

# Cellular Senescence Network (SenNet) Pre-Application Webinar

**January 22nd, 2021, 12:00-1:30PM EST**

To submit questions during the webinar please use the chat box.  
We will address questions at the end of the presentation.  
Following the webinar, questions can be sent to [cs2@nih.gov](mailto:cs2@nih.gov)



**National Institutes of Health**  
*Office of Strategic Coordination - The Common Fund*

# The NIH Common Fund



The Common Fund

## Origins of the Common Fund

2004: NIH Roadmap is launched

December 9, 2006: Congress unanimously passes a reauthorization bill affirming importance of NIH and its vital role in advancing biomedical research to improve the health of the Nation



Establishes the Division of Program Coordination, Planning, and Strategic Initiatives (DPCPSI) within Office of the Director and the NIH Common Fund to provide a dedicated source of funding to enable goal-driven, *trans*-NIH research

[commonfund.nih.gov](http://commonfund.nih.gov)



### One Hundred Ninth Congress of the United States of America

AT THE SECOND SESSION

*Begun and held at the City of Washington on Tuesday,  
the third day of January, two thousand and six*

#### An Act

To amend title IV of the Public Health Service Act to revise and extend the authorities of the National Institutes of Health, and for other purposes.

*Be it enacted by the Senate and House of Representatives of  
the United States of America in Congress assembled,*

#### SECTION 1. SHORT TITLE.

This Act may be cited as the "National Institutes of Health Reform Act of 2006".

#### TITLE I—NIH REFORM

THE COMMON FUND

10<sup>TH</sup> ANNIVERSARY

RESEARCH SYMPOSIUM PROGRAM

A DECADE OF DISCOVERY

THURSDAY  
JUNE 19, 2014  
8:30 A.M.—5:00 P.M. ET

MASUR AUDITORIUM, BUILDING 10  
NATIONAL INSTITUTES OF HEALTH  
BETHESDA, MD

NIH National Institutes of Health  
Office of Strategic Coordination - The Common Fund

A DECADE OF DISCOVERY  
NIH COMMON FUND  
2004-2014

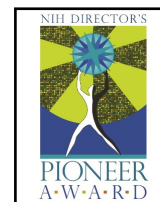
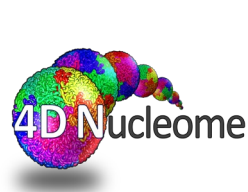
Slide 2

# Criteria for Common Fund Programs



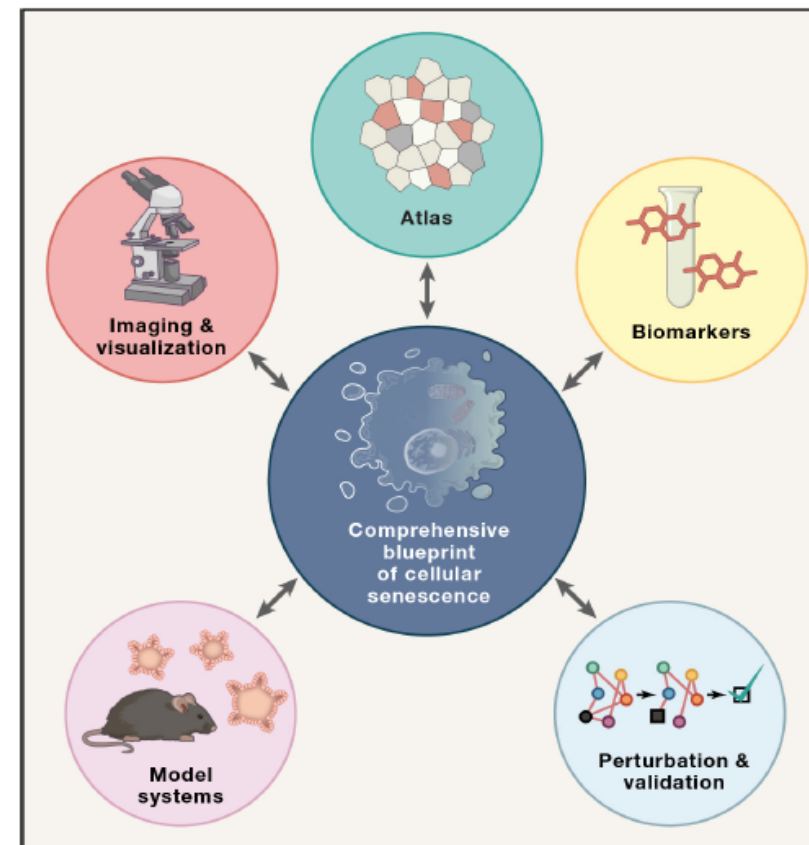
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- **Transformative:** Must have high potential to dramatically affect biomedical and/or behavioral research over the next decade
- **Catalytic:** Must achieve a defined set of high impact goals within 5-10 years
- **Synergistic:** Outcomes must synergistically promote and advance individual missions of NIH Institutes and Centers to benefit health
- **Cross-cutting:** Program areas must cut across missions of multiple NIH Institutes and Centers, be relevant to multiple diseases or conditions, and be sufficiently complex to require a coordinated, trans-NIH approach
- **Unique:** Must be something no other entity is likely or able to do



## **Vision:**

To identify and functionally characterize the heterogeneity of senescent cells across multiple tissues in human health and lifespan at single cell resolution.



