

**BIOGRAPHICAL SKETCH**

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NAME Irene Georgakoudi		POSITION TITLE Associate Professor, Biomedical Engineering	
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Dartmouth College, Hanover NH	B.A.	1993	Physics
University of Rochester, Rochester NY	M.Sc.	1996	Biophysics
University of Rochester, Rochester NY	Ph.D.	1999	Biophysics
MIT, Cambridge MA	Postdoc	1999-2002	Biomedical Optics

**A1. Positions**

- 2/2002-8/2002 Research Scientist, G.R. Harrison Spectroscopy Laboratory, MIT, Cambridge, MA  
 9/2002-12/2002 Manager, Optical Modeling Group, Argose Inc., Waltham, MA  
 1/2003-1/2007 Instructor, Harvard Medical School; Assistant in Physics, Wellman Center for Photomedicine, Massachusetts General Hospital, Boston, MA  
 9/2004-8/2008 Assistant Professor, Biomedical Engineering Department, Tufts University, Medford, MA  
 9/2008-Present Associate Professor, Biomedical Engineering Department, Tufts University, Medford, MA

**A2. Honors**

- 1991 C.V. Starr Foundation Scholarship, *Dartmouth College*, Hanover, NH  
 1993 Francis W. Sears Prize, *Department of Physics and Astronomy, Dartmouth College*, Hanover, NH  
 1994 Leonidas Lantzounis Research Grant, *Hellenic Medical Society of New York*  
 1996 Graduate Alumni Fellowship, *University of Rochester*, Rochester, NY  
 1997 Graduate Student Society Leadership Award, *University of Rochester*, Rochester, NY  
 1997 Agnes M. and George Messersmith Fellowship, *University of Rochester*, Rochester, NY  
 1998 William F. Neuman Award, *Biophysics Department, University of Rochester*, Rochester, NY  
 1999-2002 National Research Service Award, *U.S. National Institutes of Health*  
 2004 Claflin Distinguished Scholar Award, Massachusetts General Hospital, Harvard Medical School.  
 2005 Inaugural Sturge Price awarded for "pioneering contributions to spectral diagnosis of biological materials using optical spectroscopic methodology."  
 2006-2011 NSF Career Award: Non-invasive modalities for optical imaging of cell-matrix interactions in engineered tissues  
 2006 Attendee of the US Frontiers in Engineering Symposium organized by the National Academy of Engineering  
 2008-2009 Board of Directors, Optical Society of America (OSA)

**A3. Professional Leadership and Service**

- 2003 Chair, Spectroscopy and Imaging for Disease Diagnosis session, Annual OSA meeting, Tucson, AZ  
 2004-06 Program Committee and session chair, OSA meeting on Biomedical Optics, Miami Beach and Ft.Lauderdale, FL  
 2005/2007 Ad-hoc peer review committee member, American Cancer Society Canary Fund Postdoctoral fellowships

- 2005 Program committee and Session chair, Advances in Optics for Biotechnology, Medicine and Surgery, Engineering Conferences International, Copper Mountain, CO
- 2006 Session organizer and chair (New Technology/Methodology), Gordon Research Conference on Lasers in Medicine and Biology, Plymouth, NH
- 2006 Program committee and session organizer (Spectroscopies and Contrast Agents for Disease Diagnostics), Annual OSA Meeting, Rochester, NY
- 2006-2008 Program committee, Annual CLEO/QELS meeting, CA
- 2008-2009 Program committee and session chair, SPIE Photonics West meeting, San Jose, CA
- 2007-2009 Vice-chair and chair of the Education and Member Services committee, Optical Society of America
- 2008 Program co-chair, Optical Society of America meeting on Biomedical Optics, Tampa, FL
- 2009 Program co-chair, European Conference in Biomedical Optics, Munich, Germany

Panel member: NIH NCI P01 Prevention, Control and Population Studies Section (2007-present)  
NIH AIDS Small Business Innovative Research Section (2006-2007, mail-in reviewer)  
NSF Instrument and Instrument Development Unit (2007)  
NSF Biophotonics, Advanced Imaging and Sensing for Human Health Program (2008)  
American Cancer Society, Canary Foundation Postdoctoral Fellowships (2005-Present)

Reviewer for scientific articles in Cancer Research, Optics Letters, Journal of Biomedical Optics, Lasers in Medicine and Surgery, Applied Optics, Photochemistry & Photobiology, IEEE Transactions on Biomedical Engineering.

