



CHAN
ZUCKERBERG
INITIATIVE

Request for Applications: Pilot Projects for a Human Cell Atlas

This RFA is now closed.

The Chan Zuckerberg Initiative invites applications for one year pilot projects to develop technologies for the Human Cell Atlas (HCA), establish best practices in the field, and begin a common data archive for analysis and investigation.

OPPORTUNITY

Overview

The goal of the International Human Cell Atlas project is to create a reference atlas of all cells in the healthy human body as a resource for studies of health and disease. As part of this effort, the Chan Zuckerberg Initiative seeks applications to support the Human Cell Atlas community's convergence around standards, protocols, and best practices for the creation of a freely and openly available reference database of healthy human cells and tissues.

Project Specifications

We expect the reference Cell Atlas to ultimately include a variety of data types, including single-cell RNA sequencing, in situ hybridization imaging, proteomics, metabolomics, epigenetic information, low- and high-resolution images of biological samples, and more. For the initial phases of the project, we are especially interested in groups that can help evaluate protocols and best practices for the collection of single-cell molecular data, ideally by directly comparing multiple approaches to tissue preparation, data generation, or data analysis.

Example pilot project goals might include, but are not limited to:

- Systematic comparisons of tissue preparation and preservation, sample handling, and cell dissociation approaches for a variety of human tissues and organs.
- Systematic comparisons of sequencing technologies, protocols, and resulting datasets.
- Evaluation of experimental replicability, including comparing different experimental procedures within the same lab, and similar procedures across labs.

- Comparison of image-based approaches, such as single-molecule fluorescent in situ hybridization imaging (smFISH), with sequencing-based approaches.
- Comparison of different multiplexing strategies for image-based approaches.
- Evaluating suitability of experimental strategies to different computational pipelines.
- Evaluation of biological replicability depending on donor age, sex, or tissue type.
- Evaluation of multiple tissues from one individual, compared to different individuals.
- Generation of new benchmark or validation datasets.

We are primarily interested in assembling a broad and biologically compelling set of human tissues for the reference atlas, but in this pilot phase, we will also consider proposals for obtaining data from cell lines, organoids, or non-human animals.

Project Requirements

As a method of accelerating scientific discovery, the Chan Zuckerberg Initiative supports a consent, sharing, and publication policy for open and rapid dissemination of research results.

All human tissue for the reference atlas must be fully consented upon collection to enable open sharing of the resulting data in accordance with laws and regulatory requirements. Appropriate documentation of consents will be required prior to an award for this pilot project RFA, but is not required for the initial stage of the application process. Preservation of tissue for replication or future experiments is strongly encouraged where possible.

Any code developed in support of this work must be made publicly available on appropriate code sharing sites (e.g. GitHub) and released under a permissive open-source license (MIT, Simplified BSD, ISC, or similar), and at a minimum, any analysis packages must be released through the appropriate language-specific package manager (e.g. PyPi for Python, CRAN for R) with documentation and example data.

Any publications related to this work must be submitted to a preprint server such as bioRxiv at or before the time of first submission to a journal.

For HCA pilot projects funded by the Chan Zuckerberg Initiative, indirect costs are limited to 15% of direct costs. Indirect costs may not be assessed on capital equipment or subcontracts, but subcontractors may include up to 15% indirect costs of their direct costs.

Data Coordination

A data coordination plan, developed jointly by the HCA Consortium and partner institutions, will determine how data is ingested, processed, and shared. Complete details will be provided in an official data coordination document; key points are emphasized below.

All raw experimental data (e.g. FASTQ files for sequencing data) and comprehensive metadata must be submitted in a timely fashion, and prior to publication, to a common authenticated data ingestion service, either directly through the official Human Cell Atlas web portal or through a registered data broker. Upload will be made possible through a variety of mechanisms, including web-based UIs, spreadsheet templates, or direct posting via APIs (for bulk uploads or integration with lab systems). Data should be deposited at least quarterly, and ideally no later than one month after acquisition.

The HCA Consortium will govern format specifications and validation, including basic quality assurance. These requirements will be described in publicly-accessible documents, and the relevant code will be available in public repositories (e.g. on Github). All validation required by the data ingestion service will be made available in the form of tools that can be run locally prior to data upload.

After upload, data will be deposited into a primary data store and synced across multiple public cloud repositories. One or more secondary analysis pipelines (e.g. alignment for sequencing data) will be run on all submitted data, generating intermediate results (e.g. BAM files, gene-cell tables) and quality control metrics for depositing into the same data store with appropriate metadata and analysis provenance. Where necessary, different pipelines will be made available for different data types and sequencing approaches. All code for these secondary analysis pipelines will be open-source (e.g. MIT licensed), available in public code repositories, and provided in a form that is easy for labs to reproduce locally or in the cloud (e.g. with containerization).