A Blueprint for Characterizing Senescence. Roy et al. Cell. 183, 5, 1143-1146.

<https://doi.org/10.1016/j.cell.2020.10.032>

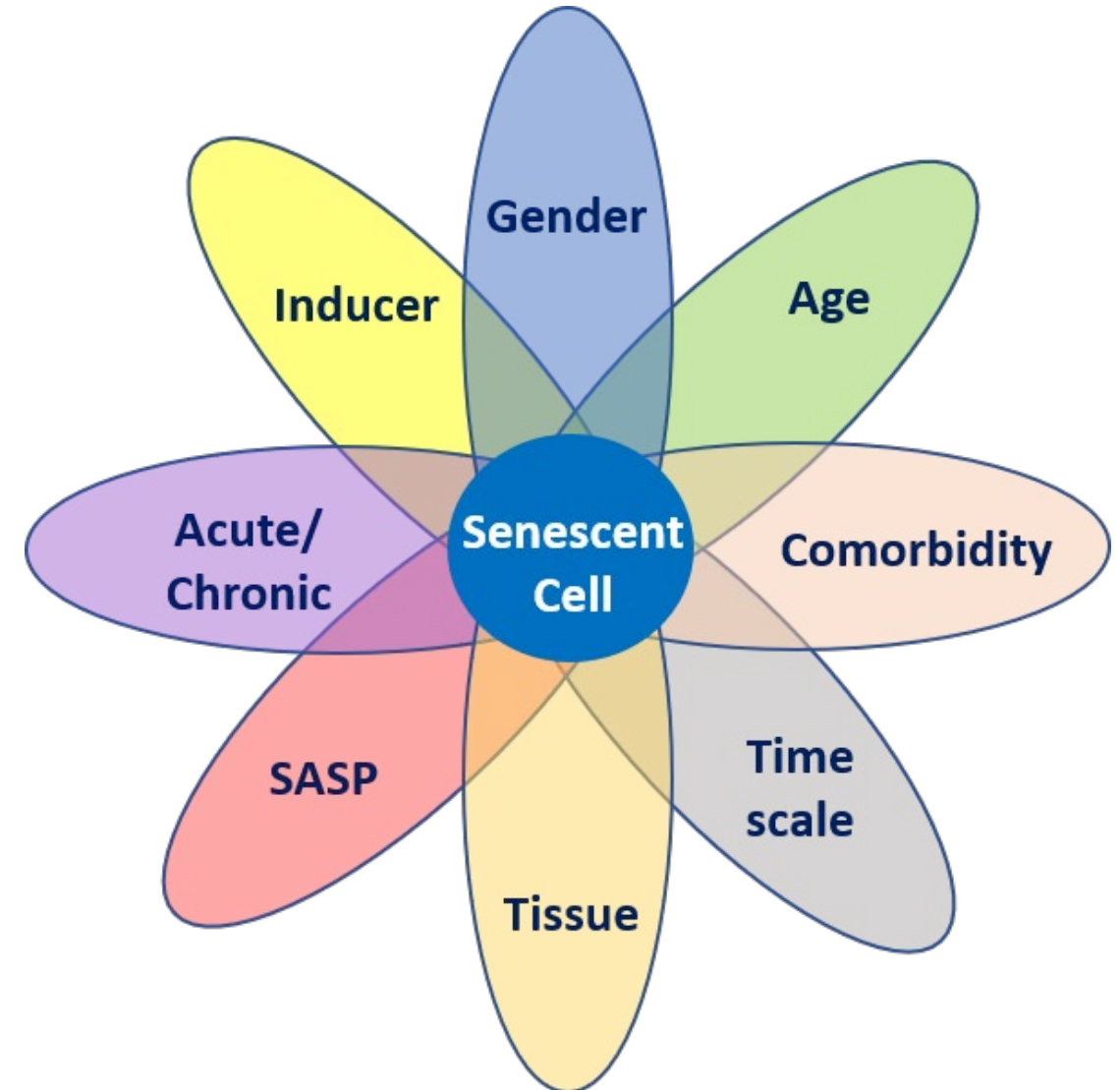
# Cellular Senescence Network (SenNet)



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- Cellular senescence is heterogeneous across cell types, tissues, and timescales
- Inducers of senescence and behaviors of senescent cells can vary dramatically
- Harnessing senescence for human health will require new tools and resources to gain a deeper understanding of senescent cell biology and heterogeneity

