Cellular Senescence Network (SenNet)

Pre-Application Webinar

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National Institutes of Health
Office of Strategic Coordination–The Common Fund

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Housekeeping



This webinar is being recorded for internal purposes only and will not be made publicly available. Presentation slides and a list of FAQs will be posted at https://commonfund.nih.gov/senescence



The chat feature is disabled, and attendees will be unable to send messages during the webinar.



Please use the Q&A box to submit questions at any time during the webinar. We will respond to questions throughout the session.



Due to limited time, questions with the most upvotes will be prioritized during the Q&A session. If your question is not addressed, please email CS2@nih.gov.



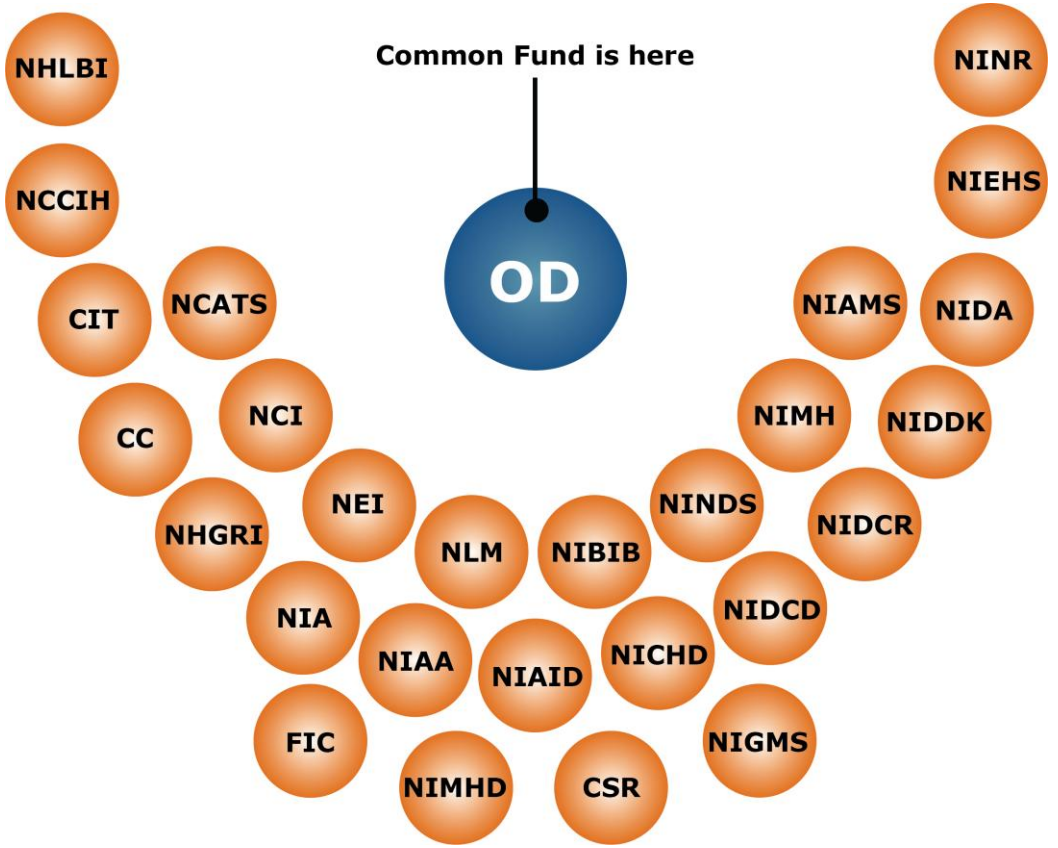
To upvote a question. Attendees can click the **arrow** appearing at the bottom of a published question. Each attendee can upvote a single question once.

