 2nd Global Congress on Nanoengineering for Medicine & Biology, Boston, MA, February 6, 2013.
34. “Nanocytology: Transforming Colon Cancer Screening”, Early Detection Seminar, Stanford University, Palo Alto, CA, October 25, 2012.
35. “Nanocytology: Transforming Colon Cancer Screening”, Northwestern University Learning for Life Lectures, Chicago, IL, October 10, 2012.

36. Norgine, Inc., London, UK, April 17, 2012.
37. Roche, Inc., Basel, Switzerland, April 16, 2012.
38. “New Technologies for Colorectal Cancer Screening”, Colorectal Cancer Screening Working Group, Orlando, March 2012.
39. “Physical Markers and Universal Parameters in Cancer”, National Cancer Institute Think Tank on Integrating the Physical Science Perspective to Open a New Frontier in Oncology, Washington, D.C., Feb. 8, 2012.
40. “Cell Imaging at the Nanoscale: Detecting Nuclear Chromatin Alterations in Field Carcinogenesis”, AACR Conference on Frontiers in Cancer Prevention Research, Boston, MA, October 22-25, 2011.
41. “Partial wave spectroscopic microscopy: detecting alterations in cell nanoarchitecture in early carcinogenesis”, IEEE Photonics 2011, Arlington, VA, October 9-13, 2011.
42. “Clinical optical imaging & spectroscopy: Approaching the clinic”, Advances in Optics for Biotechnology, Medicine and Surgery XII, An ECI Conference Series, Naples, FL, June 5-8, 2011.
43. "Alterations in nuclear nanoscale architecture: optical imaging and the role in early carcinogenesis", NCI PS-OC Network Investigators' Meeting, La Jolla, CA, April 10-12, 2011.
44. “Physics Meets Biology: Understanding the Role of Cell Nanoscale Structure in Carcinogenesis”, American Physical Society (APS) March Meeting, Dallas, TX, March 21-25, 2011.
45. “Scattering From Mass Fractals: Modeling and Observation”, SPIE Photonics West Conference, San Francisco, CA, Jan 22-27, 2011.
46. “Probing Cellular Nanoscale Organization”, Life Science Symposium, Swiss Federal Institute of Technology of Lausanne (EPFL), Lausanne, Switzerland, September 2-4, 2010.
47. “Optical Imaging: Insights into Cell Nanoarchitecture”, EECS Seminar, Northwestern University, May 12, 2010.
48. “Detecting Alterations in Cell Ultrastructure with Optical Imaging: Implications for Cancer Screening”, Frontiers of GI Research Conference, University of Illinois at Chicago, Department of Medicine, February, 2010.
49. “Detecting Alterations in Cell Ultrastructure with Optical Imaging: Implications for Cancer Screening”, Department of Physics, University of Wisconsin – Milwaukee, Milwaukee, December 11, 2009.
50. “Detecting Alterations in Cell Ultrastructure with Optical Imaging: Understanding the Role of Cell Morphology in Carcinogenesis”, Future of Light Symposium, Boston University Photonics Center, November 16, 2009.
51. “Translating of Biophotonics Technologies into Clinical Practice: Challenges and Successes”, Coulter Biomedical Optics Industry-Academia Collaborative Meeting, Boston University, November 10, 2009.

52. "A Translational Biomedical Research Model", Innovation Workshop Series, University of Chicago, October 29, 2009.
53. "Measuring cell nanoscale organization: partial wave spectroscopic microscopy", IEEE-EMBS Annual Meeting, Minneapolis, September 2-6, 2009.
54. "Cancer Screening via Biophotonics: A "Remote Sensing" Approach", University of Connecticut Health Center, April 9, 2009.
55. "Detecting alterations in cell nanoarchitecture with optical imaging", University of California Irvine, April 2, 2009.
56. "Detecting alterations in cell nanoarchitecture with optical imaging", University of Rochester, December 5, 2008.
57. "Optically sensing alterations in nanoscale cell architecture: a new paradigm for cancer screening", Biotechnology Seminar, Northwestern University, October 29, 2008.
58. "Detecting alterations in cell nanoarchitecture with optical imaging: Implications for cancer detection", Annual Optical Society of America Meeting, Frontiers in Optics (FiO)/Laser Science XXIV (LS) Conference, Rochester, NY, October 23, 2008.
59. "Optically sensing alterations in nanoscale cell architecture: a new paradigm for cancer screening", Illinois Institute of Technology, Chicago IL, October 11, 2008.
60. "Surrogate Anatomic/Functional Sites for Evaluating Cancer Risk", Physical Sciences & Oncology Mini-Symposium, Northwestern University, Chicago, IL, October 3, 2008.
61. "Alterations in Cellular Nanoarchitecture Is an Early Event in Carcinogenesis", IBiS Seminar Series, Northwestern University, Chicago, IL, September 30, 2008.
62. "Optically sensing alterations in nanoscale cell architecture: a new paradigm for cancer screening", University of Chicago Medical School, Chicago, IL September 18, 2008.
63. "Biophotonics for colon cancer screening", Keynote speaker, Midwest Colon Cancer Symposium, September 13, 2008.
64. "Probing tissue architecture at submicron scale: seeing beyond histology", 2008 Gordon Conference on Lasers in Medicine and Biology, Session on "Novel Techniques: Microscale to Nanoscale", New Hampshire, July 20-25th, 2008.
65. "Enhanced Backscattering for tissue characterization and diagnosis", APS/USNC/URSI 2008, San Diego, CA, July 5-11, 2008.
66. "Cancer Screening via Biophotonics: A "Remote Sensing" Approach", Clinical and Translational Research Seminar Series, Robert H. Lurie Comprehensive Cancer Center, Northwestern University, May 2008.
67. "Cancer Screening via Biophotonics: A "Remote Sensing" Approach", FDA, April 2008.
68. "Cancer Screening via Biophotonics: A "Remote Sensing" Approach", University of Chicago, Department of Chemistry Seminar, April 2008.
69. "Low-Coherence Enhanced Backscattering as a colon cancer screening technology", Midwest Biomedical Engineering Conference (MBEC), Chicago, IL, April 4, 2008.

