

# Changhuei Yang

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## *EDUCATION*

**Massachusetts Institute of Technology**, B.Sc. 1997 Physics  
**Massachusetts Institute of Technology**, B.Sc. 1997 EECS  
**Massachusetts Institute of Technology**, M.Eng. 1997 EECS  
**Massachusetts Institute of Technology**, B.Sc. 2002 Mathematics  
**Massachusetts Institute of Technology**, Ph. D. 2002 EECS

## *AWARDS*

Massachusetts Institute of Technology Lester Wolfe Fellowship (1997-2001).  
Institut National de la Sante et de al Recherche Medicale Post-doctoral Fellowship (2002).  
Singapore Agency for Science, Technology and Research Post-doctoral Fellowship (2002-2003).  
National Science Foundation CAREER award (2006).  
Coulter Foundation Early Career Translational Research Awards (2006).  
Discover Magazine ‘Best Brains in Science’ (2008).  
Massachusetts Institute of Technology Dasari Speaker (2009).  
National Institute of Health New Innovator Award (2010)  
Wallace H. Coulter Foundation Fellow (2010)  
American Institute for Medical and Biological Engineering Fellow (2013)  
Optical Society of America Fellow (2015)  
International Society for Optics and Photonics Fellow (2016)

## *APPOINTMENTS*

Assistant Professor, California Institute of Technology (2003 – 2009)  
Associate Professor, California Institute of Technology (2009 -2010)  
Professor, California Institute of Technology (2010 - 2016)  
Thomas G. Myers Professor of Electrical Engineering, Bioengineering and Medical Engineering, California Institute of Technology (2016 - present)  
Associate Director of the Center for Optofluidic Integration (2004 – 2008)  
Option Representative for Electrical Engineering, California Institute of Technology (2009)  
Option Representative for Bioengineering, California Institute of Technology (2013 - present)  
Editorial Board Member, Journal of Biomedical Optics (2013 – present)  
Associate Editor, Optica (2014 – present)

## ***COMMERCIAL ACTIVITIES***

Co-founded Visualyze Inc. (2009)

Co-founded Clearbridge Biophotonics Pte. Ltd. (2010)

Co-founded ePetri Inc. (2012)

## ***PEER REVIEWED PUBLICATIONS***

1. Kyungwon An, Changhuei Yang, Ramachandra R. Dasari and Michael S. Feld, "Cavity ring-down technique and its application to measurement of ultraslow velocities," *Optics Letters* 20, pg. 1068 (1995).
2. Changhuei Yang and Kyungwon An, "Quantum trajectory analysis of a thresholdlike transition in the microlaser," *Physical Review A* 55, pg. 4492 (1997).
3. Changhuei Yang, Kyungwon An, Lev T. Perelman, Ramachandra R. Dasari and Michael S. Feld, "Spatial coherence of forward-scattered light in a turbid medium," *Journal of the Optical Society of America A* 16, pg. 866 (1999).
4. Changhuei Yang, Kyungwon An, Lev T. Perelman, Adam Wax, Ramachandra R. Dasari and Michael S. Feld, "Feasibility of field-based light scattering spectroscopy," *Journal of Biomedical Optics* 5, pg. 138 (2000).
5. Changhuei Yang, Adam Wax, Irene Georgakoudi, Eugene B. Hanlon, Kamran Badizadegan, Ramachandra R. Dasari and Michael S. Feld, "Interferometric phase dispersion microscopy," *Optics Letters* 25, pg. 1526 (2000).
6. Changhuei Yang, Adam Wax and Michael S. Feld, "Measurement of anomalous phase velocity of ballistic light in a random medium using a novel interferometer," *Optics Letters* 26, pg. 235 (2001).
7. Changhuei Yang, Adam Wax, Ramachandra R. Dasari and Michael S. Feld, "Phase dispersion optical tomography," *Optics Letters* 26, pg. 686 (2001).
8. Changhuei Yang, Adam Wax, Mariah Hahn, Kamran Badizadegan, Ramachandra R. Dasari and Michael S. Feld, "The study of sub-wavelength and sub-Hertz cellular dynamics using a novel phase referenced interferometer," *Optics Letters* 26, pg. 1271 (2001).
9. Adam Wax, Changhuei Yang, Ramachandra R. Dasari and Michael S. Feld, "Measurement of angular distributions using low-coherence interferometry for lightscattering spectroscopy," *Optics Letters* 26, pg. 322 (2001).
10. Adam Wax, Changhuei Yang, Ramachandra R. Dasari and Michael S. Feld, "Path-length-resolved dynamic light scattering: modeling the transition from single to diffusive scattering," *Applied Optics* 40, pg. 4222 (2001).
11. Changhuei Yang, Adam Wax, Ramachandra R. Dasari and Michael S. Feld, " $2\pi$  ambiguity-free optical depth ranging with sub-nanometer precision using a novel phase-crossing low coherence interferometer," *Optics Letters* 27, pg. 77 (2002).
12. Adam Wax, Changhuei Yang, Vadim Backman, Maxim Kalashnikov, Ramachandra R. Dasari and Michael S. Feld, "Determination of particle size using the angular distribution of backscattered light as measured with low-coherence interferometry," *Journal of the Optical Society of America A* 19, pg. 737 (2002).
13. Adam Wax, Changhuei Yang, Vadim Backman, Kamran Badizadegan, Charles W. Boone, Ramachandra R. Dasari and Michael S. Feld, "Cellular organization and sub-

