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- Please submit any questions or comments to “Everyone” using the “Chat” function located at the bottom of your Zoom screen.
- Questions will be read and answered by your co-hosts. You may submit questions at any time during the talk. All questions will be addressed at the end of the presentation.
- After the webinar, answers to frequently asked questions will be posted to the registration webpage. This document may subsequently be updated without additional notice.

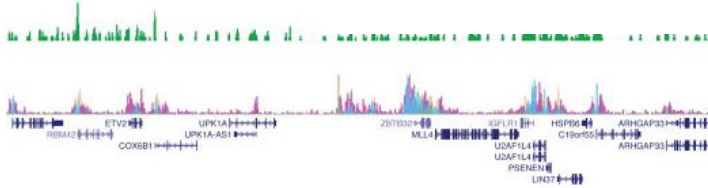
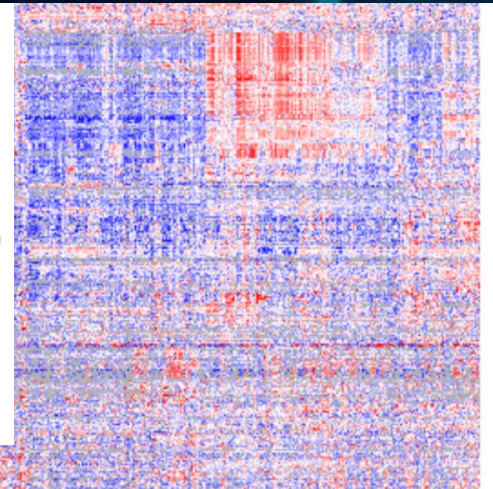
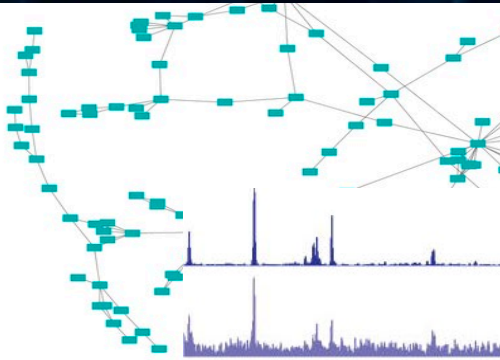


National Institute of
Diabetes and Digestive
and Kidney Diseases

ANALYSIS, TECHNOLOGY, LEADERSHIP, ADMINISTRATION AND SCIENCE (ATLAS) CENTER

PRE-APPLICATION WEBINAR FOR RFA-DK-21-034
(U24 CLINICAL TRIAL NOT ALLOWED)

JANUARY 14, 2022
2:00 p.m. – 3:00 p.m. EST



National Institute of
Diabetes and Digestive
and Kidney Diseases

Welcome

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Please reach out to us with any questions!!

If you have questions specific to your application, we are more than happy to set-up follow-up discussions.



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The ATLAS Center will have scientific and administrative responsibilities including:

Data
Integration

Generating a “go-to” open-access resource and interactive knowledgebase for the research community regarding mouse and human renal and genitourinary development and disease.

Tools

Developing, adopting, or improving state-of-the-art computational tools and approaches to carry out analyses of multi-modal molecular and imaging data for individuals with varying computational expertise.

Mapping

Building interactive 2D/3D atlases and molecular maps with FAIR principles (findable, accessible, interoperable, and reusable) to promote data retrieval, exploration, discovery, and analysis by the community.

Data
Access/Storage

Developing, designing, maintaining, and enhancing an **open-access, interactive public data and analysis portal**.

Administration

Coordinating internal and external activities of the GenitoUrinary Development Molecular Anatomy Project (GUDMAP) and (Re)Building a Kidney (RBK) consortia, including administration of an opportunity pool to address scientific gaps and opportunities.

ATLAS Center: Award Information

Mechanism: U24 Cooperative Agreement to support research projects contributing to improvement of the capability of resources to serve biomedical research.