**Establishing a Cellular Senescence Network will address these challenges**





# Cellular Senescence Network (SenNet) 2021 Initiatives



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## **Initiative 1: Tissue Mapping Centers (TMC)**

- Each Center will have an Administrative Core and three research units: Biospecimen Core, Biological Analysis Core, and Data Analysis Core

**FOA: RFA-RM-21-008**

## **Initiative 2: Technology Development and Application Projects (TDA)**

- To develop innovative tools and technologies that can ultimately be implemented by the consortium for studying cellular senescence and their SASP in human tissues

**FOA: RFA-RM-21-009**

## **Initiative 3: Consortium Organization and Data Coordination Center (CODCC)**

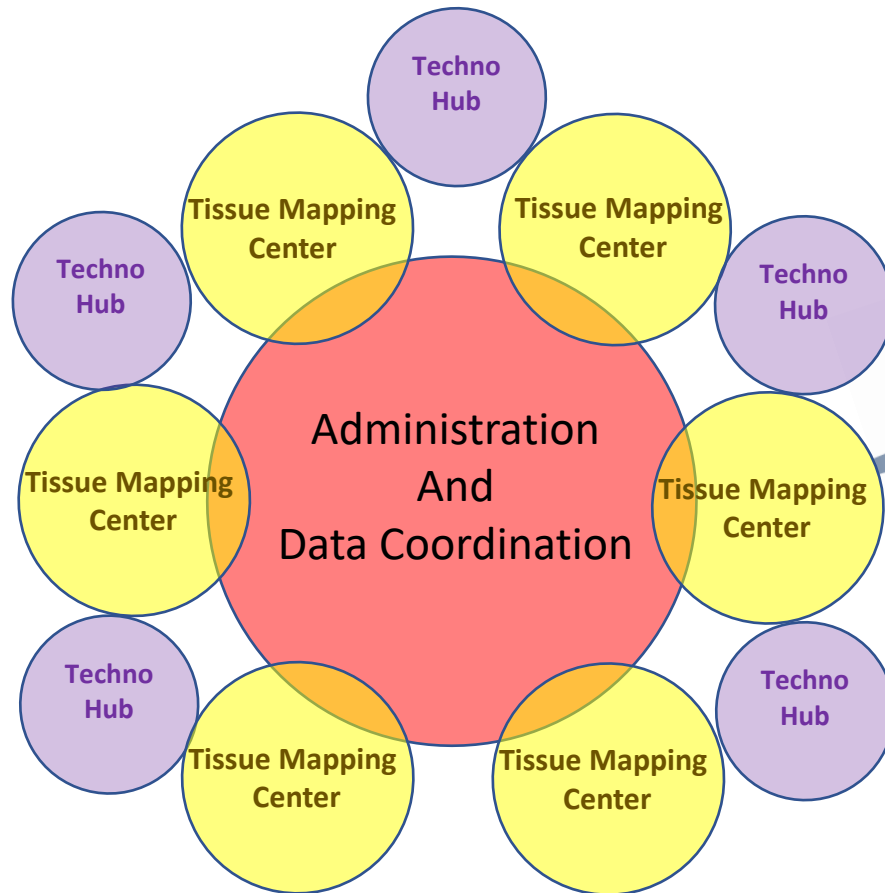
- Will serve as an organizational hub for the consortium
- Will leverage existing standards and analysis pipelines of a suitable single cell atlas data platform to ensure interoperability and sustainability

**FOA: RFA-RM-21-010**

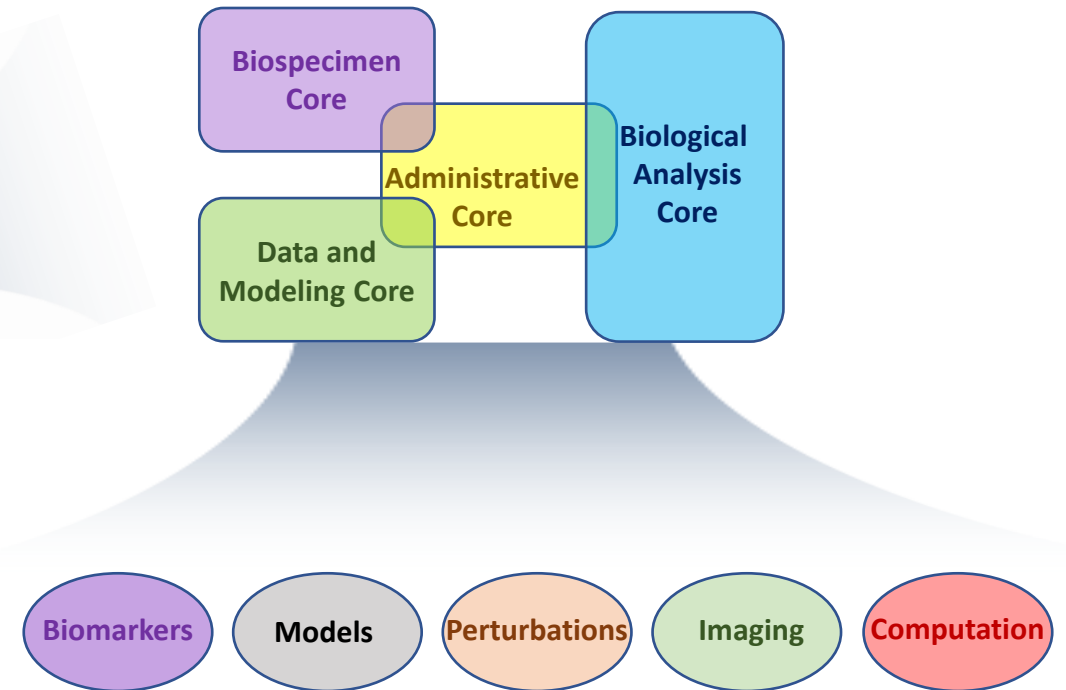
# Cellular Senescence Network (SenNet) Program Structure