Editorial Boards: Journal of Biological Physics  
Applied Optics (Guest Editor, Biomedical Optics Special Issue 2009)

Member: Optical Society of America, American Association for Cancer Research, International Society for Optical Engineering, Biomedical Engineering Society

### **Selected Peer-reviewed Publications**

1. Georgakoudi I, Nichols MG, Foster TH. The mechanism of Photofrin photobleaching and its consequences for photodynamic dosimetry. *Photochem Photobiol* 1997; 65: 135-144.
2. **Georgakoudi I**, Foster TH. Effects of the subcellular redistribution of two Nile blue derivatives on photodynamic oxygen consumption. *Photochem Photobiol* 1998; 68:115-122.
3. **Georgakoudi I**, Jacobson BC, Van Dam J, Backman V, Wallace M, Muller M, Zhang Q, Badizadegan K, Sun D, Thomas G, Perelman LT, Feld MS. Fluorescence, reflectance and light scattering spectroscopy for evaluating dysplasia in patients with Barrett's esophagus. *Gastroenterology* 2001; 120: 1620-1629.
4. Müller MG, **Georgakoudi I**, Zhang Q, Wu J and Feld MS. Intrinsic fluorescence spectroscopy in turbid media: Disentangling effects of scattering and absorption. *Applied Optics* 2001; 40: 4633-4646.
5. Gurjar R, Backman V, Perelman LT, **Georgakoudi I**, Badizadegan K, Itzkan I, Dasari R and Feld MS. Functional imaging of human epithelia with polarized light scattering spectroscopy. *Nature Medicine* 2001; 7: 1245-1248.
6. **Georgakoudi I**, Jacobson BC, Mueller MG, Sheets EE, Badizadegan K, Carr-Locke DL, Crum CP, Boone CW, Dasari RR, Van Dam J, Feld MS. NAD(P)H and collagen as quantitative fluorescent biomarkers of epithelial precancerous changes. *Cancer Research* 2002; 62: 682-687.
7. **Georgakoudi I**, Sheets EE, Mueller M, Backman V, Crum CP, Badizadegan K and Feld MS. Tri-modal spectroscopy as a tool for the detection and biochemical/morphological characterization of cervical pre-cancers in vivo. *American Journal of Obstetrics and Gynecology* 2002; 186: 374-382.