70. "Rectal Coherent Backscattering Spectroscopy to screen for colon cancer", Invited talk, American Institute for Medical and Biological Engineering (AIMBE) 17th. Annual Event, Washington D.C, February 20-22, 2008.
71. "Single-cell partial-wave spectroscopic microscopy: early detection of cancer", Invited talk, SPIE - Photonics West, Symposium on Biomedical Optics, 2008, San Jose, CA, January 18-24, 2008.
72. "Cellular and Tissue Optical Measurements for the Detection of Colorectal Cancer – Does the Field Effect Exist", Biomedical Imaging Research Opportunities Workshop, North Bethesda, Maryland, January 18, 2008.
73. "Detecting alterations in tissue nanoarchitecture with optical imaging: implications for cancer screening", Chicago Biomedical Consortium, Chicago, IL, November 9, 2007.
74. "Analysis of nanoarchitecture of buccal epithelium for lung cancer screening", 15th EDRN Steering Committee Meeting, Ann Arbor, Michigan, September 17-19, 2007.
75. "Low coherence Enhanced Backscattering", EMBS Annual Meeting, Lyon, France, August 2007.
76. "Partial wave microscopy: seeing beyond histopathology", Clinical Pathology Meeting, Rosemont, IL, June 9-10, 2007.
77. "Preneoplasia: Predicting the Behavior of the Early Lesion", The Educational Session, Annual Meeting of the American Association for Cancer Research, Los Angeles, CA, April 14, 2007.
78. Low-coherence Enhanced Backscattering: characteristics and applications for colon cancer screening", SPIE - Photonics West, Symposium on Biomedical Optics, San Jose, CA, January 20-25, 2007
79. "Utilizing the field effect for cancer screening", Northwestern University Cancer Center Board Meeting, Chicago, IL, November 2, 2006.
80. "Single cell partial wave spectroscopy: understanding alterations of intracellular nanoarchitecture in cancer", Invited Talk, Annual Meeting of the Optical Society of America: Frontiers in Optics, Rochester, NY, October 8-12, 2006.
81. "Biophotonics Techniques in Detection of Early Colon Precancer: Using Colonic Cells as Reporters of Carcinogenesis", NCI and DCTD Cancer Imaging Program Workshop on Imaging Science Development for Cancer Prevention and Preemption, Gaithersburg, MD, July 9-11, 2006.
82. "Low-coherence enhanced backscattering for biomedical applications", Optical Society of America Summer Topical Meeting on Coherent Optical Technologies and Applications (COTA), Whistler, British Columbia, Canada, June 28-30, 2006.
83. "Screening for Pancreatic Cancer", 2nd Annual Dinner of Alexander H. Steinkoler Foundation for Pancreatic Cancer Research, New York, NY, May 10, 2006.
84. "Biophotonics for Cancer Screening: Can Star Trek-like Diagnostics Become a Reality?", Northwestern University Alumni Association, May 3, 2006.

