Niagen.

BIOSCIENCE

State of the Science

Clinical Research on Niagen®



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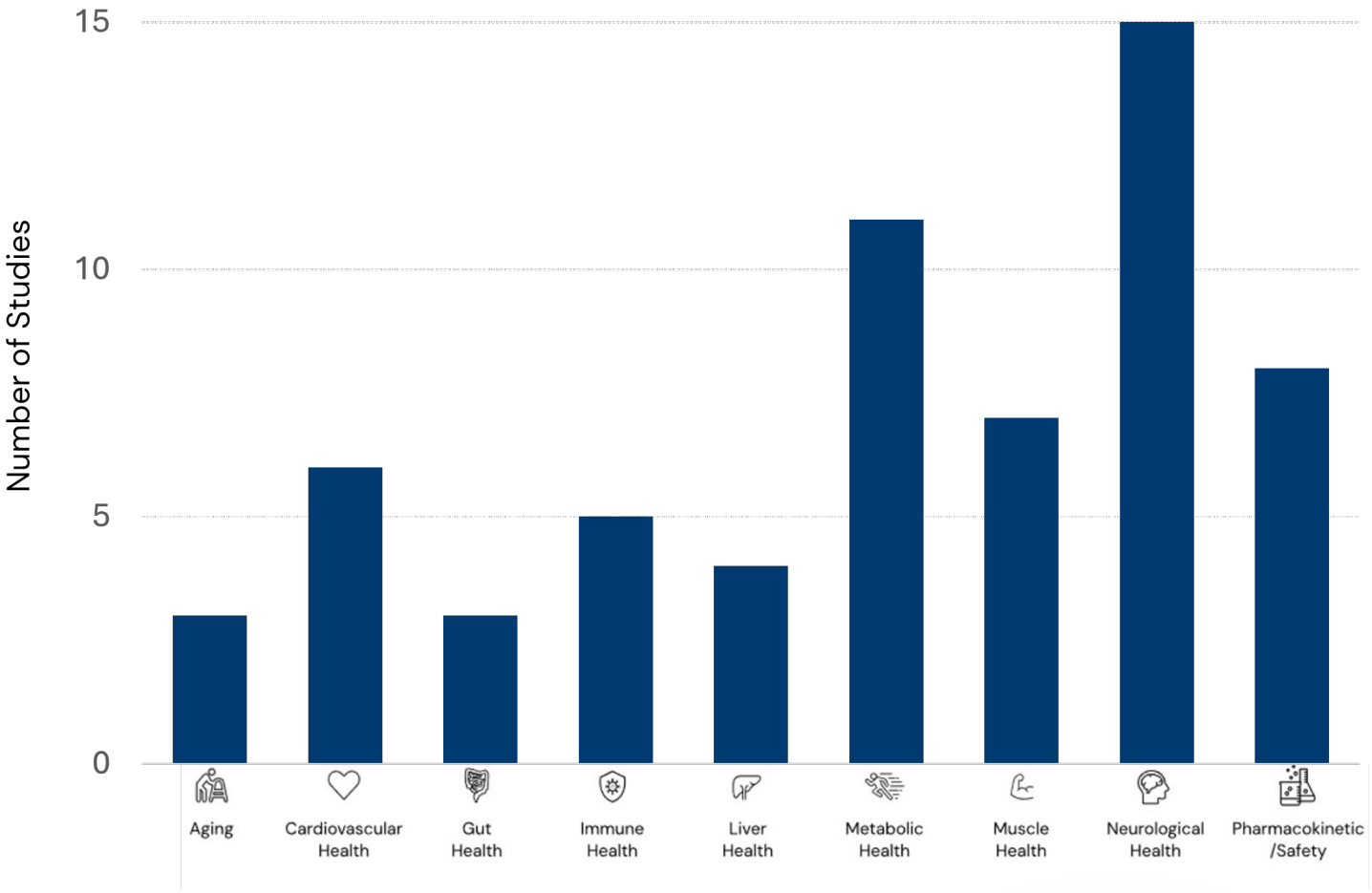
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USC School of Gerontology Dean

A recognized aging expert with pioneering research and discoveries on mitochondria and novel microproteins



