The Human BioMolecular Atlas Program (HuBMAP)

Pre-Application Webinar

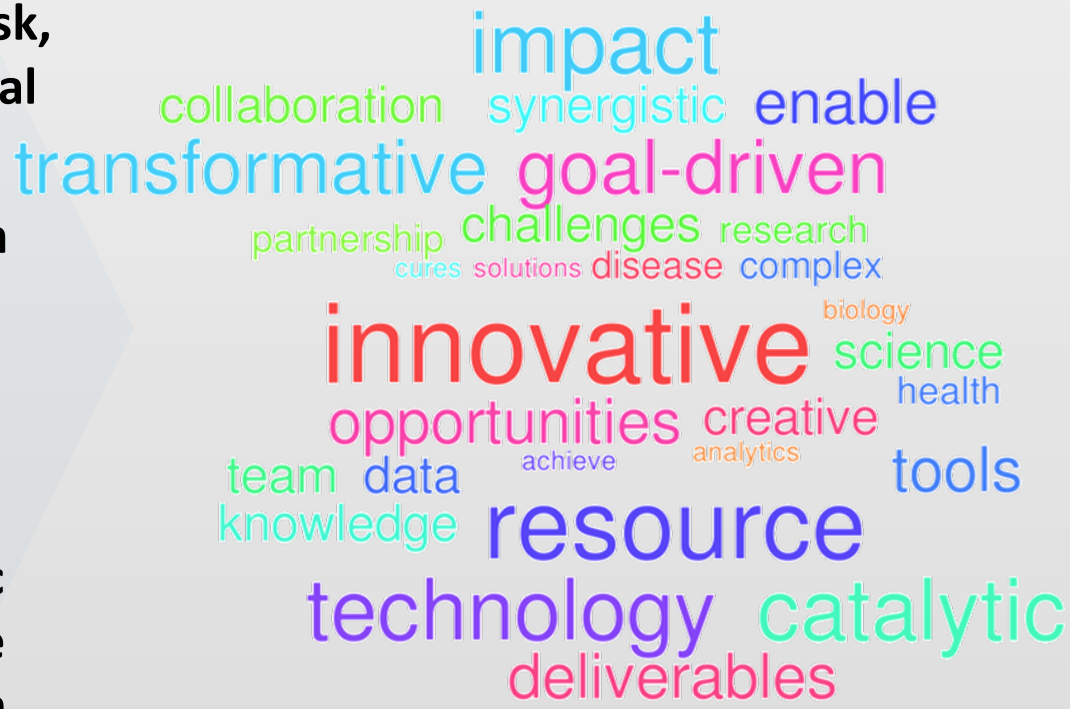
January 13th 2020, 1:00 - 2:00PM EST

To submit questions during the webinar please use the Q&A box. We will address questions at the end of the presentation. Following the webinar, questions can be sent to HuBMAP@mail.nih.gov

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

What is the NIH Common Fund?

- **Supports a set of trans-NIH scientific programs;**
- **“Venture capital” space for high-risk, innovative endeavors with potential for extraordinary impact;**
- **Short-term (5-10 year), goal-driven programs focused on developing specific deliverables (data, tools, technologies, etc.) to catalyze research;**
- **Managed by the Office of Strategic Coordination within the NIH Office of the Director, in partnership with the NIH Institutes and Centers.**



Common Fund programs are intended to benefit the entire biomedical research community

The Human BioMolecular Atlas Program (HuBMAP)

Vision: Catalyze development of an open, global framework for comprehensively mapping the human body at a cellular resolution

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HuBMAP Goals

1. **Accelerate the development of the next generation of tools and techniques for constructing high resolution spatial tissue maps**
2. **Generate foundational 3D tissue maps**
3. **Establish an open data platform**
4. **Coordinate and collaborate with other funding agencies, programs, and the biomedical research community**
5. **Support projects that demonstrate the value of the resources developed by the program**

What makes HuBMAP unique?