Raw data, metadata, and derived results in the data store will be freely and openly available to any and all downstream users. This architecture will support the development of a rich ecosystem of linked tools for analysis, visualization, and complex queries, which will in turn be available to all researchers.

ELIGIBILITY

All applicants must hold a PhD, MD, or equivalent degree and have a faculty position or equivalent independent investigator status at a college, university, medical school, or other research facility. Applications may be submitted by scientists at domestic and foreign non-profit and for-profit organizations; public and private institutions, such as colleges, universities, hospitals, laboratories, units of state and local government, companies, and eligible agencies of the federal government. Projects including any activities in Office of Foreign Asset Control (OFAC) sanctioned countries (<https://www.treasury.gov/resource-center/sanctions/Programs/Pages/Programs.aspx>) are not eligible to apply. Facebook employees, including employees of any subsidiary Facebook entities, are not permitted to apply for this grant. We encourage applications from women, underrepresented minorities, and early career scientists.

APPLICATION PROCESS

Key Dates

3/15/17: Application portal is open for registrations and applications.

4/17/17: Applications due by 5:00 PM PT.

6/15/17: Earliest notification of decisions (subject to change).

8/1/17: Earliest start date of pilot project (subject to change).

Award period and start date: Proposed pilot projects should be one year in duration with a projected start date of no earlier than August 1, 2017. Actual start date may vary.

Registration

Prospective applicants must first register through the Chan Zuckerberg Initiative's online grants management portal (Fluxx) at <https://chanzuckerberg.fluxx.io/> . If your registration is approved, you will

receive login credentials to the portal within two business days. This notification will be sent to you as an automated email from the Fluxx system. Please consider that these emails may end up in your spam filter. All applications must be submitted through Fluxx, so timely registration is a must. For more information, please see the detailed application instructions (<https://chanzuckerberg.com/initiatives/rfa/instructions/>) .

Application Requirements

All applications must be completed and submitted through the Chan Zuckerberg Initiative's online grants management portal at (<https://chanzuckerberg.fluxx.io/>). It is recommended that you familiarize yourself with this portal well in advance of any deadlines.

- The application must include the following components:
- Proposed title.
- Project Summary (approximately 250 words; 1,750 characters maximum including punctuation and spaces).
- Full citations and PubMed links for up to five of your most significant publications relevant to the proposal.
- Proposal (1,600 words maximum for text and one page maximum for figures), organized as follows:
 1. Summary.
 2. Project aims, and how they address program goals.
 3. Experimental plan and deliverables.
 4. Prior contributions in this area and preliminary results (not required).
 5. Description of commitment to full sharing of primary data, metadata, methods, and software.
- References cited (no page limit).
- Biosketch (five pages maximum; NIH format or equivalent).
- Brief preliminary budget (one page maximum): Application budgets must reflect the actual needs of the proposed project. The Chan Zuckerberg Initiative will work closely with successful applicants to arrive at a suitable budget after review.

The proposal, references cited, biosketch, and brief preliminary budget and must be uploaded in PDF format. All text in these documents must be in Arial 11 point font and no less than single spaced.

The formatting and component requirements, including word and page limits indicated above, will be enforced by the review team. Any submitted materials that exceed the word and page limits or do not follow the requirements will not be considered during the application review process.

Please note that this application is considered a pre-proposal. For successful applications, we will request additional materials, co-signed by your institutional officials, to determine final budget and administrative details of the award. The Chan Zuckerberg Initiative does not require institutional sign-off at this stage of the application process, but we strongly suggest that you consult your home institution to determine your eligibility to apply for this grant and your institutional policy on indirect costs.

Detailed application instructions are available on the Chan Zuckerberg Initiative website (<https://chanzuckerberg.com/initiatives/rfa/instructions/>), as well as in the grants management portal following registration.

REVIEW

The Chan Zuckerberg Initiative will evaluate all applications for scientific and technical merit and will seek independent expert review of applications. Applications will be reviewed based on the qualifications of the applicant; the strength, scope, and feasibility of the project; the alignment of the project with the goal of developing standards, protocols, and best practices; and the applicant's demonstrated commitment to collaboration and data sharing.

There is no expectation of any specific number of awards, and the Chan Zuckerberg Initiative reserves the right to not fund any applications.

CONFIDENTIALITY

All submitted applications will be kept confidential to the greatest extent possible, except as necessary for processing and evaluation. Following the conclusion of the RFA process, the Chan Zuckerberg Initiative will retain one copy of all applications, and any additional copies made for the purpose of review will be destroyed. Application materials will not be returned to applicants.

REPORTING

For awarded projects, financial statements and progress reports will be due at the conclusion of the grant year. Specific deliverable requirements will be outlined in the award notification. Investigators will be required to attend a one-day in-person meeting during the one-year period of the grant. Requests for no-cost extensions will be considered.

RFA CONTACT

For administrative and programmatic inquiries, technical assistance, or other questions pertaining to this RFA, please contact sciencegrants@chanzuckerberg.com.