85. "Enhanced Light Backscattering for Non-invasive Early Detection of Colon and Pancreatic Cancer", Oncology Imaging Symposium, Chicago, April 19, 2006.
86. "Enhanced Backscattering Spectroscopy", Photomedicine Lecture Series, Wellman Center for Photomedicine, Massachusetts General Hospital, Boston, MA, November 2005.
87. "Detecting Pre-neoplastic Events in Colon Carcinogenesis with Optical Spectroscopy", NCI-NTROI Workshop, November 2005.
88. "Noninvasive Screening for Colon Cancer Without Colonoscopy", Mornings at McCormick Lecture Series, November 2005.
89. "Enhanced backscattering of light reveals the initial events in colon carcinogenesis", 27th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, Pre-conference workshop on Biomolecular Photonics and Imaging, Shanghai, China, September 2005.
90. "Detecting Pre-Neoplastic Events in Colon Carcinogenesis by Means of Low-coherence Enhanced Backscattering Spectroscopy", Engineering Conferences International, Advances in Optics for Biotechnology, Medicine and Surgery, Copper Mountain, Colorado, July 2005.
91. "Intrinsic Sources of Optical Contrast are Better Than Extrinsic Sources for In Vivo Biomedical Applications", Debate partner, Engineering Conferences International, Advances in Optics for Biotechnology, Medicine and Surgery, Copper Mountain, Colorado, July 2005.
92. "Imaging of Early Cancer", Abbott, Inc., July 13, 2005.
93. "Detecting Invisible Precursors of Cancer with Scattered Light", Biomedical Engineering Seminar, University of Illinois, Urbana-Champaign, April 2005.
94. "Detecting Invisible Precursors of Cancer with Low-coherent Backscattering Spectroscopy", Biomedical Engineering Seminar, Tufts University, March 2005.
95. "Coherent Backscattering Spectroscopy: A new Technique for Tissue Diagnosis", Biomedical Engineering Seminar, Duke University, March 2005.
96. "Understanding Pre-Neoplastic Events in Colon Carcinogenesis Using Elastic Light Scattering", Biomedical Engineering and Electrical Engineering Colloquium, Boston University, February 2005.
97. "Early Detection, Diagnosis, and Therapy of Cancer", Keynote Presentation, BIOS Hot Topics Session, BIOS Symposium at Photonics West, January 22, 2005.
98. "Detecting Invisible Precursors of Cancer with Scattered Light", Illinois Microscopy Society, Chicago, IL, November 19, 2004.
99. "Understanding Pre-Neoplastic Events in Colon Carcinogenesis Using Light Scattering", Biomedical Engineering Seminar, University of Arizona, November 2004.
100. "Coherent Backscattering Spectroscopy: A new Technique for Tissue Diagnosis", BMES 2004 Annual Meeting, Philadelphia, PA, October 13-16, 2004.

101. "Detection of Pre-Dysplastic Stages of Colon Carcinogenesis Using Elastic Light Scattering Fingerprinting", Fourth Inter-Institute Workshop on Optical Diagnostic Imaging from Bench to Bedside at the National Institutes of Health, September 20-22, 2004.
102. "Coherent Backscattering Spectroscopy: A New Technique for Tissue Diagnosis", IEEE/EMBS Conference, San Francisco, CA, September 1-4, 2004.
103. "Detection of Pre-Dysplastic Stages of Colon Carcinogenesis Using Elastic Light Scattering Fingerprinting", NSF/NIH/NASA Image-Guided Interventions (IGI) for Medical Applications Workshop, Bethesda, MD, May 13-14, 2004.
104. "Increased Mucosal Blood Supply is an Early Preneoplastic Marker in Colon Neoplasia", Distinguished Abstract, Plenary Session, Digestive Disease Week (The American Gastroenterological Association), Orlando, May, 2004.
105. "Detection of Pre-Dysplastic Stages of Experimental Colon Carcinogenesis Using Light Scattering Fingerprinting", Preventive GI Oncology Conference, Northbrook, IL, October 25, 2003.
106. "Diagnosis of the Earliest Stages of Colon Carcinogenesis Using Light Scattering "Fingerprinting", Biological Sciences Seminar Series, Harvard School of Public Health, Boston, MA, September 2, 2003.
107. "Light Scattering Spectroscopy and Imaging of the Initial Stages of Carcinogenesis", CUBIC, Chicago, IL, March 7, 2003.
108. "How to Cheat the Diffraction Limit: Far-Field Measurement of Nanometer Structures", Spectroscopy at Nanoscale Seminar, Massachusetts Institute of Technology, Cambridge, MA, January 27, 2003.
109. "Spectroscopic Optical Imaging", BMES Annual Meeting, Houston, TX, October, 2002.
110. "Light Scattering Spectroscopy and Its Potential Applications in Clinical Medicine", Illinois Innovation Initiative, West Chicago, IL, December 14, 2001.
111. "Optical Spectroscopic Imaging: From Structural Analysis to Early Cancer Detection", Technology Update, Evanston, IL, December 6, 2001.
112. "Functional Imaging of Tissue Morphology with Light Scattering Spectroscopy". Invited Speaker, American Physical Society Annual Meeting, Seattle, Washington, March 2001.
113. "Biomedical Imaging with Light Scattering Spectroscopy: a New Tool for Early Cancer Detection", Invited Speaker, Biomedical Engineering Seminar Series, Northwestern University, February 2001.
114. "Functional Imaging of Early Cancer with Light Scattering Spectroscopy", BIOS 2001, Photonics West, SPIE Conference, San Jose, CA, January 2001.
115. "Functional Biomedical Imaging with Scattered Light". Invited Speaker, Modern Optics and Spectroscopy Seminar Series, Massachusetts Institute of Technology, Cambridge, Massachusetts, September 2000.
116. "Functional Imaging with Polarized Light Scattering Spectroscopy". Invited Speaker, Optical Imaging Festival, Massachusetts Institute of Technology, Cambridge, Massachusetts, March 2000.

