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22nd Century Group and KeyGene Extend and Expand Plant Research Partnership

Updated Agreement Extends Exclusive Program to Create Valuable, New Hemp/Cannabis Varieties and Expands Collaboration to Include 22nd Century's Two Other Plant Franchises

Partnerships Will Enable 22nd Century to Accelerate the New Development of Valuable, Commercial Hemp/Cannabis Lines and Intellectual Property to Market in Two Years

BUFFALO, N.Y., May 04, 2021 (GLOBE NEWSWIRE) -- 22nd Century Group, Inc. (NYSE American: [XXII](#)), a leading plant-based biotechnology company focused on tobacco harm reduction, very low nicotine content tobacco, and hemp/cannabis research, announced today that it has reached an agreement to extend and expand its successful plant research partnership agreement with [KeyGene](#), a global leader in plant research involving high-value genetic traits and increased crop yields. The new partnership agreement extends the length of the exclusive worldwide collaboration 22nd Century has with KeyGene to develop new, disruptive hemp/cannabis plants and intellectual property for the life science, medicinal, and pharmaceutical end-use markets. It also expands the partnership to include research and development activity for non-combustible, alternative tobacco plant applications, such as protein production, and 22nd Century's third plant franchise, plus it establishes a new governance structure and working model to accelerate development timelines across all three crop/trait programs.

"We have a highly successful relationship with KeyGene, and we are excited to announce this expansion of our partnership that we have been referring to recently," said James A. Mish, chief executive officer of 22nd Century Group. "Our KeyGene partnership has proven to be crucial for 22nd Century's growth and success in the hemp/cannabis space. Since launching our collaboration in 2019, we have achieved much together, including [a breakthrough in molecular breeding](#) that will significantly reduce the time needed to develop new hemp/cannabis plant lines with commercially valuable traits. We are pleased to extend our exclusive, global hemp/cannabis research agreement with KeyGene and expand our partnership with KeyGene's world-class team of plant scientists, geneticists, molecular biologists, and bioinformaticians to achieve the same levels of success with biotechnology applications for plant-based protein production as well as our yet-to-be-announced third plant franchise."

"Our partnership with 22nd Century Group has been mutually beneficial, as we have worked together to make game-changing discoveries in hemp/cannabis genetic research," said Walter Nelson, chief executive officer of KeyGene USA. "This expanded partnership fits well into KeyGene's push into integrating metabolomics and proteomics with our capabilities in genomics using innovative informatics tools. I am excited to build on this successful relationship and look forward to what we will be able to accomplish in other crops using our technology innovation platforms."

Through this successful, expanded partnership, 22nd Century has access to KeyGene's unique suite of crop innovation platforms, including genomics, molecular breeding, trait discovery, and metabolomics technologies. KeyGene's team of scientists also possess unmatched expertise and a strong track record of success in plant biotechnology, providing 22nd Century the ability to co-develop groundbreaking genetic solutions for commercial traits in plant technology that differentiate it from other plant-based biotechnology companies.

"We have worked with KeyGene to develop platforms and tools that have allowed us to identify plant lines with unique profiles of various major cannabinoids in hemp/cannabis plants. We also found that these strains have minor cannabinoids that may have potential medicinal applications. This expanded partnership will give us the exclusive rights to develop and commercialize these unique cannabinoid traits," said Juan Sanchez Tamburrino, vice president of research and development at 22nd Century Group.

The renewed partnership will help to accelerate the development of new plant lines across 22nd Century's three franchises by enhancing the working process between the two organizations. 22nd Century and KeyGene will

form an executive steering committee to establish and refine targeted traits, technologies, intellectual property, and other deliverables and ensure collaboration achieves its objectives and timelines. With the extended and expanded partnership with KeyGene, 22nd Century has secured and enhanced four of the five key partnerships needed in the upstream segments of the cannabinoid value chain. Combining the Company's core strength in plant science and its network of operational partnerships will enable 22nd Century to drive differentiation and value by delivering new valuable plant lines and IP in two years. The Company will tailor its solutions for the hemp/cannabis industry to the unique needs of its customers and consumers across a wide range of end-use markets, including the life science, consumer product, and pharmaceutical industries.