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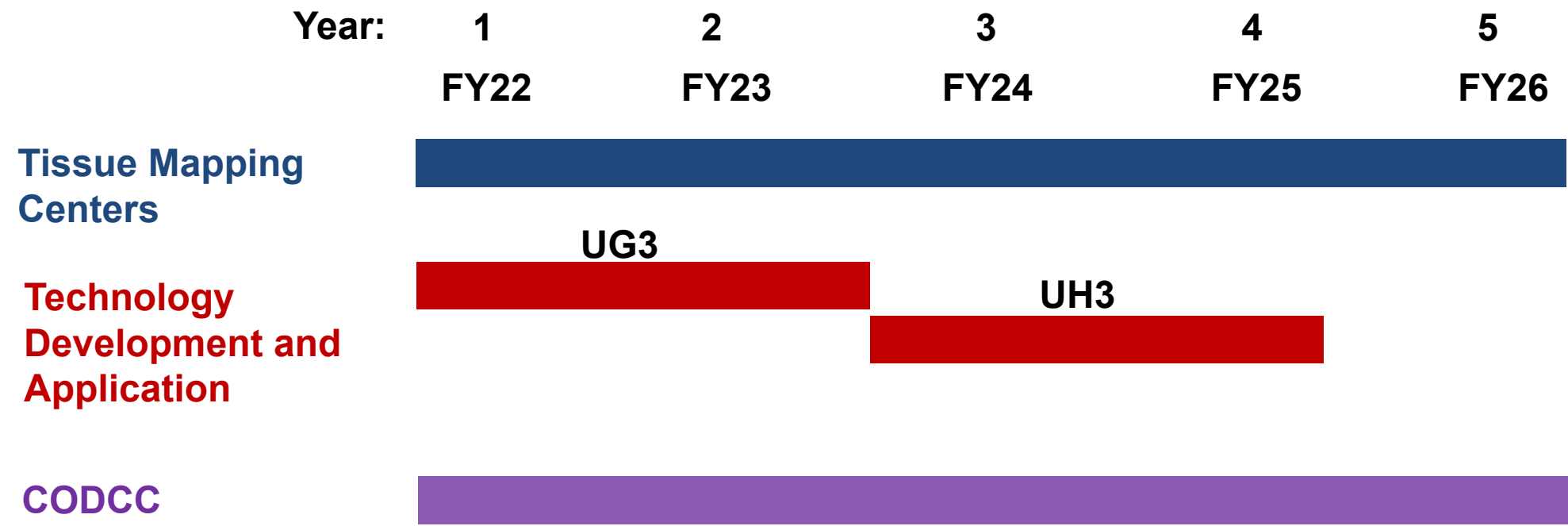
## TISSUE MAPPING CENTER COMPONENTS



# Current SenNet Timeline



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# Key Points for All SenNet RFAs



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- SenNet projects will generate high resolution, high content, high-throughput biomolecular data to generate 3D tissue maps of non-diseased, human tissue
- NIH intends that the products of SenNet will be broadly and rapidly available
- Comprehensive Sharing Plan required – expectation that data are shared with the Consortium quarterly and pre-publication
- All applicants should define a clear set of annual milestones and a timeline, including goals for data generation and sharing
- Awardees of all Cooperative Agreements must be prepared to adjust, add, or delete items from their proposed plan to align with evolving program progress and goals

# Administrative Details for All RFAs



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- **FAQs** covering many details are available online:
  - <https://commonfund.nih.gov/senescence/foafaqs>
- **Budgeting:** Applicants are encouraged to budget for Consortium activities, **travel to twice yearly consortium meetings**, resource sharing, outreach, and meeting attendance as part of their proposed budget. NIH may modify budgets on award.
- **NIH Involvement:** There will be substantial NIH programmatic involvement in individual projects and Consortium activities.
- **RFAs:** These are one-off announcements with no revisions or appeals.
  - **LOIs:** Not required, but strongly encouraged.
  - **Review:** Review will be in SEPs. Please pay attention to review criteria given in the RFAs.
- **Eligibility:** Foreign institutions (**Only for TDA RFA**) for-profit organizations/NIH intramural program are eligible to apply.