Common Fund History

2004: NIH Roadmap is launched

December 9, 2006: Congress unanimously reauthorizes the NIH

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



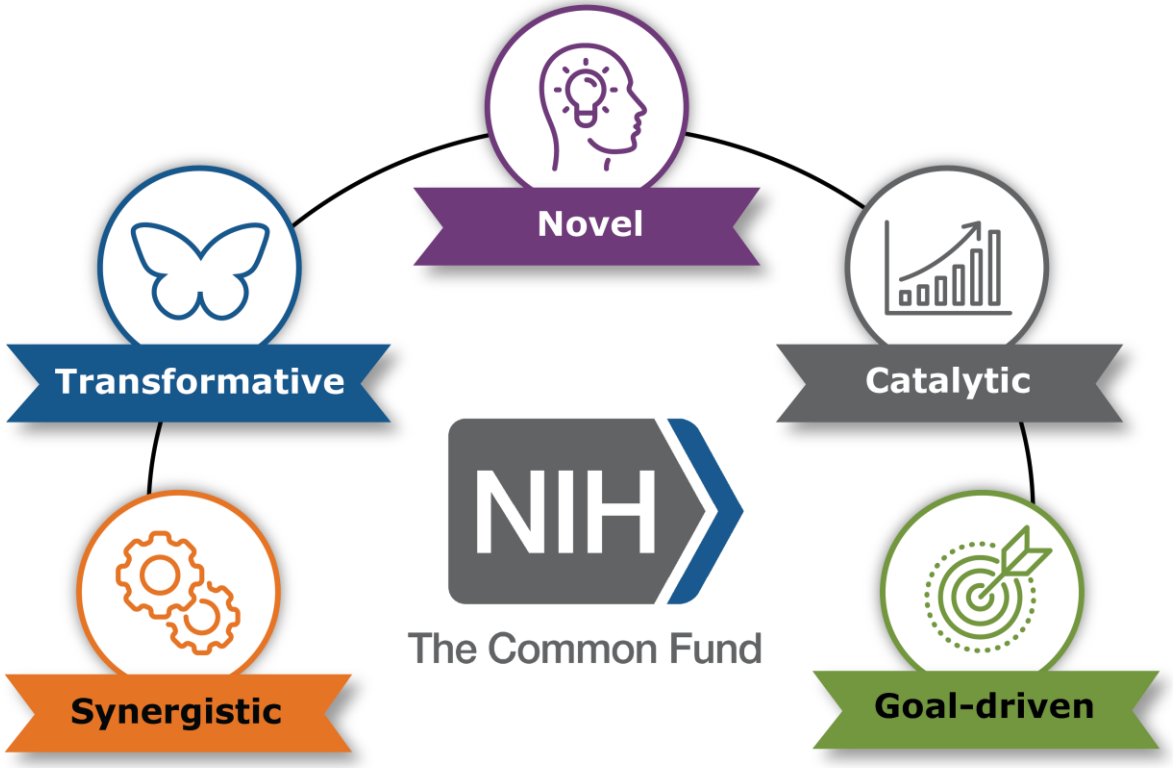
NIH Institutes and Centers

The Common Fund Moves the NIH Mission Forward - Faster

Mission:

Support **bold** scientific programs that **catalyze discovery** across all biomedical and behavioral research

- Advance research important to multiple NIH Institutes/Centers/Offices
- Support research with broad impacts for the research community
- Spur subsequent biomedical advances impossible without an initial investment



COMMON FUND= Uncommon Approaches+ Research+ Solutions

Common Fund-supported Science is Broad and High-impact

Common Fund Programs Have Advanced:



