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Editors

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Contents

vii	<i>Conference Committee</i>
ix	<i>Introduction</i>

OPTICAL COHERENCE ELASTOGRAPHY II: NOVEL METHODS

- 8946 07 **Visualization of ultrasonically induced shear wave propagation using phase sensitive optical coherence tomography** [8946-6]
T.-M. Nguyen, Univ. of Washington (United States); S. Song, Univ. of Washington (United States) and Univ. of Dundee (United Kingdom); B. Arnal, E. Y. Wong, R. K. Wang, M. O'Donnell, Univ. of Washington (United States)
- 8946 08 **Assessment of lamb wave dispersion in cornea using shear wave imaging optical coherence tomography (SWI-OCT)** [8946-7]
S. Wang, Univ. of Houston (United States); K. V. Larin, Univ. of Houston (United States) and Baylor College of Medicine (United States)

OCULAR BIOMECHANICS

- 8946 09 **Corneal biomechanical properties from air-puff corneal deformation imaging (Invited Paper)** [8946-8]
S. Marcos, Instituto de Óptica, Consejo Superior de Investigaciones Científicas (Spain); S. Kling, Instituto de Óptica, Consejo Superior de Investigaciones Científicas (Spain) and Univ. de Genève (Switzerland); N. Bekesi, C. Dorronsoro, Instituto de Óptica, Consejo Superior de Investigaciones Científicas (Spain)
- 8946 0B **Elastography methods applicable to the eye** [8946-10]
A. A. Khan, S. M. Cortina, Univ. of Illinois at Chicago (United States); W. Chamon, Univ. of Illinois at Chicago (United States) and Univ. Federal de São Paulo (Brazil); T. J. Royston, Univ. of Illinois at Chicago (United States)

ELASTOGRAPHY METHODS AND APPLICATIONS

- 8946 0F **Laser speckle tracking for monitoring and analysis of retinal photocoagulation** [8946-14]
E. Seifert, K. Bliedtner, R. Brinkmann, Medical Laser Ctr. Lübeck GmbH (Germany)
- 8946 0G **Ultrasound visualization of internal crystalline lens deformation using laser-induced microbubbles** [8946-15]
A. B. Karpiouk, S. R. Aglyamov, The Univ. of Texas at Austin (United States); A. Glasser, Univ. of Houston (United States); S. Y. Emelianov, The Univ. of Texas at Austin (United States)
- 8946 0H **Wideband optical elastography of *in vivo* human skin using geometrically focused surface waves** [8946-16]
S. P. Kearney, Z. Dai, T. J. Royston, Univ. of Illinois at Chicago (United States)

- 8946 0I **Evaluation of fingerprint deformation using optical coherence tomography** [8946-17]
H. S. Gutierrez da Costa, Univ. Federal do Paraná (Brazil) and Stanford Univ. (United States);
J. R. Maxey, Stanford Univ. (United States); L. Silva, Univ. Federal do Paraná (Brazil);
A. K. Ellerbee, Stanford Univ. (United States)

SUB-CELLULAR AND MEMBRANE BIOMECHANICS

- 8946 0K **Ultra-fast optical manipulation of single proteins binding to the actin cytoskeleton** [8946-19]
M. Capitano, European Lab. for Non-linear Spectroscopy (Italy) and Univ. degli Studi di Firenze (Italy); L. Gardini, European Lab. for Non-linear Spectroscopy (Italy); F. S. Pavone, European Lab. for Non-linear Spectroscopy (Italy), Univ. degli Studi di Firenze (Italy), Istituto Nazionale di Ottica, CNR (Italy), and International Ctr. of Computational Neurophotonics (Italy)
- 8946 0M **Linking cell shape, elasticity and fate: *in vitro* re-differentiation of chondrocytes** [8946-21]
X. Yuan, Y. Chim, H. Yin, Univ. of Glasgow (United Kingdom)
- 8946 0P **Rate-dependent dynamics of cellular membranes probed by laser tweezers and optical displacement sensing** [8946-24]
N. Khatibzadeh, Beckman Laser Institute and Medical Clinic (United States); A. A. Spector, Johns Hopkins Univ. (United States); W. E. Brownell, Baylor College of Medicine (United States); B. Anvari, Univ. of California, Riverside (United States)

OPTICAL COHERENCE ELASTOGRAPHY III: ULTRASONIC LOADING

- 8946 0T **Model-based optical coherence elastography using acoustic radiation force** [8946-28]
S. Aglyamov, The Univ. of Texas at Austin (United States); S. Wang, Univ. of Houston (United States); A. Karpiouk, The Univ. of Texas at Austin (United States); J. Li, Univ. of Houston (United States); S. Emelianov, The Univ. of Texas at Austin (United States); K. V. Larin, Univ. of Houston (United States)