structure measured using angle-resolved low coherence interferometry," *Biophysical Journal* 82, pg. 2256 (2002).

14. Changhuei Yang and Jerome Mertz, "Transmission confocal laser scanning microscopy with a virtual pinhole based on nonlinear detection," *Optics Letters* 28, pg. 224 (2003).

15. Adam Wax, Changhuei Yang, Markus G. Müller, Ronald Nines, Charles W. Boone, Vernon E. Steele, Gary D. Stoner, Ramachandra R. Dasari and Michael S. Feld, "*In Situ* detection of neoplastic transformation and chemopreventive effects in rat esophagus epithelium using angle-resolved low-coherence interferometry," *Cancer Research* 63, pg. 3556 (2003).

16. Adam Wax, Changhuei Yang and Joseph Izatt, "Fourier-domain low coherence interferometry for light-scattering spectroscopy," *Optics Letters* 28, pg. 1230 (2003).

17. Michael Choma, Marinko Sarunic, Changhuei Yang, Joseph Izatt, "Sensitivity advantage of swept source and Fourier domain optical coherence tomography," *Optics Express* 11, pg. 2183 (2003).

18. Michael Choma, Changhuei Yang and Joseph Izatt, "Instantaneous quadrature low-coherence interferometry with 3x3 fiber-optic couplers," *Optics Letters* 28, pg. 2162 (2003).

19. Changhuei Yang, Siavash Yazdanfar and Joseph Izatt, "An amplified optical delay line based on the use of a linearly chirped fiber Bragg grating pair," *Optics Letters* 29, pg. 685 (2004).

20. Changhuei Yang, Michael Choma, Laura Lamb, John Simon and Joseph Izatt, "Protein based molecular contrast OCT with phytochrome as the contrast agent," *Optics Letters* 29, pg. 1396 (2004).

21. Changhuei Yang, Michael Choma, Brian Applegate, John Simon and Joseph Izatt, "Spectral triangulation molecular contrast OCT," *Optics Letters* 29, pg. 2016 (2004).

22. Brian Applegate, Changhuei Yang, Andrew Rollins and Joseph Izatt, "Polarization resolved second harmonic generation optical coherence tomography in collagen," *Optics Letters* 29, pg. 2252 (2004).

23. Marinko V. Sarunic, Michael A. Choma, Changhuei Yang and Joseph A. Izatt, "Instantaneous complex spectral domain OCT using 3x3 fiber couplers," *Optics Express* 13, pg. 957 (2005).

24. Siavash Yazdanfar, Changhuei Yang, Marinko V. Sarunic and Joseph A. Izatt, "Frequency estimation precision in Doppler optical coherence tomography using the Cramer-Rao lower bound," *Optics Express* 13, pg. 410 (2005).

