



Precision in Redox Health: Blood NAD Testing in Personalized Supplementation

Kai Herdin
NADMED



NADMED IS A UNIVERSITY SPINOUT

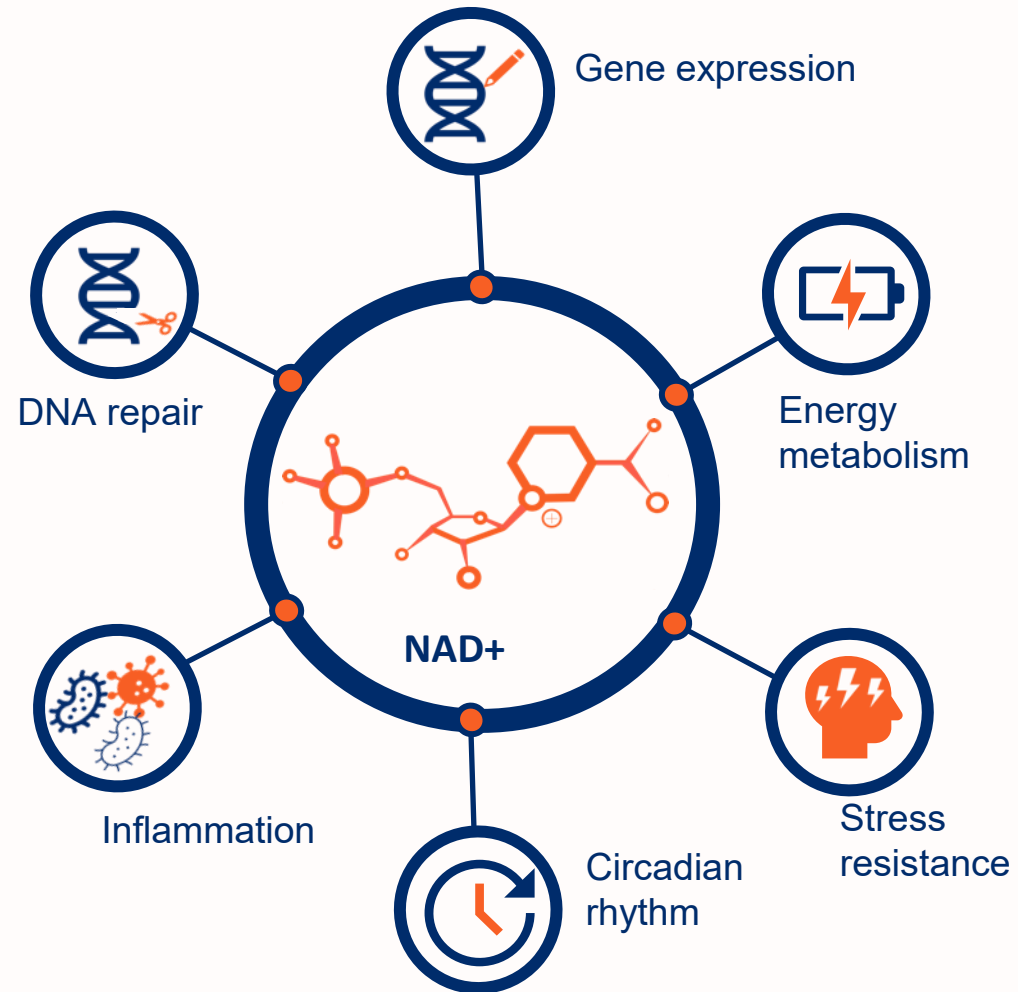


UNIVERSITY OF HELSINKI
FACULTY OF MEDICINE



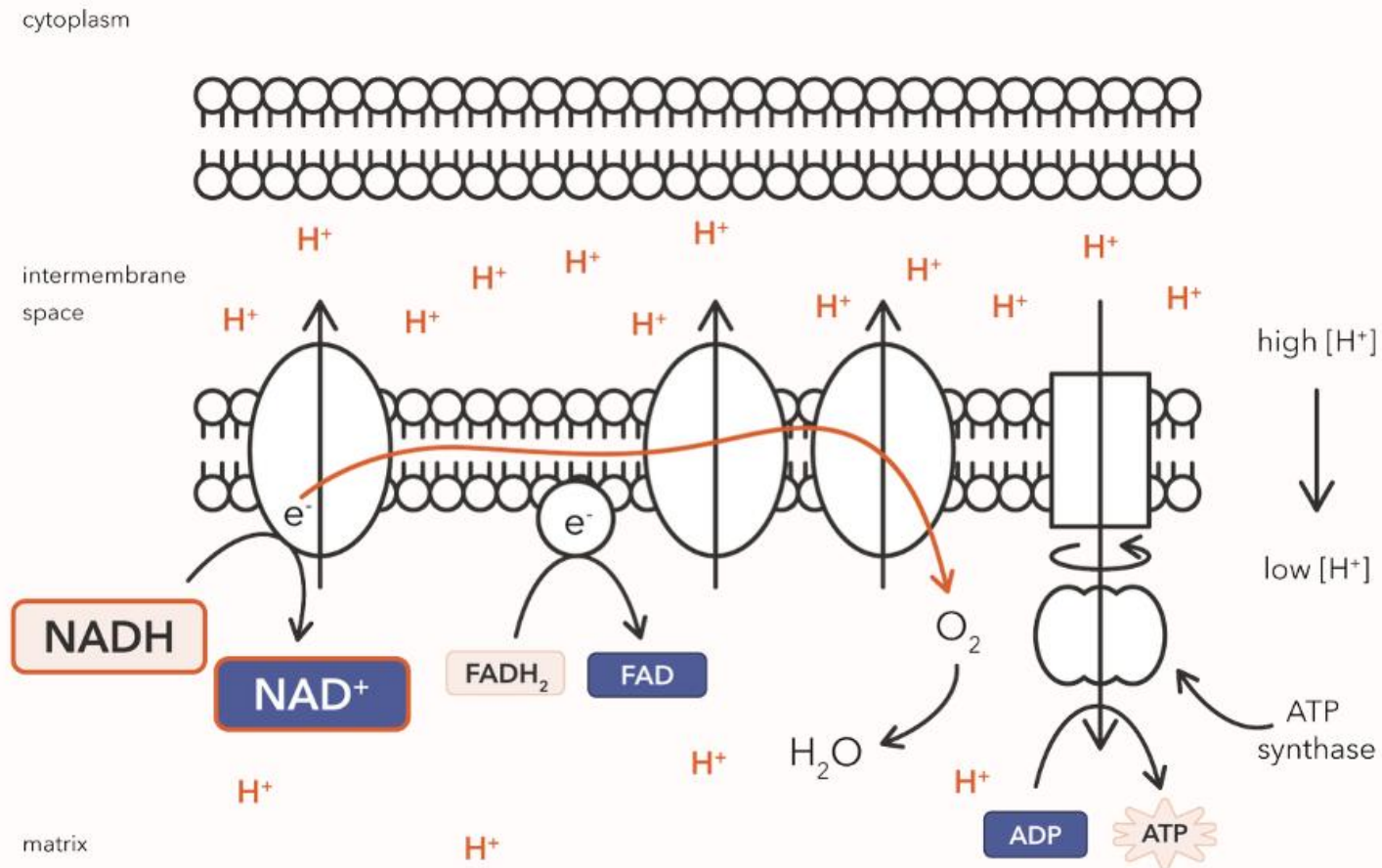
Anu Suomalainen Wartiovaara, MD, PhD
Academy Professor, University of Helsinki
Chief Physician, Helsinki University Hospital

