

Photonic Diagnosis, Monitoring, Prevention, and Treatment of Infections and Inflammatory Diseases 2022 (BO107)

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SPECIAL ABSTRACT REQUIREMENTS

Submissions to this conference must include:

- 100-word text abstract (for online program)
- 250-word text abstract (for abstract digest)
- 2-page extended abstract (for committee review only). The extended abstract must be submitted as a separate PDF document limited to two pages, including tables and figures. Include author names and affiliations; text; any figures, tables, or images; and sufficient data to permit committee review.

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 several 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 2020, the United States government announced the National Action for Combating Antibiotic-Resistant Bacteria, 2020-2025, in which it is noted that new diagnostics and therapeutics are urgently needed to combat emerging and reemerging antibiotic-resistant pathogens. On the global level, the G20 heads of state and government decided in 2017 to create a joint collaboration platform - the Global Antimicrobial Resistance Research and Development Hub, or Global AMR R&D Hub.

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 and infrared 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 and spectral fingerprint analysis for detecting infectious diseases
- Automated image analysis of bacterial morphology and spectral fingerprint analysis 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
- Magnetic resonance imaging of infections and inflammatory diseases
- Positron emission tomography scanning for infections and inflammatory diseases.
- Multimodal approaches
- Preclinical bioluminescence imaging of infectious diseases in animal models
- 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, ultraviolet irradiation, and etc.)
- Photonic-based antimicrobial therapy
- Combined antimicrobial therapies using photonic approaches and other antimicrobials.
- 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 the host cells and tissues.

Present your research at SPIE Photonics West

Below are abstract submission instructions, the accompanying submission agreement, conference presentation guidelines, and guidelines for publishing in the Proceedings of SPIE on the SPIE Digital Library. Submissions subject to chair approval.

Important dates

Abstract submission deadline	11 August 2021
Author notification	11 October 2021
Submission system opens for presentations and manuscripts*	29 November 2021
Manuscript due date	29 December 2021
Oral presentation videos due	29 December 2021
Poster PDF and preview videos due	29 December 2021
Oral presentation slide deadline	20 January 2022

*Authors must register prior to uploading.

What you will need to submit

- Title
- Author(s) information
- 250-word abstract for technical review
- 100-word summary for the program
- Keywords used in search for your paper (optional)
- Check the individual conference Call for Papers for additional requirements (for example, some conferences require 2- to 3-page extended summary for technical review, or have instructions for award competitions)

Note: Only original material should be submitted. Commercial papers, papers with no new research/development content, and papers with proprietary restrictions will not be accepted for presentation.

How to submit your abstract

- Visit the conference page: www.spie.org/bo107call
- You may submit more than one abstract but submit each abstract only once.
- Click the "Submit An Abstract" button on the conference page.
- Sign in to your SPIE account or create an account if you do not already have one.
- Follow the steps in the submission wizard until the submission process is completed.
- If your submission is related to an application track below, indicate the appropriate track when prompted during the submission process.

Application track

- **Brain:** Papers that describe the development of innovative technologies that will increase our understanding of brain function.
- **Translational Research:** Papers that showcase the latest photonics technologies, tools, and techniques with high potential to impact healthcare.
- **3D Printing:** Papers that showcase innovative ways to apply this multidimensional/multidisciplinary technology.
- **COVID-19 Research:** Papers that illustrate the creativity and breadth of the optics and photonics community's response to the COVID-19 pandemic.

Submission agreement

All presenting authors, including keynote, invited, oral, and poster presenters, agree to the following conditions by submitting an abstract:

- Register and pay the author registration fee.
- Oral Presenters: Submit a presentation video by the advertised due date, or agree to the presentation capture of your presentation on site, for online conference viewing during the event and publication in the Proceedings of SPIE on the SPIE Digital Library.
- Poster Presenters: Submit a Poster PDF and optional preview video by the advertised due date, for online conference viewing during the event and publication in the Proceedings of SPIE on the SPIE Digital Library.
- Submit a 4-page-minimum manuscript by the advertised due date, for online conference viewing during the event and publication in the Proceedings of SPIE on the SPIE Digital Library.
- Obtain funding for registration fees, travel, and accommodations, independent of SPIE, through their sponsoring organizations.
- Ensure that all clearances, including government and company clearance, have been obtained to present and publish. If you are a DoD contractor in the USA, allow at least 60 days for clearance.
- Attend the meeting.
- Present at the scheduled time.

Review and program placement

- To ensure a high-quality conference, all submissions will be assessed by the Conference Chair/Editor for technical merit and suitability of content.
- Conference Chairs/Editors reserve the right to reject for presentation any paper that does not meet content or presentation expectations.
- Final placement in an oral or poster session is subject to Chair discretion.

Publication of Proceedings in the SPIE Digital Library

- SPIE will publish all presentations for viewing during the conference, as well as permanently archive all presentations in the conference proceedings on the SPIE Digital Library.
- SPIE retains rights to distribute and market the official SPIE recording of the presentation, presentation video, and/or poster.
- Most SPIE conferences follow an onsite publication model, meaning that manuscripts received by the advertised due date will be published for online viewing during the event, as well as archived in the SPIE Digital Library.
- A select few of SPIE conferences may elect to follow a Post-Meeting model of publication in order to conduct a more thorough review of manuscripts. In this model, manuscripts will be published 2-4 weeks after the event in the SPIE Digital Library, and may not be published for online viewing during the event.
- Authors must be authorized to transfer copyright of the manuscript to SPIE, or provide a suitable publication license. Authors retain the right to prepare derivative publications based on the paper.
- Conference Chairs/Editors may require manuscript revision before approving publication and reserve the right to reject for publication any paper that does not meet acceptable standards for a scientific publication.
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- More publication information available on the [SPIE Digital Library](http://www.spiedigitallibrary.org)

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