

ChromaDex's NIAGEN™ Nicotinamide Riboside Meets Primary Endpoint in First Human Clinical Study

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- Results Confirm That NR Increases the Mitochondrial Co-enzyme NAD+ and is Safe -
- Full Study Results to be Peer Reviewed for Scientific Publication -

IRVINE, Calif., Feb. 11, 2015 /PRNewswire/ -- ChromaDex Corp. (OTCQX: CDXC) announced today that the initial results of the first human clinical study for the company's NIAGEN® nicotinamide riboside (NR) has met its primary endpoint. The results demonstrated that a single dose of NR resulted in statistically significant increases in the co-enzyme nicotinamide adenine dinucleotide (NAD+) in healthy human volunteers. The study shows for the first time a similar conversion of NR into NAD+ as has been shown in prior animal studies.

Maintenance of sufficient levels of NAD+ is key to cellular energy metabolism and mitochondrial function. If NAD+ levels go down or are redirected (as in cancer cells), mitochondrial function erodes, creating numerous adverse effects. For example, results of a mouse study conducted by the National Institutes of Health (NIH) in collaboration with ChromaDex **published in November 2014** indicated that NR was effective at restoring NAD+ levels in mitochondria and rescuing phenotypes associated with a devastating accelerated aging disease known as **Cockayne Syndrome (CS)**. The researchers concluded that NR showed promise as a potential therapy for the disease, as well as for other age-related neurodegenerative conditions.

In the first human clinical study of NIAGEN®, NAD+ metabolomic analyses were completed in blood for various time points over a 24-hour period. For the first time, the study also established an effective dose range for NR in humans.

A preliminary analysis of the results did not reveal any safety issues with NR, which is consistent with previous safety results demonstrated in numerous cell and animal studies.

The full results of the study will be submitted for peer review in the scientific literature.

The NAD⁺ metabolomics analyses were performed in the laboratory of **Dr. Charles Brenner, the Roy J. Carver Chair of Biochemistry and Professor of Internal Medicine at the University of Iowa**. In 2004, Brenner, who was then a faculty member at Dartmouth College, discovered NR to be a vital precursor of NAD⁺, which is made available by nicotinamide riboside kinases (Nrks) that are conserved between yeast and humans. In 2007, Dr. Brenner's lab discovered a second pathway by which NR is converted to NAD⁺ and showed that NR can extend the lifespan of yeast cells by virtue of elevating NAD⁺ levels and increasing the activity of the NAD⁺-dependent Sir2 enzyme.

Dr. Brenner commented, "The results of this study constitute a significant milestone in the translation of NR technologies as it is the first time an increase in NAD⁺ in humans has been demonstrated through NR supplementation. As noted in numerous scientific studies, the potential health and therapeutic benefits of NR as a precursor to NAD⁺ are significant. The results of this clinical study should encourage more studies and research regarding the possible health benefits of NR in humans."

Nobel Laureate Dr. Roger Kornberg, who chairs ChromaDex's Scientific Advisory Board, commented, "Demonstrating that NR is an effective precursor to increase NAD⁺ in humans has significant positive implications and may be a cornerstone to developing solutions to delay or reverse the effects of aging, obesity and disease."

Frank Jaksch Jr., founder and CEO of ChromaDex, commented, "We believe the confirmation that a single dose of NR increases NAD⁺ in humans is a landmark result and a significant bridge between the numerous animal studies previously conducted that have demonstrated not only an increase in NAD⁺, but also a broad range of therapeutic benefits."

Jaksch continued, "Dysfunctional cellular energy metabolism in mitochondria is increasingly implicated in diseases of aging, autoimmune diseases, muscle wasting, neuropathies and other conditions, and this study opens the door to the development of both consumer products and pharmaceuticals addressing these conditions."

ChromaDex's NIAGEN® is the only commercially available form of NR and is supported by five patents issued and several pending, with patents rights acquired from Dartmouth College, Cornell University and Washington University.

Published research has shown that NR is perhaps the most effective precursor to boost the co-enzyme NAD⁺ in the cell. NAD⁺ is arguably the most important cellular co-factor for improvement of mitochondrial performance and energy. In recent years, NAD⁺ has also been shown to participate as an extracellular signaling molecule in cell-to-cell communication. NAD⁺ is essential in supporting healthy cellular metabolism, including the efficient conversion

of blood glucose into energy.