Peer-reviewed, published Niagen® clinical studies per health area



2 years

The longest duration of supplementation

Presterud et al., 2023

3000 mg

The highest dose with established safety

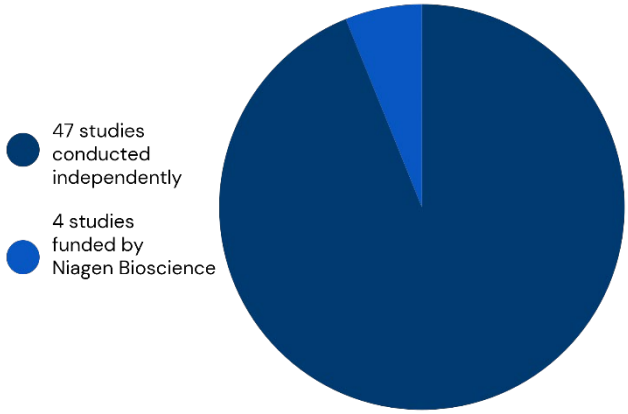
Berven et al., 2023

140 participants

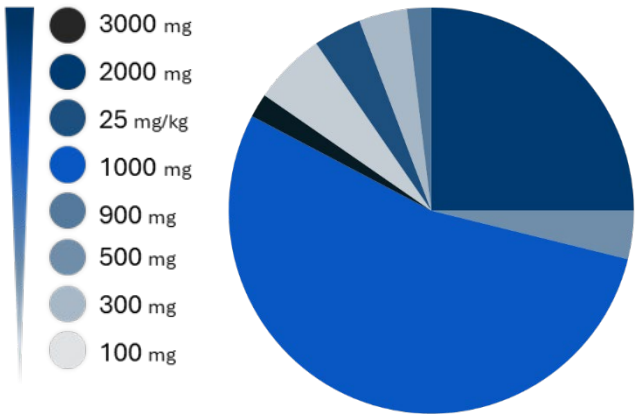
The largest population studied in a clinical trial

Conze et al., 2019

92% of the **51 Niagen®** published, peer-reviewed clinical studies were conducted independently



1000 mg is the most extensively researched daily dose



Peer-reviewed, published clinical studies on Niagen®

Publication	Dose Duration	Health Area	Study Design	Key Outcomes
Schon et al., 2026 Effects of nicotinamide riboside in mitochondrial DNA disease	20 mg/kg (1250-2000 mg) 4 weeks	Muscle Health Metabolic Health	Open-label study in 8 people with genetically confirmed heteroplasmic mitochondrial DNA (mtDNA) disease. Diagnoses were either m.3243A>G/T or single large-scale mtDNA deletion.	Niagen significantly, but minimally, improved the timed "up and go" test from 11.9 to 9.96 seconds. Niagen tended to improve measures of mitochondrial function in muscle, with these effects being most prominent in people with single large-scale mtDNA deletion. Niagen was overall well tolerated.
Martens et al., 2026 **A Phase-II Randomized Controlled Pilot Study of Nicotinamide Riboside Supplementation in Older Adults with Amnestic Mild Cognitive Impairment**	1000 mg 12 weeks	Neurological Health	Randomized, double-blind, placebo-controlled pilot study in 42 individuals with amnestic mild cognitive impairment	Niagen significantly increased blood NAD+ levels by 107.7% after 12 weeks. Niagen did not significantly improve cognitive function, although exploratory analyses showed potential improvements in blood flow to the left hippocampus, one of the earliest brain regions affected in Alzheimer's disease. Niagen trended toward improvements in diastolic blood pressure and arterial stiffness.
Heikkinen et al., 2026 **The Divergent Effects of Nicotinamide Riboside and High-Intensity Exercise Training on Skeletal Muscle Epigenetic Aging**	1000 mg 5 months	Aging Muscle Health	Secondary analysis of samples from three previously conducted intervention studies	Niagen significantly reduced estimated muscle biological age by ~2.5 years on the muscle-specific aging clock but showed inconsistent effects across other clocks.
Han et al., 2026 **NAD+ Augmentation by Nicotinamide Riboside Engages SLIT2/ROBO1 Signaling to Attenuate Th17 Inflammation in Psoriasis**	1000 mg 4 weeks	Immune Health	Randomized, placebo-controlled pilot study in 27 individuals with mild-to-moderate psoriasis	Niagen significantly increased blood NAD+ levels by 147% after 4 weeks. Niagen significantly reduced markers of inflammation and calmed the immune response that drives skin inflammation in psoriasis.

