ChromaDex Shares Promising Findings from First-Of-Its Kind Clinical Study to Demonstrate Oral Nicotinamide Riboside (NR) Supplementation Increases Muscle Mitochondrial Biogenesis

NR improves muscle mitochondrial biogenesis, satellite cell differentiation and gut microbiota composition in first-ever five-month-long study in monozygotic twin pairs

LOS ANGELES – ChromaDex Corp. (NASDAQ:CDXC), a global bioscience company dedicated to healthy aging, announced promising findings from a first-of-its kind five-month-long clinical study, as reported in the peer-reviewed journal *Science Advances* by a team of scientists led by Dr. Eija Pirinen (University of Helsinki and University of Oulu) and Dr. Kirsi Pietiläinen (University of Helsinki).

The clinical trial was part of the ChromaDex External Research Program (CERP™) and investigated the company's proprietary Niagen® ingredient (patented nicotinamide riboside, or "NR") in 20 BMI-discordant (one leaner, one heavier) identical twin pairs. Results of the study showcase that NR supplementation improved muscle mitochondrial biogenesis, satellite cell differentiation and gut microbiota composition. This is the first published and peer-reviewed clinical study demonstrating an increase in mitochondrial biogenesis following NR supplementation in humans and is consistent with a CERP preclinical study published in *Cell Reports*, demonstrating NR increased mitochondrial biogenesis in neuronal cells. Additionally at five months, this clinical study marks a milestone as the longest published NR supplementation study to date.

"While previous preclinical research has demonstrated that increasing NAD+ through precursor supplementation improves the quality and quantity of muscle stem cells, promotes muscle function, increases mitochondrial health and respiration, and has therapeutic effects in mitochondrial and muscle disorders, many of these benefits have yet to be translated in human clinical studies," said Dr. Andrew Shao, ChromaDex Senior Vice President of Global Scientific & Regulatory Affairs. "This study marks an important milestone in research between NR supplementation and mitochondrial biogenesis."

Mitochondria are widely known as the powerhouse of cells and help regulate the metabolic status of skeletal muscle by adapting their size, number, and function in response to exercise, disuse, nutrient availability, aging, and disease. One of these regulatory processes is called mitochondrial biogenesis, which occurs in response to physical stimulation, and is the process by which mitochondria increase their number and size by generating new mitochondria from pre-existing ones. Nicotinamide adenine dinucleotide (NAD+) is a coenzyme critical for this process and is directly tied to mitochondrial health. For example, NAD+ is found in high concentrations in healthy skeletal muscle mitochondria, highlighting its importance in skeletal muscle energy production.

“Our findings are a great advance in the field of muscle mitochondrial research, and they encourage us and others to continue to test the impact NR may have on muscle mitochondrial dysfunction,” Dr. Pirinen comments.

About the study:

The investigation was an open-label, parallel-assignment study of 20 BMI-discordant identical twin pairs, with 44% of the study participants female, and 56% male. The study also included a small group of BMI-concordant (same amount of body fat and muscle) identical twin pairs (n=8, 4 twin pairs). All twins from the BMI-discordant pairs were supplemented with NR. Of the BMI-concordant twin pairs, one co-twin was randomized to NR supplementation, while the other co-twin was supplemented with placebo. Featuring identical twin pairs, this unique study design allowed the team to investigate the effect of BMI to NR response in individuals with the same genetic background and would not have been possible in a standard study design featuring individuals with different genetic backgrounds.

Highlights from NR supplementation within this study:

- NR was well tolerated and increased mitochondrial biogenesis, increasing the number and density of muscle mitochondria. NR also increased muscle mitochondrial DNA (mtDNA) by about 30% and increased the expression of genes responsible for stimulating mitochondrial biogenesis.
- NR improved muscle myoblast differentiation, which is the process by which muscle stem cells mature into myotubes and is a developmental stage of a muscle fiber.
- NR improved gut microbiota composition as seen through an increase in the abundance of *Faecalibacterium prausnitzii*-one of the most beneficial bacteria found in the microbiome of healthy humans.
- NR supplemented subjects had a slight and significant increase of total plasma homocysteine, a marker of methyl donor depletion, which remained within normal clinical limits.
- NR increased body weight and whole-body fat percentage, and decreased insulin sensitivity; there are several factors to note regarding these outcomes:
    - The small placebo group of BMI-concordant twins included in the study that experienced increases in body weight and fat mass had similar outcomes to the BMI-discordant twins that were supplemented with NR. This suggests the weight gain observed in the study may be due to increases in fat over time and not due to NR, however some of these results warrant further investigation, as they have not been observed in other studies.
    - A study limitation to note is the BMI-discordant twin study protocol did not include a parallel placebo arm to adequately monitor changes. Therefore, additional research is needed to validate these findings.

These promising results suggest that NR supplementation has potential to increase muscle mitochondrial biogenesis, satellite cell differentiation, and gut microbiota composition, and we look forward to expanding additional research in this area.

About ChromaDex:

ChromaDex Corp. is a global bioscience company dedicated to healthy aging. The ChromaDex team, which includes world-renowned scientists, is pioneering research on nicotinamide adenine dinucleotide (NAD+), levels of which decline with age. ChromaDex is the innovator behind NAD+ precursor nicotinamide riboside (NR), commercialized as the flagship ingredient Niagen®. Nicotinamide riboside and other NAD+ precursors are protected by ChromaDex's patent portfolio. ChromaDex maintains a website at www.chromadex.com to which ChromaDex regularly posts copies of its press releases as well as additional and financial information about the Company.

Forward-Looking Statements:

This release contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities and Exchange Act of 1934, as amended, including statements related to whether the study showcases that NR supplementation improved muscle mitochondrial biogenesis, satellite cell differentiation and gut microbiota composition. Statements that are not a description of historical facts constitute forward-looking statements and may often, but not always, be identified by the use of such words as "expects," "anticipates," "intends," "estimates," "plans," "potential," "possible," "probable," "believes," "seeks," "may," "will," "should," "could" or the negative of such terms or other similar expressions. Risks that contribute to the uncertain nature of these forward-looking statements include the impact of the COVID-19 pandemic on our business and the global economy; our history of operating losses and need to obtain additional financing; the growth and profitability of our product sales; our ability to maintain sales, marketing and distribution capabilities; changing consumer perceptions of our products; our reliance on a single or limited number of third-party suppliers; and the risks and uncertainties associated with our business and financial condition. More detailed information about ChromaDex and the risk factors that may affect the realization of forward-looking statements is set forth in ChromaDex's Annual Report on Form 10-K for the fiscal year ended December 31, 2021, ChromaDex's Quarterly Reports on Form 10-Q and other filings submitted by ChromaDex to the SEC, copies of which may be obtained from the SEC's website at www.sec.gov. Readers are cautioned not to place undue reliance on these forward-looking statements, which speak only as of the date hereof, and actual results may differ materially from those suggested by these forward-looking statements. All forward-looking statements are qualified in their entirety by this cautionary statement and ChromaDex undertakes no obligation to revise or update this release to reflect events or circumstances after the date hereof.

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