Drug Target Screening



Genome Editing



Mapping Anatomy at the Cellular Level



Diagnosing Rare Diseases



Biomedical Research Training



Studying Rare Cell Types in Aging



Stem Cells to Treat Macular Degeneration



Exercise Research at the Molecular Level



Creating AI-ready Data



Human Microbiome Research



Clinical Trial Design

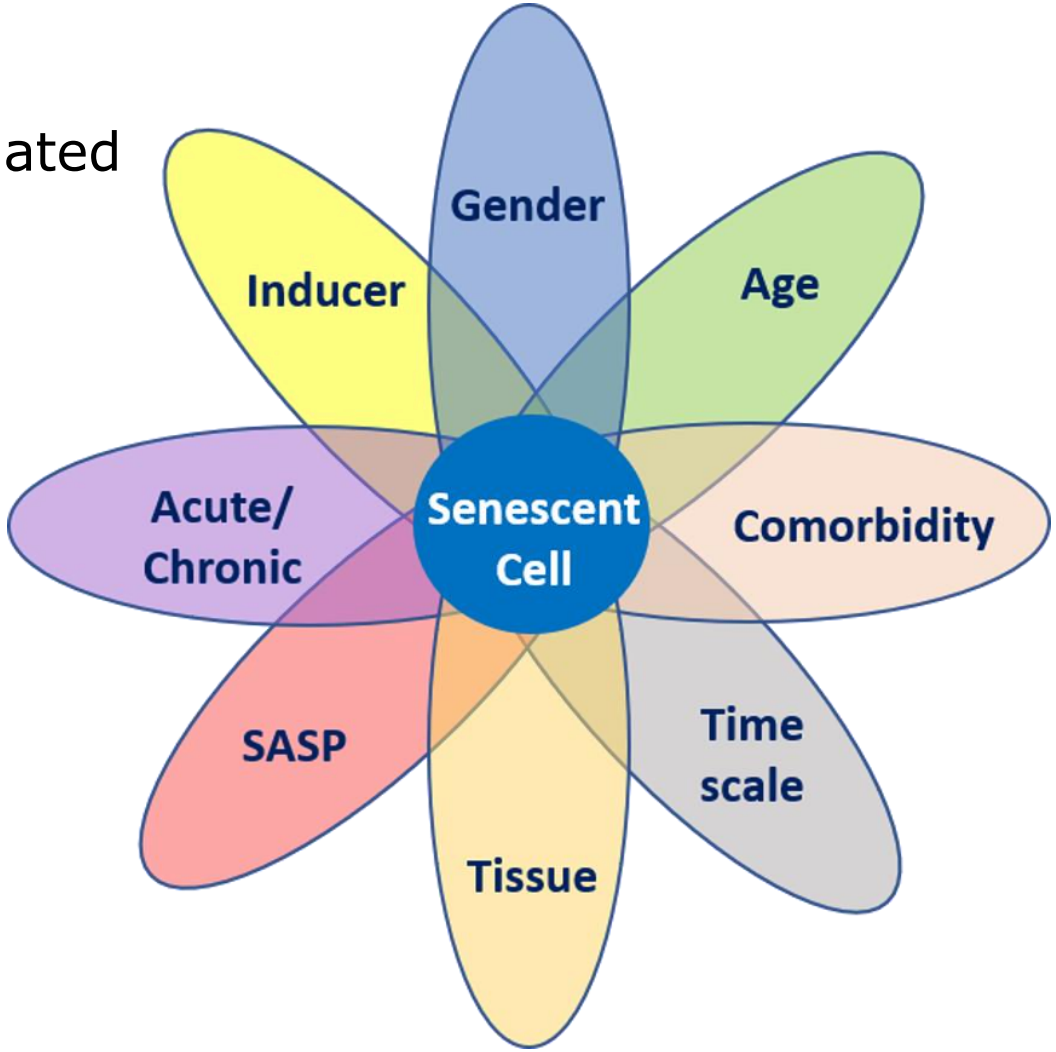


Biomarkers for Chronic Pain

Cellular Senescence Network (SenNet): Stage 2 Context

Senescence is a durable cell-cycle arrest, often accompanied by a heterogeneous senescence-associated secretory phenotype (SASP).

- **Senescent cells (SnCs)** perform tumor suppression and tissue repair functions but can accumulate with age and contribute to age-associated disease.
- **SenNet Stage 1** established extensive SnC heterogeneity in healthy aging and the need to define senescent cells using a set of markers ("senotypes") rather than single traditional marker.
- **SenNet Stage 2** will build on those resources to study biological consequences in health and disease conditions.



