SPIE. PHOTONICS WEST BIOS

The Moscone Center
San Francisco, California, United States
2 - 7 February 2019

Photonic Diagnosis, Monitoring, Prevention, and Treatment of Infections and Inflammatory Diseases 2019

Monday - Wednesday 4 - 6 February 2019

This conference is no longer accepting submissions.
Late submissions may be considered subject to chair approval. For more information, please contact Annie Gerstl.

Important Dates

SHOW | HIDE

Abstract Due:
25 July 2018

Author Notification:
1 October 2018

Manuscript Due Date:
11 January 2019

Conference Committee

SHOW | HIDE

Conference Chairs

Tianhong Dai, Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital (United States), Harvard Medical School (United States)
Jürgen Popp, Leibniz-Institut für Photonische Technologien e.V. (Germany)
Mei X. Wu, Harvard Medical School (United States)

Program Committee

Alessandro M. Deana, UNINOVE (Brazil)
Pu-Ting Dong, Boston Univ. (United States)
Walfre Franco, Wellman Ctr. for Photomedicine (United States)

Program Committee continued...

Michael R. Hamblin, Wellman Ctr. for Photomedicine (United States)
Kristen C. Maitland, Texas A&M Univ. (United States)
Akilan Palanisami, Wellman Ctr. for Photomedicine (United States), Massachusetts General Hospital (United States), Harvard Medical School (United States)
Wei-Chuan Shih, Univ. of Houston (United States)
Ying Wang, Chinese PLA General Hospital (China)

Call for Papers

Infectious diseases continue to rank high among global mortality factors. Over 95% of the mortality caused by infections is due to the lack of proper diagnosis and treatment. A definite diagnosis of infections can only be obtained by culture and/or molecular detection, which often requires tissue biopsy. This invasive diagnostic procedure takes many hours or even serval days to yield an answer, and, sometimes, it is not even possible to obtain a representative biopsy. The inability of physicians to characterize infections at the point of care has led to the wide overuse of broad-spectrum antibiotics and, subsequently, the development of antibiotic resistance by pathogens. The rise of antibiotic resistance has furthermore exponentially complicated the choice of the treatment. Many physicians are concerned that several infections soon may be untreatable. In 2014, the White House announced the National Strategy for Combating Antibiotic-Resistant Bacteria, in which it is noted that new therapeutics and diagnostics are urgently needed to combat emerging and reemerging antibiotic-resistant pathogens.

Prominent among innovative and non-antibiotic therapeutic approaches are photonic (optics-, light-based) technologies, including antimicrobial photodynamic therapy, antimicrobial blue light, ultraviolet C radiation, light-based vaccination, etc. The most attractive advantages of photonic antimicrobial therapeutics lie in their ability to eradicate pathogens regardless of antibiotic resistance and in the fundamental improbability of pathogens themselves developing resistance to these photonic therapeutics due to the rather non-specific nature of the targets. In addition, rapid, accurate, and noninvasive diagnosis of infections using photonic strategies, such as Raman spectroscopy, fluorescence spectroscopy, plasmonics, etc., could play an important role by informing treatment during the critical initial window (< 3 hours) and potentially save lives; and monitoring the response of antimicrobial therapy will lead to therapeutic approaches adapted on the patient's response, and, thus, personalized medicine.

This conference emphasizes the photonic diagnostic and therapeutic techniques for infections and inflammatory diseases. Technical and scientific papers related to advanced photonic diagnostic, monitoring, prevention, and therapeutic technologies that push beyond the scope of the state-of-the-art in basic science and clinical practice are solicited. These include, but are not limited to:

Photonic diagnosis and monitoring of infections and inflammatory diseases

- Novel optical biosensors for rapid point of care identification of infections and Inflammatory diseases
- Pathogen-targeted photonic imaging
- Optical microscopy bacterial morphology analysis for detecting infectious diseases
- Automated image analysis of bacterial morphology for characterizing antibiotic susceptibility
- Rapid detection of drug resistance via enzyme-activated fluorescence detection
- Multiphoton microscopy for detecting dynamics of immune cell responses to infection
- Confocal microscopy for detecting pathogen-host interaction
- Molecular imaging of infections and inflammatory diseases
- Photoacoustic imaging of infections and inflammatory diseases
- Preclinical bioluminescence imaging of infectious diseases in animal models
- Magnetic resonance imaging of infections and inflammatory diseases

- Positron emission tomography scanning for infections and inflammatory diseases.
- Photonic detection of systemic response to infections
- Photonic monitoring of response to antimicrobial therapy
- Photonic methods and technologies for diagnosis of infections and inflammatory diseases in low-resource settings

Photonic prevention and treatment of infections and inflammatory diseases

- Inactivation of pathogens (bacteria, mycobacteria, virus, fungi and parasites) using photonic approaches (antimicrobial photodynamic inactivation, antimicrobial blue light, and etc.)
- Photonic-based antimicrobial therapy
- Photonic vaccination for the control of infections and inflammatory diseases
- Disinfection using light-based approaches
- Inactivation of virulence factors of pathogens using photonic approaches
- Mechanism of action of photonic-based antimicrobial approaches
- Development of novel photosensitizers in antimicrobial photodynamic therapy
- Light delivery in antimicrobial light-based therapy
- Drug delivery in antimicrobial photodynamic therapy
- Potential development of light-resistance by pathogenic microbes
- Toxicity of photonic-based antimicrobial therapy (e.g., cytotoxicity, genotoxicity) to host cells and tissues
- Combined antimicrobial therapies using photonic approaches and alternative antimicrobials.