# SenNet Important Dates



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- **Letter of Intent Due Dates:**
  - February 8, 2021 for all RFAs
- **Application Receipt Dates:**
  - March 8, 2021 for all RFAs
- **Review Dates:**
  - May/June 2021 for all RFAs
- **Advisory Council:**
  - August 2021 for all RFAs
- **Earliest Start Dates:**
  - December 2021 for all RFAs
- **Kickoff Meetings:**
  - SenNet Consortium: November/December 2021 (subject to change)

# The Tissue Mapping Centers



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Tissue Mapping Centers will be expected to integrate and optimize all parts of the data generation pipeline.

They will generate the extensive data from high-content, high-throughput imaging, omics, and other technologies as appropriate, to build, benchmark, standardize, and validate senescent cell maps at high resolution.

Successful applicants are expected to propose and set aside funds for collaborative work with other members of the Consortium

Each Center will be comprised of the following components:

- Administrative Core
- Biospecimen Core
- Biological Analysis Core
- Data Analysis Core

# The Tissue Mapping Centers



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**Administrative Core** – Will coordinate all activities, both within the Center, within the Consortium as a whole, and with NIH staff. In conjunction with CODCC, the core will establish SOPs.

**Biospecimen Core** – Will collect and process high quality tissue samples from human donors and ensure appropriate broad consent forms are obtained.

**Biological Analysis Core** – Will generate high resolution, high content, high-throughput biomolecular data to generate maps of cellular senescence in non-diseased human tissues, organs and organ systems.

**Data Analysis Core** – Will be responsible for data annotation, curation, and analysis. It will utilize the biomarker and map datasets produced by the Biological Analysis Core to produce maps of the tissues of interest, to be delivered to the CODCC.

# The Tissue Mapping Centers (TMC)



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- **Funds Available and Anticipated Number of Awards**

The NIH Common Fund intends to commit \$18M in Total Costs in FY2021 to fund up to 6 awards. Awards are contingent upon NIH appropriations and the submission of sufficiently meritorious applications.

- **Award Budget**

Application budgets are not limited but must reflect the actual needs of the proposed project.

- **Award Project Period**

The scope of the project should determine the project period. The maximum project period is 5 years.

- **Letter of Intent**

Felipe Sierra, PhD  
National Institute on Aging  
Phone: 240.338.9544  
Email: [sierraf@nia.nih.gov](mailto:sierraf@nia.nih.gov)

# The Technology Development and Application



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## Cellular Senescence Network: Technology Development and Application (UG3/UH3 Clinical Trial Not Allowed) **RFA-RM-21-009**

- The purpose of this Funding Opportunity Announcement is to solicit novel analytics and technologies to identify senescent cells in human tissues.
- This FOA supports the accelerated proof-of-principle demonstration and validation of promising tools, techniques and methods that can be integrated, scaled and applied to multiple human tissues.
- The initial two-year UG3 phase will support the development and demonstration of feasibility of these emerging technologies in the identification and mapping of senescent cells in mammalian tissues.
- The subsequent UH3 phase is to support initial validation in human tissues, optimization and scale-up, and generation of production level data.
- Investigators responding to this FOA must submit both UG3 and UH3 projects as part of a single application.
- UG3 projects that have met their quantifiable milestones will be administratively considered by NIH staff and prioritized for transition to the UH3 phase, depending on the availability of funds.



# The Technology Development and Application



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- **Funds Available and Anticipated Number of Awards**

The NIH Common Fund intends to commit \$3.5M Total Costs in FY2021 to fund up to 5 awards. The awards are contingent upon NIH appropriations and the submission of sufficiently meritorious applications.

- **Award Budget**

Application budgets are not limited but must reflect the actual needs of the proposed project. Applications should not exceed \$400,000 in direct costs per year during the UG3 phase & \$550,000 in direct costs/year during the UH3 phase.

- **Award Project Period**

The proposed project period for the UG3 phase may not exceed 2 years and the UH3 phase may not exceed 3 years. The total duration of UG3 and UH3 phases may not exceed 4 years.