NAD⁺ IS CENTRAL TO CELL METABOLISM





NADs FUEL ENERGY PRODUCTION





NR STUDIES IN MICE (2014)

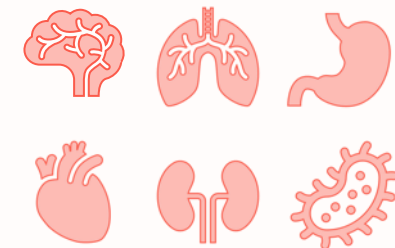
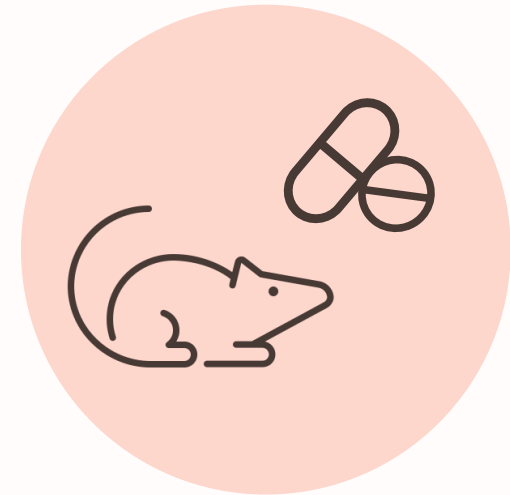
Research Article



EMBO
Molecular Medicine

Effective treatment of mitochondrial myopathy by nicotinamide riboside, a vitamin B3

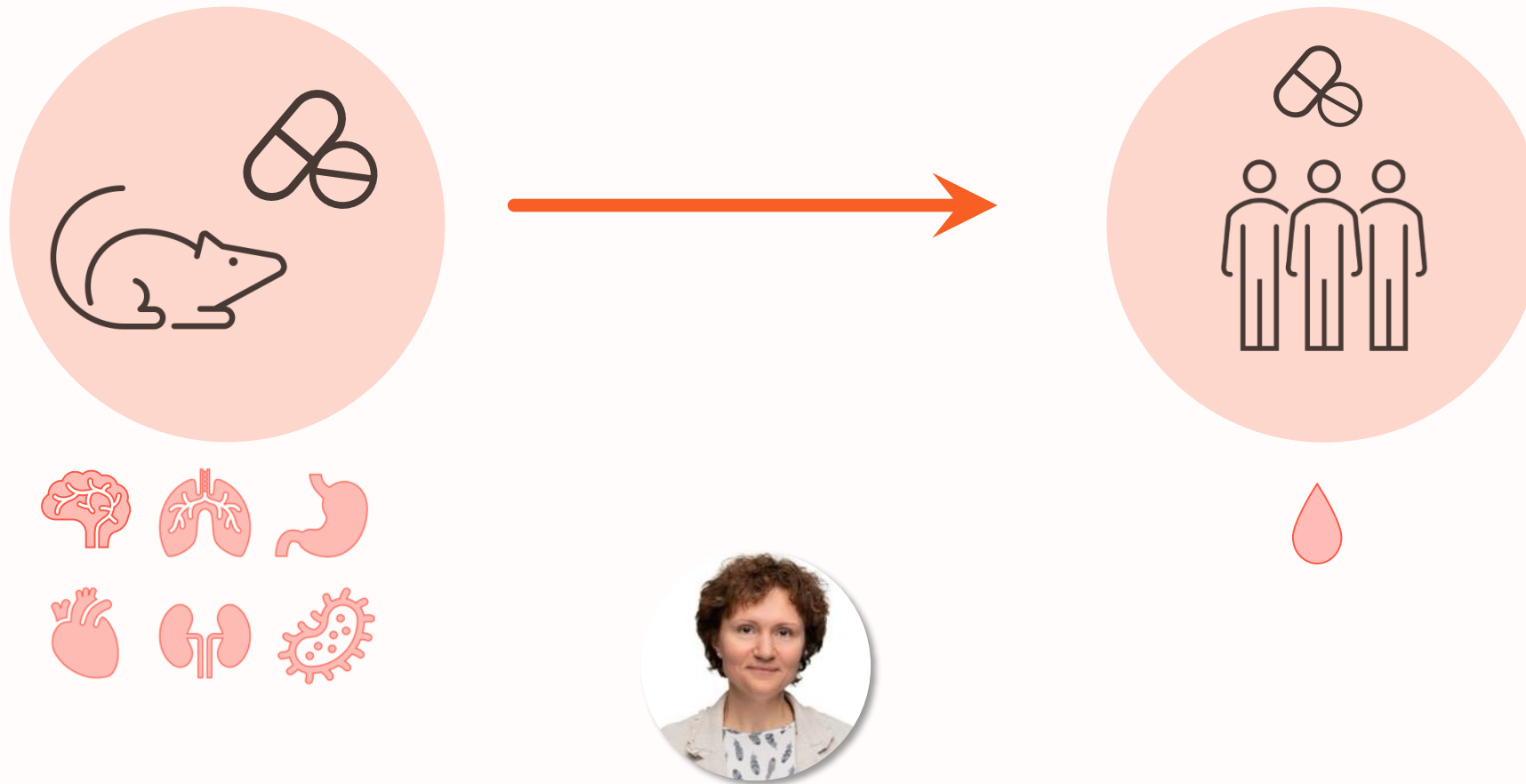
Nahid A Khan¹, Mari Auranen^{1,2,†}, Ilse Paetau^{1,†}, Eija Pirinen^{3,4}, Liliya Euro¹, Saara Forsström¹, Lotta Pasila¹, Vidya Velagapudi⁵, Christopher J Carroll¹, Johan Auwerx³ & Anu Suomalainen^{1,2,6,*}