Publication	Dose Duration	Health Area	Study Design	Key Outcomes
Lin et al., 2026 **Safety and Efficacy of Individualised Exercise and NAD+ Precursor Supplementation in Patients with Friedreich's Ataxia in the USA: a Single-Centre, 2 × 2 Factorial, Randomised Controlled Trial**	300, 600, or 900 mg (scaling with body weight) for 12 weeks	 Cardiovascular Health  Metabolic Health	Phase 2, randomized, 2x2 factorial, placebo-controlled study in 66 children and adults with Friederich's Ataxia	**Primary:** Niagen NR + exercise significantly improved VO_2 peak compared to the control group (placebo without exercise), but this did not differ from exercise alone. **Secondary:** Niagen NR + exercise significantly improved maximal workload and oxygen used per heartbeat (O2 pulse) compared to control. **Exploratory:** Niagen NR + exercise significantly reduced HbA1c and self-reported time spent doing physical activity, compared to control. Niagen NR alone significantly reduced body fat (visceral fat and fat mass index Z-score) compared to control. Niagen NR, without exercise, was associated with improvements in VO_2 peak in children but not adults.
Berven et al., 2026 **The NAD-Brain Pharmacokinetic Study of NAD Augmentation in Blood and Brain using Oral Precursor Supplementation**	Pilot: NR (600 mg) Single doses at 0 and 12 hours over 24 hours Stage 1: NR and NMN (1200 mg) 8 days Stage 2: NR (1200 mg) 4 weeks	 Pharmacokinetic /Safety	Phase I, open-label trial divided into 3 stages: Pilot: 24-hour pharmacokinetic study supplementing NR in 1 healthy adult Stage 1: Crossover pharmacokinetic study supplementing NR and NMN in 6 healthy adults Stage 2: Parallel group pharmacokinetic study supplementing NR in 6 healthy adults and 6 Parkinson's patients	After 8 days of supplementation, Niagen NR and NMN significantly elevated whole blood NAD+ levels, with the effects of NR being 2.3-fold greater. Neither precursor significantly elevated NAD+ levels in the brain within this time period. After 2 weeks of Niagen NR supplementation, blood NAD+ levels reached a new baseline in both healthy adults and Parkinson's patients, whereas brain NAD+ levels stabilized only in healthy individuals. After 4 weeks of Niagen NR supplementation, similar increases were seen between healthy and Parkinson's patients in NAD+ levels in the blood (120% and 116%, respectively) and brain (39% and 29%, respectively) from initial baseline.
Christen et al., 2026 **The Differential Impact of Three Different NAD+ Boosters on Circulatory NAD and Microbial Metabolism in Humans**	1000 mg 14 days	 Gut Health  Pharmacokinetic /Safety	Randomized, open-labeled, placebo-controlled, parallel study in 67 healthy adults Ex vivo microbiome and whole-blood mechanistic studies	NR and NMN, but not Nam, comparably increased circulatory NAD+ levels in healthy adults, while only Nam showed an acute effect on the NAD+ metabolome. In ex vivo fecal analyses, NR and NMN increased levels of NA and improved microbial growth and metabolism. In ex vivo whole blood analyses, NA boosted NAD+ levels while NMN, NR, and Nam did not.
Thomas et al., 2026 **Evaluation of Nicotinamide Riboside in Prevention of Small Nerve Fiber Axon Degeneration and Promotion of Nerve Regeneration**	2000 mg 90 days	 Neurological Health	Randomized, double-blind, placebo-controlled, Phase II study in 45 healthy adults	Niagen NR supplementation resulted in a minor increase in NAD+ in the skin samples but did not elevate plasma NAD+ levels or prevent capsaicin-induced degeneration of the epidermal sensory nerve fibers. Preliminary results show a small but statistically significant increase in the number of epidermal sensory nerve fibers at the 60-day visit, and this will need to be validated in larger studies.

Publication	Dose Duration	Health Area	Study Design	Key Outcomes
Wu et al., 2025 **Effects of Nicotinamide Riboside on NAD+ levels, Cognition, and Symptom Recovery in Long-COVID: A Randomized Controlled Trial**	2000 mg 20 weeks	 Neurological Health  Metabolic Health	Randomized, double-blind, placebo-controlled study in 58 non-hospitalized individuals with long COVID	Niagen NR significantly boosted NAD+ levels up to 210% after 5 weeks of supplementation and remained significantly elevated by 110% by the end of the 20-week intervention. While primary outcomes were not significant between Niagen NR and placebo, participants taking Niagen NR showed significant improvements from baseline to week 10 in executive functioning, fatigue severity, sleep quality, and symptoms of depression.
Lin et al., 2025 **Nicotinamide Riboside Combined with Exercise to Treat Hypertension in Middle-Aged and Older Adults: A Pilot Randomized Clinical Trial**	1000 mg 6 weeks	 Cardiovascular Health	Randomized, double-blind, placebo-controlled pilot study in 54 sedentary older adults with hypertension	The placebo plus exercise group (PL+Ex) trended toward a greater reduction in daytime systolic blood pressure (SBP) and diastolic blood pressure (DBP) compared to Niagen NR alone. Notably, the Niagen NR and exercise group (NR+Ex) trended toward an increase in daytime SBP and DBP. NR+Ex also trended toward a greater reduction in arterial stiffness compared to PL+Ex, as measured by a decrease in pulse wave velocity (PWV). In contrast, the Niagen NR only group showed a trend toward an increase in PWV. Among participants not taking antihypertensive medications, both NR+Ex and PL+Ex groups trended toward reductions in daytime SBP. For nighttime SBP, both groups also trended toward reductions, with larger reductions observed in NR+Ex. Daytime DBP trended downward in both NR+Ex and PL+Ex, while nighttime DBP decreased across all groups, with the largest reduction seen in NR+Ex.
Yulug et al., 2025 **Multi-Omics Characterization of Improved Cognitive Functions in Parkinson's Disease Patients after the Combined Metabolic Activator Treatment: A Randomized, Double-Blinded, Placebo-Controlled Phase II Trial**	2000 mg 12 weeks *(12.35g L-serine, 1g NR, 2.55g N-acetyl-L-cysteine, and 3.73g L-carnitine tartrate) 1 dose for 28 days and two doses for the next 56 days.*	 Neurological Health	Randomized, double-blind, placebo-controlled, phase II study in 48 Parkinson's disease (PD) patients	CMA supplementation did not improve motor function in PD patients. CMA significantly improved cognitive function, particularly in patients with low baseline Montreal Cognitive Assessment (MoCA) scores, indicative of worsened cognitive function. However, the variability in baseline MoCA scores likely influenced the observed outcomes.
Shoji et al., 2025 **Nicotinamide Riboside Supplementation Benefits in Patients with Werner Syndrome: A Double-Blind Randomized Crossover Placebo-Controlled Trial**	1000 mg 26 weeks	 Aging	Randomized, double-blind, placebo-controlled, crossover study in 9 patients with Werner Syndrome	Niagen NR improved arterial stiffness, as measured by the cardio-ankle vascular index. Niagen NR increased the number of high-density lipoprotein particles. Niagen NR reduced skin ulcer size and tended to prevent heel pad thinning, while ulcers worsened in the placebo group.

