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**Sensing  
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Baltimore Convention Center

Baltimore, Maryland, USA

5 - 9 May 2014

## **Sensing Technologies for Global Health, Military Medicine, and Environmental Monitoring IV**

**Manuscript Due Date (OPTIONAL)**

7 April 2014 for paper, May 20 for electronic SPIE Proceedings

**Conference Chair**

Šárka O. Southern, Gaia Medical Institute (United States)

**Conference Co-Chairs**

Isaac Rodriguez-Chavez, National Institute of Dental and Craniofacial Research at NIH (United States)

Virginia E. Wotring, Universities Space Research Association, NASA Johnson Space Ctr. (United States)

Mark A. Mentzer, Neuroscience Applications Group (United States)

**Monday 5 May 2014**

**Session 1:**

**Noninvasive Disease Diagnostics for Global Health I**

8:30 AM - 10:30 AM

Session Chairs:

Sarka O. Southern, Gaia Medical Institute (United States)

Isaac R. Rodriguez-Chavez, NIH/NIDCR (United States)

Daniel Malamud, New York Univ. (United States)

**NIH/NIDCR perspective on noninvasive disease diagnostics based on oral fluids**


**(Invited Paper)**

Paper 9112-1

Time: 8:30 AM - 9:30 AM

Author(s): Isaac R. Rodriguez-Chavez, Penny W. Burgoon, National Institute of Dental and Craniofacial Research (United States)

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**Rapid noninvasive tests for diagnostics of infectious disease**

Paper 9112-\_\_\_\_\_

Time: 9:30 AM - 10:00 AM

Author(s): Daniel Malamud, New York Univ. (United States)

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**Saliva-based molecular test for malaria**

Paper 9112-8

Time: 10:00 AM - 10:20 PM

Author(s): Sungano Mharakurwa, Johns Hopkins Univ. (United States)

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**Rapid saliva test for HIV/AIDS screening and monitoring**

Paper 9112-5

Time: 10:20 AM - 10:40 AM

Author(s): Sarka O. Southern, Gaia Medical Institute (United States)

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Coffee Break 10:40 AM - 11:00 AM

**Programmable bio-nano-chip system for noninvasive disease diagnostics**

Paper 9112-7

Time: 11:00 AM - 11:20 AM

Author(s): John McDevitt, Rice Univ. (United States)

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**Micro- and nano-scale medical technologies for Global Health applications.**

Paper 9112-\_\_

Time: 11:20 AM - 11:40 AM

Author(s): Utkan Demirci, Harvard Medical School (United States)

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**Next-gen microblotting for confirmatory disease diagnostics**

Paper 9112-\_\_\_\_\_

Time: 11:40 AM - 12:00 PM

Author(s): Amy Herr, Univ. of California Berkeley (United States)

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**Solar-based, rapid PCR-based test for KSHV**

Paper 9112-\_\_\_\_\_

Time: 12:00 AM - 12:20 PM

Author(s): David Erickson, Cornell University (United States)

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**Wireless, quantitative, and universal lateral flow test reader**

Paper 9112-6

Time: 12:20 AM - 12:40 PM

Author(s): Sophie Gerrick, Ray C. Delcher, Onur Mudanyali, Neven Karlovac, Holomic LLC (United States)

Show Abstract

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Lunch Break 12:40 PM - 2:00 PM

**Session 2:**

**Noninvasive Disease Diagnostics for Global Health II**

2:00 PM - 5:20 PM

Session Chairs:

Timothy J. Griffin, Univ. of Minnesota (United States)

Charles F. Streckfus, Univ. of Texas Houston (United States)

Sarka Southern, Gaia Medical Institute (United States)

**Human saliva proteome: an overview (Invited Paper)**

Paper 9112-11

Time: 2:00 PM - 2:30 PM

Author(s): Timothy J. Griffin, Univ. of Minnesota (United States)

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**Top down protein analysis for characterizing health and disease**

Paper 9112-17

Time: 2:30 PM - 2:50 PM

Author(s): Julian Whitelegge, Univ. of California, Los Angeles (United States)

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**Oral microbiome: a role in dynamic proteomics of whole saliva**

Paper 9112-10

Time: 2:50 PM - 3:10 PM

Author(s): Eva J. Helmerhorst, Boston Univ. (United States)