Cerutti, R., Pirinen, E., Lamperti, C., Marchet, S., Sauve, A.A., Li, W., Leoni, V., Schon, E.A., Dantzer, F., Auwerx, J., et al. (2014). NAD⁺-dependent activation of Sirt1 corrects the phenotype in a mouse model of mitochondrial disease. *Cell Metab.* 19, 1042–1049



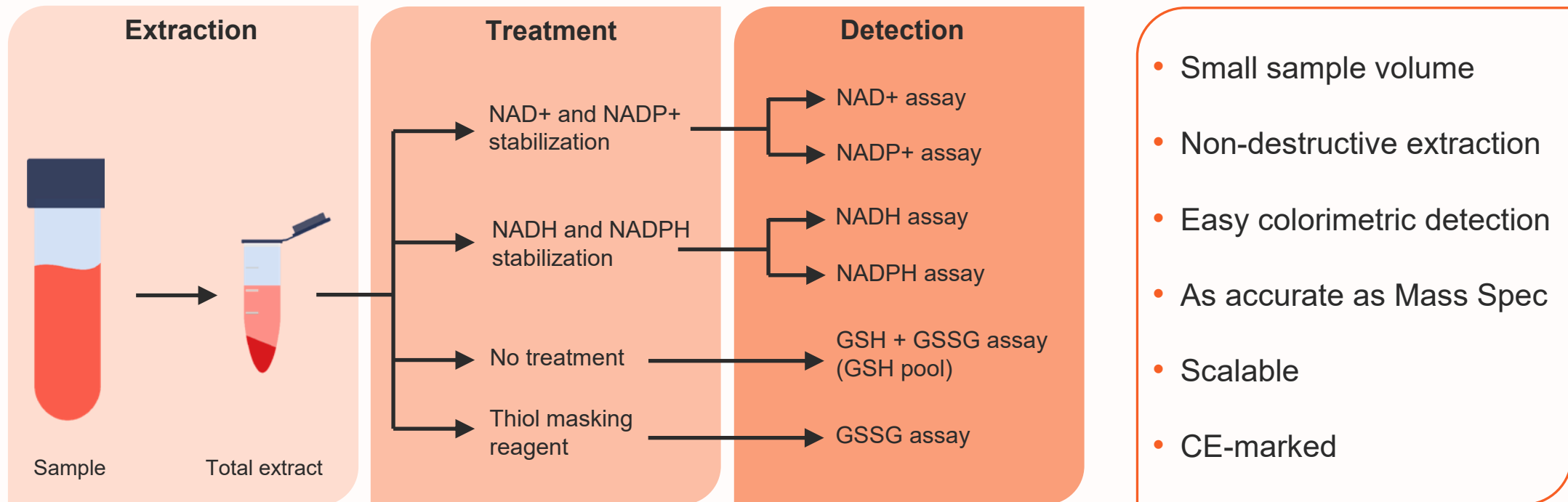
HOW TO MEASURE NADs IN PATIENTS?



