

CURRICULUM VITAE of ALEX VITKIN

EDUCATION and TRAINING	DEGREE	YEAR(s)	FIELD OF STUDY
Ontario Cancer Institute, Canada	Post doctorate	1994-1996	Clinical Physics Residency
McMaster University, Hamilton, Canada / Harvard U, USA	Ph.D.	1990-1994	Medical Physics
University of Toronto, Canada	M.A.Sc.	1988-1990	Mechanical Engineering
Queen's University, Kingston, Canada	B.A.Sc.	1981-1985	Engineering Physics

POSITIONS & HONORS

Positions and Employment

2007-present	Full Professor, Departments of Medical Biophysics and Radiation Oncology, University of Toronto, Canada
2004-present	Senior Scientist, Division of BioPhysics and Bioluminescence, Ontario Cancer Institute, Toronto, Canada
2002-2006	Associate Professor, Departments of Medical Biophysics and Radiation Oncology, University of Toronto, Canada
1997-present	Radiation Physicist, Radiation Oncology Physics, Princess Margaret Hospital, Toronto, Canada
1997-2003	Director, Radiation Physics Residency Program, Princess Margaret Hospital, Toronto, Canada
1996-2001	Assistant Professor, Dept of Medical Biophysics, University of Toronto, Canada
1996-2004	Staff Research Scientist, Ontario Cancer Institute / University Health Network, Toronto, Canada
1994-1997	Resident, Radiation Oncology Physics, Princess Margaret Hospital, Toronto, Canada
1990-1994	Visiting Researcher, Wellman Laboratories of Photomedicine, Massachusetts General Hospital, Boston, USA
1985-1988	Staff Scientist, Physics + Engineering, Xerox Research Centre of Canada, Toronto, Canada

Awards and Honours

2017	Publication Impact Prize in Medical Physics, Canadian Organization of Medical Physicists (COMP), Ottawa, Canada
2013, 2008	Research Productivity Award in Radiation Medicine, Princess Margaret Hospital, Toronto, Canada
2012-present	Visiting Professorship / Mega-Grant Leading Scientist, Nizhny Novgorod Medical Academy, Nizhny Novgorod, Russia
2012-present	Fellow, Society for Photo-optical Instrumentation Engineers (SPIE)
2011-present	Fellow, Optical Society of America (OSA)
2009-present	Visiting Professorship, Department of Physics, University of Cyprus, Nicosia, Cyprus
2007-present	International Visiting Lecturer, SPIE (Bellingham, WA, USA) and OSA (Washington, DC, USA)
2003-8	Premier's Research Excellence Award, Province of Ontario, Toronto, Canada
2007	Guest Faculty, CePOF Biophotonics Summer School, Universidade de Sao Paulo at San Carlos, Brazil
2005	Guest Faculty, International Photonics School, Inst. Nacional de Astrofisica, Optica y Electronica, Puebla, Mexico
1990-4	Centennial Scholarship, McMaster University, Hamilton, Canada
1992-4	National Cancer Institute (Canada) Steve Fonyo PhD Studentship, McMaster University, Hamilton, Canada
1992	Medical Research Council of Canada PhD Scholarship, McMaster University, Hamilton, Canada
1991-2	Natural Sciences Engineering Research Council, PhD Scholarship, McMaster University, Hamilton, Canada

Research Grants – study sections, panels, site visits, reviews

- Canadian Institutes of Health Research, Medical Physics and Imaging – panel member (2007 –)
- National Institutes of Health: NCI, NIBIB, NIDDK and NCRR – panelist on study sections (since 2004, ~20 in the last 5 years)
- Natural Sciences and Engineering Research Council of Canada, Global Partnerships Program – panel member (2005 –)
- Center for Integration of Medicine & Innovative Technology (CIMIT) – annual site visitor and panellist (Boston, MA, USA; 2005 –)
- Dutch Health R&D Council ZonMW – international advisory panellist / site visitor (The Hague, Netherlands – 2010, 2016)
- MIT Laser Biomedical Research Center – P41 site visitor (Boston, MA, USA – 2006, 2011, 2017)
- UBC / BCCA Molecular Imaging program – P01 site visitor and external advisor (Vancouver, BC, Canada, 2011 –)
- COMP-CAP Kirkby Medal Selections Committee (Ottawa, ON, Canada, 2017 --)
- Canada Foundation for Innovation (Ottawa, ON, Canada) • Michael Smith Foundation for Health Research (Vancouver, BC, Canada) • Alberta Heritage Foundation for Medical Research (Edmonton, AL, Canada) • US Army Medical Research and Materiel Command (Reston, VA, USA) • Dutch Technology Foundation STW (Amsterdam, Netherlands) • Raine Medical Research Foundation (Perth, Australia) • German Research Foundation DFG (Berlin, Germany) • IHU Biomedical Research Fund + Mission Plan Cancer (Paris, France) • National Biophotonics Imaging Platform (Galway, Ireland) • NZ Royal Society Mardsen Fund (Auckland, New Zealand) • Genesis Oncology Trust (Wellington, New Zealand) – *external reviewer*

Editorial Responsibilities

- 2009-present Topical Editor, *Optics Letters* (biophotonics, 2nd 3-year term), Optical Society of America, Washington, DC, USA
- 2014-present Editor, *Modern Technologies in Medicine*, Russian Medical Engineering Society, Nizhny Novgorod, Russia
- 2013 Guest Editor (Coherent Optical Methods), *Optical Engineering*, SPIE, Bellingham, WA, USA
- 2007 Guest Editor (Biophysics), *Journal of Applied Physics*, American Institute of Physics, College Park, MD, USA
- 1998-2002 Editorial Advisory Committee, *Optics & Photonics News*, OSA, Washington, DC, USA

Professional Activities & Other Experience

2000-present	Board Certification 2000, Recertification 2005 + 2010 + 2015, Canadian College of Physicists in Medicine, Canada
2002-2003	Task Group Member on Future of Radiation Medicine, Ministry of Health, Toronto, Ontario, Canada

Manuscript Reviewer (partial list of journals)

- The Analyst
- Journal of Biomedical Optics
- Lasers in Surgery and Medicine
- Nature Photonics
- Physics in Medicine and Biology
- Applied Optics
- Journal of Biophotonics
- Medical Physics
- Optics Express
- PLoS One
- Cancer Research
- Journal of the Royal Society Interface
- Nature
- Physical Review Letters
- Science Translational Medicine

Selected Invited National and International Lectures (last FIVE (5) years, total of 137)

- 2018 Universidade de Medellin, OSA Student Chapter invited lecturer (Medellin, Colombia)
- 2108 LALS International Conference (Bar Ilat University, Israel)
- 2018 SE Asia Biomedical Engineering Conference (Ho Chi Min City, Vietnam)
- 2017 UC Berkeley, SPIE Student Chapter invited lecturer (UC Berkeley, CA, USA)
- 2017 COPL Photonics grand rounds (Quebec City, QC, Canada)
- 2017 Topical Problems in Biophotonics (Volga, Russian Federation) – conference co-chair and plenary
- 2017 European Conference on Biomedical Optics (Munich, Germany) – conference co-chair and hot topics speaker
- 2016 University of Central Florida, SPIE Student Chapter invited lecturer (Orlando, FL, USA)
- 2016 Beijing Jiaotong University, SPIE Student chapter invited lecturer (Beijing, China)
- 2016 TNO Innovations in Optics invited lecture (Delft, Netherlands)
- 2016 Applications of Laser Technologies (Galway, Ireland)
- 2016 Mega-Grant Holders Annual Scientific Conference (Kazan, Russia)
- 2016 Rutgers University, OSA Student chapter invited lecturer (Brunswick, NJ, USA)
- 2015 Weizmann Institute of Science molecular imaging seminar (Rehovot, Israel)
- 2015 Topical Problems in Biophotonics (Volga, Russian Federation) – conference co-chair and plenary
- 2015 European Conference on Biomedical Optics (Munich, Germany) – conference co-chair and hot topics speaker
- 2015 International Conference on Biophotonics (Florence, Italy)
- 2015 Wash U International Year of Light Symposium + OSA student chapter invitee (St. Louis, MI, USA) – plenary
- 2015 McGill University / MUHC Med Phys Unit biomedical rounds (Montreal, QC, Canada)
- 2014 Florida International University, Biomedical Engineering rounds (Miami, FL, USA)
- 2014 OSA Europe Annual Congress (Prague, Czech Republic) – plenary
- 2014 Frontiers of Science – Gordon Conference on Lasers in Medicine & Biology (Plymouth, NH, USA)
- 2014 Mega-Grant Holders Annual Scientific Conference (St. Petersburg, Russia)
- 2014 Frontiers of Medical Imaging rounds, Nizhny Novgorod State Medical Academy (Nizhny Novgorod, Russia)
- 2014 SPIE Photonics Europe: Biophotonic Solutions for Better Health Care (Brussels, Belgium)
- 2014 Volga Cities, Science & People public lecture (Nizhny Novgorod, Russia)
- 2013 National University of Ireland, Physics lecture series (Galway, Ireland)
- 2013 Nizhny Novgorod State Medical Academy, University Senate lecture (Nizhny Novgorod, Russia)
- 2013 Institute of Bio-Organic Chemistry rounds (Moscow, Russia)
- 2013 National Taiwan University, Biomedical Engineering rounds (Taipei, Taiwan)
- 2013 International Symposium on Topical Problems in Biophotonics (Volga River - scientific cruise conference, Russia)
- 2013 Russian Academy of Sciences, Institute of Applied Physics SPIE Student chapter invited lecturer (Nizhny Novgorod, Russia)
- 2013 Photonics North, Biomedical Photonics conference (Ottawa, ON, Canada)
- 2013 Ryerson University, Physics and Astronomy departmental seminar series (Toronto, ON, Canada)
- 2013 National Cheng-Kung University, Physics seminar series (Tainan, Taiwan)
- 2013 York University, Biophysics Club invited lecturer (Toronto, ON, Canada)
- 2012 Universidad Nacional Autónoma de México, UNAM invited lecture (Mexico City, Mexico)
- 2012 McGill University, OSA Student chapter invited lecturer (Montreal, QC, Canada)
- 2012 Photonics North, Bio-Medical-Infection conference (Montreal, QC, Canada)
- 2012 SPIE Photonics Europe: Biophotonic Solutions for Better Health Care (Brussels, Belgium)
- 2012 McMaster University, SPIE Student chapter invited lecturer (Hamilton, ON, Canada)
- 2012 University of Toronto, Physics and Astronomy Club invited lecturer (Toronto, ON, Canada)
- 2012 TBRI Medical Imaging Summer School (Thunder Bay, ON, Canada)
- 2011 University of Otago, LART Symposium + OSA Student chapter invited lecturer (Dunedin, New Zealand)
- 2011 Young Scientist's Conference on Radiophysics, Electronics, Photonics and Biophysics (Kharkov, Ukraine)
- 2011 Albert Einstein College of Medicine (Bronx, NY, USA)
- 2011 International Workshop of Fiber Optics and Passive Components (Montreal, QC, Canada)
- 2011 OSA Advanced Photonics Congress (Toronto, ON, Canada)
- 2011 Photonics North (Ottawa, ON, Canada) – plenary