117. “Early Detection of Precancer Using Polarized Light Scattering Spectroscopy”, Invited Speaker, Press Conference at American Physical Society Meeting, Minneapolis, Minnesota, March 2000.
118. “Fourier Transform Reflectance Spectroscopy for Non-invasive Diagnosis of Dysplasia”. Harvard-MIT Biomedical Engineering Seminar Series, Cambridge, Massachusetts, February 1998.
119. “Fourier Transform Reflectance Spectroscopy: A New Method of Dysplasia Diagnosis”. Invited Speaker, Lester Wolfe Workshop on Biomedical Optics, Cambridge, Massachusetts, March 1997.
120. “Determination of Polarization of Vacuum-Ultraviolet Radiation by Fluorescence and Probe-Beam Techniques”. Invited Speaker, International Workshop on Solar Polarization, St. Petersburg, Russia, 1995.

PROFESSIONAL AND UNIVERSITY SERVICE

Symposia Organization:

- Conference Chair, Biophotonics, Biology and Biophysics: Convergence (B3C) II, Photonics West, San Francisco, California, February 2017.
- Panel Leader, Optical Nanoscale Imaging: Unraveling the Chromatin Structure-Function Relationship, AAAS Annual Meeting, Boston, MA, February 2017.
- Program Committee, 5th International Conference on Photonics, Optics and Laser Technology, Porto, Portugal, February 2017.
- Advisory Board, Point of Care Diagnostics World Congress, San Diego, CA, September 2016.
- Program Committee, OSA Biomedical Optics Congress, Hollywood, FL, April 2016.
- Conference Chair, Biophotonics, Biology and Biophysics: Convergence (B3C), Photonics West, San Francisco, California, February, 2016.
- Advisory Board, Point of Care Diagnostics World Congress, San Diego, CA, September 2015.
- Conference Chair, Biomedical Applications of Light Scattering IX, Photonics West, San Francisco, California, February, 2015.
- Advisory Board, Point of Care Diagnostics World Congress, San Diego, CA, September 2014.
- General Chair, Biomedical Optics Congress, Miami, FL, May 2014.
- Conference Chair, Biomedical Applications of Light Scattering VII, Photonics West, San Francisco, California, February, 2014.
- Conference Chair, Biomedical Applications of Light Scattering VI, Photonics West, San Francisco, California, January, 2013.
- Organizer, Colorectal Cancer Screening Working Group, Orlando, March 2012.
- Program Chair, Optical Spectroscopy, OSA BIOMED, Miami, FL, April 29-May 2, 2012.
- Co-Chair, Early Cancer Detection, World Molecular Imaging Congress (WMIC), San Diego, CA, September 7-10, 2011.
- Program Committee, ECI Advances in Optics for Biotechnology, Medicine and Surgery XII, Chair for Clinical Optical Imaging and Spectroscopy session, Naples, Florida, June 5-8, 2011.

Conference Chair, Biomedical Applications of Light Scattering V, Photonics West, San Francisco, California, January, 2012.

Conference Chair, Biomedical Applications of Light Scattering IV, Photonics West, San Francisco, California, January, 2011.

Conference Chair, Biomedical Applications of Light Scattering III, Photonics West, San Francisco, California, January, 2010.

Program Committee, Bio-Optics in Clinical Application, OSA Biomed Topical Meeting, Miami, April 11-15, 2010.

Mini-symposium on Ultra-sensitive Biomedical Sensing Technologies, IEEE-EMBS Annual Meeting, Minneapolis, September 2-6, 2009.

Program Committee, Novel Optical Instrumentation for Biomedical Applications Subconference at the European Conference on Biomedical Optics, Munich, June 2009.

Conference Chair, Biomedical Applications of Light Scattering III, Photonics West, San Jose, California, January, 2009.

Conference Chair, Biomedical Applications of Light Scattering II, Photonics West, San Jose, California, January, 2008.

Program Committee, LEOS Annual Meeting, Florida, October 24, 2007.

Conference Chair, Biomedical Applications of Light Scattering I, Photonics West, San Jose, California, January 20-25, 2007.

Committee Member, LEOS Annual Meeting, Montreal, QC, Canada, October 29 – November 2, 2006.

Program Committee for the Optical Society of America Biomedical Optics Meeting: Optical Spectroscopic Imaging & Diagnostics, April, 2006.

Program Committee for Biophotonics, Lasers and Electro-Optics Society (LEOS) Annual Meeting, Montreal, Canada, October-November, 2006.

Chair, Subcommittee for Medical and Biological Applications, CLEO 2006.

Technical Program Committee for Medical and Biological Applications, CLEO, Baltimore, MD, May 23-27, 2005.

Session Chair:

New Technologies in Medical Diagnostics, Biophysics, Biology and Biophotonics III: the Crossroads, Photonics West, San Francisco, California February 2018.

Theory I, Biomedical Applications of Light Scattering VIII, Photonics West, San Francisco, California, February, 2015.

Spectroscopy of Elastic Light Scattering, Biomedical Optics and 3D Imaging, Miami FL, USA, May 2, 2012.

Clinical optical imaging & spectroscopy: Approaching the clinic, Advances in Optics for Biotechnology, Medicine and Surgery XII, An ECI Conference Series, Naples, FL, June 5-8, 2011.