Liliya Euro, PhD



NADMED TECH FOR NADs AND GLUTATHIONE

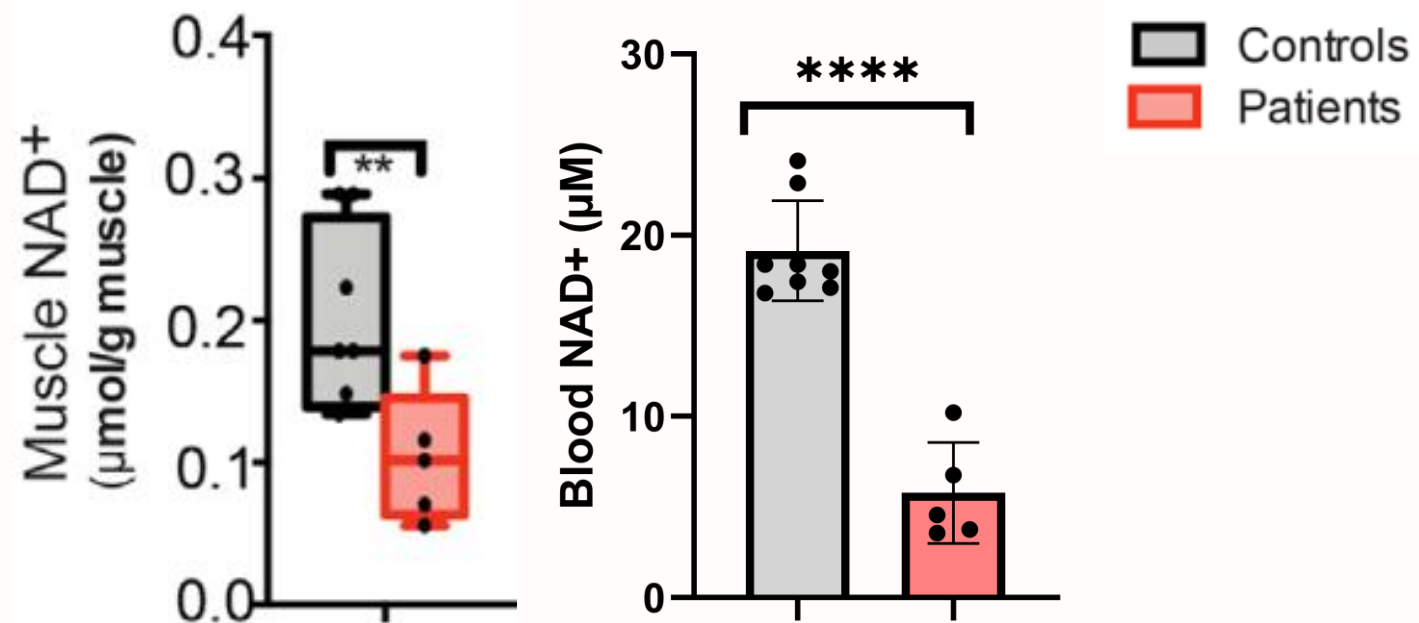


PATENT
PENDING



METABOLIC DISEASES CAN CAUSE SYSTEMIC NAD⁺ DEPLETION

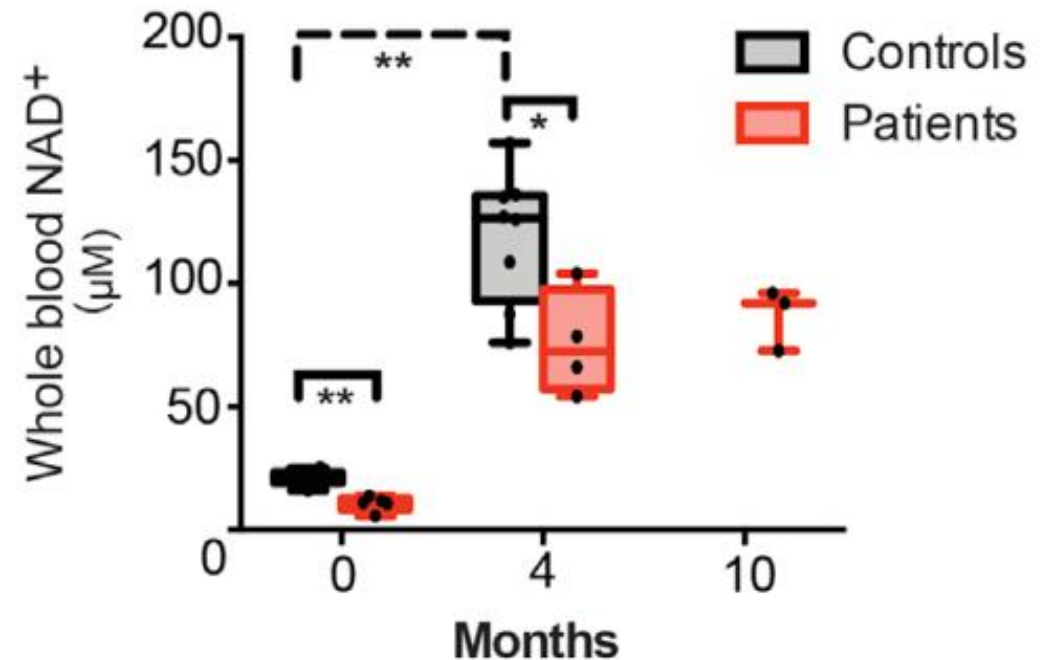
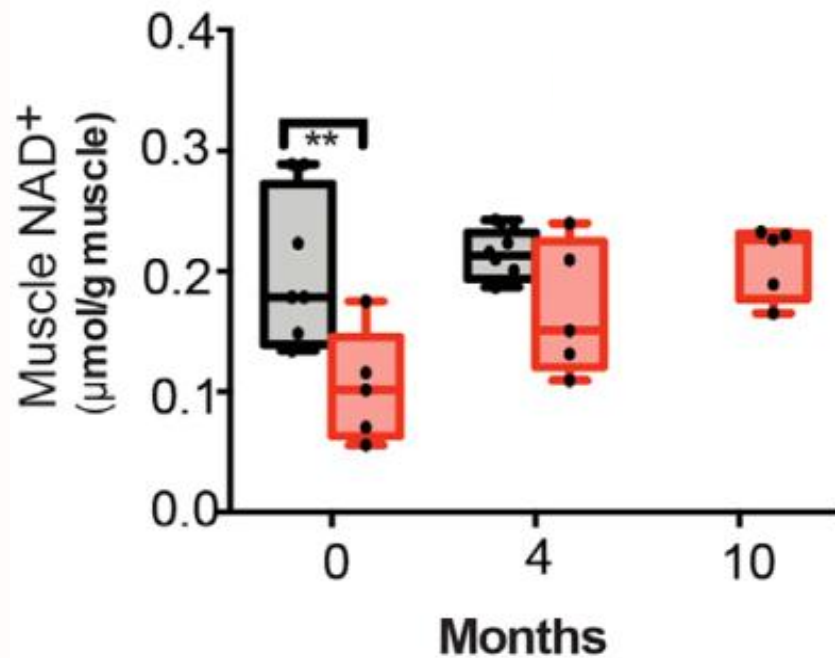
Mitochondrial dysfunction in muscle leads to NAD⁺ depletion, followed by a decrease of NAD⁺ in blood.





SUPPLEMENTATION WITH VITAMIN B3

- restores systemic NAD⁺ levels
- significantly improves disease symptoms



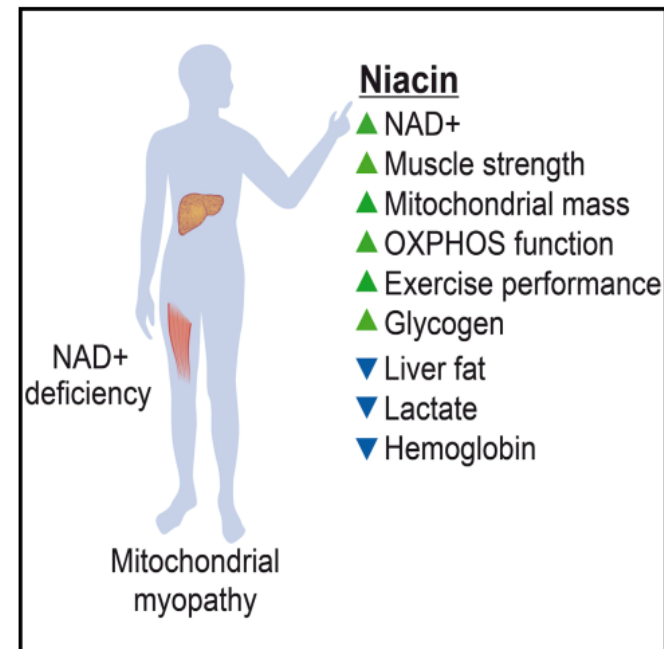


NIACIN IMPROVED MITOCHONDRIAL MYOPATHY

Cell Metabolism Clinical and Translational Report

Niacin Cures Systemic NAD⁺ Deficiency and Improves Muscle Performance in Adult-Onset Mitochondrial Myopathy

Graphical Abstract



Authors

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In Brief

Pirinen et al. report that niacin, a vitamin B3, can efficiently rescue NAD⁺ levels in the muscle and blood of patients with mitochondrial myopathy, improving disease signs and muscle strength. NAD⁺ levels increased also in healthy subjects. The evidence suggests that niacin is an effective NAD⁺ booster in humans.