Statement of Willingness:

- Cooperatively interact with NIDDK in support of the projects and activities.
- Actively seek input from NIDDK regarding resource or expertise needs that may arise during the performance of the project.
- Work closely with other relevant stakeholders (e.g. KPMP, HuBMAP, HCA) to achieve the goals of this FOA.

Award Budget: The NIDDK intends to **commit \$1,621,000** to support one award under this FOA in Fiscal Year 2022.

Direct costs are expected to be **approximately \$850,000 per year** (excluding the Opportunity Pool).

Budget Period: The scope of the proposed project should determine the project period. The maximum project period is 5 years.

Eligibility Information

Foreign Institutions:

- Non-domestic (non-U.S.) Entities (Foreign Institutions) **are not** eligible to apply.
- Non-domestic (non-U.S.) components of U.S. Organizations **are not** eligible to apply.
- Foreign components, as defined in the NIH Grants Policy Statement **are** allowed.

ATLAS Center: Key Dates

Key Dates

Letter of Intent Due: February 24, 2022 (optional)

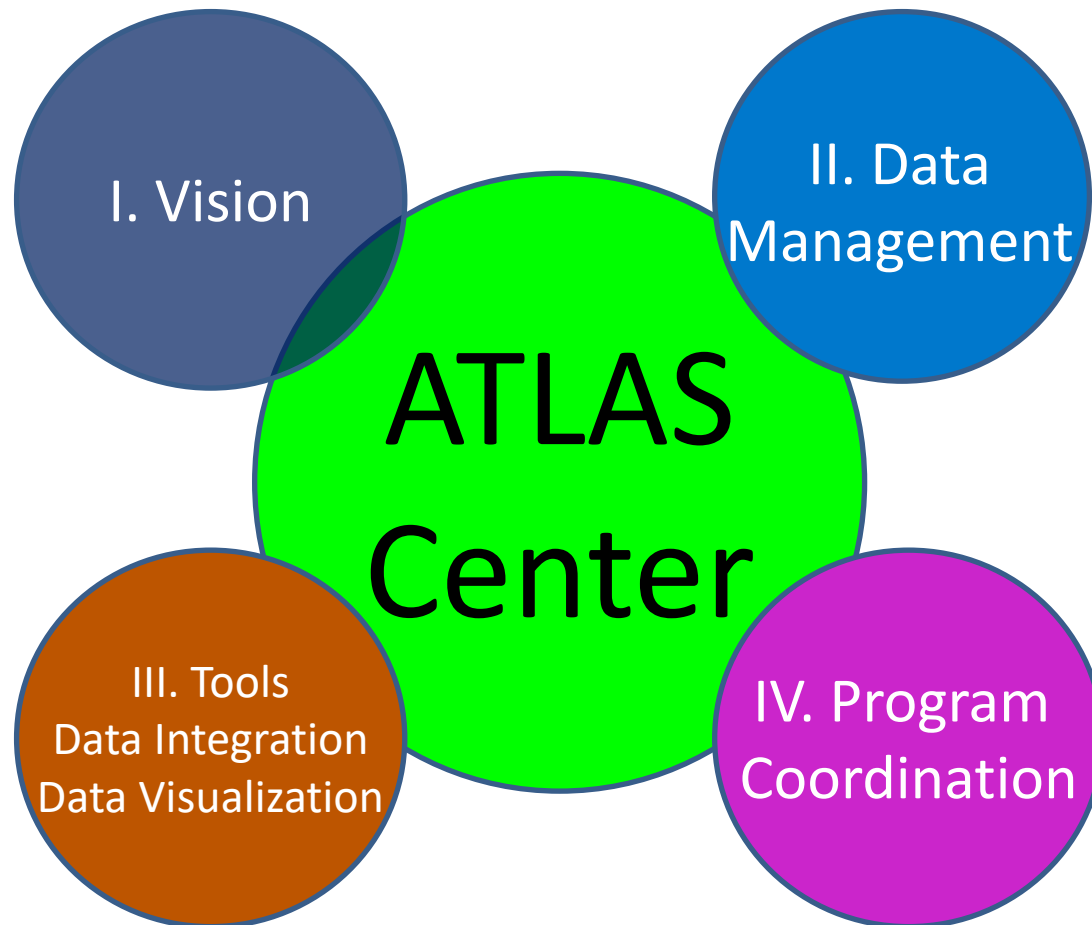
Application Due: March 24, 2022

Scientific Merit Review: July 2022

Advisory Council Review: October 2022

The ATLAS Center

Analysis, Technology, Leadership, Administration and Science



I. Overall Vision

- Provide scientific vision and leadership for an interactive **knowledgebase** that integrates multiple datasets and datatypes and provides tools for analysis and visualization as the “**go-to**” **open-access resource** for the research community regarding mouse and human renal and genitourinary development and disease.
- Participate in and **leverage research community efforts** (e.g., involving ontology development) that will facilitate connections between other databases or knowledgebases (KPMP, HUBMAP, HCA).
- **Understand the research community needs** and adapt resources to meet those needs from the super-user familiar with large and complex datasets, to the basic scientist, clinician, or student with varied computational experience.
- Support a **collaborative bioinformatics community** across the GUDMAP and RBK consortia, as well as the external research community that promotes the analysis and usage of data.

II. Data Management

- Develop, maintain, and enhance **an open-access, public knowledgebase website**.
- Ingest, clean, harmonize, store, and **archive all GUDMAP and RBK consortia data** and adhere to FAIR principles.
- **Build and manage internal and external facing IT tools** for the GUDMAP and RBK consortia, and external research community, to include communications, file sharing, data access and data analysis.
