



NATIONAL SCIENCE FOUNDATION  
2415 EISENHOWER AVENUE  
ALEXANDRIA, VIRGINIA 22314

**NSF 23-039**

## Dear Colleague Letter: MPS-NCI SuPporting new AReas of Knowledge (SPARK): Cancer as a Living Material – New Ideas and New Connection

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January 3, 2023

Dear Colleague:

The National Science Foundation's (NSF) Division of Materials Research (DMR) in the Directorate for Mathematical and Physical Sciences (MPS) announces a new collaboration with the Division of Cancer Biology (DCB) and the Center for Cancer Training (CCT) of the National Cancer Institute (NCI) at the National Institutes of Health (NIH). This collaboration emerged from a series of Square-Table workshops <sup>[1, 2]</sup> between MPS and DCB, including a workshop on Living Materials. This workshop highlighted an opportunity to accelerate an emerging interdisciplinary field in which cancer can be studied as a living material. Inspired by this workshop, this Dear Colleague Letter (DCL) seeks to encourage submission of supplemental funding requests to existing NSF and NCI awards to promote convergence between materials researchers and cancer researchers to study cancer as a living material and promote new collaborations, cross-training, and exchange of expertise via:

1. the support for visiting graduate students and/or postdoctoral researchers bringing materials science expertise to cancer labs or cancer research expertise to materials science labs. One or both labs must have current NCI or NSF funding in order to receive supplement funding to support the visiting researcher(s).
2. the initiation of new collaborative research between materials researchers and cancer researchers; and/or
3. the development of workshops or collaboration building events that promote exchange of ideas or convergence in materials research and cancer research.

A living material can be defined as a composite of engineered materials and living cells that is adaptive, self-assembling, self-replicating and modulating its properties or function in response to its environment. Many fundamental scientific questions remain outstanding in the

development of truly living materials. These questions include understanding the dynamic interactions between extracellular matrix material and cells, harnessing control of that interface in response to external stimuli to modulate characteristics of the whole composite, and frontier questions of emergent structures far-from-equilibrium.

Cancer exhibits characteristics of a prototypical living material with its emergent structure, modulation of that structure and properties in response to external stimuli, and modification of its local environment to promote and safeguard the emergent structures. In viewing cancer through this lens, researchers may advance the understanding and development of novel adaptive living materials that are cancer-inspired. These living materials may be applied to non-biomedical applications, aid in elucidating properties of living materials *per se*, or lead to increased understanding of cancer properties. In turn, researchers may further the development of functionalized materials that reflect the heterogeneous and dynamic nature of cancer *in vivo*. Further, this effort and outcomes coordinate government efforts to advance biotechnology and biomanufacturing towards innovative solutions in health, climate change, energy, food security, agriculture, supply chain resilience, and national and economic security [3].

## WEBINAR

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A webinar was hosted by NSF on **January 19th, 2023**, that will provide details on this collaborative effort featuring National Science Foundation Program Officers from the Directorate of Mathematical and Physical Sciences (MPS) as well as Program Officers from the Division of Cancer Biology (DCB) and the Center for Cancer Training (CCT) of the National Cancer Institute (NCI).

In addition, this webinar will provide context-setting talks to stimulate and encourage materials researchers as well as cancer-sciences communities to develop new, forward-thinking research approaching cancer as a prototypical living material that can inform the understanding and development of living materials for broad applications. This research may in turn further the development of advanced biomaterials for cancer biology research applications.

Link to the webinar recording:

[https://players.brightcove.net/679256133001/NkgrDczuol\\_default/index.html?videoId=6319313882112](https://players.brightcove.net/679256133001/NkgrDczuol_default/index.html?videoId=6319313882112)

[Webinar slides](#)

Contact for webinar inquiries:

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## SUPPLEMENTAL FUNDING TO EXISTING NSF OR NCI AWARDS

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- Prior to submission of a supplemental funding request, PIs must provide a brief 1–2-page description of the proposed effort to the NSF or NCI Program Director listed later in this DCL and to the cognizant NSF or NCI Program Officer for the award to be supplemented. Descriptions must be submitted via email by **February 9th, 2023**.
- Supplemental funding requests can only be submitted after invitation by the cognizant NSF or NCI Program Officer. **The email inviting the submission must be included in the supplemental funding request.** Uninvited requests for supplemental funding will be returned without review.
- The initial brief descriptions and the supplemental funding requests will be shared with the MPS-NCI Working group to provide an assessment of the initial description and an internal review of submitted invited requests.
- All NCI supplemental-funding requests will be subject to administrative review. NCI will conduct administrative reviews of applications and will support the most meritorious applications submitted for consideration, based upon the availability of funds. NCI grant mechanisms eligible for supplemental funding include R01, U01, R61 and R33 awards.
- All requests for supplements to NCI grants must be submitted electronically through eRA Commons, see [NOT OD-20-128](#) more information. Applicants are strongly encouraged to notify the NCI Program Director assigned to the parent award that a request has been submitted in response to this Notice of Special Interest (NOSI) in order to facilitate efficient processing of the request.
- At least one full year on the current NCI or NSF award to be supplemented must remain at the time of submission. Projects in no-cost extension will not qualify for this funding opportunity.
- Supplement budget requests must reflect the actual needs of the proposed **one-year project** and should not exceed \$50,000 in direct costs for the entire project. Funding is subject to limitations of available funds supplemental-funding and requests will be subject to the NSF's merit review process, as described in the *NSF Proposal and Award Policies and Procedures Guide* ([PAPPG](#)).
- All NSF supplemental funding requests must follow the guidance specified in the PAPPG Chapter VI.E.5, which includes, in addition to the budget and budget justification, the following sections: 1) a summary of the proposed work, and 2) justification of the need for supplemental funds. In addition, the request must include, as a single-copy document, a copy of the email inviting submission of the supplemental funding request.
- The deadline for submission of invited supplemental funding requests is **March 10th**,

**2023.**

## **COGNIZANT PROGRAM DIRECTORS FOR SUPPLEMENT REQUEST INQUIRIES**

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Sincerely,

Sean Jones  
Assistant Director, Directorate for Mathematical and Physical Sciences (MPS),  
National Science Foundation

Daniel Gallahan  
Director, Division of Cancer Biology,  
National Cancer Institute, National Institutes of Health

Oliver Bogler  
Director, Center for Cancer Training,  
National Cancer Institute, National Institutes of Health

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## **REFERENCES**

- [1] <https://www.nsf.gov/mps/cancer-collab.jsp>
- [2] <https://www.cancer.gov/about-nci/organization/dcb/news/square-tables>
- [3] <https://www.whitehouse.gov/briefing-room/presidential-actions/2022/09/12/executive-order-on-advancing-biotechnology-and-biomanufacturing-innovation-for-a-sustainable-safe-and-secure-american-bioeconomy/>