Recent International Conferences Chairmanship

- Conference Chair - Novel Biophotonic Techniques and Applications, European Conference on Biomedical Optics ECBO (Munich, Germany, 2009; 2011; 2013; 2015; 2017); ECBO General Chair – 2019
- Conference co-Chair – Topical Problems in Biophotonics (Nizhny Novgorod, Russia, 2013; 2015; 2017)
- Organizing Committee / Session Chair – Photonics Europe, SPIE Photonics Congress (Brussels, Belgium, 2012; 2014; 2016)

- Organizing Committee / Session Chair – OSA Europe Photonics Congress (Prague, Czech Republic, 2014)
- Organizing Committee / Session Chair – International Scientific Mega-Grant Holders Conference (St. Petersburg, Russia, 2014)
- Organizing Committee / Session Chair – Biophotonics / Mathematics of Medical Imaging, MITACS-Fields Institute Symposium (Toronto, ON, Canada, 2011)
- Conference Co-Chair - Advanced International SAOT Workshop on Biophotonics (Erlangen, Germany, 2009)

Industry Linkages

- Michelson Diagnostics Ltd (Kent, UK – licensing agreement and ongoing collaboration)
- LightLab Imaging / St. Jude Medical (Cambridge, MA, USA – ongoing consultant, expert witness at a scientific lawsuit)
- National Institute of Optics, INO (Quebec City, QC, Canada – ongoing consultant)
- Ontario Institute for Cancer Research, IP and Commercialization (Toronto, ON, Canada – occasional consultant)
- Seno Medical Instruments (San Antonio, TX, USA) • FP Technologies (Mountain View, CA, USA) • GE Global Research (Niskayuna, NY, USA) • Med Tech Partners (Montreal, PQ, Canada) • LEK Medical Inc (San Francisco, CA, USA) • Monteris Medical Inc (Winnipeg, Manitoba) – occasional consultant

Patents

- Method and apparatus for high resolution optical imaging (PCT #10723-56, US #7,242,833; licensing agreement with Michelson Diagnostics Ltd, Kent, UK; continuing to receive royalty payments)
- Fiber-optic based real-time readout for radiation absorbed dose measurements (US #7,399,977).
- Laser photo-thermo-acoustic frequency swept heterodyned lock-in depth profilometry imaging system (US #7,525,661)
- A system for real-time tissue coagulation monitoring using interstitial optical probes (patent pending)
- A flexible polarimetric probe for performing Mueller matrix analysis of biological tissues (patent pending US #62/067,503; 23/10/2014)
- System and method for optimized mass spectrometry analysis (PCT pending, US provisional patent #62/221,778; 22/09/2015)
- Visualizing tissue motion on a sub-micron scale with low coherence tomography. (Russian Federation 2626310; 25/07/2017)
- A co-registration system for cross-polarized low coherence interferometry imaging. (Russian Federation 261535; 03/04/2017)

Peer Reviewed Publications (Web of Science h-index = 39; Google Scholar index = 46)

1. **Vitkin IA**, Christofides C, Mandelis A, Laser-induced photothermal reflectance investigation of silicon damaged by arsenic ion implantation: a temperature study, *Appl Phys Lett* 54 2392-4, 1989
2. **Vitkin IA**, Peralta SB, Mandelis A, Sadowski W, Walker E, Thin-film photopyroelectric detection of thermal impulse response of single-crystalline $\text{YB}_2\text{Cu}_3\text{O}_{7-x}$, *Meas Sci Technol* (formerly *J Phys E*) 1 184-8, 1990
3. Christofides C, **Vitkin IA**, Mandelis A, Photothermal reflectance investigation of processed silicon part I: room temperature study of the induced damage and of the annealing kinetics of defects in ion implanted wafers, *J Appl Phys* 67 2815-21, 1990
4. **Vitkin IA**, Christofides C, Mandelis A, Photothermal reflectance investigation of processed silicon part II: signal generation and lattice temperature dependence in ion implanted and amorphous thin layers, *J Appl Phys* 67, 2822-30, 1990
5. Simard-Normandin M, Weaver L, Vacca D, Rogers D, **Vitkin IA**, Tiedje T, Analytic microscopy of titanium nitride, *Can J Phys* 69 290-7, 1991
6. Prah SA, **Vitkin IA**, Bruggemann U, Wilson BC, Anderson RR, Determination of optical properties of turbid media using pulsed photothermal radiometry, *Phys Med Biol* 37 1203-17, 1992
7. **Vitkin IA**, Wilson BC, Kaplan RS, Anderson RR, The feasibility of monitoring exogenous dye uptake in tissue *in vivo* using pulsed photothermal radiometry, *J Photochem Photobiol B: Biol* 16 235-9, 1992
8. **Vitkin IA**, Woolsey J, Wilson BC, Anderson RR, Optical and thermal characterization of natural (*Sepia Officinalis*) melanin, *Photochem Photobiol* 59 455-62, 1994
9. **Vitkin IA**, Wilson BC, Anderson RR, Pulsed photothermal radiometry in transparent media containing discrete optical absorbers, *Phys Med Biol* 39 1721-44, 1994
10. **Vitkin IA**, Wilson BC, Anderson RR, Analysis of layered scattering materials by pulsed photothermal radiometry: application to photon propagation in tissue, *Appl Opt* 34 2973-82, 1995
11. **Vitkin IA**, The optical shield of cephalopods: modelling the effect of melanin particle size, *Optics & Photonics News* 6 (10) 40-2, 1995
12. Kielne AW, Lilje L, **Vitkin IA**, Patterson MP, Wilson B, Hibst R, Steiner R, Why do veins appear blue: a new look at an old question, *Appl Opt* 35 1151-60, 1996
13. Silverman MP, Strange W, Badoz J, **Vitkin IA**, Large optical rotation in turbid chiral fluids, *Bull Amer Phys Soc* 41, 705, 1996
14. **Vitkin IA**, Polarized light, optical activity, and the asymmetry of life, *Optics & Photonics News* 7 (7) 30-3, 1996
15. Silverman MP, Strange W, Badoz J, **Vitkin IA**, Enhanced optical rotation and diminished depolarization in diffusive scattering from a chiral fluid, *Optics Communic* 132 410-6, 1996
16. Bays R, Wagnieres G, Robert D, Theumann JF, **Vitkin IA**, Savary JF, Monnier P, van den Bergh H, A three-dimensional optical phantom and its application in photodynamic therapy, *Lasers Surg Med* 21 227-234, 1997
17. **Vitkin IA**, Moriarty JA, Peters R *et al*, Magnetic resonance imaging of temperature changes during interstitial microwave heating: a phantom study, *Med Phys* 24 269-77, 1997
18. **Vitkin IA**, Shedding some light on the blue veins enigma, *Optics & Photonics News* 8 (6) 39-42, 1998
19. Iizuka MN, Sherar MD, **Vitkin IA**, Optical phantom materials for laser photocoagulation studies, *Lasers Surg Med* 25 159-69, 1999

