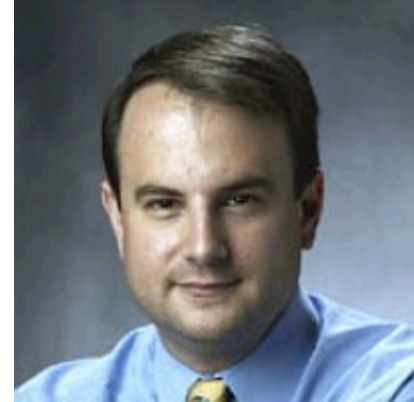




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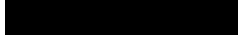

ADAM P WAX, ASSOCIATE PROFESSOR

Dr. Wax's research interests include optical spectroscopy for early cancer detection, novel microscopy and interferometry techniques.



The study of intact, living cells with optical spectroscopy offers the opportunity to observe cellular structure, organization and dynamics in a way that is not possible with traditional methods. We have developed a set of novel spectroscopic techniques for measuring spatial, temporal and refractive structure on sub-hertz and sub-wavelength scales based on using low-coherence interferometry (LCI) to detect scattered light. We have applied these techniques in different types of cell biology experiments. In one experiment, LCI measurements of the angular pattern of backscattered light are used to determine non-invasively the structure of sub-cellular organelles in cell monolayers, and the components of epithelial tissue from freshly excised rat esophagus. This work has potential as a diagnostic method for early cancer detection. In another experiment, LCI phase measurements are used to examine volume changes of epithelial cells in a monolayer in response to environmental osmolarity changes. Although cell volume changes have been measured previously, this work demonstrates for the first time the volume of just a few cells (2 or 3) tracked continuously and in situ.

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CIEMAS 2547 T4, TuTh 02:50 PM-04:05 PM
- BME 236L.01L, *BIOPHOTONIC INSTRUMENTATION*
CIEMAS 2547 T4, TuTh 04:25 PM-06:25 PM

Education:

PhD, Duke University, 1999
MA, Duke University, 1996
BS, Rensseler Polytechnic Institute, 1993
BS, State University of New York, 1993

Specialties:

Photonics
Medical Imaging
Cancer diagnostics and therapy
Sensing and Sensor Systems

Research Interests:

Dr. Wax's research interests include optical spectroscopy for early cancer detection, novel microscopy and interferometry techniques.

Curriculum Vitae

Awards, Honors, and Distinctions

Capers and Marion McDonald Award for Excellence in Teaching and Research, Duke University, Pratt School of Engineering
Chandran Research Award, Duke University
NIH Postdoctoral Fellowship, National Institutes of Health
NSF Early CAREER Award, National Science Foundation
ORAU Ralph E. Powe Junior Faculty Enhancement Award
W. H. Coulter Foundation Early Career Award, W. H. Coulter Foundation

Representative Publications (More Publications)

Pyhtila J. W., K. J. Chalut, J. D. Boyer, J. Keener, T. A. D'Amico, M. A. Gottfried, F. Gress, and A. Wax, *In situ detection of nuclear atypia in Barrett's esophagus using angle-resolved low coherence interferometry*, *Gastrointestinal Endoscopy*, vol. 65 (2007), pp. 487-491 .
Chalut, K.J., L.A. Kresty, J. W. Pyhtila, R. Nines, M. Baird, V. E. Steele, and A. Wax,, *In situ assessment of intraepithelial neoplasia in hamster trachea epithelium using angle-resolved low coherence interferometry*, *Cancer Epidemiol Biomarkers Prev*, vol. 16 (2007), pp. 223-7 .
Pyhtila, J.W. and Boyer, J.D. and Chalut, K.J. and Wax, A., *Fourier-domain angle-resolved low coherence interferometry through an endoscopic fiber bundle for light-scattering spectroscopy*, *Opt. Lett. (USA)*, vol. 31 no. 6 (2006), pp. 772 - 4 [OL.31.000772] [abs].
Curry, Adam and Hwang, William L. and Wax, Adam, *Epi-illumination through the microscope objective applied to darkfield imaging and microspectroscopy of nanoparticle interaction with cells in culture*, *Optics Express*, vol. 14 no. 14 (2006), pp. 6535 - 6542 [OE.14.006535] [abs].
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Wax, A. and Pyhtila, J.W. and Graf, R.N. and Nines, R. and Boone, C.W. and Dasari, R.R. and Feld, M.S. and Steele, V.E. and Stoner, G.D., *Prospective grading of neoplastic change in rat esophagus epithelium using angle-resolved low-coherence interferometry*, *J. Biomed. Opt. (USA)*, vol. 10 no. 5 , pp. 51604 - 1 [1.2102767] [abs].
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Changhuei Yang and Wax, A. and Dasari, R.R. and Feld, M.S., *Phase-dispersion optical tomography*, *Opt. Lett. (USA)*, vol. 26 no. 10 (2001), pp. 686 - 8 [abs].

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