Publication	Dose Duration	Health Area	Study Design	Key Outcomes
Wu et al., 2025 **Cognitive and Alzheimer's Disease Biomarker Effects of Oral Nicotinamide Riboside (NR) Supplementation in Older Adults with Subjective Cognitive Decline and Mild Cognitive Impairment**	1000 mg 8 weeks	 Neurological Health	Randomized, double-blind, placebo-controlled, crossover study in 46 older adults with subjective cognitive decline and mild cognitive impairment.	Niagen NR supplementation had no impact on cognition. Niagen NR supplementation resulted in a 7% reduction in plasma pTau217 concentrations, a biomarker for AD, while placebo resulted in an 18% increase.
Ahmadi et al., 2025 **A Pilot Trial of Nicotinamide Riboside and Coenzyme Q10 on Inflammation and Oxidative Stress in CKD**	1000 mg 6 weeks *NR (1000 mg/day) or CoQ10 (1200 mg/day)*	 Metabolic Health	Randomized, double-blind, placebo-controlled, crossover study in 25 people with moderate to severe chronic kidney disease	Niagen NR supplementation primarily affected gene activity related to carbohydrate/fat metabolism and immune signaling, while CoQ10 influenced genes linked to immune/stress response and fat metabolism. Both Niagen NR and CoQ10 reduced plasma oxidative stress markers, but their effects on inflammation markers differed. NR showed mixed results, whereas CoQ10 consistently reduced inflammation. Only Niagen NR improved mitochondrial function in monocytes, a type of white blood cell.
Wu et al., 2024 **Nicotinamide Riboside Augments Human Macrophage Migration via SIRT3-Mediated Prostaglandin E2 Signaling**	1000 mg 1 week	 Immune Health	Ex Vivo: Monocytes were extracted from young, healthy subjects and then treated with NR In Vivo: Randomized, double-blind, placebo-controlled, pilot study in 36 young, healthy subjects	Ex Vivo: Niagen NR treatment increased levels of NAD+ and prostaglandin E2 (PGE2), a key regulator of inflammatory and immune responses, in monocytes from healthy subjects. In Vivo: Niagen NR supplementation increased PGE2 levels in human serum.
Nanga et al., 2024 **Acute Nicotinamide Riboside Supplementation Increases Human Cerebral NAD+ Levels in Vivo**	900 mg 4 hours	 Neurological Health	Open-label, pilot study in 10 healthy subjects	Niagen NR supplementation significantly increased brain NAD+ levels by about 16% compared to baseline.
McDermott et al., 2024 **Nicotinamide Riboside for Peripheral Artery Disease: the NICE Randomized Clinical Trial**	1000 mg 6 months *NR (1000 mg/day) alone or in combination with Resveratrol (125 mg/day).*	 Aging  Cardiovascular Health	Randomized, double-blind, placebo-controlled, phase II study in 90 peripheral artery disease (PAD) patients	Niagen NR supplementation significantly improved treadmill walking time and the six-minute walking distance (by 17.6 meters), a clinically meaningful change. Niagen NR effectively improved walking performance in individuals with PAD, while resveratrol did not enhance the benefits of NR. Niagen NR combined with resveratrol did not significantly improve the six-minute walk distance compared to placebo.

