

BIOGRAPHICAL SKETCH

NAME	RONALD H. SILVERMAN	POSITION TITLE	PROFESSOR OF OPHTHALMIC SCIENCE	
	rsilverman@riversideresearch.org			
INSTITUTION AND LOCATION		DEGREE	YEAR(s)	FIELD OF STUDY
Brooklyn College, Brooklyn, NY		B.S.	1971	Chemistry
Polytechnic Institute of NY, Brooklyn, NY		M.S.	1979	Bioengineering
Polytechnic University, Brooklyn, NY		Ph.D.	1990	Computer Science

Positions

Department of Ophthalmology Columbia University Medical College New York, NY	Professor of Ophthalmic Science Dec 2010 - present
Department of Ophthalmology Columbia University Medical College New York, NY	Assistant Professor of Ophthalmic Science May 2010 – Dec 2010
Frederic L. Lizzi Center for Biomedical Engineering Riverside Research Institute New York, NY	Consulting Member Research Staff July 2005 - present
Department of Ophthalmology Weill Medical College of Cornell University New York, NY	Professor of Computer Science in Ophthalmology September 1999 - 2010
Department of Ophthalmology Cornell University Medical College New York, NY	Associate Research Professor July 1994 – September 1999
Department of Ophthalmology Cornell University Medical College New York, NY	Assistant Research Professor March 1990 - July 1994
Department of Ophthalmology Cornell University Medical College New York, NY	Senior Research Associate 1985 - 1990
Department of Ophthalmology Cornell University Medical College New York, NY	Research Associate 1982 - 1985
Genetics Research Laboratory Kingsbrook Jewish Medical Center Brooklyn, NY	Laboratory Specialist 1973 - 1982
Dept. of Contractile Proteins Institute for Muscle Disease New York, NY	Research Assistant 1971 – 1973

Honors

Fellow, American Institute of Ultrasound in Medicine; Achievement Award, American Academy of Ophthalmology (2005, 2008); Dyson Scholarship (2007 -2010); Coleman Lecture (2008); Lecture to Cornell University Board of Trustees and Weill-Cornell Board of Overseers (2010); Senior Member IEEE (2011); Fellow, American Institute for Medical & Biological Engineering (2012)

Roles in Scientific Organizations

American Society for Ophthalmic Ultrasound	President,	1996-2000
	Board Member-at-Large	2000-2005
American Institute of Ultrasound in Medicine	Chairman Ophthalmology Section,	1995-1997
	Co-Chairman, Ophthalmology Section	1998-2001
	Membership Committee	2001-2002
	Endowment for Ed. & Res. Committee	2009-2012
	High-Freq Clin & Preclin Committee	2009-
NIH Transducer Resource, USC	Advisory Board Member	1999 - 2010
International Conference on Ultrasonic Biomedical Microscanning	Program Committee	2002 -
International Society for Imaging the Eye	Program Committee	2008 -
Association for Research in Vision & Ophthalmology, Anatomy & Pathology Section	Program Committee	2008 - 2011
Department of Ophthalmology, Director, Columbia University Medical Center	Basic Science Course	2012 -

Selected Recent Publications

Kim, D.Y., **Silverman, R.H.**, Chan, R.V.P., Khanifar, A.A., Rondeau, M.J., Lloyd, H.O., Schlegel, P.N., Coleman, D.J.. "Measurement of choroidal perfusion and thickness following systemic Sildenafil (Viagra®)," *Acta Ophthalmol.* (in press).

Lethiecq, M., Lou-Moeller, R., Ketterling, J.A., Levassort, F., Tran-Huu-Hue, L.P. Filoux, E., **Silverman, R.H.**, and Woln, W.W., "Non-planar pad-printed thick-film focused high-frequency ultrasonic transducers for imaging and HIFU applications," *IEEE Trans. Ultrason. Ferroelect. Freq. Contr.* 59(9):1976-82, 2012.

Kong, F., **Silverman, R. H.**, Liu, L., Chitnis, P.V., Lee, K. K., and Chen, Y. C., "Photoacoustic guided convergence of light through optically diffusive media," *SPIE Proceedings on Photons Plus Ultrasound: Imaging and Sensing*, 7899, 2011.

Yonekawa Y, Sun G, **Silverman RH**, Coleman DJ, Chan RVP., "The current role of high-frequency ultrasound in ophthalmic diagnosis," In: *Contemporary Ophthalmology* (in press).

Silverman, R.H., Ketterling, J.A., Mamou, J., Lloyd, H.O., Filoux, E., and Coleman, D.J., "Pulse-encoded ultrasound imaging of the vitreous with an annular array," *Ophthalmic Surgery, Lasers & Imaging* **43** 82-86 (2012) [PMID: 21902166]

Kong, F., **Silverman, R.H.**, Liu, L., Chitnis, P.V., Lee, K.K., and Chen, Y.C., "Photoacoustic-guided convergence of light through optically diffusive media," *Optics Letters*, 36(11):2053-2055, 2011. PMID: 21633446

Lethiecq, M., Lou-Moeller, R., Ketterling, J.A., Levassort, F., Tran-Huu-Hue, L.P., Filoux, E., **Silverman, R.H.**, and Wolny, W.W., "Non-planar pad-printed thick-film focused high-frequency ultrasonic transducers for imaging and HIFU applications," *Proc. ISAF-PFM*, 2011, pp. 1-4.