# The Consortium Organization and Data Coordination Center (CODCC)



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**Purpose:** This Funding Opportunity Announcement ([RFA-RM-21-010](#)) will support a SenNet Consortium Organization and Data Coordinating Center (CODCC)

The CODCC is the **organizational hub** for SenNet with two areas of responsibility:

- collecting, storing, curating, and disseminating all data, metadata, analysis and visualization tools, computational models, and aggregate data across the Network into a **searchable Atlas of Cellular Senescence** and will do so in alignment with existing single cell data platforms and the Common Fund Data Ecosystem (CFDE)
- coordinating SenNet activities including in-person and virtual **Network Steering Committee meetings and working groups and promoting collaboration and communication** among SenNet Investigators and the broader research community

# The Consortium Organization and Data Coordination Center (CODCC)



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The two components of CODCC responsibility are detailed in the FOA:

## **(1) Data Analysis and Integration:**

- Develop a SenNet Data Portal and Atlas of Cellular Senescence, allowing centralized access and comparative viewing and analysis of all completed tissue-level atlases
- Ensure the database is flexible to manage and integrate multiple data types and that the data are findable accessible, interoperable, and reusable (FAIR)
- Harmonize all workstreams with other single-cell data platforms (HTAN, HuBMAP, and HCA)
- Facilitate data use by the broader scientific community

## **(2) Administrative Core:**

- Provide administrative support for all common activities of the SenNet
- Organize SenNet Steering Committee and cross-consortium working group meetings
- Facilitate interactions with other single-cell atlas research efforts and the Common Fund Data Ecosystem
- Evolve, adapt, and improve during the project period in response to the needs of the SenNet community
- Provide NIH staff with quantitative updates upon request

# The Consortium Organization and Data Coordination Center (CODCC)



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## **Award Information**

Mechanism: U24

Funds: \$3.5M Total Costs per year /5 years

# Awards: 1 award

**Travel Funds:** The budget should include sufficient funds to support travel of CODCC PD(s)/PI(s) at twice yearly SenNet Steering Committee meetings.

The CODCC is responsible for arranging for and supporting travel expenses for up to six external program consultants to in-person Steering Committee meetings.

The CODCC is responsible for arranging for a meeting space(s) to accommodate 50-100 investigators for twice yearly in-person Steering Committee meetings at a non-federal facility in the Bethesda, MD area.

**Leadership Effort Commitment:** The CODCC contact PD/PI must commit and maintain through the life of the award a minimum of 2.4 person-months of effort. For applications with multiple PDs/PIs, a minimum effort of 1.8 person-months is required for the Contact PD/PI and 1.2 person-months of effort per additional PD/PI is required.

## **Letter of Intent**

T. Kevin Howcroft, Ph.D.

National Cancer Institute (NCI)

Telephone: 240-276-6229

Email: [Howcrofk@mail.nih.gov](mailto:Howcrofk@mail.nih.gov)