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**The diagnostic potential of bacterial glycan recognition in saliva**

Paper 9112-15

Time: 3:10 PM - 3:30 PM

Author(s): Stefan Ruhl, Univ. at Buffalo (United States)

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Coffee Break 3:30 PM - 4:00 PM


**Salivary biomarkers for modeling breast cancer progression (Invited paper)**

Paper 9112-14

Time: 4:00 PM - 4:30 PM

Author(s): Charles F. Streckfus, Univ. of Texas Houston (United States)

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**Saliva biomarkers in cardiovascular disease (Invited Paper)**

Paper 9112-13

Time: 4:30 PM - 5:00 PM

Author(s): Jeffrey L. Ebersole, Craig S. Miller, Univ. of Kentucky (United States)

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**Nanosensor for saliva based glucose monitoring**

Paper 9112-9

Time: 5:00 PM - 5:20 PM

Author(s): Jonathan C. Claussen, U.S. Naval Research Lab. (United States)

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**Tuesday 6 May**

**Session 3:**

**Military Medicine I: Traumatic Brain Injury and PTSD**

8:30 AM - 11:40 AM

Session Chairs:

Mary E. Michel, National Institutes of Health (United States);

Geoffrey Ling, Uniformed Services Univ. of the Health Sciences (United States)

Barry D. Jordan, Sports Concussion Institute (United States)

**Rehabilitation technologies for traumatic brain injury and stroke (Invited Paper)**

Paper 9112-18

Time: 8:30 AM - 9:00 AM

Author(s): Mary E. Michel, National Institutes of Health (United States)

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**The military's approach to TBI and PTSD (Invited Paper)**

Paper 9112-20

Time: 9:00 AM - 9:30 AM

Author(s): Geoffrey Ling, Uniformed Services Univ. of the Health Sciences (United States)

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**Sports-related traumatic brain injury: prevention and rehabilitation (Invited Paper)**

Paper 9112-21

Time: 9:30 AM - 10:00 AM

Author(s): Barry D. Jordan, Sports Concussion Institute (United States)

Show Abstract

Add To My Schedule 

Coffee Break 10:00 AM - 10:30 AM

**Mouth device in clinical trials as possible treatment for TBI**

Paper 9112-23

Time: 10:30 AM - 10:50 AM

Author(s): Yuri L. Danilov, Tactile Communication Neuro-rehabilitation Laboratory, Univ. of Wisconsin (United States)

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**Clinical detection of brain damage in TBI**

Paper 9112-22

Time: 10:50 AM - 11:10 AM

Author(s): Ava M. Puccio, Univ. of Pittsburgh Medical Ctr. (United States)

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**Saliva-based biomarkers for TBI diagnostics**

Paper 9112-24

Time: 11:10 AM - 11:30 AM

Author(s): Sarka O. Southern, Gaia Medical Institute (United States)

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Lunch/Exhibition Break 11:30 AM - 1:00 PM

**Session 4:**

**Military Medicine II: Physiology and Medicine of Extreme Environments and Spaceflight**

Tuesday 6 May 2014

1:00 PM - 6:00 PM

Session Chairs:

Virginia E. Wotring, Universities Space Research Association, NASA/JSC (United States);

Jonathan D. Stallings, U.S. Army Ctr. for Environmental Health Research (United States)

Chris Steele, Office of Naval Research (United States)

Karen Kelly, Naval Health Research Ctr. (United States)

**Monitoring physiology during spaceflight (Invited Paper)**

Paper 9112-25

Time: 1:00 PM - 1:30 PM

Author(s): Virginia E. Wotring, Universities Space Research Association (United States)

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**Rapid, High-Sensitivity Diagnostic Assay for Viral DNA in Saliva: Translation from Space to Patients on Earth.**

Paper 9112-\_\_\_\_\_

Time: 1:30 PM - 1:50 PM

Author(s): Duane L Pierson, Satish Mehta, Johnson Space Center, NASA (United States)

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**NASA laboratory analysis for manned exploration missions**

Paper 9112-\_\_\_\_\_

Time: 1:50 PM - 2:10 PM

Author(s): Michael Krihak, University of California Santa Cruz, Tianna Shaw, NASA Ames Research Center, Moffett Field (United States)