20. Iizuka MN, **Vitkin IA**, Kolios MC, Sherar MD, Effect of dynamic optical properties on the biophysics of interstitial laser coagulation, *Phys Med Biol* 45 1335-57, 2000
21. Douplik AY, Stratonnikov AA, Loshchenov VB, Lebedeva VS, Derkacheva VM, **Vitkin IA**, Romyanceva VD, Kusmin SG, Mironov AF, Luk'yanets EA, The study of photodynamic reactions in human blood, *J Biomed Opt* 5 338-49, 2000
22. **Vitkin IA**, Hoskinson E, Polarization studies in multiply scattering chiral media, *Opt Eng* 39 353-62, 2000
23. Studinski R, **Vitkin IA**, Polarization preservation in exact backscattering direction in diffusive scattering from biological tissues, *J Biomed Opt* 5 330-7, 2000
24. Skinner MG, Everts S, Reid A, **Vitkin IA**, Lilge L, Sherar MD, Determination of the Arrhenius process parameters of rat prostate optical properties in the near-infrared over the 20-85°C temperature range, *Phys Med Biol* 45 1375-86, 2000
25. **Vitkin IA**, Studinski R, Polarization preservation in diffusive scattering from in-vivo turbid biological media: effects of tissue optical absorption in the exact backscattering direction, *Optics Communic* 190 37-43, 2001
26. Whelan WM, Chun P, Chin L, **Vitkin IA**, Laser thermal therapy: utility of interstitial fluence monitoring for locating optical sensors, *Phys Med Biol* 46 N91-6, 2001
27. Nicolaidis L, Chan Y, Mandelis A, **Vitkin IA**, Analytical and experimental aspects of optical property determination of turbid media using frequency-domain photothermal radiometry, *J Opt Soc Am A* 18 2548-2556, 2001
28. **Vitkin IA**, Introduction to special issue on biophotonics and trends in biomedical optics: guest editorial, *Optics & Photonics News* 12 (7) 5; *OPN Trends in Biophotonics* 1(2) S3, 2001
29. **Vitkin IA**, Laszlo RD, Whyman CL, Effects of molecular asymmetry of optically active molecules on the polarization properties of multiply scattered light, *Opt Express* 10, 222-229, 2002
30. Yang VXD, Gordon ML, Mok A, Zhao Y, Chen Z, Cobbold R, Wilson BC, **Vitkin IA**, Application of the Kasai velocity estimator and histogram segmentation for resolution improvement and motion suppression in phase-resolved optical Doppler tomography, *Opt Communic* 208 209-14, 2002
31. Hadley K, **Vitkin IA**, Optical rotation and linear and circular depolarization rates in diffusively scattered light from chiral, racemic, and achiral turbid media, *J Biomed Opt* 7 291-9, 2002
32. Yang VXD, Gzarnota GJ, **Vitkin IA**, Kolios M, Sherar MD, de Boer J, Wilson BC, Ultrasound backscatter microscopy/spectroscopy and optical coherence (Doppler) tomography for mechanism-specific monitoring of photodynamic therapy *in vivo* and *in vitro*, *Proc SPIE* 4612 128-35, 2002
33. Yang VXD, Goertz DE, Needles A, Gordon ML, Foster FS, Wilson BC, **Vitkin IA**, Structural and Doppler imaging of *xenopus laevis* embryos and murine skin tumors *in vivo*: a comparison of ultrasound biomicroscopy and optical coherence tomography, *Ultras Med Biol* 29 72-4, 2003
34. Chin L, Whelan WM, **Vitkin IA**, Models and measurements of light intensity changes during laser interstitial thermal therapy: implications for optical monitoring of the coagulation boundary location, *Phys Med Biol* 48 543-59, 2003
35. Chin L, Pop M, Whelan WM, Sherar MD, **Vitkin IA**, Utility of optical sensors in monitoring interstitial thermal therapies, *Rev Scient Instrum* 74 393-5, 2003
36. Yang VXD, Gordon ML, Qi B, Pekar J, Lo SSW, Seng-Yue E, Mok A, Wilson BC, **Vitkin IA**, High speed, wide velocity dynamic range Doppler optical coherence tomography (part I): system design, signal processing, and performance characterization, *Opt Express* 11 794-809, 2003
37. Yang VXD, Gordon ML, Seng-Yue E, Lo SSW, Qi B, Pekar J, Mok A, Wilson BC, **Vitkin IA**, High speed, wide velocity dynamic range Doppler optical coherence tomography (part II): imaging *in vivo* cardiac dynamics of *xenopus laevis*, *Opt Express* 11 1650-8, 2003
38. Yang VXD, Gordon ML, Tang S, Marcon NE, Gardiner G, Qi B, Bisland S, Seng-Yue E, Lo SSW, Pekar J, Wilson BC, **Vitkin IA**, High speed, wide velocity dynamic range Doppler optical coherence tomography (part III): *in vivo* endoscopic imaging of blood flow in the rat and human GI tract, *Opt Express* 11 2416-24, 2003
39. Yang VXD, Gordon ML, Qi B, Bisland SK, Seng-Yue E, Tang S, Pekar J, Lo S, Marcon NE, Wilson BC, **Vitkin IA**, High sensitivity detection and monitoring of microcirculation using cutaneous and catheter probes for Doppler optical coherence tomography, *Proc SPIE* 4965 153-9, 2003
40. Tang SJ, Gordon ML, Yang VXD, Faughnan ME, Cirocco M, Qi B, Seng-Yue E, Gardiner G, Haber G, Kandel G, Kortan P, **Vitkin IA**, Wilson BC, Marcon NE, *in vivo* Doppler optical coherence tomography of mucocutaneous telangiectases in hereditary hemorrhagic telangiectasia, *Gastroint Endoscopy* 58 591-8, 2003
41. Yang VXD, Gordon ML, Qi B, Seng-Yue E, Bisland SK, Lo S, Marcon NE, Wilson BC, **Vitkin IA**, High sensitivity detection and monitoring of microcirculation using cutaneous and catheter probes for Doppler optical coherence tomography, *Proc SPIE* 4965 153-9, 2003
42. Moriyama EH, Zangaro RA, Lobo PDC, Villaverde AB, Pacheco MT, **Vitkin IA**, Opto-thermal transfer simulation in laser-irradiated human dentin, *J Biomed Opt* 8 298-302, 2003
43. Yang VXD, Pekar J, Lo SSW, Gordon ML, Mok A, Wilson BC, **Vitkin IA**, Optical coherence and Doppler tomography for monitoring tissue changes induced by laser thermal therapy - an *in-vivo* study, *Rev Scient Instrum* 74 437-40, 2003
44. Korol R, Bikersteth B, Yang VXD, Dimov S, Vatsya P, Gordon ML, **Vitkin IA**, Liu L, Canham P, Clarke S, A Lucas, Semi-quantitative analysis of atherosclerotic plaque using optical coherence tomography and time-of-flight secondary ion mass spectrometry, *Proc. SPIE* 5140 212-20, 2003
45. Cote D, **Vitkin IA**, Balanced detection for low-noise precision polarimetric measurements of optically-active, multiply-scattering tissue phantoms, *J Biomed Opt* 9 213-20, 2004
46. Qi B, Himmer PA, Gordon ML, Yang VXD, Dickensheets DL, **Vitkin IA**, Dynamic focus control in high-speed optical coherence tomography based on a microelectromechanical (MEMS) mirror, *Opt Communic* 232 123-8, 2004
47. Chin L, Wilson BC, Whelan WM, **Vitkin IA**, Radiance monitoring of the extent of tissue coagulation during laser interstitial thermal therapy, *Opt Lett* 29 259-61, 2004
48. Yang VXD, Munce N, Pekar J, Gordon ML, Wilson BC, **Vitkin IA**, Novel micro-machined array tip for multi-focus fiber-based optical coherence tomography, *Opt Lett* 29 578-81, 2004

49. Fan Y, Mandelis A, Spirou G, **Vitkin IA**, Development of laser photo-thermo-acoustic frequency swept system for subsurface imaging, *J Acoust Soc Am* 116 3523-33, 2004
50. Yang VXD, Lui T, Standish BA, Mao L, Sinclair M, Jafari R, Munce N, Marcon NE, Kucharczyk W, Wilson BC, **Vitkin IA**, Interstitial Doppler optical coherence tomography, *Opt Lett* 30 1791-3, 2005
51. Yeow JTW, Yang VXD, Chanwan A, Gordon ML, Qi B, **Vitkin IA**, Wilson BC, Goldenberg AA, Micromachined 2D MEMS scanner for 3D optical coherence tomography, *Sensors Actuat A117* 331-40, 2005
52. Whelan WM, Davidson S, Chin LCL, **Vitkin IA**, Strategy for monitoring laser thermal therapy via changes in opto-thermal properties of heated tissues, *Intern J Thermophys* 26 233-41, 2005
53. Davidson S, **Vitkin IA**, Whelan WM, Characterization of measurement artifacts in fluoroptic temperature sensors: Implications for laser thermal therapy at 810 nm, *Lasers Surg Med* 36 289-96, 2005
54. Rink A, **Vitkin IA**, Jaffray DA, Suitability of radiochromic medium for real-time optical measurements of ionizing radiation dose, *Med Phys* 32 1140-55, 2005
55. Côté D, **Vitkin IA**, Robust concentration determination of optically active molecules in turbid media with validated 3-D polarization sensitive Monte Carlo simulation, *Opt Express* 13 148-63, 2005
56. Yang VXD, Qi B, Gordon ML, Seng-Yue E, Tang S, Gardiner G, Kortan P, Haber G, Kandel G, Marcon NE, **Vitkin IA**, Wilson BC, In vivo demonstration of endoscopic catheter-based Doppler optical coherence tomography imaging of vascular pathologies in the GI tract, *Gastrointest Endosc* 61 879-90, 2005
57. Spirou G, Oraevsky AA, **Vitkin IA**, Whelan WM, Optical and acoustic properties of polyvinyl chloride plastisol at 1064 nm for use as a tissue phantom in biomedical photoacoustics, *Phys Med Biol* 50 N141-53, 2005
58. Rink A, **Vitkin IA**, Jaffray DA, Characterization and real-time optical measurements of the ionizing radiation dose response for a new radiochromic medium, *Med Phys* 32 2510-16, 2005
59. Yang VXD, Himmer PA, Standish BA, Mao L, Jafari R, Munce N, Dickensheets DL, **Vitkin IA**, Doppler optical coherence tomography with micro-electro-mechanical membrane mirror for high-speed dynamic focus tracking, *Opt Lett* 31 1262-64, 2006
60. Skliarenko JV, Lunt SJ, Gordon ML, **Vitkin IA**, Milosevic M, Hill RP, Effects of vascular disrupting agent ZD6126 on interstitial fluid pressure and cell survival in tumours, *Cancer Res* 66 2074-80, 2006
61. Guo X, Wood MFG, **Vitkin IA**, Angular measurements of light scattered by turbid chiral media using linear Stokes polarimeter, *J Biomed Opt* 11 041105-10, 2006
62. Chin LCL, Whelan WM, **Vitkin IA**, Information content of point radiance measurements in turbid media: Implications for interstitial optical property quantification, *Appl Opt* 45 2101-14, 2006
63. Li H, Standish BA, Mariampillai A, Munce NR, Mao Y, Chiu S, Marcon NE, Wilson BC, **Vitkin IA**, Yang VXD, Feasibility of interstitial Doppler optical coherence tomography for in vivo detection of microvascular changes during photodynamic therapy, *Lasers Surg Med* 38 754-61, 2006
64. Wood MFG, Guo X, **Vitkin IA**, Polarized light propagation in multiply scattering media exhibiting both linear birefringence and optical activity: Monte Carlo model and experimental methodology, *J Biomed Opt* 12 14029-10, 2007
65. Standish BA, Yang VXD, Munce NR, WongKeeSong L-M, Lin A, Mao YI, **Vitkin IA**, Marcon NE, Wilson BC, Doppler optical coherence tomography monitoring of microvascular tissue response during photodynamic therapy in an animal model of Barrett's esophagus, *Gastrointest Endosc* 66 326-33, 2007
66. Standish BA, Jin X, Smolen J, Mariampillai A, Munce NR, Wilson BC, **Vitkin IA**, Yang VXD, Interstitial Doppler optical coherence tomography monitors microvascular changes during photodynamic therapy in a Dunning prostate model under varying treatment conditions, *J Biomed Opt* 12 034022-8, 2007
67. Guo X, Wood MFG, **Vitkin IA**, Stokes polarimetry in multiply scattering chiral media: effects of experimental geometry, *Appl Opt* 46 4491-4500, 2007
68. Guo X, Wood MFG, **Vitkin IA**, Monte Carlo study of pathlength distribution of polarized light in turbid media, *Opt Express* 15 1348-60, 2007
69. Rink A, **Vitkin IA**, Jaffray DA, Intra-irradiation changes in signal of polymer based dosimeter (Gafchromic EBT) due to dose rate variations, *Phys Med Biol* 52 N523-29, 2007
70. Rink A, **Vitkin IA**, Jaffray DA, Energy dependence (75 kVp to 18 MV) of radiochromic films assessed with a real-time optical dosimeter, *Med Phys* 34 458-63, 2007
71. Munce NR, Yang VXD, Standish BA, Qiang B, Butany J, Courtney BK, Graham JJ, Dick AJ, Strauss BH, Wright GA, **Vitkin IA**, Ex vivo imaging of chronic total occlusions using forward-looking optical coherence tomography, *Lasers Surg Med* 39 28-35, 2007
72. Morofke D, Kolios MC, **Vitkin IA**, Yang VXD, Wide dynamic range detection of bi-directional flow in Doppler optical coherence tomography using 2-dimensional Kasai estimator, *Opt Lett* 32 253-55, 2007
73. Chin LCL, Whelan WM, **Vitkin IA**, Perturbative diffusion theory formalism for interpreting temporal light intensity changes during laser interstitial thermal therapy: implications for point optical monitoring of coagulation boundary dynamics, *Phys Med Biol* 52 1659-74, 2007
74. Mariampillai A, Standish BA, **Vitkin IA**, Yang VXD, Retrospectively gated 2D blood flow imaging at 1000 frames per second and 4D imaging at video rates with a swept source Doppler optical coherence tomography system, *Opt Express* 15 1627-38, 2007
75. Ahn H, Mousavi P, Chin LCL, Roth S, Finkelstein J, **Vitkin IA**, Whyne C, The effect of pre-vertebroplasty tumor ablation using laser-induced thermotherapy on biomechanical stability and cement fill in the metastatic spine, *Eur Spine J* 16 1171-78, 2007
76. Chin LCL, Whelan WM, **Vitkin IA**, Determination of the optical properties of turbid media using relative interstitial radiance measurements: Monte Carlo study, experimental verification and sensitivity analysis, *J Biomed Opt* 12 036706-11, 2007
77. Munce NR, Mariampillai A, Standish BA, Pop M, Anderson KJ, Liu GY, Luk T, Courtney BK, Wright GA, **Vitkin IA**, Yang VXD, Electrostatic forward-viewing scanning probe for optical coherence tomography using a dissipative polymer catheter, *Opt Lett* 33 657-59, 2008
78. Rink A, Lewis DF, Varma S, **Vitkin IA**, Jaffray DA, Temperature and hydration effects on absorbance spectra and radiation sensitivity of a radiochromic medium, *Med Phys* 35 4545-55, 2008