25. Changhuei Yang, "Molecular contrast OCT: a review," *Photochemistry and Photobiology* 81, pg. 215 (2005).

26. Andrew Ahn, Changhuei Yang, Adam Wax, Gabriel Popescu, Chris Fang-Yen, Kamran Badizadegan, Ramachandra Dasari and Michael Feld, "Harmonic phase-dispersion microscope with a Mach-Zehnder interferometer," *Applied Optics* 44, pg. 1188-1190 (2005).

27. Brian E. Applegate, Changhuei Yang and Joseph A. Izatt, "Theoretical comparison of the sensitivity of molecular contrast optical coherence tomography techniques," *Optics Express* 13, pg. 8146-8163 (2005).

28. Michael A. Choma, Audrey K. Ellerbee, Changhuei Yang and Joseph A. Izatt, "Spectral-domain phase microscopy," *Optics Letters* 30, pg. 1162-1164 (2005).

29. Jigang Wu, Michael Conry, Chunhui Gu, Fei Wang, Zahid Yaqoob and Changhuei Yang, "Paired Angle Rotation Scanning Optical Coherence Tomography (PARS-OCT) forward-imaging probe," *Optics Letters* 31, pg. 1265-1267 (2006).
30. Zahid Yaqoob, Jeff Fingler, Xin Heng and Changhuei Yang, "Homodyne en face optical coherence tomography," *Optics Letters* 31, pg. 1815 (2006).
31. Demetri Psaltis, Steven Quake and Changhuei Yang, "Developing optofluidic technology through the fusion of microfluidics and optics," *Nature* 442, pg. 381 (2006).
32. Xin Heng, David Erickson, Larry R. Baugh, Zahid Yaqoob, Paul W. Sternberg, Demetri Psaltis and Changhuei Yang, "Optofluidic microscopy: A Method for Implementing High Resolution Optical Microscope on a Chip," *Lab on a Chip* 6, pg. 1274 (2006).
33. Xiquan Cui, Xin Heng, Jigang Wu, Zahid Yaqoob, Axel Scherer, Demetri Psaltis and Changhuei Yang, "Slanted Hole Array Beam Profiler (SHArP) - A high resolution on-chip beam profiler based on a linear aperture array," *Optics Letters* 31, pg. 3161 (2006).
34. Zahid Yaqoob, Jigang Wu, Xiquan Cui, Xin Heng and Changhuei Yang, "Harmonically-related diffraction gratings-based interferometer for quadrature phase measurements," *Optics Express* 14, pg. 8127 (2006).
35. Zahid Yaqoob, Emily McDowell, Jigang Wu, Jeff Fingler, Xin Heng and Changuei Yang, "Molecular contrast optical coherence tomography: A pump-probe scheme using indocyanine green as a contrast agent," *Journal of Biomedical Optics* 11, pg. 063001 (2006).
36. Zahid Yaqoob, Jigang Wu, Emily J. McDowell, Xin Heng and Changhuei Yang, "Methods and application areas of endoscopic optical coherence tomography," *Journal of Biomedical Optics* 11, pg. 1 (2006).
37. Xin Heng, Xiquan Cui, David W. Knapp, Jigang Wu, Zahid Yaqoob, Emily J. McDowell, Demetri Psaltis and Changhuei Yang, "Characterization of light collection through a subwavelength aperture from a point source," *Optics Express* 14, pg. 10410 (2006).
38. Jigang Wu, Zahid Yaqoob, Xin Heng, Lap Man Lee, Xiquan Cui and Changhuei Yang, "Full field phase imaging using a harmonically matched diffraction grating pair based homodyne quadrature interferometer," *Applied Physics Letters* 90, pg. 151123 (2007).
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40. Emily J. McDowell, Marinko V. Sarunic, Zahid Yaqoob and Changhuei Yang, "SNR enhancement through phase dependent signal reconstruction algorithms for phase separated interferometric signals," *Optics Express* 15, pg. 10103-122 (2007).
41. Jeff Fingler, Dan Schwartz, Changhuei Yang and Scott E. Fraser, "Mobility and transverse flow visualization using phase variance contrast with spectral domain optical coherence tomography," *Optics Express* 15, pg. 12653-653 (2007).
42. Guoan Zheng, Lixin Ran and Changhuei Yang, "Electromagnetic equivalent model for phase conjugate mirror based on the utilization of left-handed material," *Optics Express* 15, pg. 13877-885 (2007).