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**Drug stability analyzer for long duration spaceflights**

Paper 9112-26

Time: 2:10 PM - 2:30 PM

Author(s): Stuart R. Farquharson, Chetan S. Shende, Real-Time Analyzers, Inc. (United States)

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**Office of Naval Research: Force Health protection program (Invited Paper)**

Paper 9112-27

Time: 2:30 PM - 3:00 PM

Author(s): Chris Steele, Office of Naval Research (United States)

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Coffee Break 3:00 PM - 3:30 PM

**Prioritizing military-relevant toxicants and future sensing needs for exposure assessment and adverse health effects (Invited Paper)**

Paper 9112-30

Time: 3:30 PM - 4:00 PM

Author(s): Jonathan D. Stallings, U.S. Army Ctr. for Environmental Health Research (United States)

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**Warfighter performance physiology**

Paper 9112-28

Time: 4:00 PM - 4:20 PM

Author(s): Karen Kelly, Naval Health Research Ctr. (United States)

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**Noninvasive monitoring of hydration status in warfighters**

Paper 9112-29

Time: 4:20 PM - 4:40 PM

Author(s): Sarka O. Southern, Gaia Medical Institute (United States)

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**Optimization of a paper-based ELISA for a human performance biomarker**

Paper 9112-33

Time: 4:40 PM - 5:00 PM

Author(s): Joshua A. Hagen, Air Force Research Lab. (United States)

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**Military target task performance after wavefront-guided (WFG) and wavefront-optimized (WFO) photorefractive keratectomy (PRK)**

Paper 9112-34

Time: 5:00 PM - 5:20 PM

Author(s): Tana Maurer, Oanh Nguyen, Greg Mueller, U.S. Army Night Vision & Electronic Sensors Directorate (United States); Denise Ryan, Rose K. Sia, Richard Stutzman, Joseph Pasternak, Kraig Bower, Warfighter Refractive Surgery and Research Ctr. (United States)

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**Raman spectroscopic analysis of whole sheep's blood acetylcholinesterase**

Paper 9112-32

Time: 5:20 PM - 5:40 PM

Author(s): Phillip G. Wilcox, U.S. Army Edgewood Chemical Biological Ctr. (United States), Johns Hopkins Univ. (United States); Jin U. Kang, Johns Hopkins Univ. (United States)

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**The probability of being able to separate two person's blood with hyperspectral imaging devices**


Paper 9112-35



Time: 5:40 PM - 6:00 PM

Author(s): Jaana R. Kuula, Heikki J. Rinta, Univ. of Jyväskylä (Finland)

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**Posters-Tuesday** Tuesday 6 May 2014, 6:00 PM - 7:30 PM

## Wednesday 7 May

### Sensing Technology + Applications Plenary Session

9:00 AM - 10:00 AM

Coffee/Exhibition Break 10:00 AM - 10:30 AM

#### Session 5:

#### Sensing Technologies for Disease Diagnostics and Environmental Monitoring I

Wednesday 7 May 2014

10:30 AM – 12:00 PM

Session Chairs:

Stephen M. Hewitt, National Cancer Institute (NCI), NIH (United States)

Richard Conroy, National Institute of Biomedical Imaging and Bioengineering (NIBIB), NIH (United States)

Sarka Southern, Gaia Medical Institute (United States)


#### **Next generation Disease diagnostics: Advances in laboratory and field-expedient technologies (Invited Paper)**

Paper 9112-36

Time: 10:30 AM - 11:00 AM

Author(s): Stephen M. Hewitt, NCI/NIH (United States)

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#### **Optical Imaging and Spectroscopy program at NIBIB**

Paper 9112-37

Time: 11:00 AM - 11:30 AM

Author(s): Richard Conroy, NIBIB/NIH (United States)

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#### **Quantification of cellular disease biomarkers using digital image analysis**

Paper 9112-\_\_

Time: 11:30 AM - 11:50 AM

Author(s): James Evans, Gaia Medical Institute (United States)

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**Saliva-based multiplex technology: applications for oral clinical diagnostics in HIV/AIDS**

Paper 9112-\_\_

Time: 11:50 AM - 12:10 PM

Author(s): Jennifer Webster-Cyriaque, Univ. of North Carolina at Chapel Hill (United States)