79. Wood MFG, Côté D, **Vitkin IA**, Combined optical intensity and polarization methodology for analyte concentration determination in simulated optically clear and turbid biological media, *J Biomed Opt* 13 044037-10, 2008
80. Mariampillai A, Standish BA, Moriyama EH, Khurana M, Munce NR, Leung MKK, Jiang J, Cable A, Wilson BC, **Vitkin IA**, Yang YXD, Speckle variance detection of microvasculature using swept-source optical coherence tomography, *Opt Lett* 33 1530-32, 2008
81. Liu GY, Mariampillai A, Standish BA, Munce NR, Gu X, **Vitkin IA**, High power wavelength linearly swept mode locked fiber laser for OCT imaging, *Opt Express* 16 14095-105, 2008
82. Spirou GM, Mandelis A, **Vitkin IA**, Whelan WM, Frequency domain photothermoacoustic signal amplitude dependence on the optical properties of water: Turbid polyvinyl chloride-plastisol system, *Appl Opt* 47 2564-73, 2008
83. Guo X, Wood MFG, **Vitkin IA**, A Monte Carlo study of penetration depth and sampling volume of polarized light in turbid media, *Opt Communic* 281380-7, 2008
84. Lam S, Standish BA, Baldwin C, McWilliams A, leRiche J, Gazdar A, **Vitkin IA**, Yang VXD, Ideda N and MacAulay C, In vivo optical coherence tomography imaging of pre-invasive bronchial lesions, *Clin Cancer Res* 14 2006-11, 2008
85. Ghosh N, Wood MFG, **Vitkin IA**, Mueller matrix decomposition for extraction of individual polarization parameters from complex turbid media exhibiting multiple scattering, optical activity, and linear birefringence *J Biomed Opt* 13 044036-10, 2008
86. Standish BA, Lee KKC, Jin X, Smolen J, Mariampillai A, Munce NR, Wilson BC, **Vitkin IA**, Yang VXD, Interstitial Doppler optical coherence tomography as a local tumour necrosis predictor in photodynamic therapy of prostatic carcinoma: an *in-vivo* study, *Cancer Res* 68 9987-95 2008 ([featured article on cover](#))
87. Douplik BA, Morofke D, Chiu S, Bouchelev V, Mao Yi, Yang VXD, **Vitkin IA**, In vivo real time monitoring of vasoconstriction and vasodilation by a combined diffuse reflectance spectroscopy and Doppler optical coherence tomography approach, *Lasers Surg Med* 40 323-31, 2008
88. Courtney BK, Munce NR, Anderson KJ, Thind AS, Leung G, Radau PE, Foster FS, **Vitkin IA**, Schwartz RS, Dick AJ, Wright GA, Strauss BH, Innovations in imaging for chronic total occlusions: A glimpse into the future of angiography's blind spot, *Euro Heart J* 29 583-93, 2008
89. **Vitkin IA**, Ghosh N and Wood MF, Diagnostic photomedicine: probing biological tissues with polarized light, *SPIE Newsroom Highlights*, 10.1117/2.1200808.1238 (3 pages), 2008 ([top-10 SPIE downloads in 2008](#))
90. Mandelis A, Diebold GJ, Kitamori T, Hibara A, **Vitkin IA**, Preface to Special Issue: Applied Biophysics, *J Appl Phys* 105 101901-2, 2009
91. Ghosh N, Wood MFG, Li S, Weisel RD, Wilson BC, Li R-K, **Vitkin IA**, Mueller matrix decomposition for polarized light assessment of complex turbid media such as biological tissues, *J Biophoton* 2 145-56, 2009
92. Wood MFG, Ghosh N, Moriyama EH, Wilson BC, **Vitkin IA**, Proof-of-principle demonstration of a Mueller matrix decomposition method for polarized light-based tissue characterization in vivo, *J Biomed Opt* 14 014029-4, 2009
93. Chin LCL, Lloyd B, Whelan WM, **Vitkin IA**, Interstitial point radiance spectroscopy, *J Appl Phys* 105 102025-11, 2009
94. Sufan R, Moriyama EH, Mariampillai A, Roche O, Evans AJ, Lajez NM, **Vitkin IA**, Yang VXD, Liu FF, Wilson BC, Ohh M, Oxygen-independent degradation of HIF- α via bioengineered VHL tumour suppressor complex, *EMBO Molec Med* 1 66-78 2009
95. Ghosh N, Wood MFG, **Vitkin IA**, Polarimetry in turbid, birefringent, optically active media: A Monte Carlo study of Mueller matrix decomposition in the backscattering geometry, *J Appl Phys* 105 102023-8, 2009
96. Leung MKK, Mariampillai A, Standish BA, Lee KKC, Munce NR, **Vitkin IA**, Yang VXD, High-power wavelength-swept laser in Littman telescope-less polygon filter and dual amplifier configuration for multichannel optical coherence tomography, *Opt Lett* 34 2814-1, 2009
97. Wilson BC, **Vitkin IA**, Matthews DL, The potential of biophotonic techniques in stem cell tracking and monitoring of tissue regeneration applied to cardiac stem cell therapy, *J Biophoton* 2 669-81, 2009 ([featured article on cover](#))
98. Munce NR, Wright GA, Mariampillai A, Standish BA, Leung MKK, Tan L, Lee KKC, Courtney BK, Teitelbaum AA, Strauss BH, **Vitkin IA**, Yang VXD, Doppler optical coherence tomography for interventional cardiovascular guidance: in-vivo feasibility and forward-viewing probe flow phantom demonstration, *J Biomed Opt* 15 011103-8, 2010
99. Ghosh N, Wood MFG, Wallenburg MA, **Vitkin IA**, Influence of the order of the constituent basis matrices on the Mueller matrix decomposition-derived polarization metrics in complex turbid media such as biological tissues, *Opt Communic* 283 1200-08, 2010
100. Standish BA, Lee KKC, Mariampillai A, Munce NR, Leung MKK, Yang VDX, **Vitkin IA**, In-vivo endoscopic multi-beam optical coherence tomography, *Phys Med Biol* 55 615-22, 2010 ([top-10 PMB downloads in 2010](#))
101. Guo X, Ghosh N, Wood MFG, **Vitkin IA**, Depolarization of light in turbid media: A scattering event resolved Monte Carlo study, *Appl Opt* 49 153-62, 2010
102. Mariampillai A, Leung MKK, Jarvi M, Standish BA, Lee KKC, Wilson BC, **Vitkin IA**, Yang YXD, Optimized speckle variance OCT imaging of microvasculature, *Opt Lett* 35 1257-9, 2010
103. Wallenburg MA, Pop M, Wood MFG, Ghosh N, Wright GA, **Vitkin IA**, Comparison of optical polarimetry and diffusion tensor MR imaging for assessing myocardial anisotropy, *J Innov Opt Health Sci* 3 109-121, 2010
104. Wallenburg MA, Wood MFG, **Vitkin IA**, Effect of optical axis orientation on polarimetry-based linear retardance measurements, *Opt Lett* 35 2570-2, 2010
105. Wood MFG, Ghosh N, Wallenburg MA, Li S, Weisel RD, Wilson BC, Li R-K, **Vitkin IA**, Polarization birefringence measurements for characterizing the myocardium, including healthy, infarcted, and stem cell regenerated tissues, *J Biomed Opt* 15 047009-9, 2010
106. Wood MFG, Vurgun N, Wallenburg MA, **Vitkin IA**, Effect of formalin fixation on tissue optical polarization properties, *Phys Med Biol* 56 115-22, 2011
107. Wallenburg MA, Li S, Li R-K, **Vitkin IA**, Two photon microscopy of healthy, infarcted, and regenerating myocardium, *J Biophoton* 4 297-304, 2011 ([featured article on cover](#))
108. Ahmad M, Alali S, Kim AJ, Wood MFG, **Vitkin IA**, Do different turbid media with matched bulk optical properties also exhibit similar polarization properties? *Biomed Opt Express* 2 3248-58, 2011
109. Ullah H, Mariampillai A, Atif M, **Vitkin IA**, Can temporal analysis of OCT statistics report on D-glucose levels in blood? *Laser Phys Lett* 21 1962-71, 2011