NADMED METHOD

“Before NAD diagnostics can become clinically reliable, there has to be a validated & standardized NAD measurement protocol.”

Vinten et al. (2025)



Dynamics of blood NAD and glutathione in health, disease, aging and under NAD-booster treatment

Posted February 28, 2025.

 Liliya Euro,  Kimmo Haimilahti, Sonja Jansson,  Saara Forsström, Jana Buzkova,  Anu Suomalainen

doi: <https://doi.org/10.1101/2025.02.24.639825>

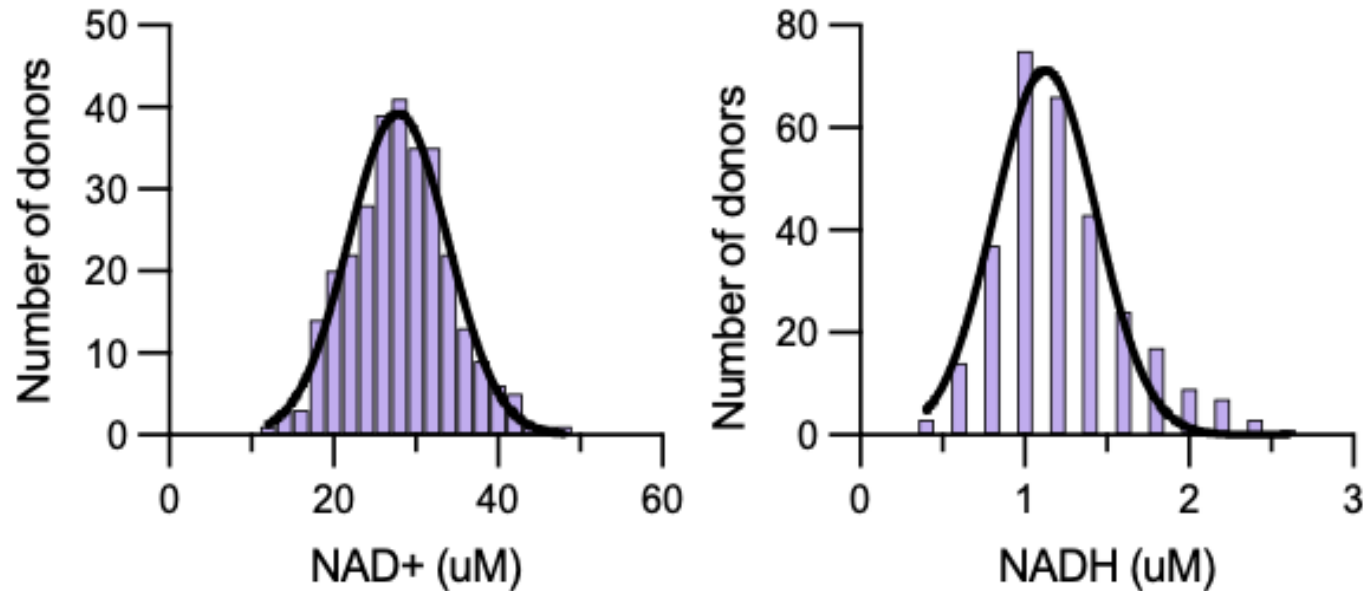
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NADs: NORMAL RANGE IN BLOOD



Normal range

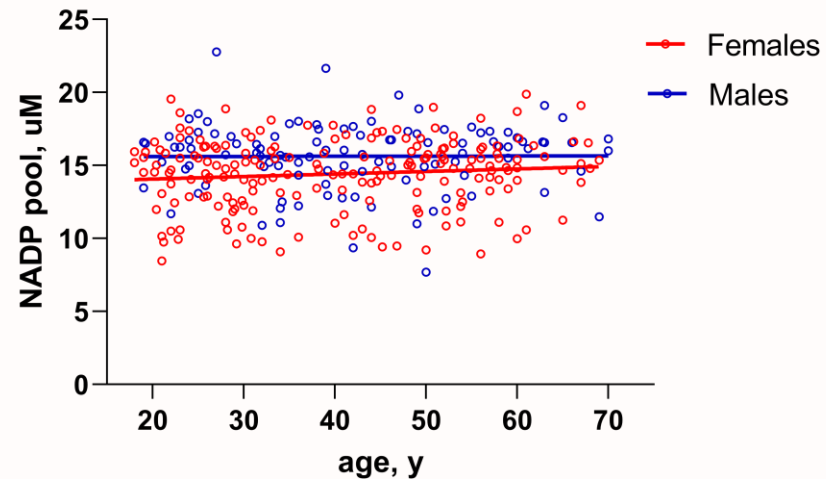
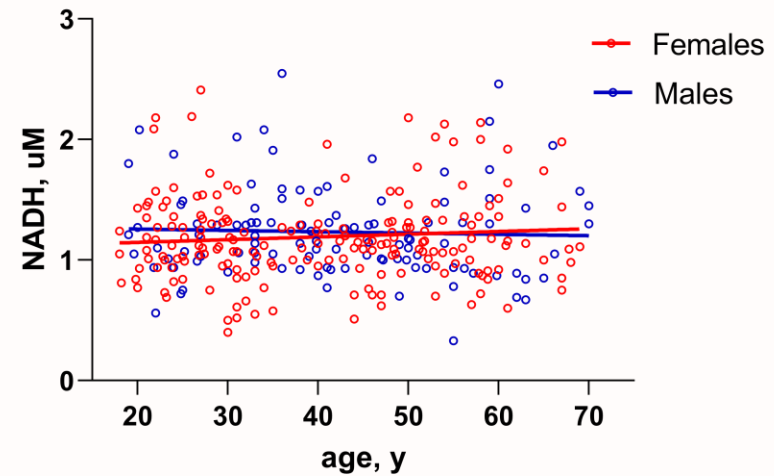
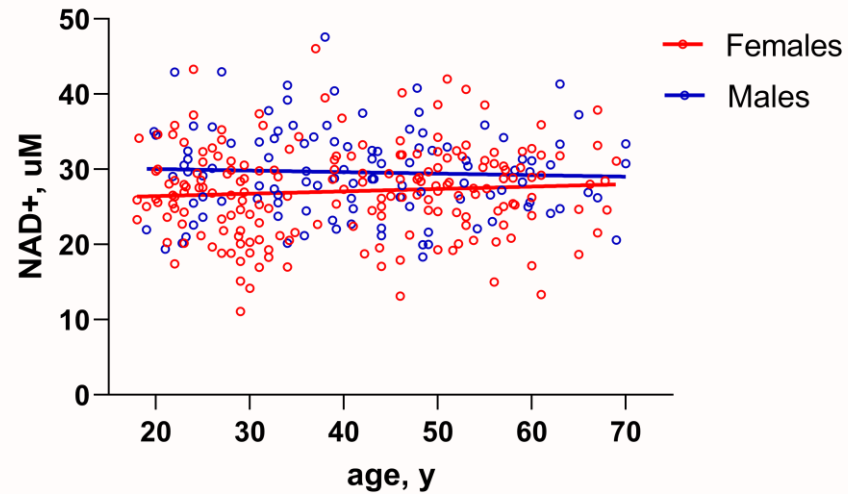
20–36 μM