As organisms age, NAD⁺ levels drop, which leads to a decrease in mitochondrial health; this in turn leads to age-related health issues. Low NAD⁺ levels limit the activity of a group of enzymes called sirtuins, which are believed to play key roles in longevity. NAD⁺ levels can be depleted by many of the stresses of life. By boosting NAD⁺, NR can increase mitochondrial health and induce creation of new mitochondria.

About Nicotinamide Riboside (NR):

Sometimes referred to as the "hidden vitamin," NR is found naturally in trace amounts in milk and other foods and is a more potent, no-flush version of Niacin (vitamin B3). Researchers around the world are studying the effect of NR on mitochondria, the powerhouses of the cell where macronutrients are converted to energy the cell can use. Mitochondria also play an important part in the aging process. Scientists hope that the stimulation of mitochondrial function with NR may result in increased longevity as well as other health improvements. Researchers worldwide are continuing to make seminal discoveries characterizing the unique properties of NR in a wide range of health benefits, including increased mitochondrial health, increased muscle endurance, neuroprotection, sirtuin activation, protection against weight gain on high-fat diet, protection against oxidative stress and improvement of blood glucose and insulin sensitivity.

While scientists have known for decades that mitochondria produce energy for cells, it is only recently that mitochondrial function has been linked to general health, aging and numerous disease conditions. Key to mitochondrial function is the maintenance of sufficient levels of NAD⁺, which is used to generate energy efficiently and allows overall mitochondria function, such as signaling, immune regulation and cell death, to proceed properly. If levels go down or are redirected (as in cancer cells), mitochondrial function erodes, creating numerous adverse effects. Scientists have begun to show in animal models that the stimulation of mitochondrial function with NR may result in increased longevity as well as other health improvements. At the same time, mitochondrial dysfunction has been increasingly linked to a broad range of disease conditions, including autoimmune diseases, macular degeneration, cancer, Alzheimer's and other central nervous system diseases, Duchenne muscular dystrophy and others.

A study by researchers from Harvard Medical School conducted in conjunction with the National Institute on Aging and published in December 2013 in **Cell** demonstrated that mitochondrial dysfunction (a hallmark of aging) in aging mice is due to a disruption in Sirtuin1-dependent nuclear-mitochondrial communication. The study further showed that a reduction in NAD⁺ levels is responsible for this disruption. Excitingly, the study demonstrated that this mitochondrial dysfunction is readily reversible by the administration of a NAD⁺ precursor. The study reported that "One week of treatment with a compound that boosts NAD⁺ levels is sufficient to restore the mitochondrial homeostasis and key biochemical markers of muscle health in a 22-month-old mouse to levels similar to a six-

month-old mouse," indicating that some aspects of aging may be theoretically reversible.

Separately, findings from **a 2012 study conducted by researchers at Weill Cornell Medical College and the Ecole Polytechnique Federale de Lausanne, Switzerland** showed that mice on a high-fat diet that were fed NR gained 60 percent less weight than mice eating the same high-fat diet without NR. Moreover, unlike the mice that were not fed NR, none of the NR-treated mice had indications that they were developing diabetes, and their energy and lower cholesterol levels improved, all without side effects. The Swiss researchers were quoted as saying the effects of NR on metabolism were "nothing short of astonishing."

About ChromaDex:

ChromaDex is an innovative natural products company that discovers, acquires, develops and commercializes proprietary-based ingredient technologies through its unique business model that utilizes its wholly owned synergistic business units, including ingredient technologies, natural product fine chemicals (known as "phytochemicals"), chemistry and analytical testing services, and product regulatory and safety consulting (as Spherix Consulting). The company provides seamless science-based solutions to the nutritional supplement, food and beverage, animal health, cosmetic and pharmaceutical industries. The ChromaDex ingredient technologies unit includes products backed with extensive scientific research and intellectual property. Its ingredient portfolio includes pTeroPure[®] pterostilbene; ProC3G[®], a natural black rice containing cyanidin-3-glucoside; PUREENERGY[®], a caffeine-pTeroPure[®] cocrystal; and NIAGEN[®], its recently launched branded nicotinamide riboside, a potent NAD+ booster and novel next-generation B vitamin. To learn more about ChromaDex, visit www.chromadex.com.

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. 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. Actual results may differ materially from those set forth in this release due to the risks and uncertainties inherent in ChromaDex's business. 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 28, 2013, ChromaDex's Quarter 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. 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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To view the original version on PR Newswire, visit: <http://www.prnewswire.com/news-releases/chromadexs-niagen-nicotinamide-riboside-meets-primary-endpoint-in-first-human-clinical-study-300034312.html>

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