110. Ghosh N and **Vitkin IA**, Concepts, challenges and applications of polarized light in biomedicine: a tutorial review, *J Biomed Opt* 16 110801-29, 2011
111. Ullah H, Davoudi B, Mariampillai A, Hussain G, Ikram M and **Vitkin IA**, Quantification of glucose levels in flowing blood using M-mode swept-source optical coherence tomography *Laser Phys* 22 497-804, 2012
112. Attique M, Ghulam Gilanie G, Ullah H, Malik S, Mehmood MS, Naweed MS, Ikram M, Javed A, Kamran JA and **Vitkin IA**, Colourization and automated segmentation of human T2 MR brain images for characterization of soft tissues, *PLoS One* 7 e33616-13, 2012
113. Conroy L, DaCosta R, **Vitkin IA**, Quantifying tissue microvasculature with speckle variance optical coherence tomography, *Opt Lett* 37 3180-2, 2012
114. Alali S, Ahmad M, Kim AJ, Wood MFG, **Vitkin IA**, Quantitative correlation between light depolarization and transport albedo of various porcine tissues, *J Biomed Opt* 17 045004-10 2012
115. Davoudi B, Lindenmaier A, Standish BA, Bizheva K, **Vitkin IA**, Non-invasive morphological and vascular imaging of oral tissue with spectral domain optical coherence tomography, *Biomed Opt Express* 3 826-39 2012
116. Alali S, Aitken K, Bagli D, **Vitkin IA**, Optical assessment of anisotropy in distended rat bladders, *J Biomed Opt* 17 086010-8 2012
117. Li Shu, Sun Z, Guo L, Han M; Wood MFG, Ghosh N, **Vitkin IA**, Weisel RD, Li R-K, Elastin overexpression by cell-based gene therapy preserves matrix and prevents cardiac dilation, *J Cellular Mol Med* 16 2429-39 2012
118. Layden D, Wood MFG, **Vitkin IA**, Optimum selection of input polarization states in determining the sample Mueller matrix: a dual photoelastic polarimeter approach, *Optics Express* 20 20466-81 2012
119. **Vitkin IA**, Improving treatment efficacy with biological or biophysical feedback, SPIE Newsroom Highlights, 10.1117 / 2.1201203.004156 (3 pages), 2012
120. Ghosh N, **Vitkin IA** and Ossikovski R, A comparative study of differential matrix and extended polar decomposition formalisms for polarimetric characterization of complex tissue-like turbid media, *J Biomed Opt* 17 105006-12 2012
121. Lindenmaier A, Conroy L, DaCosta R, Flueraru C and **Vitkin IA**, Texture analysis of OCT speckle for characterizing biological tissues in-vivo, *Opt Lett* 38 1280-2 2012
122. Maeda A, Leung MKK, Conroy L, Chen E, Bu J, Lindsay P, Winegarden N, Wang Y, Morikawa L, **Vitkin IA**, Jaffray DA, Hill R, DaCosta R, Real-time noninvasive optical imaging of tumour and microvascular response to ionizing radiation in vivo, *PLoS One* 7(8), e42133-13 2012
123. Grabchuk S, Palmer TJ, **Vitkin IA** and Whelan WM, Radiance detection of non-scattering inclusions in turbid media, *Biomed Opt Express* 3 3001-11 2012
124. Alali S, Wang YR and **Vitkin IA**, Detecting axial heterogeneity of birefringence in layered turbid media using polarized light imaging, *Biomed Opt Express* 3 3250-63 2012
125. Figley SA, Chen Y, Maeda A, Conroy L, McMullen J, Silver JI, Stapleton S, Lindsay P, Minzberg S, Virtanen C, Tsao J, Winegarden N, Wang Y, Morikawa L, **Vitkin IA**, Jaffray JA, Hill RP and DaCosta RA, A spinal cord window chamber model for in vivo longitudinal multimodal optical and acoustic imaging in a murine model, *PLoS One* 7(3) e58081-12 2013
126. Das NK, Chatterjee S, Soni J, Jagdap J, Pradan A, Sengupta TK, Panigrahi PK, **Vitkin IA** and Ghosh N, Probing multifractality in tissue refractive index: prospects for precancer detection, *Opt Lett* 38 211-3 2013
127. Davoudi B, Morrison M, Bizheva K, Yang YXD, Dinniwell R, Levin W and **Vitkin IA**, A novel optical coherence tomography platform for microvascular imaging and quantification: initial experience in late radiation toxicity patients *J Biomed Optics* 18 076008-8 2013
128. Alali S, Yang T and **Vitkin IA**, Rapid time-gated polarimetric Stokes imaging using photoelastic modulators, *Opt Lett* 38 2997-3000 2013
129. Alali S and **Vitkin IA**, Optimization of rapid Mueller matrix imaging of turbid media using four photoelastic modulators without moving parts *Opt. Engineering* 53 103114-8 2013
130. Gribble A, Layden D and **Vitkin IA**, Experimental validation of optimum selection of input polarization states in determining the sample Mueller matrix: a dual photoelastic polarimeter approach, *Opt Lett* 38 5272-5 2013
131. Mahmud SM, May GR, Kamal MM, Khwaja AS, Sun C, **Vitkin IA** and Yang VXD, Imaging pancreaticobiliary ductal system with optical coherence tomography: A review, *World J Gastrointest Endosc* 16 540-50 2013
132. Zaitsev VY, Gelikonov VM, Matveev LA, Gelikonov GV, Matveyev LA, Shilyagin PA and **Vitkin IA** Recent trends in multimodal optical coherence tomography: I – polarization-sensitive OCT and conventional approaches to OCT elastography, *Radiophysics and Quantum Electronics* 56 682-700 2014
133. Zaitsev VY, Gelikonov VM, Matveev LA, Gelikonov GV, Matveyev LA, Shilyagin PA and **Vitkin IA** Recent trends in multimodal optical coherence tomography: II – correlation stability approaches to OCT elastography and microvascular visualization *Radiophysics and Quantum Electronics* 56 701-719 2014
134. Kirillin MY, Farhad G, Sergeeva EA, Kolios MC and **Vitkin IA**, Speckle statistics in OCT images: Monte Carlo simulations and experimental studies, *Opt Lett* 39 3472-5 2014
135. Alali S, Aitken KJ, Schroeder A, Gribble A, Bagli DJ and **Vitkin IA**, Assessment of local structural disorders of the bladder wall in partial bladder outlet obstruction using polarized light imaging, *Biomed Opt Express* 5 621-9 2014
136. Das N, Chatterjee S, Kumar S, Pradhan AJ, Panigrahi P, **Vitkin IA** and Ghosh N, Tissue multifractality and the Born approximation in light scattering spectra: a novel approach for precancer detection, *Nature Sci Reports* 4 6129; doi:10.1038/srep06129 2014
137. Popov I, Weatherbee A and **Vitkin IA**, Dynamic light scattering arising from flowing Brownian particles: analytical model in OCT conditions, *J Biomed Opt* 19 127004-8 2014
138. Matveev LA, Zaitsev VY, Matveev AL, Gelinkov GV, Gelinkov VM and **Vitkin IA**, Novel methods for elasticity characterization with optical coherence tomography: brief review and future prospects, *Phot Lasers Med* 3 295-309 2014
139. Demidov V, Toronov V, Xu Y, Vuong Y, Sun C, Yang VXD and **Vitkin IA**, Imaging the electro-kinetic response of biological tissue with phase-sensitive optical coherence tomography, *Phot Lasers Med* 3 331-41 2014
140. Dadoudi B, Bizheva D, Wong A, Dinniwell R, Levin W and **Vitkin IA**, Quantitative OCT-based assessment of oral microstructural changes in head-and-neck late radiation toxicity patients – correlation with absorbed dose, *Phot Lasers Med* 3 311-21 2014