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Bhandari et al., 2024 **Feasibility of telehealth exercise and nicotinamide riboside supplementation in survivors of childhood cancer at risk for diabetes: A pilot randomized controlled trial**	1000 mg 6 weeks	 Metabolic Health  Muscle Health	Randomized, double-blind, placebo-controlled, pilot study in 20 childhood cancer survivors with prediabetes	As a feasibility study, the target of achieving ≥70% compliance with both exercise and Niagen NR interventions was successfully met, indicating that this approach was well-received by the patient population. Niagen NR supplementation showed no significant effects on markers of glucose metabolism, body composition, or muscle strength.
Yulug et al., 2023 **Combined metabolic activators improve cognitive functions in Alzheimer's disease patients: A Randomized Double-Blind Placebo-Controlled Phase-II Trial**	2000 mg 8 weeks *CMA (12.35g L-serine, 1g NR, 2.55g N-acetyl-L-cysteine, and 3.73g L-carnitine tartrate) One dose for 28 days and two doses for the next 56 days.*	 Neurological Health	Randomized, double-blind, placebo-controlled, phase II study in 69 Alzheimer's disease (AD) patients	CMA supplementation improved cognitive function by 29% in AD patients. Patients with high ADAS-Cog scores (worsened cognitive function) showed improvement with CMA supplementation. CMA also improved serum markers related to AD, as well as markers of liver and kidney health in AD patients, as seen through significant decreases in levels of ALT and uric acid.
Presterud et al., 2023 **Long-Term Nicotinamide Riboside Use Improves Coordination and Eye Movements in Ataxia Telangiectasia** **Suaste et al., 2026** **Transcriptional Profiling Shows Dampening of Interferon Gene Signatures by NAD+ Augmentation in Ataxia-Telangiectasia**	500 mg 2 years	 Neurological Health	Open-label, observational intervention study in 10 patients with AT	**Presterud et al., 2023** Long-term Niagen NR supplementation was safe and well tolerated, with no serious adverse events. Compared to historical controls, Niagen NR supplementation significantly improved motor coordination and eye movements in AT patients. This is the second clinical Niagen NR trial including children under the age of 18. **Suaste et al., 2026** Niagen was associated with reduced chronic immune and inflammation markers linked to improvements in neurological function.
Peluso et al., 2023 **Oral Supplementation of Nicotinamide Riboside Alters Intestinal Microbial Composition in Rats and Mice, but not Humans**	2000 mg 12 weeks	 Gut Health	Randomized, double-blind, placebo-controlled, parallel assignment study in 40 healthy, obese sedentary men	Niagen NR supplementation did not affect the diversity or abundance of gut bacteria in humans. However, Niagen NR increased (albeit not significantly) the ratio of Firmicutes and Proteobacteria, suggesting a potential positive effect.
Orr et al., 2023 **A Randomized Placebo-Controlled Trial of Nicotinamide Riboside in Older Adults with Mild Cognitive Impairment**	1000 mg 10 weeks	 Neurological Health	Randomized, double-blind, placebo-controlled, phase II, pilot study in 20 primarily Hispanic older adults with mild cognitive impairment (MCI)	Cognitive function measures remained stable in both Niagen NR and placebo groups throughout the study. Global methylation analyses trended towards a modest NR-associated increase in DNA methylation.
Lapatto et al., 2023 **Nicotinamide Riboside Improves Muscle Mitochondrial Biogenesis, Satellite Cell Differentiation, and Gut Microbiota in a Twin Study**	1000 mg 5 months	 Muscle Health  Gut Health	Nonrandomized, open-label, parallel-assignment study in 20 BMI-discordant (one leaner, one heavier) identical twin pairs	In the BMI-discordant twin pairs, Niagen NR supplementation was well-tolerated and increased whole blood NAD+ levels. Niagen NR also increased muscle mitochondrial biogenesis and 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.

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Han et al., 2023 **Boosting NAD Preferentially Blunts Th17 Inflammation via Arginine Biosynthesis and Redox Control in Healthy and Psoriasis Subjects**	1000 mg 1 week	 Immune Health	Ex Vivo: CD4+ T cells were extracted from mild-moderate psoriasis patients and healthy subjects and then treated with NR In Vivo: Randomized, double-blind, placebo-controlled, pilot study in 25 young, healthy subjects	Ex Vivo: NAD+/NADH ratio was reduced in psoriatic T cells compared to cells from healthy subjects. Niagen NR treatment reduced immune responsiveness in CD4+ T cells from healthy subjects and psoriasis patients. In Vivo: Niagen NR supplementation replicated the immune-modulating effects observed with ex-vivo NR administration, resulting in a decrease in inflammatory markers while enhancing antioxidant gene expression in immune cells.
Gaare et al., 2023 **Nicotinamide Riboside Supplementation is not Associated with Altered Methylation Homeostasis in Parkinson's Disease**	1000 mg 30 days	 Neurological Health	Randomized, double-blind, placebo-controlled, phase I study in 29 newly diagnosed PD patients	Niagen NR supplementation had no impact on DNA methylation in PD patients, including those with common mutations in the MTHFR gene. Niagen NR resulted in minor changes in the activity of metabolic pathways and patterns of DNA methylation. However, these changes were not harmful and did not disrupt normal DNA methylation.
Berven et al., 2023 **NR-SAFE: A Randomized, Double-Blind Safety Trial of High Dose Nicotinamide Riboside in Parkinson's Disease**	3000 mg 4 weeks	 Pharmacokinetic /Safety  Neurological Health	Randomized, double-blind, placebo-controlled, phase I clinical study in 20 idiopathic PD patients	High-dose Niagen NR supplementation was safe and well-tolerated with no related adverse events. Niagen NR did not alter whole blood homocysteine, or other major methyl donor groups, suggesting no impact on methyl donor group pool. Niagen NR significantly improved clinical symptoms of PD, suggesting augmenting NAD+ levels may have a symptomatic anti-Parkinson's effect.
Ahmadi et al., 2023 **Randomized Crossover Clinical Trial of Coenzyme Q10 and Nicotinamide Riboside in Chronic Kidney Disease**	1000 mg 6 weeks *NR (1000 mg/day) or CoQ10 (1200 mg/day).*	 Metabolic Health	Randomized double-blind, placebo-controlled, crossover study in 25 chronic kidney disease patients	Niagen NR supplementation showed a trend towards improved energy metabolism and submaximal exercise efficiency, suggesting better carbohydrate utilization for energy. Niagen NR decreased plasma levels of NAD-dependent citric acid cycle intermediates, suggesting improved mitochondrial metabolism. Niagen NR reduced short and medium-chained plasma triglycerides with a high degree of saturation (tightly packed), suggesting favorable changes in lipid metabolism. CoQ10 reduced certain types of triglycerides and increased plasma free fatty acids.