43. Matthew Lew, Xiquan Cui, Xin Heng and Changhuei Yang, "Interference of a four-hole aperture for on-chip quantitative two-dimensional differential phase imaging," *Optics Letters* 32, pg. 2963-65 (2007).
44. David T. Raphael, Changhuei Yang, Nancy Tresser, Jigang Wu, Yaoping Zhang and Linda Rever, "Images of Spinal Nerves and Adjacent Structures with Optical Coherence Tomography: Preliminary Animal Studies," *The Journal of Pain* 8, pg. 767-73 (2007).
45. Snow H. Tseng and Changhuei Yang, "2-D PSTD Simulation of optical phase conjugation for turbidity suppression," *Optics Express* 15, pg. 16005-16016 (2007).
46. Xin Heng, Edward Hsiao, Demetri Psaltis and Changhuei Yang, "An optical tweezer actuated, nanoaperture-grid based Optofluidic Microscope implementation," *Optics Express* 15, pg. 16367-75 (2007).
47. Jigang Wu, Zahid Yaqoob, Xin Heng, Xiquan Cui and Changhuei Yang, "Harmonically matched grating-based full-field quantitative high-resolution phase microscope for observing dynamics of transparent biological samples," *Optics Express* 15, pg. 18141-55 (2007).
48. Zahid Yaqoob, Demetri Psaltis, Michael S. Feld and Changhuei Yang, "Optical phase conjugation for turbidity suppression in biological samples," *Nature Photonics* 2, pg. 110 (2008).
49. Jigang Wu, Xiquan Cui, Lap Man Lee and Changhuei Yang, "The application of Fresnel zone plate based projection in optofluidic microscopy," *Optics Express* 16, pg. 15595-602 (2008).
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51. Xiquan Cui, Lap Man Lee, Xin Heng, Weiwei Zhong, Paul W. Sternberg, Demetri Psaltis and Changhuei Yang, "Lensless high-resolution on-chip optofluidic microscopes for *Caenorhabditis elegans* and cell imaging," *Proceedings of the National Academy of Science* 105, pg. 10670 (2008).
52. Shuo Han, Marinko V. Sarunic, Jigang Wu, Mark Humayun and Changhuei Yang, "Handheld forward-imaging needle endoscope for ophthalmic optical coherence tomography inspection," *Journal of Biomedical Optics* 13, pg. 020505 (2008).
53. Emily J. McDowell, Jian Ren and Changhuei Yang, "Fundamental sensitivity limit imposed by dark 1/f noise in the low optical signal detection regime," *Optics Express* 16, pg. 6822 (2008).
54. Guoan Zheng, Xin Heng and Changhuei Yang, "A Phase Conjugate Mirror Inspired Approach for Building Cloaking Structures with Left-handed Materials," *New Journal of Physics* 11, pg. 033010-25 (2009).
55. Lap Man Lee, Xiquan Cui and Changhuei Yang, "The Application of on-chip Optofluidic Microscopy for Imaging *Giardia lamblia* Trophozoites and Cysts," *Biomedical Microdevices* 11, pg. 951-958 (2009).
56. Ying Min Wang, Guoan Zheng and Changhuei Yang, "Characterization of acceptance angles of small circular apertures," *Optics Express* 17, pg. 23903-23913 (2009).
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58. Meng Cui, Emily J. McDowell and Changhuei Yang, "Observation of polarization-gate based reconstruction quality improvement during the process of turbidity suppression by optical phase conjugation," *Applied Physics Letters* 95, pg. 123702 (2009).