141. Matveev LA, Zaitsev VY, Gelikonov GV, Matveev AL, Moiseev AA, Ksenofonov S, Gelinkov VM, Demidov A and **Vitkin IA**, Hybrid M-mode-like OCT imaging of 3D microvasculature in vivo using reference-free processing of complex-valued B-scans, *Opt Lett* 40 1472-5 2015
142. Zaitsev VY, Matveev AL, Matveev LA, Gelikonov GV, Gubarkova EV, Gladkova ND and **Vitkin IA**, Hybrid method of strain estimation in optical coherence elastography using combined sub-wavelength phase measurements and supra-pixel displacement trackingspeckle pattern evolution and feasibility of correlational speckle tracking in optical coherence elastography, *J Biophotonics* 8 1-11 2015
143. Alali S and **Vitkin IA**, Polarized light imaging in biomedicine: emerging Mueller matrix methodologies for bulk tissue assessment, *J Biomed Opt* 20 061104-9 2015
144. Zaitsev VY, Matveev AL, Matveev LA, Gelikonov GV, Gelikonov VM, Demidov A and **Vitkin IA**, Deformation-induced speckle pattern evolution and feasibility of correlational speckle tracking in optical coherence elastography, *J Biomed Opt* 20 0756006-12 2015
145. Flueraru C, Popescu DP, Mao Y, Chang S, Sowa MG and **Vitkin IA**, Improved arterial tissue differentiation by spectroscopic optical coherence tomography, *Modern Technol Med* 7 13-20 2015.
146. Maslennikova A, Kochueva MI, Ignatieva N, Zakharina O, Kamenski V, Sergeeva EA, Kisileva EB, **Vitkin IA**, Bagratashvili V, Effects of gamma radiation on collagen damage and remodelling, *Int J Rad Biol* 91 240-7 2015
147. Ahmad I, Gribble AG, Ikram M, Pop M, and **Vitkin IA**, Polarimetric assessment of healthy and radiofrequency ablated porcine myocardial tissue, *J Biophotonics* 9 750-9 2015
148. Gubarkova EV, Dudenkova VV, Feldchtein FI, Timofeeva LB, Kisileva EB, Kuznetsov SS, Shahov BE, Moiseev AA, Gelikonov GV **Vitkin IA** and Gladkova ND Multi-modal optical imaging characterization of atherosclerotic plaques, *J Biophotonics* 9 doi:10.1002/jbio.201500223 2015
149. Dadoudi B, Gazumova D, Bizheva D, Dinniwell R, Levin W and **Vitkin IA**, Quantitative assessment of oral microstructural and microvascular changes in late oral radiation toxicity, using noninvasive in-vivo optical coherence tomography, *Photon Lasers Med* 5 21-32 2015
150. Kisileva EB, Kirillin MY, Sergeeva EA, Zagaynova EV, Feldchtein FI, **Vitkin IA**, Streltsova OS, Gubarkova EV, Zagaynov VA, and Gladkova ND Criteria for differential diagnosis of human bladder mucosa pathologies in vivo with cross-polarization optical coherence tomography *Biomed Opt Express* 6 1464-76 2015
151. Popov I and **Vitkin IA**, Dynamic light scattering by flowing Brownian particles measured with optical coherence tomography: impact of the optical system *J Biomed Optics* 21 171002-11 2016
152. Alali S, Gribble A and **Vitkin IA**. Rapid wide-field Mueller matrix polarimetry imaging based on four photoelastic modulators with no moving parts *Opt Letters* 41 1038-41 2016
153. Tata A, Gribble A, Ventura M, Ganguly M, Bluemke E, Ginsberg H, Jaffray DA, Ifa DR, **Vitkin IA** and Zarrine-Afsar A, Wide-field tissue polarimetry allows efficient localized mass spectrometry imaging of biological tissues *Chem Sci* 7 2162-9 2016
154. Zaitsev VY, Matveyev AL, Matveev LA, Gelikonov GV, Gubarkova EV, Gladkova ND and **Vitkin IA**, Hybrid method of strain estimation in optical coherence elastography using combined sub-wavelength phase measurements and supra-pixel displacement tracking *J Biophotonics* 9 499–509 2016
155. Weatherbee A, Siguta M, Bizheva K, Popov I and **Vitkin IA**, Probability density function formalism for optical coherence tomography signal analysis: a controlled phantom study *Opt Letters* 41(12) 2727-30 – doi: 10.1364/OL.41.002727 2016
156. Sugita M, Weatherbee A, Bizheva K, Popov I and **Vitkin IA** Analysis of scattering statistics and governing distribution functions in optical coherence tomography *Biomed Opt Express* 7 2551-64 2016
157. Pires L, Demidov V, **Vitkin IA**, Bagnato V, Kurachi C and Wilson BC Optical clearing of melanoma in vivo: characterization by diffuse reflectance spectroscopy and optical coherence tomography *J Biomed Optics* 21 081210-9 2016
158. Assadi H, Demidov V, Karshafian R, Douplik A and **Vitkin IA**, Microvascular contrast enhancement in optical coherence tomography using microbubbles *J Biomed Optics* 21 076014 - 7 doi: 10.1117/1.JBO.21.7.076014 2016
159. Tata A, Woolman M, Venture M, Bernards N, Ganguly M, Gribble A, Ginsberg HJ, **Vitkin IA**, Zheng J and Zarrine-Afsar A, Rapid detection of necrosis in breast cancer with desorption electrospray ionization mass spectrometry *Nature Sci Reports* 6 35374 - 10; doi: 10.1038/srep35374 2016
160. Zaitsev VY, Matveev AL, Matveev LA, Gelikonov GV, Gelikonov VM and **Vitkin IA**, Optimized phase gradient measurements and phase–amplitude interplay in optical coherence elastography *J Biomed Opt* 21 116005-11. doi: 10.1117/1.JBO.21.11.116005 2016
161. Popov I, Weatherbee A and **Vitkin IA**, Statistical properties of dynamic speckles from flowing Brownian scatterers in the vicinity of the image plane in optical coherence tomography, *Biomed Opt Express* 8 2004-17 2017
162. Ahmad I, Gribble A, Murtza I, Ikram M, Pop M and **Vitkin IA** Polarization image segmentation of radiofrequency ablated porcine myocardial tissue *PLoS One* 12(4) e0175173 – doi: 10.1371/journal.pone.0175173 2017
163. Woolman M, Gribble A, Bluemke E, Zou J, Ventura M, Bernards N, Wu M, Howard J, Ginsberg HJ, Sunit Das S, **Vitkin IA** and Zarrine-Afsar A Optimized mass spectrometry analysis workflow with polarimetric guidance for *ex vivo* and *in situ* sampling of biological tissues *Nature Sci Reports* 7 468 – doi: 10.1038/s41598-017-00272-y 2017
164. Sirotkina M, Matveev L, Moiseev A, Buyanova N, Shirmanova M, Elagin V, Gelikonov G, Kisileva E, Kuznetsov S, Zaitsev V, Gamayunov S, Zagaynova E, Feldchtein F, **Vitkin IA** and Gladkova ND Photodynamic therapy monitoring with optical coherence angiography *Nature Sci Reports* 7 41506 - doi: 10.1038/srep41506 2017
165. Zaitsev VY, Matveyev AL, Matveev LA, Gelikonov GV, **Vitkin IA**, Omelchenko A, Baum O, Avetisov S, Bolshunov A, Siplivy V, Shabanov D and Sobol E Optical coherence elastography for strain dynamics measurements in laser correction of cornea shape *J Biophotonics* 10 1450-1463 - 2017
166. Siguta M, Popov I, Brown RK, Bizheva K and **Vitkin IA** K-distribution three-dimensional mapping of biological tissues in optical coherence tomography *J Biomed Opt* 11 e201400055 - doi: 10.1002/jbio.201700055 2017

167. Weatherbee A, Popov I and **Vitkin IA** Accurate viscosity measurements of flowing aqueous glucose solutions with suspended scatterers using a dynamic light scattering approach with optical coherence tomography *J Biomed Opt* 22 087003 – doi: 10.1117/1.JBO.22.8.087003 2017
168. Forward S, Gribble A, Lindenmayer A, Alali S and **Vitkin IA** Flexible polarimetric probe for 3x3 Mueller matrix measurements of tissue, *Nature Sci Reports* 7 11958 – doi: 10.1038/s41598-017-12099-8 2017
169. Moiseev A, Snopova L, Kuznetsov S, Buyanova N, Elagin V, Sirotkina M, Kiseleva E, Matveev L, Zaitsev V, Feldchtein F, Zagaynova E, Gelikonov V, Gladkova N, **Vitkin IA** and Gelikonov G Pixel classification method in optical coherence tomography for tumor segmentation and its complementary usage with OCT microangiography *J Biophotonics* 11 10.1002/jbio.201700072 2017
170. Maslennikova A, Sirotkina M, Moiseev A, Finagina E, Ksenofontov S, Gelikonov G, Matveev L, Kiseleva E, Zaitsev V, Zagaynova E, Feldchtein F, Gladkova N and **Vitkin IA** *In-vivo* longitudinal imaging of microvascular changes in irradiated oral mucosa of radiotherapy cancer patients using optical coherence tomography *Nature Sci Rep* 7 16505 – doi: 10.1038/s41598-017-16823-2 2017
171. Zaitsev VY, Matveyev AL, Matveev LA, Gubarkova EV, Sovetsky AA, Sirotkina MA, Gelikonov GV, Zagaynova EV, Gladkova ND and **Vitkin IA** Practical obstacles and their mitigation strategies in compressional optical coherence elastography of biological tissues, *J Innov Opt Health Sci* 10 1742006–13 2017
172. Sidler M, Aitken KJ, Forward S, **Vitkin IA** and Bagli DJ Non-invasive voiding assessment in conscious mice, *Bladder* 5 e33 - doi:10.14440 2018
173. Demidov V, Maeda A, Sugita M, Madge V, Sadanand S, Fluerau C and **Vitkin IA** Preclinical longitudinal imaging of tumor microvascular radiobiological response with functional optical coherence tomography, *Sci Reports* 8 38 2018
174. Demidov V, Demidova O, Shabunin A and **Vitkin IA** Alternative contrast mechanism in optical coherence tomography: temporal speckle synchronization effects, *Modern Technologies in Medicine* 10 39-48 2018
175. Gelikonov V, Romashov V, Shabanov D, Ksenofontov S, Terpelov D, Shilyagin P, Gelikonov G and **Vitkin IA** Cross-polarization optical coherence tomography with active maintenance of the circular polarization of a sounding wave in a common path system *Rad & Quantum Electronics* 60 897-911 2018
176. Fung KB, Samim M, Gribble A, Bazdra V and **Vitkin IA** Monte Carlo simulation of polarization-sensitive second harmonic generation and propagation in biological tissue *J Biophotonics* e201800036 – 11, doi:10.1002/jbio.201800036 2018
177. Demidov V, Zhao X, Demidova O, Pang HYM, Fluerau C, Liu F-F, and **Vitkin IA** Preclinical quantitative *in-vivo* assessment of skin tissue vascularity in radiation-induced fibrosis with optical coherence tomography, *J Biomed Opt* 23 087003 - 9 2018
178. Demidov+Matveev, L-OCT
179. Sirotkina preclinical PDT
180. Gubarkova clinical BCC PDT
181. Gribble Wisconsin
182. Gribble 3D curvature

Book Chapters

1. **Vitkin IA**, Wilson BC, Anderson RR, Pulsed photothermal radiometry applications in biological media, in *Optical-Thermal Response of Laser Irradiated Tissue*, Welch AJ and van Gemert MJC, editors (Plenum, New York, USA), chapter 16, 1995
2. Yang VXD, **Vitkin IA**, Principles of Doppler optical coherence tomography, in *Handbook of Optical Coherence Tomography in Cardiology*, Regar E, van Leeuwen T and Serruys P, editors (Taylor and Francis Medical, Oxford, UK), chapter 32, 2006
3. Wood MFG, Ghosh N, Guo X, **Vitkin IA**, Towards non-invasive glucose monitoring in biomedicine using a polarized light approach, in *Optical Glucose Sensing, Physiology, and Clearing*, Tuchin VV, editor (CRC Press, Baton Rouge, USA), chapter 17, 2008
4. Depeursinge CD and **Vitkin IA** (editors), *Novel Optical Instrumentation for Biomedical Applications IV*, Progress in Biomedical Optics and Imaging SPIE-OSA, vol. 7371 (SPIE, Bellingham, USA), 2009
5. Ghosh N, Wood MFG, **Vitkin IA**, Polarized light assessment of complex turbid media such as biological tissues via Mueller matrix decomposition, in *Handbook of Photonics for Bio-Sciences*, Tuchin VV, editor (Taylor and Francis, London, USA), chapter 9, 2010
6. Chin LCL, Whelan WM, **Vitkin IA**, Interstitial optical fiber sensors in biomedicine, in *Optical-Thermal Response of Laser Irradiated Tissue: 2nd edition*, Welch AJ and van Gemert MG, editors (Springer, New York, USA), chapter 17, 2011
7. Standish BA, Mariampillai A, Leung MKK, **Vitkin IA**, Microvascular imaging and treatment response monitoring with biophotonics and OCT, in *Handbook of Coherent Domain Optical Methods: 2nd ed*, Tuchin VV, editor (Springer, NY, USA), chapter 22, 2013
8. Morgan SP, Wilson BC, **Vitkin IA**, Rose FRAJ, The role of optical techniques in regenerative medicine, in *Optical Techniques in Regenerative Medicine*, Morgan P, Rose FRAJ and Matcher SJ, editors (Taylor and Francis Medical, Oxford, UK), chapter 1, 2014
9. De Martino A, Ghosh N and **Vitkin IA**, Tissue Polarimetry, in *Photonics: Biomedical Photonics, Spectroscopy and Microscopy*, Andrews DL, editor (Wiley, NY, USA), volume 4, chapter 7, 2015
10. Layden D, Ghosh N and **Vitkin IA**, Tissue polarimetry – concepts, applications and challenges, in *Advanced Biophotonics: Slicing Tissue with Photons*, Wang RK and Tuchin VV, editors (CRC Press, Baton Rouge, USA), chapter 14, 2015