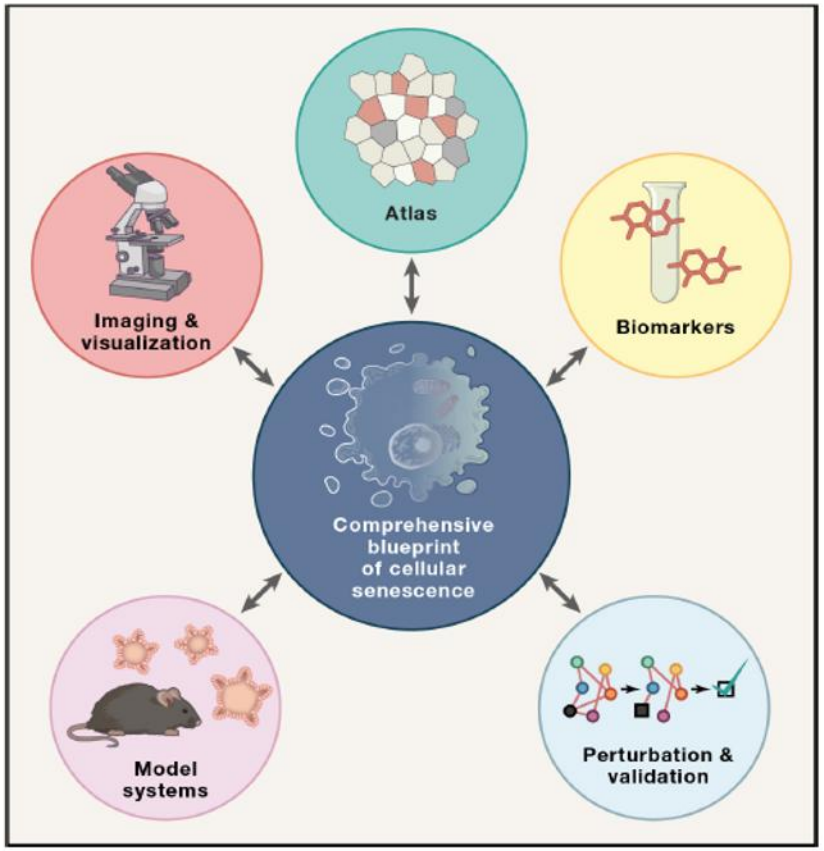
SenNet Stage 2 Vision and Objectives

Vision

Understand the biological consequences of heterogeneous senescent cells in health and disease and enable improved strategies for studying and modulating SnCs *in vivo*.

Objectives

- **Define and validate** relevant senotypes and biomarkers in health and disease
- **Advance** preclinical models and innovative senescence technologies.
- **Integrate** Stage 1 and Stage 2 outputs into public, curated Senescence Atlases.



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)
Stage 2 Initiatives

Initiative 1: Discovery and Validation Centers (DVCs)

- Define, refine, and validate tissue- and disease-relevant senotypes and biomarkers; advance preclinical models; generate primary molecular, cellular, and spatial data.

NOFO: RFA-RM-27-016 (UM1)

Initiative 2: Data Coordination and Integration Center (DCIC)

- Ingest, harmonize, integrate, and disseminate consortium data; maintain the public portal; curate searchable Senescence Atlases and analytical tools.

NOFO: RFA-RM-27-025 (UM1)

Initiative 3: Senescence Technology Projects (SenTecs)

- Develop or adapt innovative technologies and multiscale models to characterize SnCs and predict outcomes of modulating them *in vivo*.