Wolny, W.W., Ketterling, J.A., Levassort, F., Lou-Moeller, R., Filoux, E., Mamou, J., **Silverman, R.H.**, and Lethiecq, M., "Pad-printed thick-film transducers for high-frequency and high-power applications," *Proc. SPIE Medical Imaging*, vol. 7968, 2011.

Reinstein, D.Z., Archer, T.J., Gobbe, M., **Silverman, R.H.**, Coleman, D.J. "Repeatability of layered corneal pachymetry with the Artemis very high-frequency digital ultrasound arc-scanner," *J. Refract. Surg.*, 26(9):646-659, 2010.

Reinstein DZ, Archer T, Gobbe M, **Silverman RH**, Coleman DJ. "Epithelial thickness after hyperopic LASIK: Three dimensional display with Artemis very high frequency ultrasound." *J Refr Surg.*, 26(8):555-564, 2010.

Mamou, J., Aristizabal, O., **Silverman RH**, and Ketterling JA. "A perspective on high-frequency ultrasound for medical applications," in *Physics Procedia of the 2009 International Congress on Ultrasonics*, Santiago de Chile, 3(1): 289-295, 2010.

Reinstein DZ, Gobbe M, Archer TJ, **Silverman RH**, Coleman DJ. "Epithelial, stromal, and total corneal thickness in keratoconus: three-dimensional display with artemis very-high frequency digital ultrasound," *J Refract Surg.*, 26(4):259-271, 2010. PMID: PMC Journal – In Process.

Ursea R, **Silverman RH**, "Anterior-segment imaging for assessment of glaucoma," *Expert Rev Ophthalmol* ,

5(1):59-74, 2010. PMID: PMC2839239

Silverman RH, Kong F, Chen YC, Lloyd HO, Kim H.H, Cannata JM, Shung KK, and Coleman DJ, "High-resolution photoacoustic imaging of ocular tissues," *Ultrasound Med. Biol.*, 36(5):733-742, 2010. PMID: PMC Journal – In Process.

Reinstein DZ, Srivannaboon S, Gobbe M, Archer TJ, **Silverman RH**, Sutton H, Coleman DJ. "Epithelial thickness profile changes induced by myopic LASIK as measured by Artemis very high-frequency digital ultrasound," *J Refract Surg.* 2009;25(5):444-50.

Reinstein DZ, Archer TJ, Gobbe M, **Silverman RH**, Rondeau MJ, Coleman DJ. "Stromal thickness in the normal cornea: three-dimensional display with artemis very high-frequency digital ultrasound," *J Refract Surg.* 2009;25(8):776-786. PMID: PMC2711865

Mamou J, Aristizabal O, **Silverman RH**, Ketterling JA, Turnbull DH. "High-frequency chirp ultrasound imaging with an annular-array for ophthalmologic and small-animal imaging," *Ultra Med Biol.* 2009;35:1198-1208. PMID: PMC2703701

Silverman RH, Patel MS, Gal O, Sarup A, Deobhakta A, Dababneh H, Reinstein DZ, Feleppa EJ, Coleman DJ. "Effect of corneal hydration on ultrasound velocity and backscatter," *Ultrasound Med Biol.* 2009;35(5):839-846. PMID: PMC2705943

Reinstein DZ, Archer TJ, **Silverman RH**, Rondeau MJ, Coleman DJ. "Correlation of anterior chamber angle and ciliary sulcus diameters with white-to-white corneal diameter in high myopes using Artemis VHF digital ultrasound," *J Refract Surg.* 2009;25(2):185-94.

VanderBeek BL, **Silverman RH** and Starr CE, "Bilateral Salzmann's-like nodular corneal degeneration after laser in situ keratomileusis imaged with anterior segment optical coherence tomography and high-frequency ultrasound biomicroscopy," *J. Cataract Refract. Surg.*, 35(4):785-787, 2009.

Silverman RH, "High-resolution ultrasound imaging of the eye – a review," *Clin. Experiment. Ophthalmol.*, 37(1):54-67, 2009. PMID: PMC2796569

Kim HH, Cannata J, Liu R, Chang JH, **Silverman R**, Shung K. "20 MHz/40 MHz dual element transducers for high frequency harmonic imaging," *IEEE Trans Ultra Ferro Freq Contr.* 2008;55:2683-2691. PMID: PMC2717901

Kong F, Chen Y-C, Lloyd HO, **Silverman RH**, Kim H, Cannata JM, Shung KK. High-resolution photoacoustic imaging with focused laser and ultrasonic beams. *Appl Phys Lett.* 2009; 94, 033902-1-3.