22nd Century's hemp/cannabis strategy targets the upstream segments of the cannabinoid value chain and related intellectual property in the areas of plant biotechnology research, gene modification and engineering, modern plant breeding and development, and extraction. The Company is focused on developing intellectual property and proprietary hemp/cannabis plants with high-value genetic and agronomic traits, including lines with stable, ultra-high specific cannabinoid levels, lines with rare cannabinoids, and lines with ultra-high and ultra-low terpene levels. This new agreement with KeyGene aligns with the Company's focus and its updated strategy to be more aggressive with the development of commercially valuable hemp/cannabis lines.

22nd Century also believes the new agreement with KeyGene will place the two organizations in a better position to build on their partnership's success to date. Over the past year, KeyGene and 22nd Century have made tremendous progress in hemp/cannabis research. In March 2020, the Company announced that it built a [proprietary bioinformatics platform](#), allowing 22nd Century to monetize a portion of the vast knowledge foundation and intellectual property it has developed. In February of this year, the partners announced the [launch of an advanced cannabis biotechnology platform](#) that will enable 22nd Century and its strategic partners to quickly identify and incorporate commercially valuable traits into new, stable hemp/cannabis lines to be commercialized in two-year cycles. The platform includes a suite of proprietary molecular tools and an extensive library of reference genomes, molecular markers, and gene-trait correlations that the Company will begin to monetize by later this year. 22nd Century has already characterized millions of high-value single nucleotide polymorphisms (SNPs). By targeting SNPs newly identified through this platform, the Company has sequenced large numbers of cannabis varieties and assembled them into reference genomes. This has enabled 22nd Century to find the genes responsible quickly and easily for specific traits in a plant, proving the power of this tool for the Company and the hemp/cannabis industry.

22nd Century's third franchise, with a total addressable market of \$500 billion, operates in an industry less regulated than tobacco and hemp/cannabis. It is large, growing, and a natural extension of the Company's core strength and expertise with a faster route to commercialization than the Company's first two franchises. The third franchise also has a similar genome to the hemp/cannabis plant. 22nd Century is leveraging its know-how in plant science, securing valuable intellectual property, and pursuing strategic partnerships to support the development of this franchise. Combined, 22nd Century's three franchises have a total addressable market of well over \$1.3 trillion. There is a natural intersection of adjacencies across 22nd Century's three plant-based franchises. The Company will turn attention to the development of its third, plant-based franchise after securing MRTP authorization for VLN®.

About 22nd Century Group, Inc.

22nd Century Group, Inc. (NYSE American: XXII) is a leading plant biotechnology company focused on technologies that alter the level of nicotine in tobacco plants and the level of cannabinoids in hemp/cannabis plants through genetic engineering, gene-editing, and modern plant breeding. 22nd Century's primary mission in tobacco is to reduce the harm caused by smoking through the Company's proprietary reduced nicotine content tobacco cigarettes – containing 95% less nicotine than conventional cigarettes. The Company's primary mission in hemp/cannabis is to develop and commercialize proprietary hemp/cannabis plants with valuable cannabinoid profiles and desirable agronomic traits.

Learn more at xxiicentury.com, on Twitter [@xxiicentury](https://twitter.com/xxiicentury), and on [LinkedIn](#).

About KeyGene

KeyGene is a leading plant research company for higher crop yield and quality that revolutionized plant breeding using proprietary DNA technologies. Through the development and use of cutting-edge breeding technologies, bioinformatics, and data science expertise, KeyGene provides organizations with solutions to R&D challenges as well as plant-based trait platforms to deliver novel crop solutions. KeyGene was founded in 1989 and has locations in the Netherlands, United States, and India.

Learn more at keygene.com, on Twitter [@KeyGeneInfo](https://twitter.com/KeyGeneInfo), and on [LinkedIn](#).

Cautionary Note Regarding Forward-Looking Statements

Except for historical information, all of the statements, expectations, and assumptions contained in this press release are forward-looking statements. Forward-looking statements typically contain terms such as “anticipate,” “believe,” “consider,” “continue,” “could,” “estimate,” “expect,” “explore,” “foresee,” “goal,” “guidance,” “intend,” “likely,” “may,” “plan,” “potential,” “predict,” “preliminary,” “probable,” “project,” “promising,” “seek,” “should,” “will,” “would,” and similar expressions. Actual results might differ materially from those explicit or implicit in forward-looking statements. Important factors that could cause actual results to differ materially are set forth in “Risk Factors” in the Company’s Annual Report on Form 10-K filed on March 11, 2021. All information provided in this release is as of the date hereof, and the Company assumes no obligation to and does not intend to update these forward-looking statements, except as required by law.

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