- Build and **incorporate QA/QC tools** that can determine missing, incomplete, and erroneous data and sources of technical noise to ensure that only high-quality data is released and displayed to the public.
- Optimize platforms for data integrity, dimensionality reduction, harmonization, scalability, security, accessibility and re-use and migration to a **cloud-based environment**.

III. Tools, Data Integration and Data Visualization

- Implement and **improve upon state-of-the-art computational and systems-level approaches** to integrate multi-modal molecular data, spatial and imaging data from GUDMAP and RBK, and **select external data (KPMP, HuBMAP, HTAN, SenNET)** to create well-annotated and searchable 2D/3D molecular atlases and reference maps of the urinary tract.
- **Develop or enhance tools** that allow users of **various bioinformatics skill levels** to interrogate, explore and effectively analyze and visualize the data.
- Manage a **suite of visualization and analysis tools** for 2D/3D imaging data that facilitate computational access, navigation and downloading data to maximize broad usability and incentivize interrogation by the broader research community.
 - Visualize key molecular pathways, regulatory networks, marker genes, and/or gene targets present in renal and genitourinary development and disease.
 - Identify molecular and cellular composition, cell-cell interactions, tissue organization, and anatomical structures.
 - Determine tissue-level and cell-level, spatial, functional, and/or temporal relationships, including mechanisms for identifying novel cell types, cell-states, molecular or cellular marks (e.g., anchor genes), and anatomic relationships of each cell type relative to its neighbors.

IV. Program Coordination

The ATLAS Center will provide administrative functions to facilitate and coordinate the GUDMAP and RBK consortia and will be expected to:

- **Facilitate and promote interactions** between members of GUDMAP and RBK and the broader research community.
- **Coordinate the planning**, arrangement and technical, administrative, operational support of teleconferences, meetings, and site visits of these consortia.
- **Develop and execute an Opportunity Pool funding program** to address gaps or catalyze new partnerships in renal and genitourinary research. The program will be flexible as the available funds, knowledge gaps, or opportunities may change over time. This application should allow for both animal and human studies and international collaboration via the Opportunity Pool.
- **Develop creative approaches** such as hack-a-thons, data jamborees or kaggles and other collaborative efforts to **promote data reuse and data analysis from the ATLAS knowledgebase** to the wider research community.