- Focus: comprehensive 3D single cell-level maps (multimodal, multi-scale, intra- and extra-cellular) of several normal human tissues; not a survey and not all tissues
- Outcome: relationship between tissue organization and function (functional measures, functional units, network analysis)
- To understand: inter-individual variability, changes across the lifespan (CCF to integrate data into common maps)

Nature 2019: **574**, 187–192

https://www.nature.com/articles/s41586-019-1629-x

In FY18, 1x Infrastructure, 2x Tools & 2x Mapping awards.

In FY18, 5x U54 Centers funded for 4 years. **In FY20 an additional ~4-6 Centers.**

Tissue Mapping Centers (TMC)

The HIVE (HuBMAP Integration Visualization & Engagement Center)

Transformative Technology Development (TTD)

In FY18, 1x Engagement and Collaboration award.

In FY18, 4x UG3 / UH3 phased awards for 2+2 years. **In FY20 an additional ~3-5 projects.**

Research Community

Rapid Technology Implementation (RTI)

Demonstration Projects

In FY19, 4 UH3 awards to rapidly integrate new technologies.

Will come later in the program

FY18 TMC & TTD Awards

	Tissue	Imaging		Sequencing		Mass Spectromtery			Other
		RNA	Proteins	DNA	RNA	Proteins	Lipids	Metabolites	
Tissue Mapping Center (TMC)									
Atkinson, Nick (UF) Bodenmiller (Zurich)	Spleen, Thymus	smFISH, MERFISH	IHC / IF		scRNAseq	IMC			
Cai (Caltech) Shendure, Trapnell (UW)	Vasculature	seqFISH		scATACseq	scRNAseq				
Caprioli, Spraggins (Vanderbilt)	Kidney		IHC / IF			MALDI, LC-MS/MS			Acid-shift, AF
Snyder, Nolan (Stanford)	Colon		CODEX	scATACseq	scRNAseq				
Zhang, Hagood, Sun (UCSD) Jain (WU) Kharchenko (Harvard)	Lung, Kidney	DART-FISH	DART-FISHrp	scTHSseq, SNARE-seq	snDropseq				
Transformative Technology Development (TTD)									
Cai (Caltech) Yuan (Harvard)	Breast	seqFISH							
Harbury, Desai (Stanford)	Lung	LRET-ISH	LRET-IF						
Laskin (Purdue)	Lung					nano-POTS	nano-DESI	nano-POTS	
Yin (Harvard)	Tonsil	PER-DEI	SABER						

Further details of all awards here: https://commonfund.nih.gov/hubmap/fundedresearch

RFA-RM-20-001 Transformative Technology Development for HuBMAP (UG3/UH3)

https://grants.nih.gov/grants/guide/rfa-files/RFA-RM-20-001.html

Pothur Srinivas (NHLBI)

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Transformative Technology Development (TTD)

- **Objective**: Accelerate proof-of-principle demonstration and validation of promising tools, techniques, and systems that can be integrated, scaled and applied to multiple human tissues, particularly for characterizing functional modifications, lipids, and the extracellular environment
- **Period**: UG3 (up to 2 years) / UH3 (up to 2 years)
- **Budget**: 5 awards, UG3: <$250k DC / year; UH3: <$400k DC / year

Phased cooperative agreement [12 page research strategy]:

- **UG3 Phase:** Developing tech and demonstrating proof of principle in mammalian tissue.
- **Transition to UH3:** Compelling results from *in situ* analysis, unique capabilities, programmatic priority; significant attrition expected
- **UH3 Phase:** Scale-up, optimization, and validation for multiple human tissues.