Nanoscale Measurements, Biomedical Applications of Light Scattering IV, Photonics West, San Francisco, California, January, 2010.

Enhanced Backscattering, Biomedical Applications of Light Scattering IV, Photonics West, San Francisco, California, January, 2010.

Recent Advances in Translational Biophotonics and Nanophotonic Imaging Technologies, IEEE-EMBS Annual Meeting, Minneapolis, September 2-6, 2009.

Numerical Simulation Studies, Biomedical Applications of Light Scattering III, Photonics West, San Jose, California, January, 2009.
In Vitro Applications, Biomedical Applications of Light Scattering III, Photonics West, San Jose, California, January, 2009.
Spectroscopy of Biomolecular Processes, Frontiers in Optics (FiO)/Laser Science XXIV (LS), Rochester, NY, October 2008.
Biomedical Applications of Light Scattering, Photonics West, San Jose, California, 2007.
Spectroscopic Signatures, OSA Annual Meeting, 2006.
Molecular and Cellular Sensing, CLEO, 2006.
Scattering and Absorption, CLEO, 2006.
Biomedical Optics: Living on the Edge, CLEO, 2006.
Light Scattering Spectroscopy and Imaging, CLEO, May 23-27, 2005.
Tissue Optical Diagnostics, BMES 2004, October 16, 2004.
Diffuse Optical Tomography and Spectroscopy, Frontiers in Optics/Laser Science XIX Conference, October 5 - 9, 2003.

Editorial Service:

Associate Editor, *Science Advances* (2017)
Associate Editor, *Biomedical Optics Express* (2012)
Editor, *Fundamentals of Biophotonics*, CRC Press (expected completion, 2017).
Editor, *Biomedical Applications of Light Scattering*, McGraw Hill Publishing (2009).
Honorary editorial board, *Reports in Medical Imaging* (2009).
Guest Editor, *IEEE Journal of Selected Topics in Quantum Electronics*, Special Issue on Biophotonics (2007).
Co-editor, *Disease Markers*, Special Issue on Spectroscopic Markers (2006).
Guest Editor, *Journal of Biomedical Optics* (2005).

Grant Review: Chartered Member of NIH Biomedical Imaging Technology (BMIT) Study Section (September 2010 – 2014)

Other Grant Review:

NSF: CAREER Review Panel, Division of Bioengineering, (September 2017)
NSF: Biophotonics Panel, CBET (January 2015)
NSF: CAREER Review Panel, Division of Bioengineering, (October 2014)
NSF: CAREER Review Panel, Division of Bioengineering, (September 2013)
NSF: Biophotonics Panel, CBET (December 2012)
NSF: Physical Sciences and Cancer (May 2012)
NSF: CAREER Review Panel, Division of Bioengineering, (October 2011)
NSF: Biophotonics Review Panel, Division of Bioengineering, (December 2010)
NSF: CAREER Review Panel, Division of Bioengineering (2010)
NSF: Interdisciplinary Biocluster Panel, (February 2010)
NSF: Biophotonics Review Panel, Division of Bioengineering, (December 2009)
NSF: Biophotonics Review Panel, Division of Bioengineering, (May 2009)
NSF: Biophotonics Review Panel, Division of Bioengineering, (Fall 2008)
NSF: Biophotonics Review Panel, Division of Bioengineering, (Spring 2008)
NSF: CAREER Review Panel, Division of Bioengineering (2007)
NSF: Biophotonics Review Panel, Division of Bioengineering (2007)

NSF: Biophotonics Review Panel, Division of Bioengineering (2006)
 NSF: Biomedical Imaging/Optical SBIR/STTR panel (2006)
 NSF: Biophotonics Review Panel, Division of Bioengineering (2005)
 NSF: CAREER Review Panel, Division of Bioengineering (2005)
 NSF: Biophotonics Review Panel, Division of Bioengineering (2004)
 NSF: CAREER Review Panel, Division of Bioengineering (2004)
 NSF: Nanotechnology Review Panel (2003)
 NSF: CAREER Review Panel, Division of Bioengineering (2003)
 NIH: Instrumentation and Systems Development (ISD) Study Section (October 2017)
 NIH: Instrumentation and Systems Development (ISD) Study Section (June 2017)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (September 2016)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (February 2016)
 NIH: Chair, PS-OC U01 Study Section (July 2015)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (February 2014)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (June 2013)
 NIH: P41 Site Visit (November 2012)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (October 2012)
 NIH: Clinical and Translational Imaging Applications Study Section (June 2012)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (February 2012)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (October 2011)
 NIH: Advanced In Vivo Imaging to Understand Cancer Systems (NCI) (June 2011)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (February 2011)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (October 2010)
 NIH: Bioengineering Research Partnership (BRP) (June 22, 2010)
 NIH: RC4 and T-R01 Panels (April-May 2010)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (October 2009)
 NIH: Novel Imaging Study Section (SBIB-J) (June 2009)
 NIH: Challenge Grants Review (May 2009)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (October 2008)
 NIH: Quick Trials Study Section (October 2008)
 NIH: Novel Imaging Study Section (SBIB-J) (June 2008)
 NIH: Cellular and Molecular Imaging Centers (November 2007)
 NIH: Novel Imaging Study Section (SBIB-J) (October 2007)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (September 2007)
 NIH: Training grants (July 2007)
 NIH: Novel Imaging Study Section (SBIB-J) (June 2007)
 NIH: Study Section SBIB-P(02) (June 2007)
 NIH: Novel Imaging Study Section (SBIB-J) (March 2006)
 NIH: Novel Imaging Study Section (SBIB-J-1) (February and November 2006)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (February and October 2006)
 NIH: Novel Imaging Study Section (SBIB-J-1) (2005)
 NIH: Centers of Cancer Nanotechnology Excellence (CCNEs) Special Emphasis Study Section (2005)
 NIH: Biomedical Imaging Technology (BMIT) Study Section (2005)
 NIH: SBIB Study Section (2005)