Current Grant Support (last FIVE years, funded as Principal Investigator)

- 2018-2023 **Polarized Light Assessment of Multiply Scattering Heterogeneous Birefringent Media**
Natural Sciences & Engineering Research Council Canada (NSERC), 5 years
- 2018-2022 **Wide-field Polarimetric Imaging for Targeted and Rapid High-sensitivity Analysis of Breast Cancer with Mass Spectrometry**
Canadian Institutes of Health Research (CIHR), 5 years
- 2017-2019 **3D Laser Structured Biomedical Fiber – a Novel Sensor Platform for Rapid and Accurate Minimally Invasive Diagnosis**
Engineering/Medicine/Hospital Seed Fund (U of Toronto Engineering + Medicine Initiative), 2 years
- 2012-2017 **Spectroscopic and Textural Optical Coherence Tomography for Structural and Functional Monitoring of Radiation Therapy Effects**
Canadian Institutes of Health Research (CIHR), 5 years
- 2013-2018 **Development of Novel Optical Coherence Tomography Technologies for Personalized Cancer Medicine**
Leading Scientist Mega-Grant, Ministry of Education and Science, Russian Federation, 5 years
- 2012-2017 **Polarimetric Mueller Matrix Imaging in Multiply Scattering Inhomogeneous Birefringent Media**
Natural Sciences & Engineering Research Council Canada (NSERC), 5 years

Other CV sections – clinical, teaching, supervision, research summaries for SPIE Fellow Election

Clinical Medical Physics (Princess Margaret Hospital (PMH), Toronto):

- Clinical physicist, ocular and gynecologic high-dose-rate brachytherapy (2014-present)
- Clinical physicist, permanent prostate seed implant brachytherapy (2013-present)
- Lead physicist, intraoperative breast radiation therapy (2007-present, ~20 patients / year)
- Lead physicist, intravascular brachytherapy for cardiac restenosis control (2000-2004, 130 patients)
- Organizer, PMH weekly radiation physics seminar series (2000-2006)
- Director, PMH radiation physics residency program (1997-2003)

Teaching and Administrative (University of Toronto):

- Medical Biophysics – Student Seminars course; Optical, Thermal and Radiation Biophysics course
- Faculty of Medicine -- Decanal Promotions Committee panelist
- Radiation Oncology – Introduction to Radiation Oncology Physics + Advanced Medical Imaging lecture sets
- Institute of Medical Sciences – Frontiers of Radiation Medicine; Advanced Radiotherapy & Medical Physics lectures
- Mechanical and Industrial Engineering, Institute of Biomaterials and Biomedical Engineering, Biomedical Physics (Ryerson University) – guest lecturer

Assessment of Tenure and of other Senior Promotions Applications

University of Wisconsin (Biomedical Engineering); Case Western Reserve University (Biomedical Engineering); Stanford University (Biomedical Engineering); Johns Hopkins University (Faculty of Medicine); Northwestern University (Electrical and Computer Engineering); University of Indiana (Ophthalmology); University of Otago, New Zealand (Physics); Tianjin University, China (Precision Instrumentation and Optoelectronic Engineering); McMaster University (Engineering Physics); University of Waterloo (Physics); Ryerson University (Physics, Computer Science and Mathematics); Simon Fraser University (Engineering Science); University of British Columbia (Physics); University of Toronto (Medical Biophysics; Institute of Biomaterials and Biomedical Engineering; Radiation Oncology)

Supervision of Highly Qualified Personnel

45 BSc students, 13 MSc students (2 co-supervised), 10 PhD students (3 co-supervised), 5 exchange PhD students (Pakistan, India, Japan), 9 post-doctoral fellows -- **update numbers!!!**

Post-doctoral fellows and graduate students:

1. Post-doctoral fellows

- Sharon Katz, "OCT technology development for endoscopy", 1999-2001.
- Linda Mao, "Optical fiber sensors and probes for interstitial Doppler OCT", 2002-5.
- Daniel Cote, "Modeling and measurements of polarized light propagation in turbid media", 2002-4.
- Reza Jafari, "Time-frequency analysis and signal processing for time-domain OCT", 2002-4.

- Xinxin Guo, "Turbid polarization studies in biomedicine: effects of turbidity, chirality, and measurement geometry", 2004-6.
- George Liu, "Development of a frequency-swept Doppler OCT system for bioimaging", 2005-7.
- Nirmalya Ghosh, "Mueller matrix decomposition for extracting biophysical metrics from tissue polarimetry", 2007-10
- Ivan Popov, "Speckle statistics and texture analysis in OCT medical imaging", 2014-
- Mitsuro Sugita, "OCT speckle statistics, flow and Brownian motion parameters", 2015-

2. Graduate students:

- Victor Yang (co-supervised with BC Wilson; Vitkin=primary supervisor), "Development and applications of Doppler OCT", PhD 2000-2004 (winner of the Governor General's Gold Medal for doctoral research).
- Megumi Iizuka (co-supervised with MD Sherar; Vitkin=primary supervisor), "Dynamic modulation of tissue optical properties during laser interstitial thermal therapy", MSc 1996-1999
- Lee Chin (co-supervised with WM Whelan; Vitkin=primary supervisor), "Optical fluence and radiance measurements for prostate laser photo-coagulation: treatment monitoring and control," PhD 1999-2008
- Maggie Gordon, "OCT monitoring of photodynamic therapy", MSc 1999-2002
- Nigel Munce (co-supervised with GA Wright; Vitkin=primary supervisor), "Multi-modality guidance and intravascular OCT imaging of total chronic occlusions", PhD 2003-2009
- Brendan Lloyd (co-supervised with WM Whelan; Whelan=primary supervisor), "Radiance and fluence monitoring of interstitial laser photocoagulation process", MSc 2005-2008
- Alexandra Rink (co-supervised with DA Jaffray; Jaffray=primary supervisor), "Radiation dosimeters using fiber optic sensors for read-out", PhD 2003-2009
- Gloria Spirou (co-supervised with WM Whelan; Whelan=primary supervisor), "Photoacoustic monitoring of interstitial laser photocoagulation process", MSc 2004-2006
- Beau Standish, "Interstitial Doppler OCT for treatment monitoring and control of photodynamic therapies", PhD 2004-2009
- Adrian Mariampillai, "High resolution microvascular imaging with OCT: applications to photodynamic therapy and beyond", PhD 2004-2010
- Michael Leung, "Imaging cellular and vascular tumour response to radiation therapy by OCT and fluorescence microscopy *in-vivo*", MSc 2007-2010
- Marika Wallenburg, "Turbid polarimetry and 2nd harmonic generation microscopy for measuring tissue anisotropy", MSc 2008-2010
- Mike Wood, "Spectral polarimetry in turbid chiral media in the presence of birefringence", PhD 2004-2010
- Manzoor Ahmad, "Refractive index profiles of multiply scattering media: effects on polarimetric investigations of tissue", PhD 2010 (exchange student from Pakistan)
- Hafeez Ullah, "Speckle-variance OCT for viscosity-based contrast enhancement and tissue microvascular imaging", PhD 2010 (exchange student from Pakistan)
- Leigh Conroy, "Shedding light on radiotherapy: optical coherence and fluorescence monitoring of early radiobiological vascular effects in irradiated tissues", MSc 2010-2012
- Junpei Sugiyama "OCT for viscosity-based contrast enhancement and glucose monitoring", PhD 2011 (exchange student from Japan)
- Andras Lindenmeier, "Spectroscopic and textural optical coherence tomography for early radiobiological effects detection in irradiated tissues", MSc 2011-2013
- Bahar Davoudi, "Structural, Doppler and speckle-variance OCT for monitoring late radiotherapy complications in upper and lower GI", PhD 2009-2014
- Sanaz Alali, "Tissue birefringence probed with polarized light: technology development and biomedical applications" PhD 2010-2014
- Adam Gribble, "Tissue polarimetry for extracellular matrix anisotropy measurements", MSc 2012-present
- Andrew Weatherbee, "M-mode OCT for blood viscosity quantification and glucose monitoring", MSc 2012-present
- Vani Damodaran, "Microvascular analysis of OCT images from late radiation toxicity patients", PhD 2012 (exchange student from India)
- Laura Burgess (co-supervised with Gang Zhang), "OCT imaging of oral cancer PDT treatments", MSc 2012-present
- Sumara Ashraf, "Speckle-variance OCT for viscosity contrast enhancement and glucose quantification", PhD 2013 (exchange student from Pakistan)
- Valentin Demidov, "Vascular OCT for radiotherapeutic quantification", PhD 2013-present
- Iftikhar Ahmad, "Polarimetric imaging of tissue via the 4-PEM approach", PhD 2014 (exchange student from Pakistan)
- Sarah Forward, "Tissue polarimetry for fast *in-vivo* tissue measurements", MSc 2015-present
- Jared Westreich, "Polarized light guidance for mass spectrometry in breast cancer", MSc 2017-present