# Common Fund Data Ecosystem (CFDE)

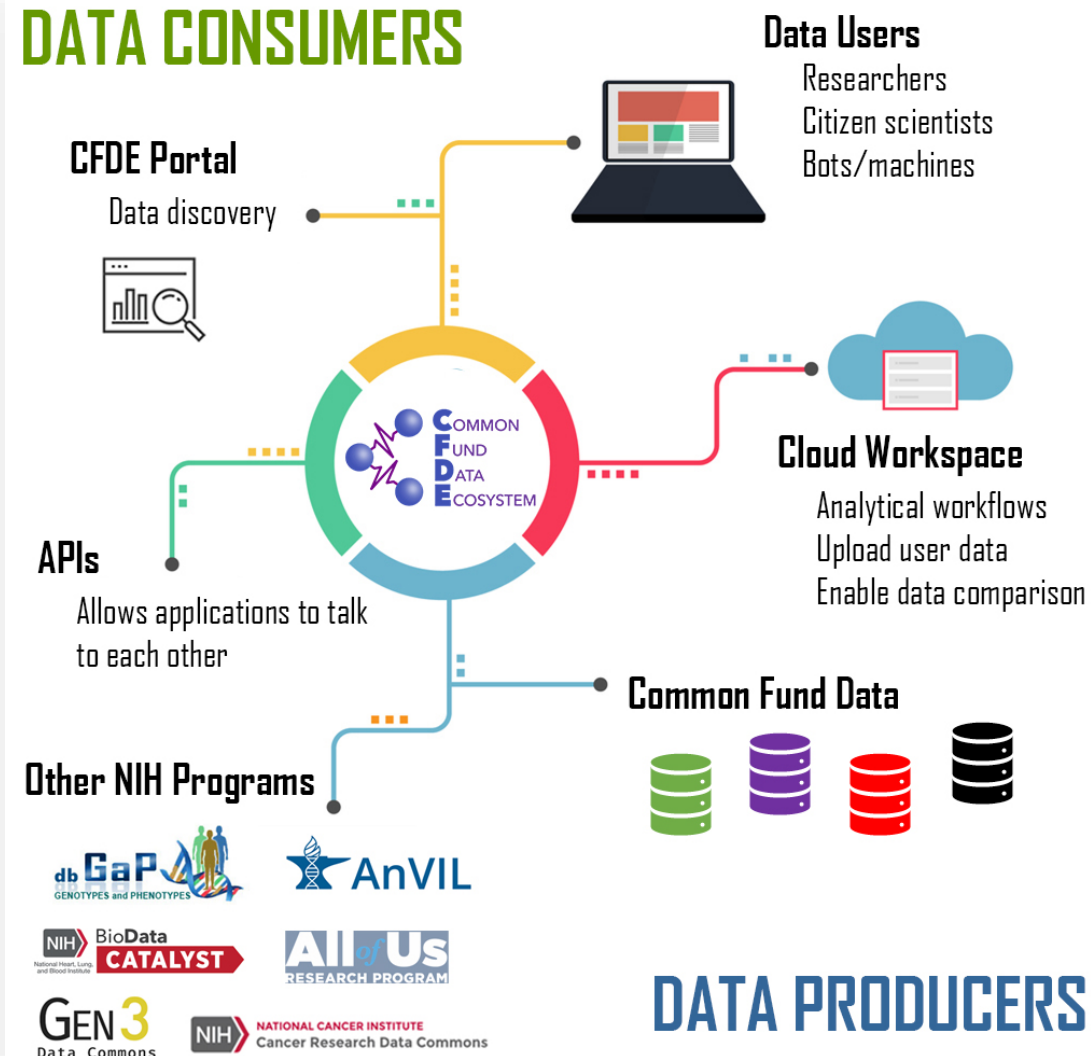


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## Goals

1. **Query** across datasets
2. **Sustain** data and tools
3. **Train** researchers to use data and tools

## DATA CONSUMERS



# CFDE and Common Fund Data Coordinating Centers (DCCs)



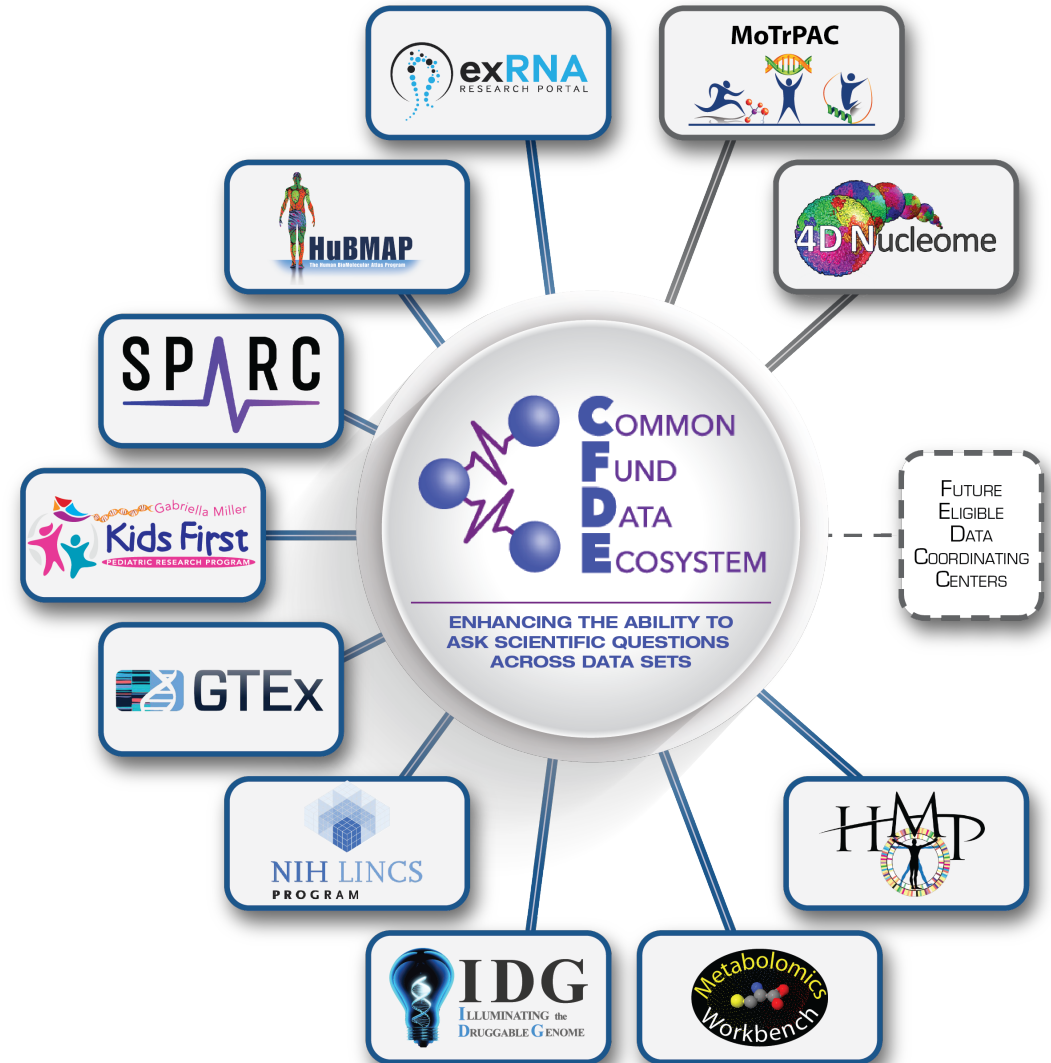
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- **Current status**