Publication	Dose Duration	Health Area	Study Design	Key Outcomes
Wu et al., 2022 **Boosting NAD+ Blunts TLR4-Induced Type I IFN in Control and Systemic Lupus Erythematosus Monocytes**	1000 mg 1 week	 Immune Health	Ex Vivo: Monocytes were extracted from young, healthy subjects and patients with systemic lupus erythematosus (SLE) and then treated with NR In Vivo: Randomized, double-blind, placebo-controlled, pilot study in 35 young, healthy subjects	Ex Vivo: Niagen NR reduced cytokine expression and type-I interferon (IFN) signaling (which plays a significant role in the human immune response) in monocytes from healthy subjects and SLE patients. In Vivo: Niagen NR supplementation increased whole blood NAD+ levels, as well as levels of related NAD+ metabolites. Niagen NR supplementation also replicated the effects observed with ex-vivo NR administration, resulting in a similar reduction in type-I IFN signaling in young, healthy subjects.
Wang et al., 2022 **Safety and Tolerability of Nicotinamide Riboside in Heart Failure with Reduced Ejection Fraction**	2000 mg 12 weeks	 Cardiovascular Health	Randomized, double-blind, placebo-controlled study in 30 patients with Stage C heart failure with reduced ejection fraction	High-dose Niagen NR supplementation was safe and well-tolerated, significantly, and dose-dependently (nearly) doubled whole blood NAD+ levels, and increased PBMC mitochondrial respiration. Niagen NR also decreased expression of inflammatory markers, such as NLRP3.
Vreones et al., 2022 **Oral Nicotinamide Riboside Raises NAD+ and Lowers Biomarkers of Neurodegenerative Pathology in Plasma Extracellular Vesicles Enriched for Neuronal Origin**	1000 mg 6 weeks	 Neurological Health	Randomized, double-blind, placebo-controlled, crossover study in 22 healthy, middle-aged, and older males and female adults	Niagen NR supplementation significantly increased NAD+ in plasma derived human neuronal extracellular vesicles (NEVs), suggesting an increase in neuronal NAD+ levels. In NEVs, Niagen NR also decreased levels of Aβ42, an Alzheimer's disease biomarker, as well as biomarkers pJNK and pERK1/2, which are involved in insulin resistance and neuroinflammatory pathways.
Brakedal et al., 2022 **The NADPARK Study: A Randomized Phase I Trial of Nicotinamide Riboside Supplementation in Parkinson's Disease**	1000 mg 30 days	 Neurological Health	Randomized, double-blind, placebo-controlled, phase I study in 30 Parkinson's disease (PD) patients	Niagen NR supplementation significantly increased cerebral NAD+ levels, altered brain metabolic pattern, and decreased levels of inflammatory cytokines in the cerebrospinal fluid of PD patients. Moreover, patients experienced a mild but significant clinical improvement, and this correlated with the change in the brain's metabolic pattern.
Zeybel et al., 2021 **Combined Metabolic Activators Therapy Ameliorates Liver Fat in Nonalcoholic Fatty Liver Disease Patients**	2000 mg 10 weeks *CMA (3.73g L-carnitine tartrate, 1g Niagen NR, 12.35g serine, and 2.55g N-acetyl-L-cysteine) One dose for 14 days and two doses for the next 56 days*	 Liver Health	Randomized, single-blind, placebo-controlled, phase II study in 31 patients with nonalcoholic fatty liver disease	CMA significantly decreased liver fat by 10%, and improved liver function, as seen through the significant reductions in serum ALT (39%), AST (30%), and uric acid (12%) levels. CMA reduced plasma levels of inflammatory proteins, suggesting a decrease in liver inflammation. Fecal and salivatory sample analyses showed that CMA supplementation caused beneficial changes in the microbiome.