0.5–1.8 μM

N=300 (Measured from 300 HEALTHY individuals)



BLOOD NAD REMAIN STABLE DURING HEALTHY AGING





WHAT METABOLIC EFFECTS NAD⁺ BOOSTING HAS ON HEALTHY INDIVIDUALS?

Niacin
Nicotinamide riboside
Nicotinamide mononucleotide



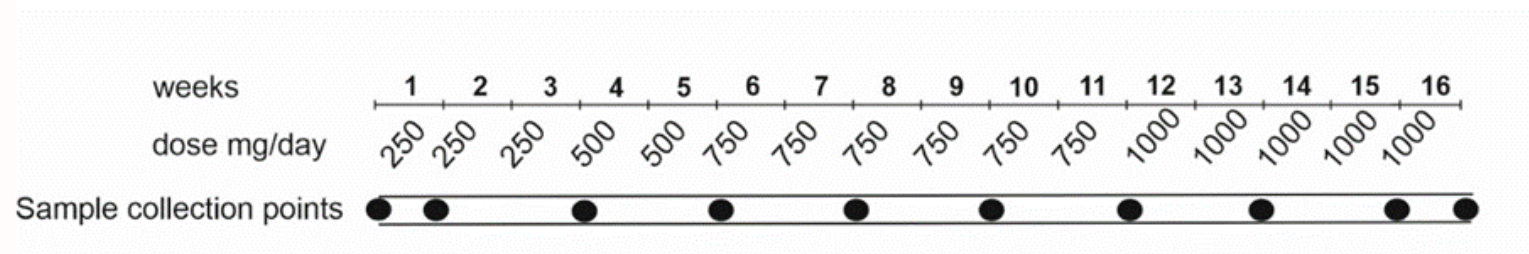
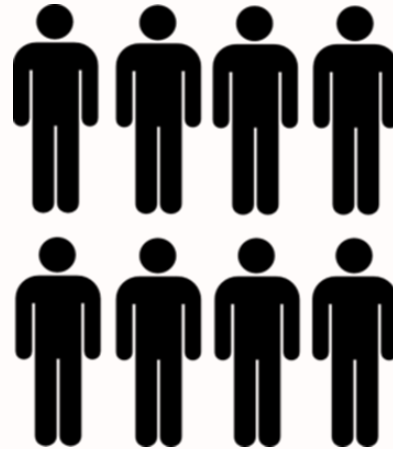
Cellular NAD⁺