NOFO: RFA-RM-27-007 (UG3/UH3)

Key Points for All SenNet Stage 2 NOFOs

- **Cooperative agreements:** substantial NIH programmatic involvement and active consortium participation are expected.
- **Milestones:** annual quantitative milestones are required; SenTecs also require 6-month UG3 milestones and a transition from UG3 to UH3 is not automatic.
- **Sharing and interoperability:** data, metadata, software, models, tools, and atlases must be shared rapidly under NIH and consortium standards; a DMS Plan is required.
- **SOOC requirement:** every DVC and DCIC application must include a complete SenNet Organization and Outreach Component; only one SOOC will be funded.
- **Set-asides differ by initiative:** DVC/DCIC applications set aside approximately 10% of total budget beginning in Year 2 for cross-consortium validation; SenTecs set aside approximately 10% of the UH3 Year 5 budget for approved collaborative demonstration project.
- **Adaptability:** awardees must be prepared to adopt consortium-wide standards and adjust workflows or deliverables as program needs evolve.

Administrative Details for All Stage 2 NOFOs

- **Mechanisms and trial status:** UM1 (DVC/DCIC) and UG3/UH3 (SenTecs); clinical trials are not allowed, although non-trial human-subjects research may be proposed.
- **Application type:** New. Applicant organizations may submit more than one application if each is scientifically distinct.
- **Letters of Intent:** not requested or accepted.
- **Foreign involvement:** foreign organizations and non-U.S. components are ineligible; foreign components are not allowed; funded foreign subawards/subcontracts are noncompliant.
- **DVC/DCIC application structure:** Multi-component application; Research strategy page limits: Elements A/B/C/D: 5/10/10/5 pages. PD/PI minimum effort is 2.4 calendar months; Element Leaders require 1.5 months per Element.
- **SenTec application structure:** 12-page Research Strategy; separate UG3 and UH3 Specific Aims; required Intellectual Property Strategy attachment (maximum 3 pages; see Section IV of NOFO).
- **Review:** CSR-convened scientific review groups; requests for reconsideration/appeals of initial peer review will not be accepted.

SenNet Important Dates (All Stage 2 NOFOs)

- **Earliest Submission Date:** October 23, 2026
- **Application Due Date:** November 23, 2026, by 5:00 PM local time of the applicant organization
- **Scientific Merit Review:** March 2027
- **Advisory Council Review:** May 2027
- **Earliest Start Date:** July 2027

Discovery and Validation Centers (DVCs)

- **Scientific focus:** at least two diseased tissues or organs; define, refine, and validate disease-relevant senotypes and biomarkers and investigate their functional consequences.
- **Models and validation:** use complementary preclinical systems, perturbation studies, and advanced imaging; validate cellular consequences in human specimens.
- **Core deliverables:** high-throughput pipelines using at least two core assay types, integrated 2D/3D spatial maps, and FAIR data/metadata submission to the DCIC.
- **Required Elements:** A) Vision and Management; B) Preclinical Modeling, Validation, and Data Analysis; C) Biospecimen Management, High-Resolution Assays, and Data Analysis; D) SOOC.
- **Award information:** approximately $3 million in direct costs per year; 5-6 DVC awards anticipated; maximum project period 5 years.
- **Human biospecimens:** broad future research use and data-sharing consent is strongly encouraged; restrictive consent plans are a negative review feature.
- **Responsiveness boundary:** mechanism-only basic research without generating or validating biomarkers and senotypes is non-responsive. Active development of senotherapeutics is not a SenNet goal.

Data Coordination and Integration Center (DCIC)

- **Role:** the data and informatics backbone of SenNet, with deep expertise in senescence biology, preclinical validation, and high-throughput spatial assays.
- **Data standards and pipelines:** develop consortium-wide formats, metadata, provenance, QC, submission, processing, and public-release workflows tailored to DVC and SenTec outputs.
- **Stage 1 continuity and integration:** maintain uninterrupted access to Stage 1 data and maps and integrate healthy Stage 1 datasets with healthy & diseased Stage 2 data.
- **Public portal and Atlases:** searchable 2D/3D maps, tissue-specific Senescence Atlases, APIs, analysis/visualization tools, tutorials, hackathons, and usage metrics.
- **Controlled-access data:** securely process and deposit Genomic Data Sharing (GDS) or Electronic Health Record (EHR) derived sensitive data in an NIH-designated repository; do not offer it for public download through the portal.
- **Required Elements:** A) Vision and Management; B) SenNet Stage 1 Data; C) Consortium Data Portal and Webpages; D) SOOC.
- **Award information:** 1 DCIC award; approximately $3 million in direct costs per year; maximum project period 5 years. Work closely with CFDE.

