IBM Newsroom

Cleveland Clinic and IBM Unveil Landmark 10-Year Partnership to Accelerate Discovery in Healthcare and Life Sciences

IBM Hybrid Cloud, High Performance Computing, Artificial Intelligence, and Quantum Computing technologies to serve as foundation for newly launched Cleveland Clinic Global Center for Pathogen Research & Human Health

IBM plans to install its first private-sector, on premises quantum computing system in the U.S. at Cleveland Clinic. Cleveland Clinic also plans to receive first, next-generation IBM 1,000+ qubit quantum system in the coming years

ARMONK, N.Y. and CLEVELAND, March 30, 2021 /PRNewswire/ -- Cleveland Clinic and IBM (NYSE: IBM) have announced a planned 10-year partnership to establish the Discovery Accelerator, a joint Cleveland Clinic - IBM center with the mission of fundamentally advancing the pace of discovery in healthcare and life sciences through the use of high performance computing on the hybrid cloud, artificial intelligence (AI) and quantum computing technologies.

The collaboration is anticipated to build a robust research and clinical infrastructure to empower big data medical research in ethical, privacy preserving ways, discoveries for patient care and novel approaches to public health threats such as the COVID-19 pandemic. Through the Discovery Accelerator, the researchers plan to use advanced computational technology to generate and analyze data to help enhance research in the new Global Center for Pathogen Research & Human Health, in areas such as: genomics, single cell transcriptomics, population health, clinical applications, and chemical and drug discovery.

As part of the collaboration, IBM plans to install its first private sector, on-premises IBM Quantum System One in the United States, to be located on Cleveland Clinic's campus in Cleveland. The company also plans to install the first of IBM's next-generation 1,000+ qubit quantum systems at a client facility, also to be located in Cleveland, in the coming years. This quantum program will be designed to actively engage with universities, government, industry, startups and other relevant organizations. It will leverage Cleveland Clinic's global enterprise to serve as the foundation of a new quantum ecosystem for life sciences, focused on advancing quantum skills and the mission of the center.

"Through this innovative collaboration, we have a unique opportunity to bring the future to life," said Tom Mihaljevic, M.D., CEO and President of Cleveland Clinic. "These new computing technologies can help revolutionize discovery in the life sciences. The Discovery Accelerator will enable our renowned teams to build a forward-looking digital infrastructure and help transform medicine, while training the workforce of the future and potentially growing our economy."

"The COVID-19 pandemic has spawned one of the greatest races in the history of scientific discovery – one that demands unprecedented agility and speed," said Arvind Krishna, Chairman and Chief Executive Officer of IBM. "At the same time, science is experiencing a change of its own – with high performance computing, hybrid cloud, data, AI, and quantum computing, being used in new ways to break through long-standing bottlenecks in scientific discovery. Our new collaboration with Cleveland Clinic will combine their world-renowned expertise in healthcare and life sciences with IBM's next-generation technologies to make scientific discovery faster, and the scope of that discovery larger than ever."

"Quantum will make the impossible possible, and when the Governor and I announced the Cleveland Innovation District earlier this year, this was the kind of innovative investment I hoped it would advance," said Ohio Lt. Governor Jon Husted, Director of InnovateOhio. "A partnership between these two great institutions will put Cleveland, and Ohio, on the map for advanced medical and scientific research, providing a unique opportunity to improve treatment options for patients and solve some of our greatest healthcare challenges."

The Discovery Accelerator will serve as the technology foundation for Cleveland Clinic's new Global Center for Pathogen Research & Human Health, announced last month as part of the Cleveland Innovation District. The center, supported by a $500 million investment from the State of Ohio, Jobs Ohio and Cleveland Clinic, brings together a research team focused on broadening understanding of viral pathogens, virus-induced cancers, genomics, immunology and immunotherapies. It will build upon Cleveland Clinic's existing programs and expertise, with newly recruited world leaders in immunology, cancer biology, immune-oncology and infectious disease research as well as technology development and education. Researchers will expand critical work on studying, preparing and protecting against emerging pathogens and virus-related diseases.

