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Singular Genomics Unveils G4X™ Spatial Sequencer, Transforming the Landscape of In Situ Multiomic Analysis

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SAN DIEGO, Feb. 05, 2024 (GLOBE NEWSWIRE) -- Singular Genomics Systems, Inc. (Nasdaq: OMIC), a company leveraging novel next-generation sequencing (NGS) and spatial multiomics technologies to empower researchers and clinicians, today unveiled the G4X™ Spatial Sequencer. The G4X is designed to offer high-throughput *in situ* direct sequencing of RNA (Direct-Seq™), targeted transcriptomics, and proteomics profiling from formalin-fixed, paraffin-embedded (FFPE) tissues. The G4X will share the same platform as the existing G4® sequencer and is expected to be the industry's first dual-purpose instrument offering both traditional NGS and tissue-based spatial sequencing capabilities. With the addition of high-throughput multiomics and novel Direct-Seq technology to its portfolio with the G4X, Singular is positioned to become the only company worldwide to offer *in situ* spatial sequencing of tissues and NGS on the same instrument.

The G4X Spatial Sequencer is designed to offer novel capabilities, stackable data streams, and unprecedented throughput for spatial profiling of tissue. Its novel capabilities will include Direct-Seq, which is the sequencing of RNA molecules *in situ* and has the potential to open new areas of scientific discovery. In addition, the G4X will offer readouts of targeted transcripts, targeted proteins, and a fluorescent H&E stain, all in the same tissue sample. And lastly, this combination of readout modalities will be offered at an unprecedented scale. With 40 cm² of flexible imaging area and single-day run times, the G4X system will enable labs to process 20 times more samples per week than existing technologies.

"We founded Singular with a commitment to listen to our customers, to innovate, and to bring products to market that have an impact," stated Drew Spaventa, co-founder and Chief Executive Officer of Singular Genomics. "The G4X embodies this commitment by providing new capabilities, novel data streams, and scale. This powerful combination has the potential to open new areas of discovery, accelerate research, and advance the medical field."

Initial kits on the G4X will support transcription, proteomics, and offer a fluorescent H&E stain. The system is designed to accommodate a large number of samples and will read out hundreds of gene targets and dozens of proteins in the same tissue section. Content will be available in fixed panels or customizable for the customer. Future kits on the G4X will also support Direct-Seq, which is designed to directly read variable regions of RNA, such as cancer hotspot mutations, guide RNAs in CRISPR screens, or B- and T-cell receptor sequences. The capability to perform direct sequencing of RNA within cells and tissues is expected to bring a powerful new readout modality for *in situ* molecular pathology. Direct-Seq will be initially available as a service, with plans for broader release shortly thereafter.

"Building on our foundation in NGS, we saw an opportunity to bring sequencing directly into cells and tissues, and to create a universal readout for spatial biology," said Eli Glezer, co-founder and Chief Scientific Officer of Singular Genomics. "Our spatial sequencing technology will enable *in situ* detection of gene transcripts, multiplexed imaging of proteins, and direct reading of mutations or variable gene regions, all in the same tissue sample. With its unprecedented throughput and direct spatial sequencing, we believe the G4X will usher in a new era of *in situ* multiomic analysis."

"As the first location to have the G4 worldwide, we are thrilled about the spatial capabilities that can be added to our existing instrument, since it will allow us to perform both NGS and spatial tissue profiling on the same platform" said Ioannis Vlachos, Associate Professor, Harvard Medical School, and Director of Spatial Technologies, HMS Initiative for RNA Medicine, Department of Pathology, Beth Israel Deaconess Medical Center. "As the spatial biology field matures, high throughput spatial platforms, such as the G4X, will empower more researchers to incorporate spatial tissue profiling into their work as well as enable us to answer bigger questions and to perform increasingly larger studies."

Singular previously announced a technology access program for the PX, the learnings from which have been applied to the development of the G4X. Through its technology access program, Singular has been actively collaborating with leading institutions to generate data on the G4X and demonstrate its applicability in critical research areas.

"The high sample throughput and the excellent data quality that has been generated on the G4X with our bone marrow samples—notoriously a very difficult tissue type—have been impressive and have allowed us to envision much larger studies that have not been previously possible," said Catherine Wu, Chief, Stem Cell Transplantation & Cellular Therapies, Harvard Medical School. "The scale provided by the G4X promises to have a tremendous impact on expanding our understanding of the tumor microenvironment in acute myelogenous leukemia (AML) and beyond."