NIH: Diagnostic Imaging (DMG) Study Section (2004)
NIH: Biomedical Imaging Technology (BMIT) Study Section (2004)
NIH: Sciences Special Study Section, National Institute of General Medical (2004)
The Indiana 21st Century Research and Technology Fund (2009)
Science Foundation Ireland
Cancer Research UK (UK)
The Wellcome Trust (UK): Molecular and Cell Biology Scientific Programme
Association for International Cancer Research (UK)
University of North Texas Excellence Fund
CCSG Program, Northwestern University
NUCATS, Northwestern University
The Technology Foundation STW, Netherlands Organization for Scientific Research, NWO, and the Dutch Ministry of Economic Affairs

Book Peer-review:

Physiology for Engineering Students (Joseph Feher, Elsevier)
Femtosecond Biomedical Optics (Cambridge University Press)
Encyclopedia of Medical Devices and Instrumentation (John Webster, ed., Wiley, Inc.)

Journal Peer-review:

Nature Nanotechnology, Nature Medicine, Nature Materials, PNAS, Optics Letters, Applied Optics, Journal of Biomedical Optics, Journal of Physics D: Applied Physics, Journal of Optical Society of America, Journal of Optics A: Pure and Applied Optics, Biotechnology Progress, Physics in Medicine and Biology, Lasers in Surgery and Medicine, Optics Express, Technology in Cancer Research and Treatment, Journal of Orthopaedic Research, Review of Scientific Instruments, TPDSci: Journal on selected Topics of Particle and Dispersion Science.

Professional Societies:

Optical Society of America, American Physical Society, International Society for Optical Engineering, American Institute for Medical and Biological Engineering (AIMBE)

Professional Membership:

Associate Member, Network for Translational Research (NTR) (2009-present)
National Institutes of Health Early Detection Research Network (2004-present)
Network for Translational Research Optical Imaging (NTROI): Optical Spectroscopy for Management of Cancer Treatment (2004-2009)

Board Membership and Other Professional Service:

The Steinkoler Pancreatic Cancer Foundation, Member of the Board (2008-present)
AIMBE Advocacy Committee (2010-present)

Consulting:

Johnson & Johnson, Inc.
Morningside Evaluations and Consulting
Round Table Group

Guidepoint Global Advisors

Northwestern University Service:

Promotion and Tenure Committee, McCormick School of Engineering and Applied Sciences (2010-present)
Biomedical Engineering Graduate Committee (2010-present)
One Northwestern Committee (2007)
Representative of McCormick School of Engineering and Applied Sciences, Admission Committee, Honors Program in Medical Education (2004-2006)
Chair of the Graduate Program Committee (2006-present)
Graduate Program Committee (2005-2006)
Programming Team, Proteomics and Nanobiotechnology Facility (2005-present)
Biomedical Engineering Department-Electrical and Computer Engineering Department Faculty Search Committee (2005)
Academic Standing Committee (2002-2004)

TEACHING

BME 302/402: Systems Physiology: Cardiovascular and Respiratory Physiology.
BME 333: Modern Optical Microscopy (new course, first offered in fall, 2001).
BME 495: Advanced Physical and Applied Optics (new course, first offered in spring, 2002).

POSTDOCTORAL FELLOW AND STUDENT SUPERVISION

Postdoctoral Fellow Supervision:

Xu Li, Ph.D. (2003-2005), currently tenure-track Assistant Professor, Biomedical Engineering Department and Electrical and Computer Engineering Department, Northwestern University.
Young Kim (2005-2007), currently tenure-track Assistant Professor, Biomedical Engineering Department, Purdue University.
Kun Chen, Ph.D. (2002-2004), currently Assistant Professor at Shanghai Institute of Optics and Fine Mechanics, Shanghai, China.
Snow Tseng, Ph.D. (2005), currently tenure-track Assistant Professor at Taiwan University.
Jianmin Gong, Ph.D. (2003-2005)
Soon-Cheol Kong, Ph.D. (2007-2009)
Alexander Heifetz (2005-2008), Research Scientist, Argonne National Laboratory
Prabhakar Pradhan (2005-2013), currently tenure-track Assistant Professor at University of Memphis
Jeremy Rogers (2007-2013), currently tenure-track Assistant Professor at University of Wisconsin-Madison
Ilker Capoglu (2007-2012), currently Scientific Advisor at Halliburton
Hariharan Subramanian (2009-2012) currently Research Assistant Professor at Northwestern University
Vladimir M. Turzhitsky (2009-2010), currently Instructor at Harvard University
Seungmoo Yang (2009-2012)
Teng Meng Tan (2011-2012), currently Electrical Engineer at University of Calgary