Accelerating Discovery

The pace of progress in science historically has been limited by bottlenecks. Researchers are increasingly working to overcome these bottlenecks with the application of AI, quantum computing and hybrid cloud technologies. New technologies are enabling accelerated methods of discovery that include deep search, AI and quantum-enriched simulation, generative models, and cloud-based AI-driven autonomous labs. Leveraging these combined innovations will supercharge new generations of information technology, fuel important advances in science, and IBM will provide access to a variety of research and commercial technologies, education and tools to assist Cleveland Clinic in accelerating discovery in healthcare and life science, including **RoboRXN**, a cloud-based platform that combines AI models and robots to help scientists design and synthesize new molecules remotely; the **IBM Functional Genomics Platform**, a cloud-based repository and research tool, which uses novel approaches to reveal the molecular features in viral and bacterial genomes to help accelerate discovery of molecular targets required for drug design, test development and treatment; **Deep Search,** which helps researchers access structured and unstructured data quickly; and **High-Performance Hybrid Cloud Computing** technologies that can enable researchers to "burst" their workloads into the cloud and access the resources they need at scale.

IBM Quantum Flagship Program

Quantum computing has the potential to have an immense impact on key healthcare challenges, such as the discovery of new molecules that can serve as the basis of new pharmaceutical breakthroughs and spur the development of new medicines and could help enhance the ability to derive deep insight from complex data that is at the heart of some of the largest challenges in healthcare.

The Discovery Accelerator will leverage IBM's multi-year roadmap for advancing quantum computing, bringing its revolutionary capabilities into the hands of scientists and practitioners in healthcare and life sciences. In addition to an on-premises quantum system, Cleveland Clinic will also have access to IBM's fleet of currently more than 20 quantum systems, accessible via the cloud. IBM is targeting to unveil its first next generation 1,000+ qubit quantum system in 2023, and Cleveland Clinic is planned to be the site of the first private-sector on-premises system.

Building Quantum Skills in Ohio

A significant pillar of the program plans to focus on educating the workforce of the future and creating jobs to grow the economy. The 10-year collaboration plans to include education and workforce development opportunities related to quantum computing.

The innovative educational curriculum will be designed for participants from high school to professional level and offer training and certification programs in data science and quantum computing, building the skilled workforce needed for cutting-edge data

science research of the future. Cleveland Clinic and IBM plan to hold research symposia and workshops with joint sessions by IBM and academic researchers for academia, industry, government and the general public.

About Cleveland Clinic

Cleveland Clinic – now in its centennial year – is a nonprofit multispecialty academic medical center that integrates clinical and hospital care with research and education. Located in Cleveland, Ohio, it was founded in 1921 by four renowned physicians with a vision of providing outstanding patient care based upon the principles of cooperation, compassion and innovation. Cleveland Clinic has pioneered many medical breakthroughs, including coronary artery bypass surgery and the first face transplant in the United States. *U.S. News & World Report* consistently names Cleveland Clinic as one of the nation's best hospitals in its annual "America's Best Hospitals" survey. Among Cleveland Clinic's 70,800 employees worldwide are more than 4,660 salaried physicians and researchers, and 18,500 registered nurses and advanced practice providers, representing 140 medical specialties and subspecialties. Cleveland Clinic is a 6,500-bed health system that includes a 173-acre main campus near downtown Cleveland, 19 hospitals, more than 220 outpatient facilities, and locations in southeast Florida; Las Vegas, Nevada; Toronto, Canada; Abu Dhabi, UAE; and London, England. In 2020, there were 8.7 million total outpatient visits, 273,000 hospital admissions and observations, and 217,000 surgical cases throughout Cleveland Clinic's health system. Patients came for treatment from every state and 185 countries. Visit us at clevelandclinic.org. Follow us at twitter.com/ClevelandClinic. News and resources available at newsroom.clevelandclinic.org.

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