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Veenhuis et al., 2021 **Nicotinamide Riboside Improves Ataxia Scores and Immunoglobulin Levels in Ataxia Telangiectasia**	25 mg/kg 4 months	 Neurological Health	Open-label proof-of-concept study in 24 patients with AT	Niagen NR supplementation improved ataxia scores (SARA and ICARS). However, this improvement disappeared after NR withdrawal, indicating a temporary, symptomatic effect of NR in AT. Niagen NR also markedly increased serum immunoglobin G (IgG) in immunodeficient patients. This is the first clinical study to investigate the effects of Niagen NR in patients with AT, and most notably, the first clinical Niagen NR trial in children under the age of 18.
Stocks et al., 2021 **Nicotinamide Riboside Supplementation Does not Alter Whole-Body or Skeletal Muscle Metabolic Responses to a Single Bout of Endurance Exercise**	1000 mg 1 week	 Muscle Health	Randomized, double-blind, placebo-controlled, crossover study in 8 young, healthy, recreationally active men	Niagen NR supplementation did not alter NAD-sensitive signaling pathways in skeletal muscle and did not have any effect on skeletal muscle mitochondrial respiration nor whole-body metabolism. Although Niagen NR did not increase skeletal muscle NAD+ levels, it increased markers of NAD+ flux, demonstrating the skeletal muscle bioavailability of Niagen NR supplementation.
Nascimento et al, 2021 **Nicotinamide Riboside Enhances In Vitro Beta-Adrenergic Brown Adipose Tissue Activity in Humans**	1000 mg 6 weeks	 Metabolic Health	Randomized, double-blind, placebo-controlled, crossover study in 8 healthy overweight and obese men and postmenopausal women	Niagen NR supplementation had no effect on cold-stimulated brown adipose tissue activity.
Li et al., 2021 **NAD+-Boosting Therapy Alleviates Nonalcoholic Fatty Liver Disease via Stimulating a Novel Exerkine Fndc5/Irisin**	1000 mg 2 weeks	 Liver Health	General screening test in 6 healthy subjects	Niagen NR supplementation increased plasma levels of Fndc5/irisin. A similar increase in plasma Fndc5/irisin was observed after two weeks of exercise, suggesting Fndc5/irisin may be a link between NAD+ and physical exercise.
Altay et al., 2021 **Combined Metabolic Activators Accelerates Recovery in Mild-to-Moderate COVID-19**	2000 mg 2 weeks *CMA (3.73g L-carnitine tartrate, 1g NR, 12.35g serine, and 2.55g N-acetyl-L-cysteine) Twice/day for 14 days*	 Immune Health	Phase II: Randomized, open-label, placebo-controlled study in 93 patients Phase III: Randomized, double-blind, placebo-controlled study in 309 COVID-19 patients	After 14 days, CMA supplementation significantly reduced recovery time compared to placebo group in phase II (6.6 vs 9.3 days, respectively), as well as in phase III (5.7 vs. 9.2 days, respectively). CMA supplementation also improved liver health and markers of inflammation in COVID-19 patients.
Zhou et al., 2020 **Boosting NAD Level Suppresses Inflammatory Activation of PBMCs in Heart Failure**	2000 mg 5-9 days	 Cardiovascular Health	Ex-vivo and pilot clinical study in 5 stage D heart failure patients	Niagen NR supplementation increased whole blood NAD+ levels and mitochondrial respiration rate of heart failure patients' PBMCs. Niagen NR reduced the production and gene expression of proinflammatory cytokines. The systemic inflammation in heart failure patients was causally linked to mitochondrial function of the PBMCs.

Publication	Dose Duration	Health Area	Study Design	Key Outcomes
Zhang et al., 2020 **The Acute Effect of Metabolic Cofactor Supplementation: A Potential Therapeutic Strategy Against Non-Alcoholic Fatty Liver Disease**	1000 mg 5 days *Combination supplement (1g NR, 20g L-serine, 5g N-acetyl-L-cysteine, and 3g L-carnitine)*	Liver Health	Acute, single dose, pilot study in 19 healthy, male subjects	CMA supplementation significantly decreased blood plasma levels of markers associated with increased liver fat, as well as blood plasma levels of branch chain amino acids. Mathematical modeling results showed a global increase in fat metabolism, decreased glucose metabolism, and increased synthesis of NAD+, carnitine, and glutathione.
Tinnevelt et al., 2020 **Variable Selection in Untargeted Metabolomics and the Danger of Sparsity**	1000 mg 4 months	Neurological Health	Comparative study in 14 patients with ataxia-telangiectasia (AT)	NR-related pathways and metabolites significantly increased after Niagen NR supplementation.
Remie et al., 2020 **Nicotinamide Riboside Supplementation Alters Body Composition and Skeletal Muscle Acetyl Carnitine Concentrations in Healthy Obese Humans**	1000 mg 6 weeks	Muscle Health Metabolic Health	Randomized, double-blind, placebo-controlled crossover study in 15 healthy, overweight, or obese, sedentary men and women	Niagen NR significantly increased markers of enhanced NAD+ metabolism in human skeletal muscle (e.g., NAAD and MeNam). Minor beneficial changes in body composition, sleeping metabolic rate, and skeletal muscle acetyl-carnitine concentrations were found.
Elhassan et al., 2019 **Nicotinamide Riboside Augments the Aged Human Skeletal Muscle NAD+ Metabolome and Induces Transcriptomic and Anti-inflammatory Signatures**	1000 mg 3 weeks	Muscle Health	Randomized, double-blind, placebo-controlled, crossover study in 12 marginally overweight, but otherwise healthy men	Niagen NR supplementation increased the muscle NAD+ metabolome. Niagen NR significantly decreased levels of circulating inflammatory markers (IL-6, IL-5, and IL-2, and TNF-α, compared to baseline).
Dollerup et al., 2019 **Nicotinamide Riboside Does not Alter Mitochondrial Respiration, Content or Morphology in Skeletal Muscle from Obese and Insulin-Resistant Men**	2000 mg 12 weeks	Muscle Health Metabolic Health	Randomized, double-blind, placebo-controlled, parallel assignment study in 40 healthy, obese sedentary men	Protein levels of nicotinamide phosphoribosyl transferase (NAMPT), an essential NAD+ biosynthetic enzyme in skeletal muscle, decreased by 14% with Niagen NR. However, Niagen NR supplementation did not affect NAD+ metabolite concentrations in skeletal muscle. Respiration, distribution, and quantity of muscle mitochondria were also unaffected by Niagen NR.
Dollerup et al., 2019 **Effects of Nicotinamide Riboside on Endocrine Pancreatic Function and Incretin Hormones in Nondiabetic Men with Obesity**	2000 mg 12 weeks	Metabolic Health	Randomized, double-blind, placebo-controlled, parallel assignment study in 40 healthy, obese sedentary men	Niagen NR supplementation did not affect fasting or post-glucose challenge concentrations of glucose, insulin, C-peptide, glucagon, GLP-1, or GIP. β-cell function did not respond to NR intervention and no changes in circulating adipsin or bile acids were observed.

