



National Cancer Institute Conference on Microbial-Based Cancer Theranostics

Wednesday, May 25, 2022

10:00 AM

Register in advance for this conference [here](#)

Purpose

Microbial-based cancer theranostics is a treatment strategy that combines cancer therapeutics with cancer imaging in one multifunctional microbial agent. The purpose of this one-day NCI conference is to discuss the various aspects of the field including the biology of microbial-tumor interaction, microbial-based therapy, microbial-based imaging and diagnosis, microbial-based cancer theranostics and the potential clinical utility of this strategy.

Background

There is a clinical need to develop new cancer treatments (including oral cancer treatment) that are more targeted and effective under conditions where conventional cancer therapies are inadequate, such as metastatic cancer, poorly vascularised hypoxic solid tumors, immunologically “cold” tumors (that do not trigger an immune response), dormant or slowly dividing cells, tumors resistant to treatment, or islands of microinvasive tumor cells buried within normal brain tissues. An attractive characteristic of anaerobic microbial agents for anticancer therapies is their capacity for tumor-specific targeting, and ability to colonize the tumor, deliver a therapeutic payload to the tumor and activate anti-tumor immunity.

Microbial cancer theranostics can be used to study microbial-tumor interactions during microbial cancer therapy and directly monitor the therapeutic effect by engineering them for use in various types of imaging/diagnosis modalities such as, MRI, PET, and ultrasound. Theranostics may allow real-time, *in vivo* imaging of the microbial therapeutic agent in the tumor, potentially providing immediate information about the localization of the microbial treatment agent, estimate of the magnitude of the microbial colonization, its duration, and its impact on the tumor. This information may be used to facilitate timely, interactive adjustment of treatment and to improve microbial based cancer therapy. Finally, the relative ease of microbial genetic manipulation to create microorganisms that have selective tumor cytotoxicity and selective anti-cancer activation of the immune system also offers the prospect of developing relatively simple, low-cost cancer immunotherapy for global health and low resource settings.

Related funding opportunities: Microbial-based Cancer Imaging and Therapy - Bugs as Drugs: [PAR-22-086](#) and [PAR-22-085](#)



NCI CONFERENCE ON MICROBIAL-BASED CANCER THERANOSTICS

DRAFT AGENDA

10:00-10:10 Welcome: Jeffrey D. White, National Cancer Institute

10:10-10:40 Keynote: Jeff Hasty, University of California San Diego
Characterization of bacterial population dynamics in solid tumors

10:40-12:20 SESSION 1: MICROBIAL-TUMOR INTERACTIONS AND THERAPY

Chair: Neil Forbes, University of Massachusetts.

Salmonella as intracellular delivery systems to transport therapeutic proteins

Dan Littman, New York University

Microbiota mediated efficacy of immune checkpoint blockade therapy

Mark Gomelsky, University of Wyoming

Bactodrones for cancer immunotherapy

Cammie Lesser, Harvard University

Platforms for screening tumor homing traits in bacteria

Q&A (10 min) Phil Daschner moderator

12:20-12:50 Lunch Break

12:50-2:30 SESSION 2: MICROBIAL-BASED IMAGING AND DIAGNOSIS

Chair: Guanshu Liu, Johns Hopkins University

Molecular imaging of bacteria by their inherent CEST MRI signal

Tal Danino, Columbia University.

Engineering probiotics for colorectal cancer screening and prevention

David Wilson, University of California, San Francisco

Targeting bacteria-specific metabolic pathways for infection imaging

Lacey McNally, University of Oklahoma

Bacterial-based contrast agents for monitoring disease

Q&A (10 min) - Imaging PD will moderate

2:30-4:10 SESSION 3: MICROBIAL-BASED CANCER THERANOSTICS

Chair: Robert Hoffman, AntiCancer and University of California, San Diego

Real-Time Fluorescence Image-Guided Oncolytic Virotherapy for Precise Cancer Treatment

Dong-Hyun Kim, Northwestern University.

Catheter directed local delivery of nano-functionalized C. novyi NT bacteriolytic cancer therapy

Avinoam Bar-Zion, California Institute of Technology

Acoustically triggered mechanotherapy using genetically encoded gas vesicles

Assaf A. Gilad, Michigan State University

A Remote magnetic activation of theragnostic genes for cancer therapy

Q&A (10 min) – Miguel Ossandon National Cancer Institute, moderator

4:10-4:50 PANEL DISCUSSION: CHALLENGES AND OPPORTUNITIES FOR MICROBIAL-BASED CANCER THERANOSTICS, Miguel Ossandon and Alejandro Salicrup, NCI moderators

4:50-5:20 REISSUE OF “MICROBIAL-BASED CANCER IMAGING AND THERAPY - BUGS AS DRUGS” (PAR-22-085 AND PAR-22-086), Avi Rasooly. NCI, moderator

5:20-5:30 Concluding remarks: Janet F. Eary, National Cancer Institute