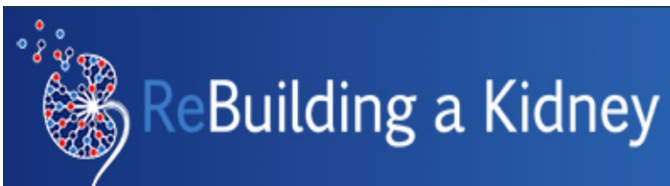
IV. Program Coordination

RBK/GUDMAP Consortium



The GenitoUrinary Development Molecular Anatomy Project (GUDMAP) provides data and tools that facilitate research on the GenitoUrinary (GU) tract for the scientific and medical community

www.gudmap.org



The goal of the (Re)Building a kidney consortium (RBK) is to improve or restore kidney function by either of two distinct approaches: (1) enhancement of endogenous productive kidney repair/regeneration by small molecules, proteins, or engraftment of cells, organoids, etc., or (2) building functional replacement kidney tissue *ex vivo* for transplantation.

www.rebuildingakidney.org

Types of data generated from mouse and human samples from multiple time points:

- Molecular data:
 - Bulk RNA-seq
 - Single-cell nucleus RNA-seq
 - Single-cell ATAC-seq
 - 10X Spatial Transcriptomics
- Imaging data:
 - CODEX
 - merFISH/RNAscope
 - nanoCT imaging
 - Light-sheet microscopy
- Additional community resources:
 - Protocols
 - Cell-lines, iPS Cells
 - Archival data (microarrays, ISH)

ATLAS Essential Objectives

- Establish a **“go-to”, web-based public resource and knowledgebase** for data retrieval, visualization, and discovery analysis related to mouse and human renal and genitourinary development and disease.
- **Develop computational platforms** and pipelines for data ingestion, quality control, cleaning, harmonization, scale-up, curation, and archiving of data.
- Generate **comprehensive tissue reference maps** and interactive 2D/3D molecular atlases of renal and genitourinary tissues using GUDMAP, RBK and external data (e.g., KPMP, HuBMAP, HCA)
- Implement intuitive query, analysis, and visualization tools that are usable to end-users with **varying computational abilities**.
- **Form collaborative bioinformatic interactions** within GUDMAP and RBK and other relevant stakeholders (e.g., KPMP, HuBMAP, HCA, SenNET).
- Follow and strictly adhere to **FAIR principles**.
- Mobilization of resources to the **cloud environment**
- **Manage an Opportunity Pool** to address research gaps and opportunities or form new partnerships.
- **Flexibility to adapt to changes** in data types and technologies, software for analysis and visualization.

Research Strategy

The Research Strategy should describe how the applicants will achieve goals in four categories: **1) Vision, 2) Data Management, 3) Tools, Data Integration, and Data Visualization, and 4) Program Coordination.**

The Research Strategy should include a section labeled “Research Concepts” that also addresses the vision for the knowledgebase and demonstrates the applicant’s capabilities:

- Provide **examples of queries** that users of varying computational experience may wish to use and what integration, analysis, and curation will be needed to enable those queries.
- Describe at least one **potential graphical tool that will be developed or adapted** to enter the data and how it could be extended to the renal and genitourinary systems.
- Describe how **2D and 3D molecular data and imaging will be integrated**, and what tools will be developed or adapted to analyze, query, and visualize data.
- Describe **how portable reference datasets** will be developed as a community standard for comparison with experimental or disease datasets.
- Describe plans to integrate, harmonize, and analyze **select external and complementary data** to maximize discovery (e.g., KPMP, HuBMAP, HCA, etc.)
- Describe how **user-friendly bioinformatic platforms, analytic pipelines, and visualization tools** will be implemented that are accessible to the expert and lay-user to maximize data usage.