8. Mueller M, Wax A, **Georgakoudi I**, Galindo L, Dasari R, Feld M. Multiexcitation fluorescence and reflectance portable spectrofluorimeter to assist real time guidance to biopsy in precancer screening. *Review of Scientific Instruments* 2002; 73: 3933-393.
9. Mueller M, Valdez T, **Georgakoudi I**, Backman V, Fuentes C, Kabani S, Laver N, Wang Z, Boone CW, Dasari RR, Shapshay SM, Feld MS. Spectroscopic detection and evaluation of morphologic and biochemical changes in early human oral carcinoma. *Cancer* 2003; 97:1681-1692.
10. **Georgakoudi I** and Van Dam J. Characterization of Dysplastic Tissue Morphology and Biochemistry in Barrett's Esophagus Using Diffuse Reflectance and Light Scattering Spectroscopy. *Gastrointest Endosc Clin North Am* 2003; 13:297-308.
11. **Georgakoudi I**, Motz J., Backman V, Angheloiu G, Haka A, Müller M, Dasari R and Feld MS. Quantitative characterization of biological tissue using optical spectroscopy. In the *Biomedical Photonics Handbook*, ed. Tuan Vo-Dinh, CRC Press: Boca Raton, FL. 2003;chapter 31, pp.1-33.
12. **Georgakoudi I**, Müller M and Feld MS. Intrinsic Fluorescence Spectroscopy of Biological Tissue. In *Fluorescence in Biomedicine*, ed. Mary-Ann Mycek and Brian Pogue, Marcel Dekker, Inc: New York. 2003; chapter 4, pp. 109-142.
13. Novak J, **Georgakoudi I**, Wei X, Prossin A, Lin C. An in vivo flow cytometer for real-time detection and quantification of circulating cells. *Opt Lett* 2004, 29: 77-79.
14. **Georgakoudi I**. Solban N, Novak J, Rice WL, Wei X, Hasan T, Lin CD. In vivo flow cytometry: A new method for enumerating circulating cancer cells. *Cancer Res* 2004, 64:5044-5047.
15. **Georgakoudi I** and Feld MS. Intrinsic Fluorescence, Diffuse Reflectance and Light Scattering for Detecting Dysplasia in Barrett's Esophagus. *Gastrointest Endosc Clin North Am* 2004, 14: 519-537.
16. Wei X, Sipkins D, Pitsillides C, Novak J, **Georgakoudi I**, Lin C. Real-time detection of circulating apoptotic cells by in vivo flow cytometry. *Mol Imaging* 2005; 4: 415-416.
17. Angheloiu G, Arendt, J, Müller, M, Haka, A, **Georgakoudi I**, Motz J, Scepanovic O, Kuban B, Myles J, Miller F, Podrez E, Fitzmaurice M, Kramer J, Feld M. Intrinsic fluorescence and diffuse reflectance spectroscopy identify superficial foam cells in coronary plaques prone to erosion. *Arteriosclerosis, Thrombosis, and Vascular Biology* 2006; 26:1594-600.
18. **Georgakoudi I**. The Color of Cancer. *J Luminescence* 2006, 119-120:75-83.
19. Levitt J, Baldwin A, Papadakis A, Puri S, Xylas J, Münger K, **Georgakoudi I**. Intrinsic fluorescence and redox changes associated with apoptosis of primary human epithelial cells. *J Biomed Optics* 2006; 11:064012 (Cover feature).
20. **Georgakoudi I**, Tsai I, Greiner C, Wong C, DeFelice J, Kaplan D. Intrinsic fluorescence changes associated with the structural conformation of silk fibroin in biomaterial matrices. *Optics Express* 2007;15: 1043-1053.
21. Boutrus S, Greiner C, Hwu D, Chan M, Kuperwasser C, Lin C, **Georgakoudi I**. A Portable Two-Color In Vivo Flow Cytometer for Real-Time Detection of Fluorescently-Labeled Circulating Cells. *JBO Letters* 2007; 12:020507.
22. Kim HJ, Kim U.J, Leisk G, Bayan C, **Georgakoudi I**, Kaplan DL. Bone regeneration on macroporous aqueous-derived silk 3-D scaffolds. *Macromolecular Bioscience* 2007; 7: 643-655.
23. Perry H, Greiner C, **Georgakoudi I**, Cronin-Golomb M, Omenetto F. Simple fabrication technique for rapid prototyping of seamless cylindrical microchannels in polymer substrates. *Review of Scientific Instruments* 2007; 78: 044302.
24. Mujat C, Greiner C, Baldwin A, Levitt J, Tian F, Stucenski L, Hunter M, Kim YL, Backman V, Feld M, Munger K, **Georgakoudi I**. Endogenous optical biomarkers of normal and human papillomavirus immortalized epithelial cells. *International Journal of Cancer* 2008; 122:363-371.
25. Levitt J, Hunter M, Mujat C, McLaughlin-Durbin M, Munger K, **Georgakoudi I**. Diagnostic cellular organization features extracted from autofluorescence images. *Optics Letters* 2007, 32:3305-3307.
26. Rice W, Kaplan D, **Georgakoudi I**. Quantitative biomarkers of stem cell differentiation based on intrinsic two-photon excited fluorescence. *Journal of Biomedical Optics (Letter)* 2007, 12:060504.
27. Rice WL, Firdous S, Gupta S, Hunter M, Wong Po Foo C, Kaplan DL, **Georgakoudi I**. Non-invasive characterization of structure and morphology of silk fibroin biomaterials using non-linear spectral imaging. *Biomaterials* 2008, 29:2015-2024..
28. Gupta S, Hunter M, Cebe P, Levitt J, Kaplan DL, **Georgakoudi I**. Non-invasive optical characterization of biomaterial mineralization. *Biomaterials* 2008, 29:2359-2369.

29. Georgakoudi I, Rice W, Hronik-Tupaj M, Kaplan D. Optical spectroscopy and imaging for the noninvasive evaluation of engineered tissues. *Tissue Eng Part B Rev.* 2008,14(4):321-40. (Cover feature)
30. Lawrence B, Cronin-Golomb M, Georgakoudi I, Kaplan DL, Omenetto FG. Bioactive silk protein biomaterial systems for optical devices. *Biomacromolecules*, 2008, 9:1214-1220.
31. Bayan C, Levitt J, Miller E, Kaplan D, Fully-automated, quantitative, non-invasive assessment of collagen fiber content and organization in thick collagen gels. *Journal of Applied Physics* 2009, 105:102042.
32. Gupta S, Hunter M, Kaplan DL, Optical characterization of the nanoscale organization of mineral deposits on silk films. *Applied Optics* 2009, 48: D45-51.
33. Huang P, Hunter M, Georgakoudi I. Confocal light scattering spectroscopic imaging system for in situ tissue characterization. *Applied Optics* 2009, 48:2595-2599.