Senescence Technology Projects (SenTecs)

- **Purpose:** develop or adapt innovative technologies grounded in senescence biology to identify, characterize, model, or predict the consequences of SnC heterogeneity in human systems.
- **UG3 phase (Years 1-2):** proof-of-principle and feasibility, guided by 6-month quantitative milestones. Transition to UH3 is not automatic and requires administrative review, a transition application, and available funds.
- **UH3 phase (Years 3-5):** optimize, scale, refine, and validate the SenTec in multiple human tissues; generate production-level data; complete a final-year collaborative demonstration project.
- **Technology scope:** examples include spatial lipidomic/proteomic/metabolomic approaches, multiscale models, AI/ML, genomic/epigenomic tools, and multimodal imaging or analysis methods.
- **Human relevance and scalability:** propose a proof-of-principle organ/tissue, inform human outcomes, and ideally support more than one human tissue or organ.
- **Award information:** up to 9 awards anticipated in the current draft; $400,000 direct costs/year in UG3 and $550,000 direct costs/year in UH3; maximum 5 years.
- **Responsiveness boundary:** applications without a clear senescence-biology focus, or applications solely proposing single-cell transcriptomic technologies, are non-responsive.

SenNet Organization and Outreach Component (SOOC)

Selection and application

- Every DVC and DCIC application must include a complete SOOC proposal as Element D (up to 5 pages).
- **An application that omits the SOOC is incomplete.**
- **NIH will fund only one SOOC across all DVC and DCIC awards.**

Budget and educational set-aside

- **Request exactly $600,000 per year in direct costs for the SOOC.**
- Dedicate 40-45% of the SOOC budget each year to educational programs.
- Educational activities include junior-investigator fellowships and summer undergraduate research internships among others.

Core functions

- Consortium organizational logistics, communication tools, Steering Committee, and Working Group support.
- Annual and virtual All-Hands meetings, outreach, and implementation of consortium policies.
- Budget travel/lodging and logistical support for program consultants and consortium meetings.
- Specific yearly milestones and quantitative metrics for consortium administration are required.

Strategic Considerations - Scope and Responsiveness

DVCs

- Center the work on at least two diseased tissues or organs and explicitly balance deep biological investigation with generation of a broadly usable community resource.
- Mechanism-only projects without biomarker/senotype generation or validation are non-responsive; active development of senotherapeutics is not a goal.

DCIC

- Maintain uninterrupted Stage 1 access, integrate healthy Stage 1 with diseased Stage 2 data, and build standards and pipelines around DVC and SenTec outputs.

SenTecs

- Address an unmet senescence-research need, inform human systems and outcomes, and ideally apply to more than one human tissue; projects solely proposing single-cell transcriptomics are non-responsive.