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Lunch/Exhibition Break 12:10 PM - 1:00 PM

**Session 6:**

**Sensing Technologies for Disease Diagnostics and Environmental Monitoring II**

Wednesday 7 May 2014

1:00 PM - 5:30 PM

Session Chairs:

Stephen M. Hewitt, National Cancer Institute (NCI), NIH (United States)

Claudia Gärtner, Microfluidic ChipShop GmbH (Germany)


**Portable capillary electrophoresis-system for on-site food analysis with lab-on-a-chip based contactless conductivity detection (Invited Paper)**

Paper 9112-38

Time: 1:00 PM – 1:30 PM

Author(s): Claudia Gärtner, René Sewart, Richard Klemm, Holger Becker, Microfluidic ChipShop GmbH (Germany)

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**Critical stages of a biodetection platform development from sensor chip fabrication to surface chemistry and assay development**

Paper 9112-39

Time: 1:30 PM - 1:50 PM

Author(s): Yildiz Uludag, Scientific & Technological Research Council of Turkey (Turkey)

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**Chemoselective surface attachment of antimicrobial peptides and its effects on interfacial behavior**

Paper 9112-40

Time: 1:50 PM - 2:10 PM

Author(s): Stella H. North, Christopher So, Kenan Fears, Chris R. Taitt, U.S. Naval Research Lab. (United States)

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**Data-driven classification of HEp-2 immunofluorescence patterns for autoimmune disease diagnosis**

Paper 9112-41

Time: 2:10 PM - 2:30 PM

Author(s): Victor V. Pomponiu, Harishwaran Hariharan, Univ. of Pittsburgh (United States)

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**Automated detection of pulmonary emphysema in CT images of the lungs**

Paper 9112-42

Time: 2:30 PM - 2:50 PM

Author(s): Harishwaran Hariharan, Victor V. Pomponiu, Univ. of Pittsburgh (United States)

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**Software system for computing material and structural properties of bone and muscle in the lower extremity from PQCT**

Paper 9112-43

Time: 2:50 PM - 3:10 PM

Author(s): Sokratis Makrogiannis, Delaware State Univ. (United States), National Institutes of Health (United States); Luigi Ferrucci, National Institutes of Health (United States)

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Coffee/Exhibition Break 3:10 PM - 3:30 PM


**Label-free single cancer marker protein detection using a nanoplasmonic-photonic hybrid whispering gallery mode biosensor**

Paper 9112-44

Time: 3:30 PM - 3:50 PM

Author(s): Stephen Holler, Fordham Univ. (United States); Venkata R. Dantham, Curtis Barbre, David Keng, Polytechnic Institute of New York Univ. (United States); Vasily Kolchenko, New York City College of Technology (United States); Stephen Arnold, Polytechnic Institute of New York Univ. (United States)

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**Miniature polymer Fabry-Perot sensor with dual optical cavities for simultaneous pressure and temperature measurements**

Paper 9112-45

Time: 3:50 PM - 4:10 PM

Author(s): Hyungdae Bae, Miao Yu, Univ. of Maryland, College Park (United States)

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**Prototype spectral analysis of water samples for monitoring and treatment of public water resources (Invited paper)**

Paper 9112-46

Time: 4:10 PM - 4:40 PM

Author(s): Samuel G. Lambrakos, Maria Lee, U.S. Naval Research Lab. (United States); Constantine Yapijakis, The Cooper Union for the Advancement of Science and Art (United States); Scott A. Ramsey, Lulu Huang, U.S. Naval Research Lab. (United States); Andrew Shabaev, George Mason Univ. (United States); Lou Massa, Hunter College (United States)

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**Estimation of suspended sediment concentrations by spectral reflectance: a field survey on the Yellow River (Invited paper)**

Paper 9112-47

Time: 4:40 PM - 5:10 PM

Author(s): Liqin Qu, Xiusheng Yang, Daniel Civco, Univ. of Connecticut (United States)

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**Antarctic sea ice temperature monitoring using passive microwave SSM/I data**

Paper 9112-48

Time: 5:10 PM - 5:30 PM

Author(s): Liu Yanxia, Wuhan Univ. (China)

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