59. Guoan Zheng, Xiquan Cui and Changhuei Yang, "Surface-Wave-Enabled Darkfield Aperture: A Method for Suppressing Background During Weak Signal Detection," *Proceedings of the National Academy of Science* 107, pg. 9043-48 (2010).
60. Emily J. McDowell, Meng Cui, Ivo M. Vellekoop, Vahan Senekerimyan, Zahid Yaqoob and Changhuei Yang, "Turbidity suppression from the ballistic to the diffusive regime in biological tissues using optical phase conjugation," *Journal of Biomedical Optics* 15, pg. 025004 (2010).
61. Meng Cui and Changhuei Yang, "Implementation of a digital optical phase conjugation system and its application to study the robustness of turbidity suppression by phase conjugation," *Optics Express* 18, pg. 3444-55 (2010).
62. Shuo Pang, Xiquan Cui, John DeModena, Ying Min Wang, Paul Sternberg and Changhuei Yang, "Implementation of a color-capable optofluidic microscope on a RGB CMOS color sensor chip substrate," *Lab on a Chip* 10, pg. 411-14 (2010).
63. Meng Cui, Emily J. McDowell and Changhuei Yang, "An in vivo study of turbidity suppression by optical phase conjugation (TSOPC) on rabbit ear," *Optics Express* 18, pg. 25-30 (2010).
64. Guoan Zheng and Changhuei Yang, "Improving Weak-Signal Identification via Predetection Background Suppression by a Pixel-Level, Surface-Wave Enabled Dark-Field Aperture," *Optics Letters* 35, pg. 2636-2638, (2010).
65. Xiquan Cui, Jian Ren, Guillermo Tearney and Changhuei Yang, "Wavefront Image Sensor Chip," *Optics Express* 18, pg. 16685-701 (2010).
66. Guoan Zheng, Ying Min Wang and Changhuei Yang, "Pixel level optical-transfer-function design based on the surface-wave-interferometry aperture," *Optics Express* 18, pg. 16499-506 (2010).
67. Jigang Wu, Lap Man Lee and Changhuei Yang, "Focus grid generation by in-line holography," *Optics Express* 18, pg. 14366-74 (2010).
68. Jigang Wu, Xiquan Cui, Guoan Zheng, Ying Min Wang, Lap Man Lee and Changhuei Yang, "Wide field-of-view microscope based on holographic focus grid illumination," *Optics Letters* 35, pg. 2188-90 (2010).
69. Jigang Wu, Guoan Zheng, Zheng Li and Changhuei Yang, "Focal plane tuning in wide-field-of-view microscope with Talbot pattern illumination," *Optics Letters* 36, pg. 2179-81 (2011).
70. Jian Ren, Henrick K. Gille, Jigang Wu and Changhuei Yang, "Ex vivo optical coherence tomography imaging of collector channels with a scanning endoscopic probe," *Investigative Ophthalmology & Visual Science* 52, pg. 3921-25 (2011).
71. Seung Ah Lee, Ricardo Leitao, Guoan Zheng, Samuel Yang, Ana Rodriguez and Changhuei Yang, "Color Capable Sub-Pixel Resolving Optofluidic Microscope and Its Application to Blood Cell Imaging for Malaria Diagnosis," *PLoS ONE* 6, pg. e26127 (2011).
72. Guoan Zheng, Christopher Kolner and Changhuei Yang, "Microscopy refocusing and dark-field imaging by using a simple LED array," *Optics Letters* 36, pg. 3987-89 (2011).
73. Guoan Zheng, Seung Ah Lee, Yaron Antebi, Michael B. Elowitz and Changhuei Yang, "The ePetri dish, an on-chip cell imaging platform based on subpixel perspective