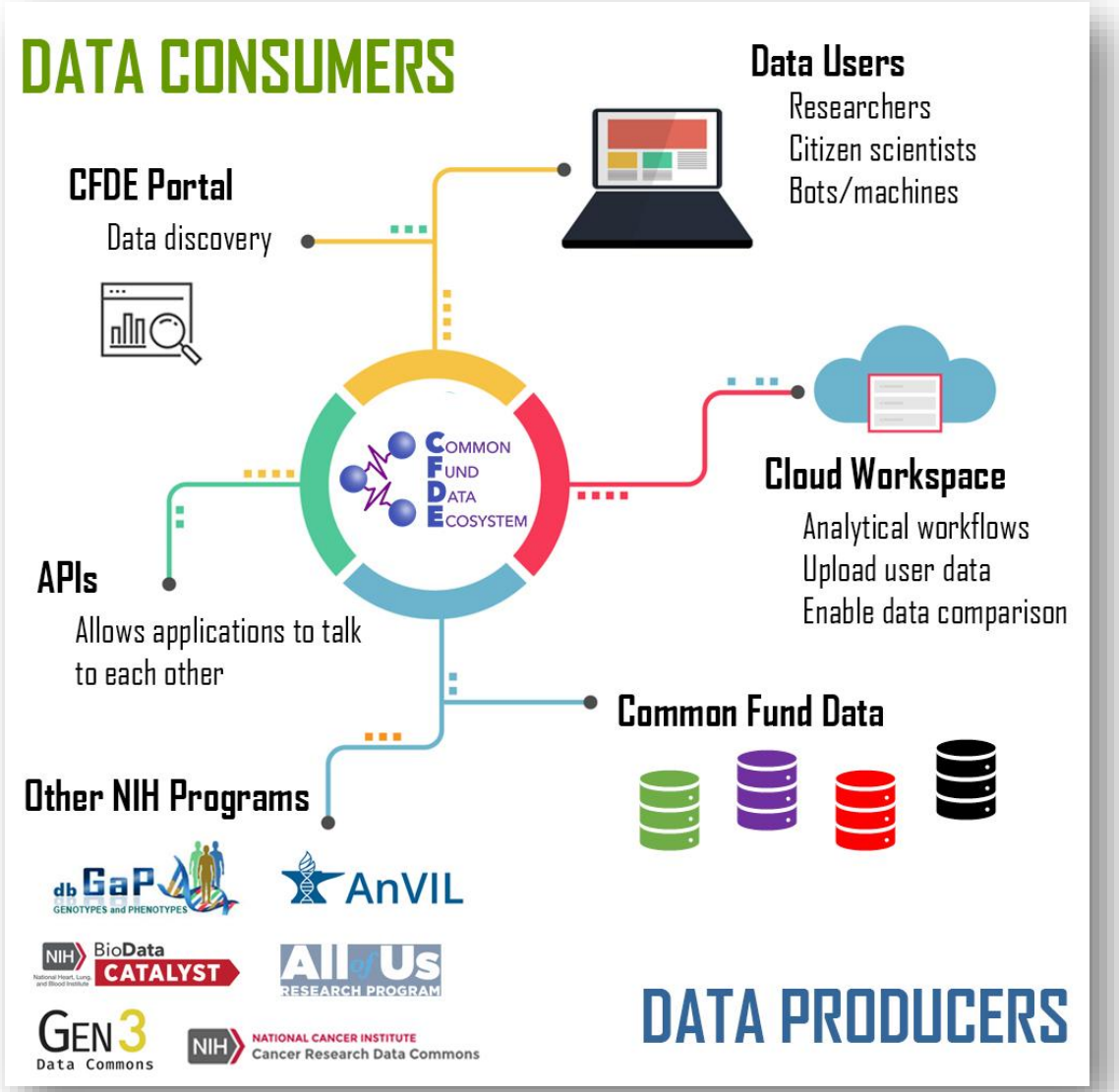
Strategic Considerations - Models, Human Relevance, and Data

- **DVC model strategy:** human *ex vivo* systems, improved animal models, microphysiological systems, and virtual organs may support discovery and validation; key cellular consequences should be validated in human specimens.
- **SenTec progression:** nonhuman proof-of-principle may be used in UG3, but UH3 should optimize, scale, and validate in multiple human tissues and generate production-level data.
- **Human biospecimen consent:** DVC consent should support broad future research use and data sharing; restrictive consent is a negative review feature.
- **Open versus controlled access:** sensitive Genomic Data Sharing- or EHR-derived data must be segregated from open data and deposited in an NIH-designated controlled-access repository.
- **Consortium resource generation:** data, metadata, tools, software, models, and atlases should be rapidly shared, interoperable, reusable, and ready for integration by the DCIC.

