



New York Genome Center Awarded \$1.5M Chan Zuckerberg Initiative Grant To Develop Integrative Single-Cell Analysis Toolkit for the Human Cell Atlas Project

Combining multimodal methods to identify disease-causing genes of interest and extract more information at significantly reduced cost

NEW YORK, NY (June 21, 2019) – Scientists at the New York Genome Center (NYGC) and the Icahn School of Medicine at Mount Sinai have been awarded a \$1.5 million collaborative grant over three years from the Chan Zuckerberg Initiative (CZI) to support the development of a toolkit for integrated multimodal cell profiling. The project involves the development of new methods and tools that leverage the strengths of existing single-cell modalities and innovative computational methods to enable a more robust and efficient characterization of human immune cells. The team’s new toolkit will be made freely available to the scientific community.

The award-winning project, “Multi-Modal Cell Profiling and Data Integration to Atlas the Immune System,” is led by Peter Smibert, PhD, Manager, NYGC Technology Innovation Lab. Rahul Satija, PhD, Core Faculty Member at the New York Genome Center and Assistant Professor of Biology at New York University, and Adeeb Rahman, PhD, Director of Technology Development, Human Immune Monitoring Center and Associate Professor of Genetics and Genomic Sciences at Icahn School of Medicine at Mount Sinai, are co-principal investigators. The toolkit under development aims to leverage particular strengths of individual technologies including scale, depth and spatial resolution and use computational integration of the different data types for a more comprehensive view of single cells.

“We are deeply grateful to CZI for their support of our innovative and collaborative research to develop and deploy next-generation genomic tools that further enhance interrogation of individual cells,” said Tom Maniatis, PhD, NYGC’s Scientific Director and CEO. “Single-cell multimodal analysis is poised to play a key role in the detailed characterization of cells central to the Human Cell Atlas.”

“Our aim is to both develop new methods for measuring important molecules in cells and exploit the advantages of existing methods,” said Dr. Smibert. “By integrating the output of different technologies, we can cost-effectively interrogate cells in their appropriate tissue context.” He noted his collaborators’ expertise in single-cell modalities and computational methods is essential to the success of the project. The collaborative project will take advantage of the strengths of each of the core technologies: multimodal RNA and protein data from CITE-seq, developed in the NYGC Technology Innovation Lab, will inform the much higher throughput protein data from Mass cytometry (CyTOF), and together will inform the spatial data obtained by Multiplexed Ion Beam Imaging (MIBI) to identify cell interactions and neighborhoods. Dr. Rahman is an early adopter of CITE-seq and has deep experience deploying

CyTOF and MIBI in his research. Dr. Satija is a leading developer of computational methods to effectively harness and integrate single-cell analysis methods.

The grant is part of CZI's Seed Networks for the Human Cell Atlas program, which aims to support foundational tools and resources for the Human Cell Atlas project, a scientific-led global initiative to create a reference map of all cell types in the human body and generate a fundamental reference for biomedical research. CZI's Seed Networks projects will generate new tools, open source analysis methods, and significant contributions of diverse data types to the Human Cell Atlas Data Coordination Platform, a resource that will enable broad data sharing across researchers and research institutes. Drs. Smibert and Satija were recipients of a 2017 CZI one-year pilot grant to develop a toolkit for the Human Cell Atlas research community on CITE-seq, and Dr. Satija has a separate pilot Human Cell Atlas grant for integration of single-cell data from 2018.

The NYGC Technology Innovation Lab is a dedicated incubator within the NYGC comprised of a multidisciplinary team in which staff scientists and faculty, as well as many research collaborators, can explore and test breakthrough genomic tools and ideas.

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About the New York Genome Center

The New York Genome Center (NYGC) is an independent, nonprofit academic research institution focused on furthering genomic research that leads to scientific advances and new insights and therapies for patients with neurodegenerative disease, neuropsychiatric disease, and cancer. Leveraging our strengths in whole genome sequencing, genomic analysis, and development of new genomic tools, the NYGC serves as a nexus for collaboration in disease-focused genomic research for the New York community and beyond.

NYGC harnesses the expertise and builds on the combined strengths of our faculty, staff scientists, member institutions, scientific working groups, affiliate members, and industry partners to advance genomic discovery. Central to our scientific mission is an outstanding faculty who are leading independent research labs based at the NYGC and one of our member institutions, bringing a multidisciplinary and in-depth approach to the field of genomics.

Member institutions include: Albert Einstein College of Medicine, American Museum of Natural History, Cold Spring Harbor Laboratory, Columbia University, Hospital for Special Surgery, Icahn School of Medicine at Mount Sinai, The Jackson Laboratory, Memorial Sloan Kettering Cancer Center, New York-Presbyterian Hospital, The New York Stem Cell Foundation, New York University, Northwell Health, Princeton University, The Rockefeller University, Roswell Park Cancer Institute, Stony Brook University, and Weill Cornell Medicine. For more information on the NYGC, please visit: <http://www.nygenome.org>.

About the Chan Zuckerberg Initiative (CZI)

Founded by Dr. Priscilla Chan and Mark Zuckerberg in 2015, the Chan Zuckerberg Initiative (CZI) is a new kind of philanthropy that's leveraging technology to help solve some of the world's toughest challenges — from eradicating disease, to improving education, to reforming the

criminal justice system. Across three core Initiative focus areas of Science, Education, and Justice & Opportunity, we're pairing engineering with grant-making, impact investing, and policy and advocacy work to help build an inclusive, just and healthy future for everyone. CZI's science work is led by Dr. Cori Bargmann, an internationally recognized neurobiologist and geneticist and the head of the Lulu and Anthony Wang Laboratory of Neural Circuits and Behavior and the Torsten N. Wiesel Professor at The Rockefeller University in New York. For more information please visit www.chanzuckerberg.com.

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