Andrew Gomes (2013)
Ji Yi (2013-2015), currently Assistant Professor, Boston University Medical School
Sebastian Thompson (2014-2016)
Andrew Radosevich (2014-2015), currently Research Scientist at AbbVie
Lusik Cherkezyan (2014-present)
Yolanda Stypula (2014-2015), currently Senior Scientist at Promega
Qin Miao (2014-2015)

Clinical Fellows Training:

Vani Konda, M.D., University of Chicago Medical School (2008-present)

Visiting Scientists

Yuki Shono, Olympus Corporation (2011-2013)
Yoko Horino, Olympus Corporation (2013)

Graduate Student Supervision:

Young Kim (Ph.D., 2005), currently tenure-track Assistant Professor, Biomedical Engineering Department, Purdue University.
Yang Liu (Ph.D., 2006), currently tenure-track Assistant Professor, University of Pittsburgh
Shiv Tumkur (M.S., 2003)
Amit Sharma (M.S., 2004)
Michael Siegel (M.S., 2005)
Zhigang Chen (Ph.D., 2005)
Bo Liu (M.S., 2007)
Hariharan Subramanian (Ph.D., 2009), currently Research Assistant Professor at Northwestern University
Vladimir M. Turzhitsky (Ph.D., 2009), currently Instructor at Harvard University
Valentina Stoyneva (M.S., 2012)
Wendy Yip (Ph.D., 2012), currently Data Scientist at The Data Incubator
Charles Maneval (M.S., 2013), currently Research & Test Engineer at SpineFrontier
Andrew Gomes (Ph.D., 2013), currently Medical Writer at Ashfield Healthcare Communications
Nikhil Mutyal (Ph.D., 2013), currently Lifesciences Business Development Specialist at AVEO Oncology
Ji Yi (Ph.D., 2013), currently Assistant Professor, Boston University Medical School
Dhwanil P. Damania (M.S., 2009; Ph.D., 2013), currently R&D Biomedical Engineer at Vital Connect, Inc.
Lusik Cherkezyan (Ph.D., 2014), currently Postdoctoral Fellow at Northwestern University
Yolanda Stypula (Ph.D., 2014), currently Senior Scientist at Promega
Andrew Radosevich (Ph.D., 2014), currently Research Scientist at AbbVie
Sarah K. Ruderman (Ph.D., 2015)
Ankit Gandhi (M.S., 2015), currently Assay Development Research Associate at T2 Biosystems
Scott Young (M.S., 2015)
Taylor Graff (M.S., 2016)

Alexis Kendra (M.S., 2016)
Ron Ellis (M.S., 2016)
John Chandler (Ph.D., expected 2016)
Luay Almassalha (Ph.D./M.D., expected 2017)
Di Zhang (Ph.D., expected 2017)
Greta Bauer (Ph.D., expected 2018)
Adam Eshein (Ph.D., expected 2018)
Scott Gladstein (Ph.D., expected 2018)
Wenli Wu (Ph.D., expected 2018)
Graham Spicer (Ph.D., expected 2018)
Andrew Stawarz (Ph.D., expected 2019)
James Winkelmann (Ph.D., expected 2019)
Aya Eid, (Ph.D., expected 2019)
Rongrong Liu (Ph.D., expected 2019)
Yue Li (Ph.D., expected 2019)
Peter Tram (Ph.D., expected 2021)
Jane Frederick (Ph.D., expected 2022)
Ranya Virk (Ph.D., expected 2022)
Vasundhara Agrawal (Ph.D., expected 2022)
Botong Hua (MS, expected 2017)
Xiang Zhou (MS, expected 2017)
Yuting Dou (MS, expected 2017)
Mary Miller (MS, expected 2017)

Undergraduate Student Supervision:

Tina Amirtha, Daniel Saddawi-Konefka, Shawn Liu, Max Choi, Tarak Shah, Lawrence Chang, Hyung-Joo Yoon, Kenneth Liu, Thomas Kluz, Parmede Vakil, Robin Brusen, Catherine Cheng, Min Kim, Josphen Young, David Raslau, Vladimir Turzhitsky, Min Kim, Kevin Huang, Nikhil Mutyal (visiting pre-doctoral fellow), Soumya Bonthu, Nicholas Deep, Jay Hoogheem, Munira Karim, David Magill, James Spadaro III, Daniel Balikov, Antonio Roy Webb, Michael J Yung, Shivaprasad Daram, N. Rishall, Vishal S. Parikh, Aditya K. Thasan, Arun Ahuja, Andrew Radosevich, Sameer Maheshwari, Todd McCullough, Aditya Gupta, Vivek Patel, Samantha Strasser, Curie Chang, Yuanija Zhu, Dennis Blurer, Craig White, Daniel Park, Rohit Subramanian, Akhilendra Vohra, Charles Hwang, Johnny Sun, Alfredo Osorio, Frank Cummins, Taylor Lee, Benjamin Tiano, Elizabeth Horcher, Varun Gupta, Arpa Mukherjee, Zita Hubler, Casey Blaha, Nick Boffi, Kellie Perkins, Brian Kennedy, Blake Burnstad, Joseph Lee, Anusha Vadlamanu, Molly Bird, Leah Bowen, Billy Frese, Christine Osorio, Michael Chen, Katerina Maria Cheronis, Ambuj Bhalla.