Transformative Technology Development (TTD)

Programmatic priorities:

- High-resolution, high-content, high-throughput biomolecular assays
- Distinct but synergistic technologies with those currently used by the Consortium
- Characterization of the extracellular environment, functional modifications of proteins and RNA, or lipids at the single-cell level

Non-responsive projects:

- Primarily focused on the pursuit of a biological mechanism
- Technologies that cannot be easily scaled for comprehensive analysis of multiple human tissues or that cannot be multiplexed with other assays
- Proposing to primarily study bodily fluids, dissociated cells, diseased tissue
- Published results demonstrating proof-of-principle in mammalian tissues

RFA-RM-20-002
Tissue Mapping Centers for HuBMAP (U54)

https://grants.nih.gov/grants/guide/rfa-files/rfa-rm-20-002.html

Zorina Galis (NHLBI)

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Tissue Mapping Centers (TMC)

- **Objective**: Generate high-resolution, multi-parameter, 3D biomolecular maps of non-diseased human organs and organ systems.
- **Period**: Up to 4 years
- **Budget**: 4-6 awards, $4M Total in FY20-21, increases to $8M in FY22-23. At least one center focused on: 1) complete organs, 2) multiple organs from same donor, 3) analysis of rare, dynamic, or motile cell types and their microenvironments.

Multi-component cooperative agreements:

- **Coordination Core (CC)** responsible for general TMC admin duties and for coordinating activities and sharing expertise and resources [6 pages]
- **Data Analysis Core (DAC)** responsible for data annotation, curation, and analysis [6 pages]
- **Organ-Specific Projects (OSPs)** responsible for generating high quality tissue maps using multiple assays for one organ or component of an organ system. A Center can propose up to four OSPs, with each focused on a separate organ [12 pages each]

Cores and projects should be synergistic with overall vision [6 pages]

Tissue Mapping Centers (TMC)

Programmatic priorities:

- Approaches that maximize the volume of non-diseased human tissue that will be analyzed while maintaining cellular resolution and high biomolecular content
- A synergistic set of well-validated high-content, high-throughput assays for multiscale and multi-modal analysis of large volumes of tissue
- Studies of whole human organs not currently studied by existing TMCs
- Centers with established informed consent from a diverse range of donors or their families with explicit consent for sharing of genomic data

Non-responsive projects:

- lacking plans to obtain spatial data information regarding the organization of cellular and non-cellular tissue components
- Proposing maps based upon a single experimental assay (i.e. maps constructed from a single data type)
- Proposing to study bodily fluids, dissociated cells, diseased, non-human tissue
- Lacking all the required TMC components

Administrative Details for All Awards

- **NIH Involvement**: There will be substantial NIH programmatic involvement in individual projects and HuBMAP Consortium activities
- **Consortium:** Abide by Consortium policies for rapid sharing, collaborative projects, regular meetings, changing goals, and milestones [https://hubmapconsortium.org/policies/]
- **Budgeting**: Applicants are strongly encouraged to budget (~20% of budget) for Consortium activities, resource sharing, outreach, and meeting attendance as part of their proposed budget. NIH may modify budgets, specific aims and milestones before award.
- **RFA**: These are one-off announcements with no revisions or appeals.
- **Eligibility**: Foreign institutions (TTDs only) / for-profit organizations / NIH intramural program are eligible to apply.
- **LOIs:** Not required, but strongly encouraged.
- **Review**: SEPs; Please pay attention to review criteria in the RFA.

Important Dates and Information

- **Letter of Intent Due Date:**
  - ✓ February 2, 2020
- **Application Receipt Date:**
  - ✓ March 3, 2020
- **Peer Review Dates:**
  - ✓ June 2020
- **Advisory Council:**
  - ✓ August 2020
- **Earliest Start Date:**
  - ✓ September 2020

- **We strongly encourage you to talk with us prior to submitting an application**
- **Pending the availability of funds, there will be additional funding opportunities in FY21 and FY22**

Questions?

To submit questions please use the Q&A box. Following the webinar, questions can be sent to HuBMAP@mail.nih.gov

Additional Information

Connect with us:

- General mailbox: HUBMAP@mail.nih.gov
- Website: https://commonfund.nih.gov/HuBMAP
- Existing Awards: https://commonfund.nih.gov/hubmap/fundedresearch
- Consortium website: https://hubmapconsortium.org/
- Mailing list: https://list.nih.gov/cgi-bin/wa.exe?SUBED1=hubmap_news_and_information&A=1

Frequently Asked Questions:

https://commonfund.nih.gov/HuBMAP/generalfaqs

Interested in applying:

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