NIACIN SUPPLEMENTATION IN HEALTHY SUBJECTS

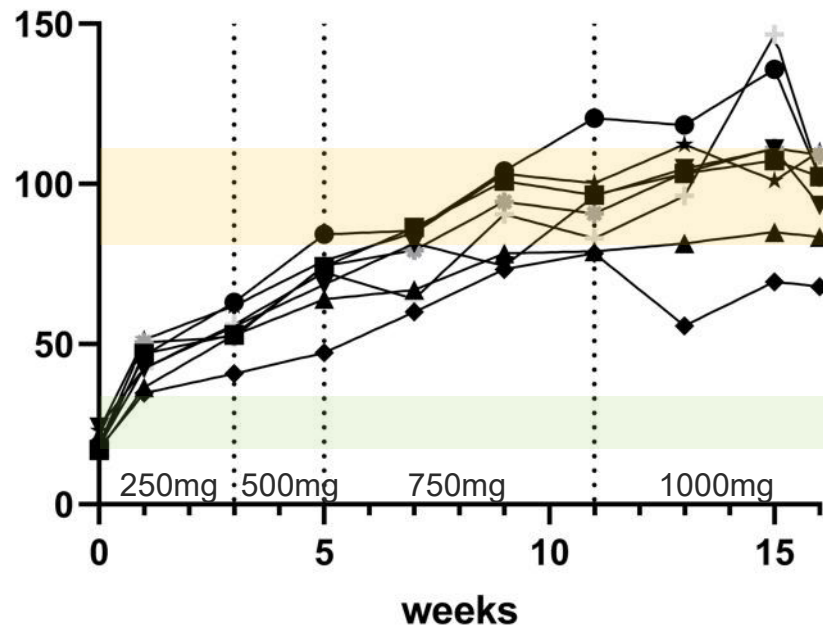
Niacin
16
weeks



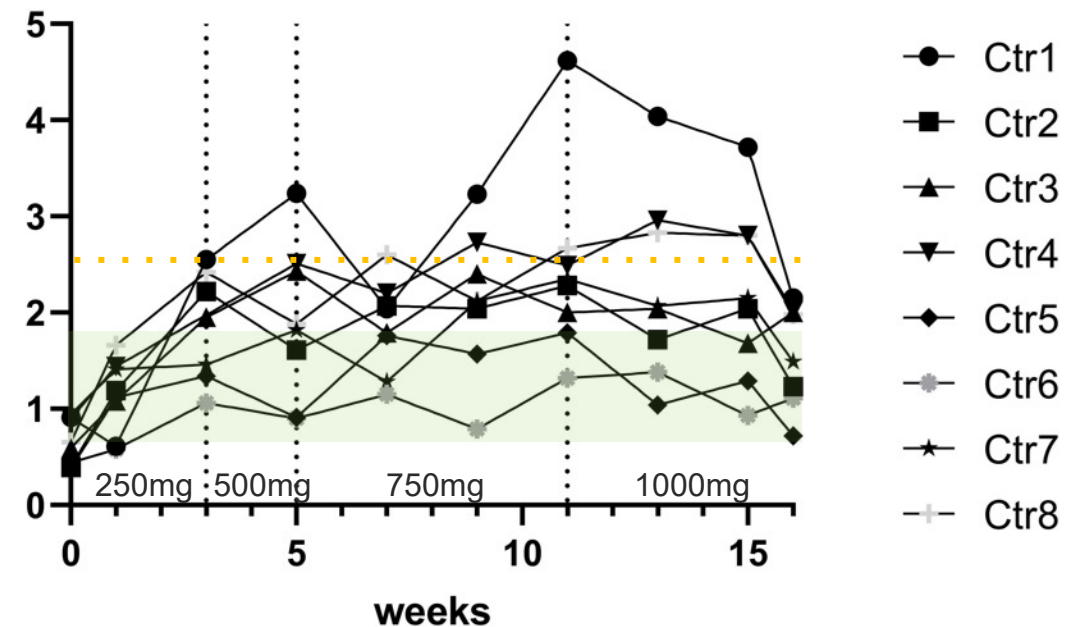


NADs RESPOND RAPIDLY TO NIACIN **IN BLOOD**

NAD⁺ (μM)



NADH (μM)