Thesis Committee:

Young Kim (Ph.D., 2005), Zhigang Chen (Ph.D., 2005), Yang Liu (Ph.D., 2006), Vladimir M. Turzhitsky (M.S., 2006), Abhishek Mathur (Ph.D., 2007), Michael Siegel (M.S., 2005), Snow Tseng (Ph.D., 2005), Marissa Darmoc (M.S., 2005), Wendy Yip (Ph.D., 2012), Olga Lyandres (Ph.D.), Ke Ma (Ph.D., 2013), Kvar Black (Ph.D., 2012),

German Picasso (Ph.D., 2014), Wenzhong Liu (Ph.D., expected 2018), Sean Allen (Ph.D., expected 2017).

SELECTED MEDIA COVERAGE

Title: New DNA Imaging Technique Breaches 10-Nanometer Resolution Threshold, Becomes First To See DNA “Blink”.

Source: International Business Times

Posted: February 20, 2017

Title: Enhancing Molecular Imaging with Light

Source: Science Daily

Posted: July 25, 2016

Title: Six New Medical Technologies Worth Watching

Source: Wall Street Journal

Posted: June 27, 2016

Title: Using Data to Protect Coral Reefs from Climate Change

Source: Science Daily

Posted: April 13, 2016

Title: Metastatic Cells Colonize Implantable Scaffold in Mice

Source: Oxford University Press Blog

Posted: February 2, 2016

Title: Prognosis: Proportionate Response

Source: Nature

Posted: December 15, 2015

Title: New Technique Might Identify Dangerous Prostate Cancers

Source: Chicago Sun-Times

Posted: April 10, 2015

Title: Nanotechnology Shows Promise for More Accurate Prostate Cancer Screening, Prognosis

Source: Medical Xpress

Posted: March 16, 2015

Title: First Screening Method to Detect Presence of Ovarian Cancer

Source: NSF ‘Science Now’

Posted: May 23, 2013

Title: Nanotechnology May Aid Ovarian Cancer Detection

Source: Chicago Tribune

Posted: May 15, 2013

Title: Extra Scrutiny for 'Grantee' Grantees

Source: Nature

Posted: February 20, 2012

Title: Breakthrough in Early Cancer Detection

Source: NSF Science Nation & PBS News Hour

Posted: January 9, 2012

Title: Combined Technologies Offer Promise for Detecting Colon Cancer in Women

Source: NSF News, U.S. News & World Report

Posted: July 20, 2010

Title: New method shines light on pancreatic cancer screening

Source: Chicago Tribune

Posted: February 23, 2009

Title: Shining light on pancreatic cancer

Source: NSF, Year in News, 2007

Posted: August 1, 2007

Title: Lighting up cancer: Experimental test for colon cancer

Program: ABC 7 News, 10:00 pm

Station: ABC

Airdate: April 5, 2006

Subject: New Test for Colon Cancer

Program: CBS News, 5:00 pm

Station: CBS

Airdate: July, 2006

Subject: Colon Testing Made Easier

Program: NBC News, 4:30 pm and 10 pm

Station: NBC

Airdate: June 28, 2006

The story also aired by 180 NBC affiliates.

Title: "Shining a light on colon testing. Cheap, comfortable screening technique."

Newspaper: HealthBeat section in Tempo, Chicago Tribune

Publication date: June 13, 2006.

Subject: Colon cancer research

Program: WGN News at Nine

Station: WGN

Airdate: May 19, 2006

Media summary for publication of the development of partial wave spectroscopic (PWS) microscopy and its application for pancreatic cancer diagnosis in *Optics Letters* (February, 2009): NSF News: Feature # 1; *Current*, NSF Monthly News Letter (August 2009); *Chicago Tribune*; over 40 news articles reaching an audience of 1.4 million.

Media summary for publication of pancreatic cancer screening by biophotonics in *Clinical Cancer Research* (August 1, 2007): News National Science Foundation News, Forbes, Scientific American, U.S. News & World Report, WebMD, Los Angeles Daily News, Science Daily, United Press International, CNN, Photonics.com, yahoo.com news.

Media summary for publication of the development of partial wave spectroscopic (PWS) for lung cancer screening in *Cancer Research* (October, 2010): NSF News: Feature # 3 “Cheek Swab May Detect Lung Cancer”, Scientific American, US News & World Report, and multiple other media reports.