- CFDE Coordinating Center
- 8 Common Fund program DCCs are actively engaging with CFDE
- Harmonizing metadata and fostering collaboration among DCCs

- **Points of Contact**

- Chris Kinsinger: [kinsingc@mail.nih.gov](mailto:kinsingc@mail.nih.gov)
- Haluk Resat: [haluk.resat@nih.gov](mailto:haluk.resat@nih.gov)



# STRIDES: Science and Technology Research Infrastructure for Discovery, Experimentation, and Sustainability



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- **STRIDES provides:**
  - Discounted rates on cloud services
  - Access to support & training
- **Common Fund award applicants should:**
  - Include cost estimates for cloud computing needs in their application(s)
  - NIH will use this cost estimate to provide in-kind services from STRIDES if application is funded
  - NIH staff will work with awardees to set up STRIDES accounts

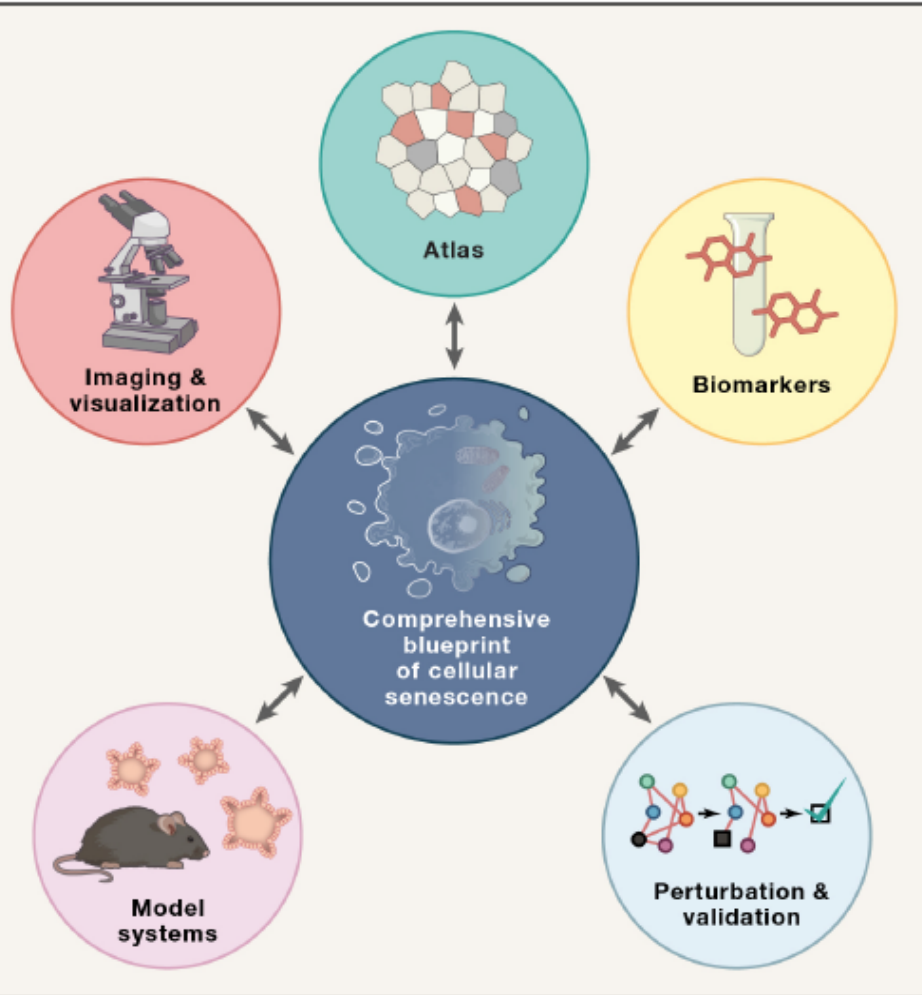


For more information visit:

[commonfund.nih.gov/dataecosystem/faqs](https://commonfund.nih.gov/dataecosystem/faqs)



# Additional Information



A Blueprint for Characterizing Senescence. Roy et al. Cell. 183, 5, 1143-1146. <https://doi.org/10.1016/j.cell.2020.10.032>

## ***Connect with us:***

- General mailbox: [CS2@mail.nih.gov](mailto:CS2@mail.nih.gov)
- Website: <https://commonfund.nih.gov/senescence>
- Center for Scientific Review (CSR) contact: Maqsood Wani, Ph.D. [wanimags@csr.nih.gov](mailto:wanimags@csr.nih.gov)

## ***Frequently Asked Questions:***

<https://commonfund.nih.gov/senescence/foafaqs>

## ***Interested in applying:***

**We strongly recommend you discuss any application with us in advance and that you submit a LOI.**