sweeping microscopy (SPSM)," *Proceedings of the National Academy of Science* 108, pg. 16889-94 (2011).

74. Shuo Pang, Chao Han, Lap Man Lee and Changhuei Yang, "Fluorescence microscopy imaging with a Fresnel zone plate array based optofluidic microscope," *Lab on a Chip* 11, pg. 3698-3702 (2011).

75. Shuo Pang, Chao Han, Mihoko Kato, Paul W. Sternberg and Changhuei Yang, "Wide and scalable field-of-view Talbot-grid-based fluorescence microscopy," *Optics Letters* 37, pg. 5018-20 (2012).

76. Roarke Horstmeyer, Richard Y. Chen, Benjamin Judkewitz and Changhuei Yang, "Markov speckle for efficient random bit generation," *Optics Express* 20, pg. 26394-410 (2012).

77. Ivo M. Vellekoop, Meng Cui and Changhuei Yang, "Digital optical phase conjugation of fluorescence in turbid tissue," *Applied Physics Letters* 101, pg. 1108 (2012).

78. Ying Min Wang, Benjamin Judkewitz, Charles A. DiMarzio and Changhuei Yang, "Deep-tissue focal fluorescence imaging with digitally time-reversed ultrasound-encoded light," *Nature Communications* 3, Article number: 928 (2012).

79. Seung Ah Lee, Guoan Zheng, Nandini Mukherjee and Changhuei Yang, "On-chip continuous monitoring of motile microorganisms on an ePetri platform," *Lab on a Chip* 12, pg. 2385-90 (2012).

80. Jian Ren, Xiquan Cui, Lap Man Lee and Changhuei Yang, "Quantitative surface normal measurement by a wavefront camera," *Optics Letters* 37, pg. 199-201 (2012).

81. Chao Han, Shuo Pang, Danielle V. Bower, Patrick Yiu and Changhuei Yang, "Wide Field-of-View On-Chip Talbot Fluorescence Microscopy for Longitudinal Cell Culture Monitoring from within the Incubator," *Analytical Chemistry* 85, pg. 2356-60 (2013).

82. Joseph L. Hollmann, Roarke Horstmeyer, Changhuei Yang and Charles A. DiMarzio, "Analysis and modeling of an ultrasound-modulated guidestar to increase the depth of focusing in a turbid medium," *Journal of Biomedical Optics* 18, pg. 025004 (2013).

83. Shuo Pang, Chao Han, Jessey Erath, Ana Rodriguez and Changhuei Yang, "Wide field-of-view Talbot grid-based microscopy for multicolor fluorescence imaging," *Optics Express* 21, pg. 14555 (2013).

84. Mooseok Jang, Anne Sentenac and Changhuei Yang, "Optical phase conjugation (OPC)-assisted isotropic focusing," *Optics Express* 21, pg. 8781-92 (2013).

85. Seung Ah Lee, Xiaoze Ou, J. Eugene Lee and Changhuei Yang, "Chip-scale fluorescence microscope based on a silo-filter complementary metal-oxide semiconductor image sensor," *Optics Letters* 38, pg. 1817-19 (2013).

86. Benjamin Judkewitz, Ying Min Wang, Roarke Horstmeyer, Alexandre Mathy and Changhuei Yang, "Speckle-scale focusing in the diffusive regime with time-reversal of variance-encoded light (TROVE)," *Nature Photonics* 7, pg. 300-5 (2013).

87. Guoan Zheng, Roarke Horstmeyer and Changhuei Yang, "Wide-field, high-resolution Fourier ptychographic microscopy," *Nature Photonics* 7, 739-745 (2013).

88. Guoan Zheng, Xiaoze Ou, Roarke Horstmeyer and Changhuei Yang, "Characterization of spatially varying aberrations for wide field-of-view microscopy," *Optics Express* 21, pg. 15131-143 (2013).

89. Roarke Horstmeyer, Benjamin Judkewitz, Ivo M. Vellekoop, Sid Assaworrorarit and Changhuei Yang, "Physical key-protected one-time pad," *Nature Collections Scientific Reports* 3, Article number 3543 (2013).

