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Project Details

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Bridge2AI: Cell Maps for AI (CM4AI) Data Generation Project

Project Number	Contact PI/Project Leader	Awardee Organization
3OT2OD032742-01S2	IDEKER, TREY Other PIs	

Description

Abstract Text

As part of the NIH Common Fund's Bridge2AI program, the CM4AI data generation project seeks to map the spatiotemporal architecture of human cells and use these maps toward the grand challenge of interpretable genotype-phenotype learning. In genomics and precision medicine, machine learning models are often "black boxes," predicting phenotypes from genotypes without understanding the mechanisms by which such translation occurs. To address this deficiency, project will launch a coordinated effort involving three complementary mapping approaches – proteomic mass spectrometry, cellular imaging, and genetic perturbation via CRISPR/Cas9 – creating a library of large-scale maps

cellular structure/function across demographic and disease contexts. These data will broadly stimulate research and development in "visible" machine learning systems informed by multi-scale cell and tissue architecture. In addition to data and tools, this project will implement a standards data management approach based on FAIR access and software principles, with deep provenance and replication packages for representation of cell maps and their underlying datasets; initiate a research program in ethical AI, especially as it relates to how maps will be used in genomic medicine and model interpretation; and stimulate a diverse portfolio of training opportunities in the emerging field of biomachine learning.

Public Health Relevance Statement

Machine learning (ML) models show great promise in analyzing the human genome to make predictions, but the inner workings of these models are typically difficult-to-interpret "black boxes." To address this challenge, this Bridge2AI data generation project will generate a resource of matched data and tools to enable the creation of "visible" ML systems, which are not black boxes but are built directly on knowledge maps of cell and tissue architecture.

NIH Spending Category

No NIH Spending Category available.

Project Terms

Address **Architecture** **Black Box**

Bridge to Artificial Intelligence

CRISPR/Cas technology **Cells**

Cellular Structures **Computer software**

Data Data Set Disease Funding

Generations Genetic Genomic medicine

Genotype Human Human Genome

Knowledge Learning Libraries

Machine Learning Maps

Details

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Department Type

INTERNAL MEDICINE/MEDICINE

Organization Type
SCHOOLS OF MEDICINE

State Code
CA

Congressional District
50

Other Information

Opportunity Number
OTA-21-008

Study Section
Data Coordination, Mapping, and Modeling[DCMM]

Fiscal Year
2025

Award Notice Date
22-November-2024

Administering Institutes or Centers
NIH Office of the Director

Assistance Listing Number
93.310

DUNS Number
804355790

UEI
UYTTZT6G9DT1

Project Start Date
01-September-2022

Project End Date
31-August-2026

Budget Start Date
01-December-2024

Budget End Date
30-November-2025

No Cost Extension
N

Project Funding Information for 2025

Total Funding
$5,289,382

Direct Costs
$4,632,095

Indirect Costs
$657,287

Year	Funding IC	
2025	NIH Office of the Director	$5,289,382

Sub Projects

No Sub Projects information available for 3OT2OD032742-01S2

Publications

Disclaimer

No Publications available for 3OT2OD032742-01S2

Patents

No Patents information available for 3OT2OD032742-01S2

Outcomes

The Project Outcomes shown here are displayed verbatim as submitted by the Principal Investigator (PI) for this award. Any opinions, findings, and conclusions or recommendations expressed are those of the PI and do not necessarily reflect the views of the National Institutes of Health. NIH has not endorsed the content below.

No Outcomes available for 3OT2OD032742-01S2

Clinical Studies

No Clinical Studies information available for 3OT2OD032742-01S2

News and More

Related News Releases

No news release information available for 3OT2OD032742-01S2

History

No Historical information available for 3OT2OD032742-01S2

Similar Projects

No Similar Projects information available for 3OT2OD032742-01S2