3. Miscellaneous supervisory roles (Medical Biophysics unless otherwise noted)

graduate thesis committees – Jason Davis MSc 1998-2000; Norman Freeman MSc 1998-2000; Louis-Michel Song MSc 1998-2004; Vanessa Choy MSc 2000-3; Michael Strauss MSc 2001-3; Andreas Rau MSc 2002-4; Paul Constantinou PhD 2001-8; Cathy Nangini PhD 2001-6; Claire McCann PhD 2004-7; Jay Detsky PhD 2004-8; Aman Thind PhD 2004-9; John Hudson PhD 2004-10 ; Brian Keller (IMS) PhD 2004-8; Isuru Silva MSc 2005-8; Golnaz Fahrat MSc 2007- ; Dououd

Shah MSc 2007-10; Eli Lechtman 2008-13; Kenneth Ng (IBBME) 2008- ; Steve Bartolac PhD 2010-3; Marc Calais MSc 2010-3 ; Jane He PhD 2012-8 ; Priscilla Lau PhD 2014- ; Caryn Geady MSc 2016-; Kevin Kuzai MSc 2017-; Ramy Ayoub 2018-..

theses defence examinations – Paul McNamara PhD (external examiner, University of Limerick, Ireland), Chiara Buscemi PhD (external examiner, University Paris-Est Creteil, France), Alexander Doronin PhD (external examiner, University of Otago, New Zealand), Jalpa Soni PhD (external examiner, IISER Kolkata, India), Kathy Beaudette PhD (external examiner, Ecole Polytechnique, Montreal), Suja Shrestha PhD (Dentistry) Joshua Lockwood MEng (IBBME), Nasim Shams PhD, Ruoshi Shi MSc, Mattea Welch MSc, Daniel Schep MSc, Hiram Karimi PhD, Charles Tremblay-Derveau PhD, Daria Taiakina MSc, Nardin Samuel MSc, Mojden Shakiba MSc, Melissa Hill PhD, Jeff Cassidy MSc (ECE), Michael Velec PhD (IMS) , Mira Sibai MSc, Annie Strestha PhD (Dentistry), Charles Tremblay-Derveau MSc, Elizabeth de Guzman MSc, Lindsay Lustig MSc, Christopher Roy MSc, Setareh Ghorbanian MSc, Elizabeth Huyhn PhD, Greg Griffin MSc, Mark Jarvi PhD, Michael Velec MS (IMS), Jasdeep Sagar MSc, Matthew Scaife MSc, Karen Lim MSc (IMS), Benjamin Lai MSc, William Lo MSc, Mark Lee MSc (IMS), Michelle Lenarduzzi MSc, Alison Aiken MSc, Toby Lam MSc, Jinzi Zheng PhD, Gordon Duncan MSc, Xia Wu PhD, James Mainprize MSc, Brenda Chow MSc, Melanie Barfelds MSc, Olga Pawlarczyk MSc, Natalie Pamerleau MSc, Donald Christopher MSc, Claire McCann MSc, Adam Tunis MSc, Alina Mahai MSc (IMS), Laurel O'Malley MSc, Luc Charron MSc, Lindsay Auld MEng (Biomedical Engineering), Andrew White PhD; SGS chair – Fabio Settecase MSc, Heather Flemming PhD, Joanna Hodson PhD, Tracey Asano PhD, Carrie MacTavish PhD, John Stavrinides PhD, Laura Esmail PhD, Karen Aitken PhD, Olga Bykova PhD, Luca Pisterzi PhD, Jane Maciver PhD, Nancy Mitchell PhD, Gabriela Rozanski PhD, Brittany Matthews PhD, Lindsay Lustig MSc, Janice Pong MSc, Elina Korpela MSc, Stuart Locke MSc, Pietro Sollazzo MSc, John Doran PhD, Kristina Lisk PhD, Emad Heidaryashrash PhD

supervision of undergraduate (co-op) students – Emile Hoskinson, Nader Jahshan, David Giewerker, Ruchi Kalia, Leena Chacho, James Donald, Ryan Studinski, Maggie Gordon, Claire Whyman, Richard Laszlo, Stewart Lo, Julius Pekar, Kevin Hadley, Emily Seng-Yue, Alvin Mok, Natalie Swoboda, Josip Zic, Eric Cheng, Selma Li, Anton Izraelian, Maria Wunderlinch, Mike Sinclair, Michele Heng, Tracey Liu, Joshua Grimes, Brian Li, Stephanie Chiu, Daina Burnes, Paul Webster, Xiao Jin, Jurek Smolen, Tina Randall, Tewadros Mamo, Kenneth Lee, Timothy Luk, Louis Tan, Shannon Dang, Nasit Vurgun, Rain Wong, Melanie Morrison, Vani Damodaran (India), David Layden, Chitram Bannerjee (India), Vicky Madge, Barry Fung

Areas of professional specialization (optical biophysics and engineering; professional contributions meriting election to SPIE Fellowship) – candidate's 1-page statement [2013]

I have been engaged in biomedical optics research for 20 years, since my PhD studies at McMaster University (department of Physics and Astronomy) and Harvard University (Massachusetts General Hospital, Wellman Laboratories of Photomedicine).

- The PhD work focused on opto-thermal transfer in laser irradiated tissues, and I implemented the technique of pulsed photothermal radiometry (PPTR) for this purpose. Significant advances in PPTR ensued, including its extension to examinations of turbid media such as tissue, signal generation and evolution in layered scattering media, effects of particulate inclusions, determination of tissue optical properties and the ability to track tissue absorption changes. These conceptual and practical advances were summarized in ~10 papers and book chapters stemming from my PhD thesis, and have since been picked up / extended by other research groups.

Following a post-doctoral fellowship at the University of Toronto and a clinical physics residency at the Princess Margaret Hospital / Ontario Cancer Institute, I became a medical physicist in radiation oncology, with a research program in biophotonics. I've been in Toronto since then, and am now a full professor of Medical Biophysics and Radiation Oncology at the University of Toronto, a medical physicist at Princess Margaret Hospital, and a senior scientist at the Ontario Cancer Institute (Biophysics and Bioimaging division). Accomplishments in the following areas can be noted:

- I initiated a program in the use of polarized light in biomedicine. The field of turbid polarimetry is underdeveloped in biophotonics, partly because of the extensive loss of polarization engendered by tissue multiple scattering. Yet we (and others) have developed methods to reliably measure and quantify the polarization-retaining fraction of multiply scattered light, and have used this finding in a variety of important pre-clinical scenarios (chiral molecule detection for glucose monitoring in diabetics, birefringence mapping in infarcted and regenerating heart muscle). Specific contributions, largely unavailable in biophotonics community previously, include: optimization of various polarization modulation / synchronous detection schemes, development and validation of polarization sensitive Monte Carlo models for simulating simultaneous polarimetry effects, derivation of polar decompositions for extracting unique biophysical characteristics otherwise obscured in the tissue Mueller matrix, and applications of this polarimetry platform in the above-mentioned preclinical scenarios. ~40 journal publications and several reviews / book chapters have summarized our findings, as active research in tissue polarimetry continues (for example, pathology detection and treatment response monitoring in urology).
- Since 2002, my group has played an active role in the advancement of optical coherence tomography (OCT) for functional imaging of tissues. Specifically, our research concentrated on OCT extensions that enable microvascular detection of tissue blood flow at the perfusion (microcirculation) level. Specific accomplishments include: world's first endoscopic Doppler OCT detection of subsurface microvasculature in human esophagus, MEMS-enabled dynamic focus tracking for SNR and resolution improvement in OCT, development of Doppler-free visualization of tissue microvasculature based on speckle variance, engineering of interstitial / endoscopic / intraoperative / multi-channel OCT probes, fundamental multimodality (OCT + other optical techniques) studies of cellular - vascular - stromal dynamics in a mouse window chamber model, and monitoring of photodynamic therapy treatment effects using the microvascular OCT platform. ~45 journal publications, patents (one licensed to Michelson Diagnostics Ltd, Kent, UK), and book chapters have summarized our progress over the past decade, and active research in biomedical OCT continues (currently concentrating on OCT imaging of early radiobiological changes in X-ray irradiated tissues, for optimization and feedback control of radiation therapy of cancers).
- An active program in optical fiber sensors for biomedical applications has also been pursued. Here, we have mostly concentrated on the development and use of novel interstitial optical fluence and optical radiance fiber detectors, in the context of photothermal laser therapy. Specifically, our fiber sensor methodology has enabled *in-vivo* detection of such important photothermal treatment events as initiation of the thermal coagulation damage front, its evolution in time and space, and onset of tissue charring (an undesirable event to be avoided). We've also increased the information content of the fiber sensor feedback by replacing direction-independent fluence readings with directionally-resolved radiance detection. Recently, we took advantage of the fiber optic platform to address outstanding issues in on-line dosimetry in radiation therapy, by developing (and patenting) a fiber-based radiation sensor for accurate real-time point measurements of radiation absorbed dose. This approach is currently in scale-up production in a government optics lab, with clinical pilot testing scheduled to commence shortly.

Specific SPIE Fellows Nomination Criteria:

1. Technical accomplishments – leading edge research in biophotonics, including functional/vascular OCT, tissue polarimetry, and optical fiber sensors [>170 publications, several book chapters, many invited and plenary lectures, editorship of *Optics Letters*, participation in national and international research grant panels and site visits, organization of conferences, active educational/training activities (25 past and present MSc/PhD students, ~40 undergraduates), several patents, clinical translation of technologies (several patents and licensing agreements, ongoing human clinical studies), consulting engagements for several companies – details in CV]
2. Services to the general optics community – editorship of *Optics Letters* (biophotonics field, 2nd 3-year term), guest editorship of *Journal of Applied Physics* and *Journal of Biomedical Optics*, international lectures and visits as part of SPIE Visiting and OSA Travelling Lecturers programs, organization of conferences (ECBO, SPIE Photonics Europe, LALS, OSA Photonics Congress, SPIE Photonics North), service on many Canadian (NSERC, CIHR), USA (NIH, CIMIT, US Army) and other international research grants panels (Dutch ZonMw and STW, German DFG, NZealand's Royal Marsden, Australia's Raine Medical Foundation)
3. Services to SPIE – active participation in SPIE Visiting Lecturer Program (visits to student chapters in Taiwan, Russia, Ukraine, Brazil, Germany, Cyprus, New Zealand, Israel, China, Vietnam), organization of conferences (SPIE Photonics North, Photonics Europe, European Conference on Biomed Optics – conference chair for Novel Biophotonic Techniques and Applications, etc)