

REISSUE OF “MICROBIAL-BASED CANCER IMAGING AND THERAPY - BUGS AS DRUGS” (PAR-22-085 AND PAR-22-086)

1. Reissued funding opportunity; Avi Rasooly
2. Program’s areas of interest:
 - a. Microbial-based imaging, Yisong Wang
 - b. Oral cancer, Zhong Chen
 - c. Microbial based cancer therapy and imaging for global health, Alejandro Salicrup
 - d. Microbial-tumor interaction, Phillip J. Daschner
 - e. Microbial based cancer therapy, Avi Rasooly
 - f. Microbial-based cancer detection and diagnosis, Miguel Ossandon
3. NIH and CSR publicly available tools to help applicants with the referral of their applications, Miguel Ossandon
4. Q&A Phillip J. Daschner

The initial funding opportunities PAR-19-193 and PAR-19-194 focused on:

- **microbial-tumor interactions**, studying the biological and mechanistic basis of microbial-based cancer therapy
- **microbial-based cancer therapy**, advancing research on microorganisms for cancer therapy

The program attracted nearly 300 applications, significantly increasing the interest and NCI investment

The reissued funding opportunities added several new topics:

- **microbial-based cancer imaging** to provide better analytical capabilities for microbial-based cancer therapy and to develop new cancer imaging modalities
- **microbial-based cancer diagnosis** to provide new diagnostics capabilities including non-invasive early detection of asymptomatic cancers
- **microbial-based cancer therapy for global health**, promoting the development of microbial-based cancer therapies as a potential low-cost cancer therapy for global health and low resource settings

The new broadened funding opportunities address scientific, clinical, and technology areas related to cancer therapy. In addition, they encourage research aimed at addressing **urgent issues of access to cancer therapy**, especially cancer immunotherapy, in low resource settings

Microbial-based cancer therapy-Avi Rasooly (OCCAM)

NCI Division of Cancer Treatment and Diagnosis:

Advancing research on microorganisms for cancer therapy

- Microbial colonization and destruction of tumor
- Microbial activation of anti-tumor immune response
- Microorganisms as a vector for therapeutics
- Microbial treatment for metastases

Microbial-based Cancer Imaging

Yisong Wang (NCI/DCTD/CIP)

- **DCTD Cancer Imaging Program** supports non-invasive in vivo cancer imaging studies via basic and applied research for better understanding of cancer biology, and for cancer diagnosis and treatment
- Enhancing bacterial tumor colonization and penetration for imaging applications
- Microbial-specific contrast agents and molecular imaging probes for the various in vivo imaging modalities
- Microbial labeling for microbial-based cancer detection
- Developing precise spatiotemporal resolution (including computation and image manipulation) of microbial-based cancer imaging
- Microbial-based image-guided delivery of anti-cancer drugs, genes or radiotherapy in vivo

Oral and Salivary Cancers--Zhong Chen (NIDCR)

National Institute of Dental and Craniofacial Research (NIDCR) Areas of Interest:

- NIDCR supports research on dental, oral, and craniofacial health and disease, including the treatment of cancers of the oral cavity, oropharynx, and salivary glands
- Microbial-based treatment of oral, salivary gland, or oropharyngeal cancers
- Microbial delivery of anti-cancer therapeutics to oral, salivary gland, or oropharyngeal tissues
- Microbial manipulation of the oral microbiome to reduce the risk of developing cancers of the oral cavity, oropharynx, and salivary gland
- Microbial or microbial metabolite-based inhibition of HPV acquisition, infection, and persistence in the oral cavity to prevent oral cancer

The NCI Center for global health

- Introduce a more suitable cancer immunotherapy approach to LMICs.
- Low-cost microbial-based cancer therapies and diagnosis for low resource settings
- Low-cost imaging technologies such as ultrasound for microbial-based cancer therapy to enable monitoring of microbial-based cancer therapy
- Novel cancer-targeting approaches suitable for LMICs
- Microbial cancer therapy delivery approaches suitable to LMICs.

Division of Cancer Biology

1. Basic Biology of Tumor/Microbe Interactions
 - Direct vs. Indirect (stromal) interactions/ TME signaling
 - Types of signaling - Adhesion, metabolism, cytokines, etc.
2. Features of the TME that promote homing and colonization of microbial agents
 - Hypoxia, immune suppression, nutrients
3. Approaches to Identify Mechanisms of how microbial agents effect tumor immunity;
 - Metabolomics, immune (activation or tolerance) assays, cytokine analysis
4. Innate or engineered features of microbial agents that improve colonization, persistence, and efficacy in tumor control
 - Quorum sensing,
 - auxotrophy
5. Interactions with the tumor-associated microbiome
 - Effects on metastatic disease?
 - Effects on physical oncology (e.g. tumor stiffness and fibrosis)

Cancer Diagnosis Program

- To stimulate research on the various approaches of microbial-based cancer diagnosis
- Development of microorganisms for cancer diagnosis in order to provide information about the tumor organ site and characteristics
- Facilitate early detection or analysis of asymptomatic cancers
- Engineering of microorganisms with detectible markers of interactions with tumor cells
- Exploring microorganisms as biomarkers for cancer
- Monitoring shifts in microbial populations associated with cancer

Appropriate review with expertise **and experience** reviewing the topic of your application is critical for your success. The NIH has provided tools that can be used to recommend potentially study sections for your research topic.

- Assisted Referral Tool (ART): ART was developed by CSR to target and recommend appropriate study sections for your project.
- NIH RePORTER: RePORTER can be used to identify study sections that favorable reviewed applications in your area of research.
- After the appropriate study section is identified, it can be requested through the PHS Assignment Request Form found in your application package.

Thank you and questions?



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