90. Xiaoze Ou, Roarke Horstmeyer, Changhuei Yang and Guoan Zheng, "Quantitative phase imaging via Fourier ptychographic microscopy," *Optics Letters* 38, pp. 4845-48 (2013).
91. Roarke Horstmeyer and Changhuei Yang, "A phase space model of Fourier ptychographic microscopy," *Optics Express* 22, pg. 338-358 (2014).
92. Guoan Zheng, Xiaoze Ou and Changhuei Yang, "0.5 gigapixel microscopy using a flatbed scanner," *Biomedical Optics Express* 5, pg. 1-8 (2014).
93. Joseph L. Hollmann, Roarke Horstmeyer, Changhuei Yang and Charles A. DiMarzio, "Diffusion model for ultrasound-modulated light," *Journal of Biomedical Optics* 19, pg. 035005 (2014).
94. Mooseok Jang, Haowen Ruan, Benjamin Judkewitz and Changhuei Yang, "Model for estimating the penetration depth limit of the time-reversed ultrasonically encoded optical focusing technique," *Optics Express* 22, pg. 5787-807 (2014).
95. Seung Ah Lee, Jessey Erath, Guoan Zheng, Xiaoze Ou, Phil Willems, Daniel Eichinger, Ana Rodriguez and Changhuei Yang, "Imaging and Identification of Waterborne Parasites Using a Chip-Scale Microscope," *PLoS ONE* 9(2), e89712 (2014).
96. Xiaoze Ou, Guoan Zheng and Changhuei Yang, "Embedded pupil function recovery for Fourier ptychographic microscopy," *Optics Express* 22, pg. 4960-72 (2014).
97. Edward Haojiang Zhou, Haowen Ruan, Changhuei Yang and Benjamin Judkewitz, "Focusing on moving targets through scattering samples," *Optica* 1, pg. 227-32 (2014).
98. Roarke Horstmeyer, Xiaoze Ou, Jaebum Chung, Guoan Zheng and Changhuei Yang, "Overlapped Fourier coding for optical aberration removal," *Optics Express* 22, pp. 24062-80 (2014).
99. Jae Hee Jung, Chao Han, Seung Ah Lee, Jinho Kim and Changhuei Yang, "Microfluidic-integrated laser-controlled microactuators with on-chip microscopy imaging functionality," *Royal Society of Chemistry: Lab on a Chip* 14, pg. 3781-89 (2014).
100. Seung Ah Lee and Changhuei Yang, "A smartphone-based chip-scale microscope using ambient illumination," *Royal Society of Chemistry: Lab on a Chip* 14, pg. 3056-3063 (2014).
101. Anthony Williams, Jaebum Chung, Xiaoze Ou, Guoan Zheng, Siddarth Rawal, Zheng Ao, Ram Datar, Changhuei Yang and Richard Cote, "Fourier ptychographic microscopy for filtration-based circulating tumor cell enumeration and analysis," *Journal of Biomedical Optics* 19, pg. 066007 (2014).
102. Jinho Kim, Jessey Erath, Ana Rodrigue and Changhuei Yang, "A high-efficiency microfluidic device for size-selective trapping and sorting," *Lab on a Chip* 14, pg. 2480-90 (2014).
103. Mooseok Jang, Haowen Ruan, Haojiang Zhou, Benjamin Judkewitz and Changhuei Yang, "Method for auto-alignment of digital optical phase conjugation systems based on digital propagation," *Optics Express* 22, pg. 14054-71 (2014).
104. Benjamin Judkewitz and Changhuei Yang, "Axial standing-wave illumination frequency-domain imaging (SWIF)," *Optics Express* 22, pg. 11001-10 (2014).
105. Chao Han and Changhuei Yang, "Viral plaque analysis on a wide field-of-view, time-lapse, on-chip imaging platform," *Analyst* 139, pg. 3727-34 (2014).
106. Haowen Ruan, Mooseok Jang, Benjamin Judkewitz and Changhuei Yang, "Iterative Time-Reversed Ultrasonically Encoded Light Focusing in Backscattering Mode," *Scientific Reports* 4, Article number: 7156 (2014).



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112. Roarke Horstmeyer, Sid Assaworarith, Ulrich Ruhmair and Changhuei Yang, "Physically secure and fully reconfigurable data storage using optical scattering," *IEEE Hardware Oriented Security and Trust (HOST)*, pg. 157-62 (2015).
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114. Roarke Horstmeyer, Xiaoze Ou, Guoan Zheng, Phil Willems and Changhuei Yang, "Digital pathology with Fourier ptychography," *Computerized Medical Imaging and Graphics* 42, pg. 38-43 (2015). Copyright 2014 Elsevier Ltd. All rights reserved.
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