

carcinogenic potential of environmental chemicals (including mixtures), engineering safer products, and designing more effective multi-target therapeutics.

The hallmarks of cancer (1) and the key characteristics of carcinogens (2) offer two paradigms for organizing information to better understand the interactions between environmental exposures and biological systems that lead to cancer. The hallmarks of cancer represent the biological traits of tumors that allow for the unchecked growth of cancer, while the key characteristics of carcinogens begin with known human carcinogens and identify the defining properties of carcinogens. A series of webinars prior to the workshop will provide background on these frameworks. Discussion at the workshop will include recommended application of the two frameworks, clarifying terminology, the relationship between the frameworks, and the available assays for measuring effects associated with each of the hallmarks and key characteristics.

It is clear from biomonitoring studies that humans are constantly exposed to numerous structurally-diverse chemicals. A recent nomination to NTP was for development of a testing strategy to better understand how environmental chemicals might interact with multiple cancer-relevant biological pathways to elicit mixture effects that would not be expected based on single chemical considerations. An aim of the workshop is to channel the collective wisdom of cancer biologists, toxicologists, and mixtures statisticians to propose testing approaches designed to evaluate hypotheses regarding the joint action of chemicals that target cancer pathways. This effort will include discussion of cancer-specific pathways and mechanisms, associated technologies including organotypic and/or mechanistically insightful tools, preferred animal models, in silico/computational approaches to link relevant biological pathways, as well as specific cancer types to use in evaluating the hypotheses.

**Meeting and Registration:** This meeting is open to the public, free of charge, with attendance limited only by the space available. The meeting will consist of plenary sessions (webcast), breakout discussion sessions, and a poster session. The breakout sessions and poster session will be open to the public but will not be webcast. Individuals who plan to attend in person as observers or view the proceedings via webcast should register on the NTP website (<https://ntp.niehs.nih.gov/go/coc>) by April 22,

2019, to facilitate meeting planning. Interested individuals are encouraged to visit the web page to stay abreast of the most current information about the meeting.

Information for visitors to the US EPA is available at <https://www.epa.gov/aboutepa/visiting-epa-headquarters>. Individuals with disabilities who need accommodation to participate in this event should contact Dr. Cynthia Rider at phone: (984) 287-3175 or email: [cynthia.rider@nih.gov](mailto:cynthia.rider@nih.gov). TTY users should contact the Federal TTY Relay Service at 800-877-8339. Requests should be made at least five business days in advance of the event.

**Meeting Materials:** The preliminary agenda and additional information are available at <https://ntp.niehs.nih.gov/go/coc>.

## References

1. Hanahan D, Weinberg RA. Hallmarks of cancer: The next generation. *Cell*. 2011;144(5):646–74. doi: 10.1016/j.cell.2011.02.013. PubMed PMID: 21376230.
2. Smith MT, Guyton KZ, Gibbons CF, Fritz JM, Portier CJ, Rusyn I, et al. Key Characteristics of Carcinogens as a Basis for Organizing Data on Mechanisms of Carcinogenesis. *Environmental health perspectives*. 2016;124(6):713–21. doi: 10.1289/ehp.1509912. PubMed PMID: 26600562; PubMed Central PMCID: PMC4892922.

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## DEPARTMENT OF HEALTH AND HUMAN SERVICES

### National Institutes of Health

#### National Institute of Allergy and Infectious Diseases; Notice of Closed Meetings

Pursuant to section 10(d) of the Federal Advisory Committee Act, as amended, notice is hereby given of the following meetings.

The meetings will be closed to the public in accordance with the provisions set forth in sections 552b(c)(4) and 552b(c)(6), Title 5 U.S.C., as amended. The grant applications and the discussions could disclose confidential trade secrets or commercial property such as patentable material, and personal information concerning individuals associated with the grant applications, the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.

**Name of Committee:** Microbiology, Infectious Diseases and AIDS Initial Review Group; Acquired Immunodeficiency Syndrome Research Review Committee.

**Date:** April 24, 2019.

**Time:** 8:00 a.m. to 6:00 p.m.

**Agenda:** To review and evaluate grant applications.

**Place:** Renaissance Arlington Capital View Hotel, 2800 South Potomac Avenue, Arlington, VA 22202.

**Contact Person:** Robert C. Unfer, Ph.D., Scientific Review Officer, Scientific Review Program, Division of Extramural Activities, Room 3F40A, National Institutes of Health, NIAID, 5601 Fishers Lane, MSC 9834, Bethesda, MD 20892-9834, (240) 669-5035, [robert.unfer@nih.gov](mailto:robert.unfer@nih.gov).

**Name of Committee:** Microbiology, Infectious Diseases and AIDS Initial Review Group; Acquired Immunodeficiency Syndrome Research Review Committee, AIDSRRRC Review Meeting.

**Date:** August 1–2, 2019.

**Time:** 10:00 a.m. to 6:00 p.m.

**Agenda:** To review and evaluate grant applications.

**Place:** National Institutes of Health, 5601 Fishers Lane, Rockville, MD 20892, (Telephone Conference Call).

**Contact Person:** Robert C. Unfer, Ph.D., Scientific Review Officer, Scientific Review Program, Division of Extramural Activities, Room 3F40A, National Institutes of Health, NIAID, 5601 Fishers Lane, MSC 9834, Bethesda, MD 20892-9834, (240) 669-5035, [robert.unfer@nih.gov](mailto:robert.unfer@nih.gov).

**Name of Committee:** Microbiology, Infectious Diseases and AIDS Initial Review Group; Acquired Immunodeficiency Syndrome Research Review Committee, AIDSRRRC Review Meeting.

**Date:** December 3–4, 2019.

**Time:** 10:00 a.m. to 6:00 p.m.

**Agenda:** To review and evaluate grant applications.

**Place:** National Institutes of Health, 5601 Fishers Lane, Rockville, MD 20892, (Telephone Conference Call).

**Contact Person:** Robert C. Unfer, Ph.D., Scientific Review Officer, Scientific Review Program, Division of Extramural Activities, Room 3F40A, National Institutes of Health, NIAID, 5601 Fishers Lane, MSC 9834, Bethesda, MD 20892-9834, (240) 669-5035, [robert.unfer@nih.gov](mailto:robert.unfer@nih.gov).

(Catalogue of Federal Domestic Assistance Program Nos. 93.855, Allergy, Immunology, and Transplantation Research; 93.856, Microbiology and Infectious Diseases Research, National Institutes of Health, HHS)

**Dated:** February 13, 2019.

**Natasha M. Copeland,**

*Program Analyst, Office of Federal Advisory Committee Policy.*

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