

Old Dominion University and Admera Health Partner to Advance Alzheimer's Research with Innovative AI Platform

ODU & Admera Health collaborate on a grant-funded project to build a generative AI platform linking genes to Alzheimer's progression & cognitive decline.

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-- A new collaboration between Old Dominion University (ODU) and [Admera Health](#), a leading provider of Next-Generation Sequencing services for researchers worldwide, has been awarded a grant to develop a generative AI-based platform to uncover new insights into Alzheimer's disease (AD). The project, titled "Knowledge-Augmented Genomics Transformers for Mechanistic Links to AD Dementia," will utilize a pre-trained AI model called scGPT to analyze large-scale genomic datasets from AD cohorts. The goal is to identify the specific genes and pathways within different cell types that are linked to the progression of AD and cognitive decline.

The award is provided by the University of Pennsylvania Penn Artificial Intelligence and Technology Collaboratory for Healthy Aging ([PennAITech](#)), an initiative funded by the National Institute on Aging (NIA) of the National Institutes of Health (Grant Nr. P30AG073105).

The research team is a multidisciplinary partnership that includes academic AI researchers from Old Dominion University, AD scientists from the University of Pennsylvania and Sanford Burnham Prebys, and bioinformatics experts from Admera Health. Dr. Hong Qin, an Associate Professor at ODU, will serve as the contact Principal Investigator, leading the AI development for the project. Yaping Feng, Ph.D and Shunian Xiang, Ph.D from Admera Health will act as a Principal Investigator. Dr. Corey McMillan and Dr. Xiao Tian will serve as consultants.

"This grant will enable our team to explore the potential of hypothesis-driven AI to uncover insights into Alzheimer's disease," said Dr. Hong Qin. "We aim to identify precise genetic markers and pathways that are linked to cognitive decline. If successful, this research can empower medical professionals to develop new tools for diagnosis and treatment and transform our



understanding of the complexities of Alzheimer's. In parallel, the company Admera Health will apply this AI-driven research to enhance cell type annotation within its single-cell analysis pipeline."

This project aims to address key challenges in AD research, such as integrating diverse multi-omic datasets and improving the interpretability of AI predictions in biomedical research. The team will fine-tune the scGPT model on two extensive datasets: the Religious Orders Study and Memory and Aging Project (ROSMAP) and the Seattle Alzheimer's Disease Brain Cell Atlas (SEA-AD). By using explainable AI methods, such as Shapley value analysis, the researchers will pinpoint cell type-specific genes and pathways that predict neuropathological burden and cognitive impairment.

"The close collaboration between our bioinformatics team, led by Yaping Feng, Ph.D with contributions from Shunian Xiang, Nihir Patel, Hua Ke, Jingling Hou, Yaoqi Li, Haixin Shu and Boyuan Wu, and the academic researchers from ODU is what makes this project so promising," said Yun Zhao, CEO of Admera Health. "This partnership underscores our shared goal to provide the scientific community with reliable tools to advance discoveries and accelerate the development of new therapeutics and diagnostics for Alzheimer's disease."

A key focus of the project is to enhance the reliability and interpretability of the model's predictions. The team plans to incorporate prior biological knowledge into single cell AI models and use conformal prediction to quantify the uncertainty of the results. These AI-derived discoveries will be compared against traditional bioinformatics methods to ensure scientific rigor.

This new collaboration is well-positioned to develop "trustworthy, knowledge-guided AI methods for neurodegenerative disease research." The team's previous work on a cross-species aging clock demonstrates their capacity to succeed. The commercialization strategy, led by Admera Health, will leverage the company's Next-Generation Sequencing services to provide novel insights into Alzheimer's disease progression and accelerate the development of new therapeutics and diagnostics for the scientific community.

About Old Dominion University:

Old Dominion University (ODU), located in Norfolk, is Virginia's forward-focused public doctoral research university with more than 24,000 students. A top R1 research institution offering rigorous academics, ODU is recognized nationally for academic excellence, social mobility and access. Military friendly and home to an energetic residential community and robust initiatives that currently contribute \$3.8 billion annually to Virginia's economy, ODU is a leader in the commonwealth. Macon & Joan Brock Virginia Health Sciences at Old Dominion University, founded July 1, 2024, represents the most comprehensive health sciences center in the

Commonwealth of Virginia.

About PennAITech:

Founded in 1740, the University of Pennsylvania (Penn) is a private Ivy League research university with a strong focus on interdisciplinary innovation. Located in Philadelphia, Penn is a leading institution in fields ranging from medicine to engineering and business. The Penn Artificial Intelligence and Technology Collaboratory for Healthy Aging (PennAITech) is an initiative funded by the National Institute on Aging (NIA) of the National Institutes of Health. It brings together experts from various disciplines to leverage cutting-edge technology and AI to address challenges in healthy aging. PennAITech fosters collaborations between researchers, industry partners, and community members to develop and test innovative solutions that improve the health and well-being of older adults. This initiative exemplifies Penn's commitment to translating research into real-world impact and its role as a global leader in biomedical research and technology.

About Admera Health:

Admera Health is a global provider of advanced genomic and bioinformatic support that leverages Next-Generation Sequencing expertise to serve researchers in academia, biotech, pharma, government, and animal health companies. Admera Health is located in New Jersey offering a comprehensive suite of services for all species such as genomics, transcriptomics, epigenomics, single-cell omics, spatial transcriptomics, bioinformatics, and tailored solutions. All samples are managed with exceptional attention and upheld to the highest quality standards, processed in a CLIA/CLEP-certified and CAP-accredited environment.

Admera Health is at the forefront of research utilizing innovative next-generation sequencing technologies to provide comprehensive solutions. Our expert team employs state-of-the-art platforms and tools to deliver robust results through cutting-edge sequencing and bioinformatics.

For more information, please visit <http://www.admerahealth.com>.

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