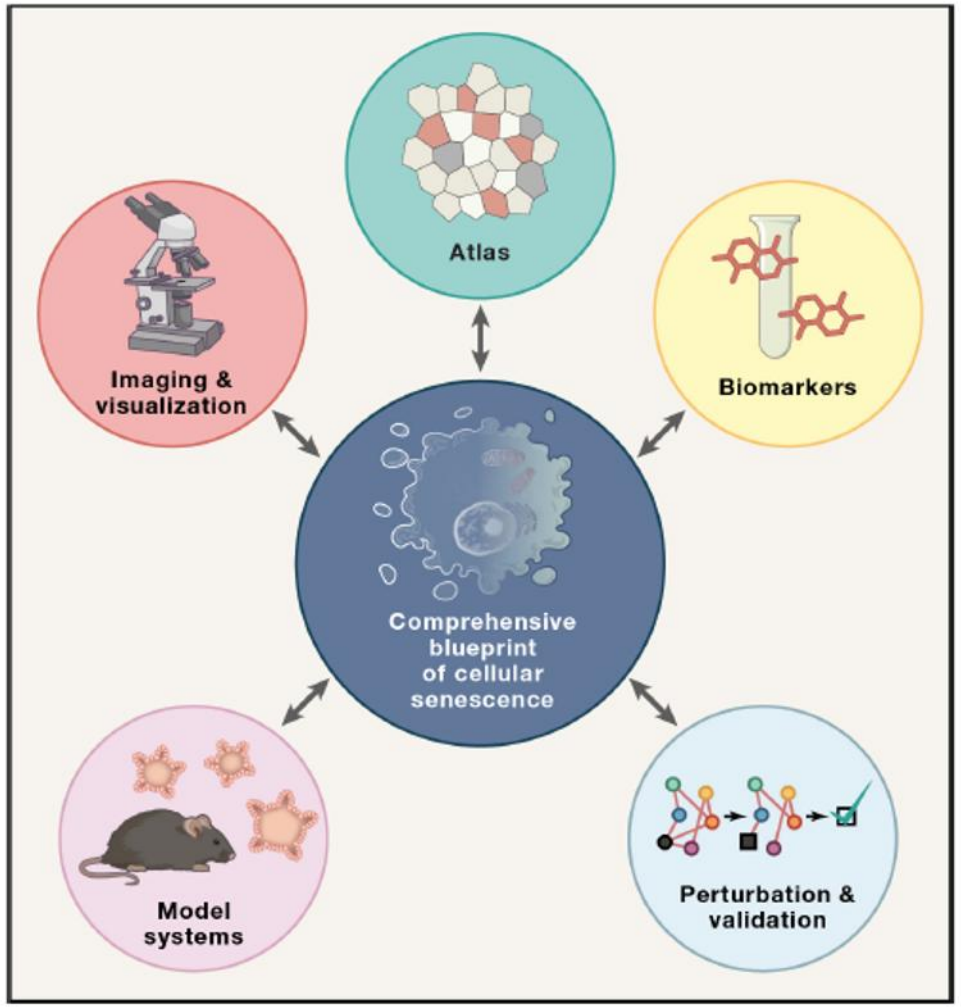
Common Fund Data Ecosystem (CFDE)

How CFDE supports SenNet

- Make diverse Common Fund data and digital objects usable within and across programs.
- Promote interoperability, reuse, sustainability, and broader scientific impact.
- SenNet awardees should coordinate with the DCIC and leverage CFDE technologies and infrastructure where feasible.
- Stage 2 data standards, metadata, and public resources should support cross-program discovery and reuse.



Additional Information



Connect with us

- **General and scientific inquiries:** CS2@nih.gov
- **NIH Common Fund SenNet website:** https://commonfund.nih.gov/senescence
- **SenNet consortium resources:** https://sennetconsortium.org/
- **Stage 1 data portal:** https://data.sennetconsortium.org/
- **Peer review contact:** NOFOReviewContact@csr.nih.gov
- Participation in the pre-application webinar is not required to apply.
- **NIH encourages inquiries concerning these funding opportunities and welcomes questions from prospective applicants.**

Q&A Session



Please use the Q&A box to submit questions.



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