Opportunity Pool

Describe how the ATLAS will create and administer an Opportunity Pool to **address research gaps or form new partnerships**. The organization of the Opportunity Pool Program should be flexible as the size and use of the pool may change, but at a minimum, it should:

- Applicants **must request** support for an Opportunity Pool of **at least \$300,000** or more per year (inclusive of all F&A costs) to address gaps and scientific opportunities.
- Work with the Consortium's Steering Committee, NIDDK staff, and potential other funding partners to perform a yearly assessment to **identify emergent needs of infrastructure and resources**.
- Publicly announce solicitations, manage acceptance of proposals, organize peer-review, prioritize proposals for funding.

Review Criteria: Significance

Specific to this FOA:

- How well do the Research Concepts demonstrate a vision for developing a knowledgebase that is the “go-to” open-access resource for the research community investigating mouse and human renal and genitourinary development and disease?
- How well do the proposed bioinformatic and computational tools enable basic, translational, and clinical researchers with minimal computational experience the ability to explore data and fully unlock the potential in the data?
- How well does the project maximize opportunities for sharing of knowledge, resources, and tools generated by GUDMAP Atlas and RBK Research Projects?

Review Criteria: Investigators

Specific to this FOA:

- How appropriate is the domain expertise in program management, bioinformatics and computational analysis, website and software development, biocuration and ontology development (including specific expertise in appropriate organ anatomy and physiology) for the defined key personnel?
- How appropriate is the evidence that the investigators will abide by the expectations pertaining to sharing as defined by the FOA and the priorities and policies agreed upon by the SC of each consortium?

Review Criteria: Innovation

Specific to this FOA:

- How innovative are the computational methods and systems-level approaches to integrate multi-modal data to generate reference maps and 2D/3D atlases
- How innovative and novel are the tools for visualizing 2D/3D molecular, spatial, and imaging data?
- How useful are the tools to:
 - Query data across multiple datatypes or improve the representation of relationships of structures/cells across data types?
 - Enable users with varying computational abilities to explore the data (i.e., casual user to savvy user)?
- How creative are the approaches to invite and incentivize the research community to participate in the analysis of knowledgebase data such as the formation of hack-a-thons, data jamborees or kaggles?

Review Criteria: Approach

Specific to this FOA:

- How **robust and appropriate are the plans** for the proposed ATLAS Center to generate a “go-to” open-access resource for the research community of mouse and human renal and genitourinary development and disease.
- How appropriate are the proposed **integration strategies to enable novel analyses** across multiple-omic and imaging datasets by the research community?
- How appropriate are the plans to **implement FAIR principles**?
- Will the overall methodologies allow for efficient maintenance and upgrading the knowledgebase and be adaptable to new data types?
- How **complete and adequate are the plans to continue to develop ontology** for components of the renal and genitourinary system?
- To what extent will the proposed plan for **incorporating select external data** to generate tissue reference maps add value to the ATLAS?
- **How appropriate are the plans to administer an Opportunity Pool of funds**, including criteria for solicitation, evaluation by rigorous peer review, and selecting projects to support GUDMAP and RBK consortia and address gaps and scientific opportunities?
- How well will the plans **promote data use and analysis from the ATLAS knowledgebase**?

Nuts and Bolts: Letter of Intent

Although a **letter of intent is not required**, is not binding, and does not enter into the review of a subsequent application, the information that it contains allows IC staff to estimate the potential review workload and plan the review.

Letter of Intent Due: February 24, 2022 (optional)

By the date listed in [Part 1. Overview Information](#), prospective applicants are asked to submit a letter of intent that includes the following information:

- Descriptive title of proposed activity
- Name(s), address(es), and telephone number(s) of the PD(s)/PI(s)
- Names of other key personnel
- Participating institution(s)
- Number and title of this funding opportunity

The letter of intent should be sent to:

John F. Connaughton, Ph.D.

Chief, Scientific Review Branch

National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)

Telephone: 301-594-7797

Email: NIDDKLetterofintent@mail.nih.gov

Questions?



**National Institute of
Diabetes and Digestive
and Kidney Diseases**



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