Publication	Dose Duration	Health Area	Study Design	Key Outcomes
Conze et al., 2019 **Safety and Metabolism of Long-term Administration of NIAGEN (Nicotinamide Riboside Chloride) in a Randomized, Double-Blind, Placebo-controlled Clinical Trial of Healthy Overweight Adults**	100 mg 300 mg 1000 mg 8 weeks	 Pharmacokinetic /Safety	Randomized, double-blind, placebo-controlled, parallel assignment study in 140 overweight, but otherwise healthy men and women	Niagen NR supplementation significantly and dose-dependently increased whole blood NAD+ levels by 22%, 51%, and 142%, respectively, within two weeks. These levels were maintained throughout the remainder of the study.
Dollerup et al., 2018 **A Randomized Placebo-Controlled Clinical Trial of Nicotinamide Riboside in Obese Men: Safety, Insulin-Sensitivity, and Lipid-Mobilizing Effects**	2000 mg 12 weeks	 Pharmacokinetic /Safety  Liver Health  Metabolic Health	Randomized, double-blind, placebo-controlled, parallel assignment study in 40 healthy, obese sedentary men	Niagen NR-supplemented subjects had an average 2% absolute reduction in liver fat content compared to a 0.2% absolute reduction in the placebo group. Of the subset of men who started the trial with greater than 5% liver fat, 69% experienced a reduction in liver fat compared to only 39% of the men taking the placebo. Niagen NR supplementation tended to decrease circulating levels of alanine aminotransferase (ALT) in the blood.
Martens et al., 2018 **Chronic Nicotinamide Riboside Supplementation is Well-Tolerated and Elevates NAD+ in Healthy Middle-Aged and Older Adults**	1000 mg 6 weeks	 Pharmacokinetic /Safety  Cardiovascular Health	Randomized, double-blind, placebo-controlled crossover study in 30 healthy, middle-aged, and older male and female adults	Niagen NR significantly increased average NAD+ levels by 60% compared to placebo. Niagen NR supplementation tended to lower blood pressure, especially in subjects with elevated blood pressure (in the stage I hypertension range). Niagen NR also tended to decrease aortic stiffness.
Airhart et al., 2017 **An Open-Label, Non-Randomized Study of the Pharmacokinetics of the Nutritional Supplement Nicotinamide Riboside (NR) and its Effects on Blood NAD+ Levels in Healthy Volunteers**	2000 mg 9 days	 Pharmacokinetic /Safety	Non-randomized, open-label study in 8 healthy men and women	Niagen NR supplementation significantly increased blood NAD+ concentrations between baseline and Day 9. On average, NAD+ levels increased 2-fold. No significant changes were observed in blood pressure, body temperature, body weight, white blood cell count, lactate dehydrogenase (LDH), or aspartate aminotransferase (AST).
Trammell et al., 2016 **Nicotinamide Riboside is Uniquely and Orally Bioavailable in Mice and Humans**	100 mg 300 mg 1000 mg 24 hours	 Pharmacokinetic /Safety	Randomized, double-blind study in 12 healthy men and women	Single oral doses of Niagen NR significantly and dose-dependently increased NAD+ and related metabolites in peripheral blood mononuclear cells. Mouse pharmacokinetic data demonstrated that Niagen NR increased NAD+ levels better than niacin (NA) and stimulated NAD+ consuming activities in the liver more than nicotinamide (NAM).

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Publication	Dose Duration	Health Area	Study Design	Key Outcomes
Reyna et al., 2026 **Intravenous Infusion of Nicotinamide Adenine Dinucleotide (NAD+) versus Nicotinamide Riboside (NR): A Retrospective Tolerability Pilot Study in a Real-World Setting**	500 mg Intravenous Infusion 4 days	 Pharmacokinetic /Safety	Retrospective tolerability pilot study	Infusion times between NAD+ IV and NR IV averaged 97 and 37 minutes, respectively. NR IV significantly reduced HbA1c, whereas NAD+ IV significantly reduced HDL-C. NAD+ IV infusion resulted in self-reported moderate to severe gastrointestinal symptoms, increased heart rate, and chest pressure during infusions, while NR IV resulted in minor tongue, jaw, and arm tingling and mild cramping during infusion.

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