Expected Key Features of the G4X™ Spatial Sequencer:

- **Industry-leading Throughput:** An imaging area of 40 cm² per run across four spatial flow cells is expected to dramatically increase sample throughput while retaining flexibility for smaller runs.
- **Direct-Seq:** *In situ* sequencing of RNA, designed to sequence variable gene regions directly within cells and tissues, with potential applications in immunology, immuno-oncology, cancer research, and gene editing.
- **Transcripts:** Hundreds of gene transcripts, which will be available in curated panels and custom gene target selection.
- **Proteins:** Dozens of proteins, which will be available in curated panels and custom protein target selection.
- **Fluorescent H&E:** Fluorescent H&E stain overlaid with transcripts and proteins on the same tissue sample.

- **Rapid Turn-around-time:** With a specialized tissue transfer process, streamlined sample preparation workflow, and high-speed single-day sequencing, users will have the ability to go from sample-to-discovery in just three days.
- **Cost-Effective:** With its unprecedented throughput, the G4X will significantly reduce the cost per sample to less than half that of alternative approaches, making spatial multiomics more accessible.

The system is listed at \$495,000, G4X upgrades are expected to be available to G4 customers by the end of 2024, along with an initial immunology panel of approximately 300 gene transcripts, 10-15 proteins, and the ability to customize content. Direct-Seq and additional panels are expected to be released at a later date. Singular also plans to provide G4X Spatial Sequencing Technology Access Services starting in the second quarter of 2024. The company plans to share more information and data at the upcoming annual [AGBT General Meeting](#) in Orlando, Florida (February 5–8, 2024).

Learn more about the G4X Spatial Sequencer at www.singulargenomics.com/g4x.

About Singular Genomics Systems, Inc.

Singular Genomics is a life science technology company that develops next-generation sequencing and multiomics technologies. The commercially available G4[®] Sequencing Platform is a powerful, highly versatile benchtop genomic sequencer designed to produce fast and accurate results. In addition, the company is currently developing the G4X[™] Spatial Sequencer, an upgrade to the G4, which will leverage Singular's proprietary sequencing technology, applying it as an *in situ* readout for transcriptomics, proteomics and fluorescent H&E in tissue, with spatial context. Singular Genomics' mission is to empower researchers and clinicians to advance science and medicine. Visit www.singulargenomics.com for more information.

Forward Looking Statements

Certain statements contained in this press release, other than historical information, constitute forward-looking statements within the meaning of the federal securities laws. Forward-looking statements include, but are not limited to, statements regarding: (i) our timeline and successful development of the G4X and the ability to deliver associated services; (ii) expected features, capabilities and specifications of the G4X and the ability to deliver associated services; (iii) our ability to successfully manufacture, commercialize and support the G4, G4X and our flow cell kits in accordance with our timelines, objectives and specifications; and (iv) quotes of management. Any such forward-looking statements are based on our management's current expectations and are subject to risks and uncertainties that could cause our actual future results to differ materially from our management's current expectations or those implied by our forward-looking statements. These risks and uncertainties include, but are not limited to, the following: (i) we are currently developing the G4X Spatial Sequencer and may not be successful in completing its development on our projected timeline, with the features and capabilities we expect, or at the cost we anticipate; (ii) we have very little history manufacturing and commercializing our products or technology; (iii) the life sciences technology market is highly competitive, and if we fail to compete effectively, our business and operating results will suffer; (iv) if we are sued for infringing, misappropriating or otherwise violating intellectual property rights of third parties, such litigation could be costly and time consuming and could prevent or delay us from developing or commercializing our products; (v) if our products fail to achieve early customer and scientific acceptance, we may not be able to achieve broader market acceptance for our products, and our revenues and prospects may be harmed; (vi) we expect to be highly dependent upon revenue generated from the sale of the G4 and future products, and any delay or failure by us to successfully manufacture and commercialize the G4 and future products could have a substantial adverse effect on our business and results of operations; and (vii) recent macroeconomic challenges such as inflation and rising interest rates may materially and adversely impact our business, operations, product manufacturing and commercialization objectives. These and other risk factors that may affect our future results of operations are identified and described in more detail in our most recent filings on Forms 10-K and 10-Q and in other filings that we make with the SEC from time to time, including our Quarterly Report on Form 10-Q for the period ended September 30, 2023, filed with the SEC on November 14, 2023. Accordingly, you should not rely on forward-looking statements as predictions of future events or our future performance. Except as required by law, we undertake no obligation to update publicly or revise any forward-looking statements contained herein, whether as a result of any new information, future events, changed circumstances or otherwise.

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