CELLULAR BIOMECHANICS AND APPLICATIONS

- 8946 0V **Imaging the cellular response to transient shear stress using time-resolved digital holography** [8946-30]
Y. Arita, M. Antkowiak, F. Gunn-Moore, K. Dholakia, Univ. of St. Andrews (United Kingdom)
- 8946 0W **Dimensional characterisation of collagen constructs *in situ*** [8946-31]
R. Taylor, J. Reynolds, B. Chikkanna, D. Daly, Lein Applied Diagnostics Ltd. (United Kingdom); R. A. Brown, N. S. Tan, Univ. College London (United Kingdom)

POSTER SESSION

- 8946 10 **Optical coherence tomography detection of shear wave propagation in MCF7 cell modules** [8946-35]
M. Razani, A. Mariampillai, E. S. L. Berndl, Ryerson Univ. (Canada); T.-R. Kiehl, Univ. Health Network (Canada) and Univ. of Toronto (Canada); V. X. D. Yang, Ryerson Univ. (Canada) and Univ. of Toronto (Canada); M. C. Kolios, Ryerson Univ. (Canada)
- 8946 11 **An OCT-based air suction-indentation probe for tissue elasticity measurement** [8946-36]
Y. Zheng, L. Wang, T. Li, The Hong Kong Polytechnic Univ. (Hong Kong, China); Y. Wang, Fudan Univ. (China)

Author Index

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- 1 Optical Coherence Elastography I: Tissue Mechanical Contrast
Kirill V. Larin, University of Houston (United States)
David D. Sampson, The University of Western Australia (Australia)
- 2 Optical Coherence Elastography II: Novel Methods
Stephen A. Boppart M.D., University of Illinois at Urbana-Champaign
(United States)
Zhongping Chen, Beckman Laser Institute and Medical Clinic
(United States)
- 3 Ocular Biomechanics
Giuliano Scarcelli, Harvard Medical School (United States)
Ruikang K. Wang, University of Washington (United States)
- 4 Elastography Methods and Applications
Daniel S. Elson, Imperial College London (United Kingdom)
A. Claude Boccara, Institut Langevin (France)
- 5 Sub-Cellular and Membrane Biomechanics
Francesco S. Pavone, European Laboratory for Non-linear Spectroscopy
(Italy)
Seok Hyun A. Yun, Wellman Center for Photomedicine (United States)
- 6 Optical Coherence Elastography III: Ultrasonic Loading
Victor X. D. Yang, Ryerson University (Canada)
Brendan F. Kennedy, The University of Western Australia (Australia)
- 7 Cellular Biomechanics and Applications
Amy L. Oldenburg, The University of North Carolina at Chapel Hill
(United States)
Seemantini K. Nadkarni, Harvard Medical School (United States)

Introduction

Optical elastography is the use of optics to characterize cells and tissues based on their elastic and viscoelastic mechanical properties. In utilizing the high-resolution capability of optics, this rapidly emerging field builds on and complements the related fields of ultrasound and MR elastography, as well as existing methods for biomechanics, such as atomic force microscopy and rheology.

Mechanical forces play an important role in the behavior and development of cells at all spatial scales, from cells and their constituents, to tissues and organs. Such forces profoundly influence the health, structural integrity, and normal function of cells and organs. Accurate determination of cell and tissue biomechanical properties (e.g., Young's or shear modulus) is a vitally important area. High-resolution optical methods could help further the understanding of mechanical interactions, and mechanical properties, with application to clinical diagnosis and interpretation of a wide range of diseases.

The inaugural subconference was very vibrant and displayed a strongly multidisciplinary character bringing together technology and application experts in bioengineering, biophysics, cell biology, clinical sciences, medical imaging, optics and photonics, and tissue engineering. More than 35 contributed papers were built around two days of invited and contributed talks. Exceptional invited talks headlined the contributed program:

- Stephen A. Boppart M.D., University of Illinois at Urbana-Champaign (United States) Optical coherence elastography techniques for assessing biomechanical properties of tissues and cells
- Susana Marcos, Consejo Superior de Investigaciones Científicas (Spain) Corneal biomechanical properties from air-puff corneal deformation imaging
- Kishan Dholakia, University of St. Andrews (United Kingdom) New light on cell manipulation and rheology
- Ruikang K. Wang, University of Washington (United States) Use of phase sensitive OCT to track and visualize dynamic mechanical wave propagation within tissue

Many topics were covered and highlights include the impressive advances in optical coherence elastography techniques, particularly in compression methods and shear wave visualization. Applications in the anterior eye proved popular, with some interest also in breast cancer. Optical elastography and tissue biomechanics confirmed its status as a rapidly emerging area—we look forward with excitement

and anticipation to see what the next twelve months will bring. In the meantime, please enjoy reading the papers submitted for this volume.

Kirill V. Larin
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