Reinstein DZ, Archer TJ, Gobbe M, **Silverman RH**, Coleman DJ. "Epithelial thickness in the normal cornea: three-dimensional display with Artemis very high-frequency ultrasound," *J. Refract. Surg.* 2008;24(6):571-81. PMID: PMC2592549

Ketterling JA, Mamou J, **Silverman RH**. "Dynamic-receive focusing with high-frequency annular arrays," *Acoustical Imaging*, Vol. 29, I. Akiyama (Ed.), Springer, Dordrecht, pp. 267-272, 2008.

Mamou J, Ketterling JA, **Silverman RH**. "High-frequency pulse-compression ultrasound imaging with an annular array," *Acoustical Imaging*, Vol. 29, I. Akiyama (Ed.), Springer, Dordrecht, pp. 81-86, 2008.

Paul T, Lim M, Starr CE, Lloyd HO, Coleman DJ, **Silverman RH**. "Central corneal thickness as measured by Orbscan II, Ultrasound Pachymeter and Artemis-2," *J Cat Refr Surg.*, 2008;34:1906-1912.

Mamou J, Aristizabal O, **Silverman RH**, Ketterling JA. "40-MHz ultrasound imaging with chirps and annular arrays," *Proceedings of the IEEE International Conference of the Engineering in Medicine and Biology Society*, 2008;1:2518-2521.

Silverman RH, Ketterling JA, Mamou J, Coleman DJ. "Improved high-resolution ultrasonic imaging of the eye" *Arch Ophthalmol*, 2008;126(1):94-97.

Mamou J, Ketterling JA, **Silverman RH**. "Chirp coded excitation imaging with a high-frequency ultrasound annular array", *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, 2008;55(2):508-513.

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Liu T, Lizzi FL, Ketterling JA, **Silverman RH**, Kutcher GJ. "Ultrasonic tissue characterization via 2-D spectrum analysis: Theory and in vitro measurements," Med. Phys., 2007;34(3):1037-1046.

Kim HH, Cannata JM, Liu R, Sun L, Shung KK, **Silverman RH**, Babar S., "Dual element transducers for high frequency harmonic imaging," Proc. IEEE 2006 Ultrasonics Symposium, 2006.

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Coleman DJ, **Silverman RH**, Rondeau MJ, Lloyd HO, Daly S., "Explaining the current role of high-frequency ultrasound in ophthalmic diagnosis," Expert Rev Ophthalmol. 2006;1:63-76.

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Ketterling, JA, Mamou, J and **Silverman, RH**, High-frequency ultrasound imaging of the eye with annular arrays, in *Proc. 9th Sendai Symp., Ultrasonic Tissue Characterization*, 5-8, 2006.

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Reinstein DZ, Archer T, **Silverman RH**. VHF digital ultrasound: Artemis 2 scanning in corneal refractive surgery. In: P. Vinciguerra (editor), *Refractive Surface Ablation: PRK, Lasek, Epi-Lasik and Custom*. Slack, Inc. Thorofare, NJ, 2006.

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Silverman, R.H., Coleman, D.J., Ketterling, J.A. and Lizzi, F.L., "High-frequency harmonic imaging of the eye," in *Medical Imaging 2005: Ultrasonic Imaging and Signal Processing, Society of Photo-Optical Instrumentation Engineers*, W.F. Walker and S.Y. Emelianov (Eds.), vol. 5750, pp. 16-25, Bellingham, WA, 2005. PMID: PMC1635964

Liu, T. Lizzi, F.L., Ketterling J.A., Lee, P., Kalisz, A., Silverman, R.H. and Kutcher, G.J., "Relationship of 2-D ultrasonic spectral parameters to the morphology and angulation of scatterers in tissue ," in *Medical Imaging 2004: Ultrasonic Imaging and Signal Processing*, Society of Photo-Optical Instrumentation Engineers, W.F. Walker and S.Y. Emelianov (Eds.), vol. 5373, pp.231-241, Bellingham, WA, 2004.

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Liu, T., Lizzi, F.L., Silverman, R.H. and Kutcher, G.J., "Ultrasonic tissue characterization using 2-D spectrum analysis and its application in ocular tumor diagnosis," *Med. Phys.*, 31(5):1032-1039, 2004. PMID: PMC2838231

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Silverman, R.H., Folberg, R., Lizzi, F.L., Boldt, H.C., Lloyd, H.O., Rondeau, M.J. and Coleman, D.J., "Noninvasive evaluation of metastatic potential of ocular melanoma by analysis of radiofrequency ultrasound data," in *Medical Imaging 2000: Ultrasonic Imaging and Signal Processing*, Society of Photo-Optical Instrumentation Engineers, M. Insana and W.F. Walker (Eds.), vol. 4687, pp. 160-170, Bellingham, WA, 2002.

Silverman, R.H., Lizzi, F.L., Ursea, B.G., Cozzarelli, L., Ketterling, J.A., Deng, C.X., Folberg, R. and Coleman, D.J., "Safety levels for exposure of cornea and lens to very high-frequency ultrasound," *J. Ultrasound Med.*, 20:979-986, 2001. PMID: 11549159