- Ctr1
- Ctr2
- ▲ Ctr3
- ▼ Ctr4
- ◆ Ctr5
- Ctr6
- ★ Ctr7
- Ctr8

Normal range

20–36 μM

0.5–1.8 μM

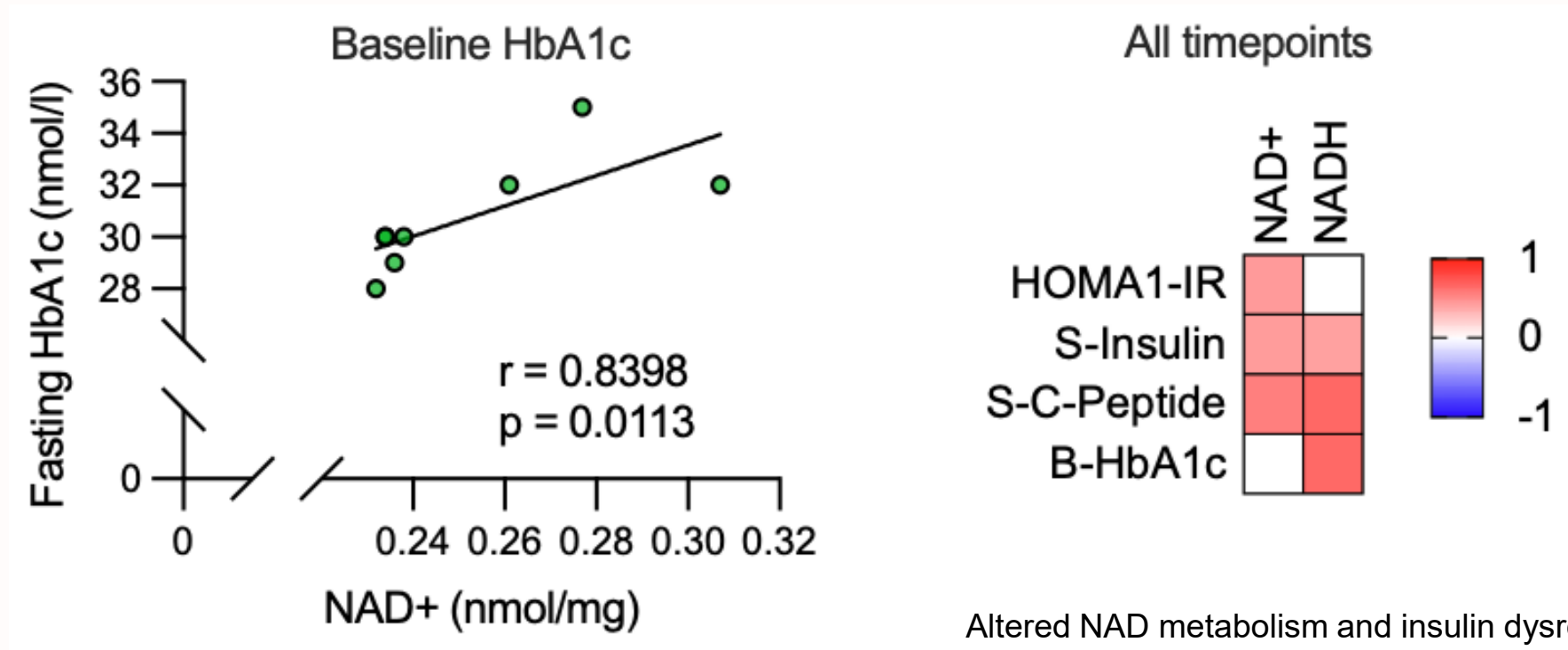
Saturation
concentration

85–110 μM

2.5 μM

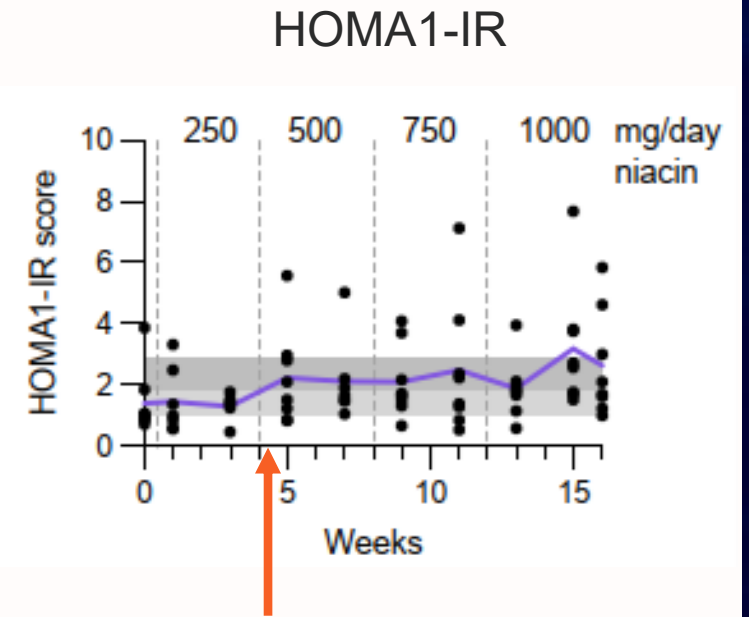
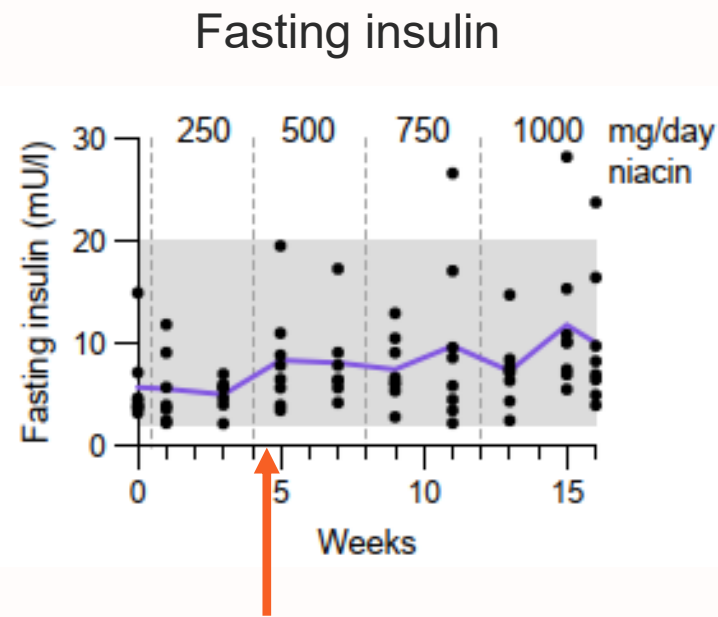
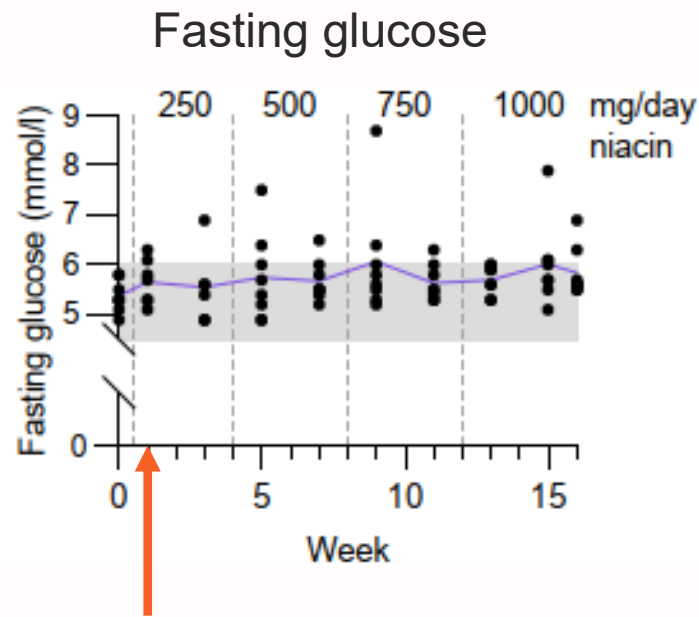


GLYCATED HEMOGLOBIN CORRELATES WITH NAD⁺





NIACIN AFFECTS GLUCOSE METABOLISM





NR ELEVATES HOMOCYSTEINE IN PARKINSON'S PATIENTS

nature communications



Article

<https://doi.org/10.1038/s41467-023-43514-6>

NR-SAFE: a randomized, double-blind safety trial of high dose nicotinamide riboside in Parkinson's disease

Received: 24 March 2023

Accepted: 13 November 2023

Published online: 28 November 2023

Haakon Berven^{1,2,3}, Simon Kverneng^{1,2,3}, Erika Sheard¹, Mona Søgner¹, Solveig Amdahl Af Geijerstam¹, Kristoffer Haugarvoll ¹, Geir-Olve Skeie^{1,2}, Christian Dölle ^{1,2,3}  & Charalampos Tzoulis ^{1,2,3} 



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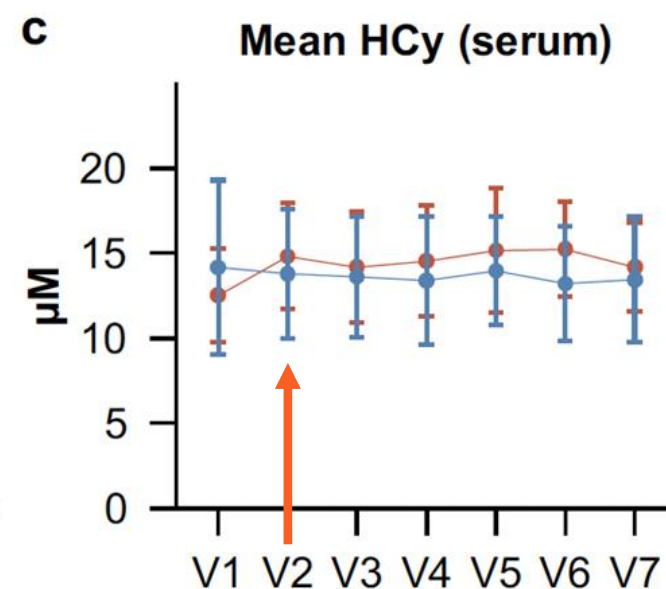
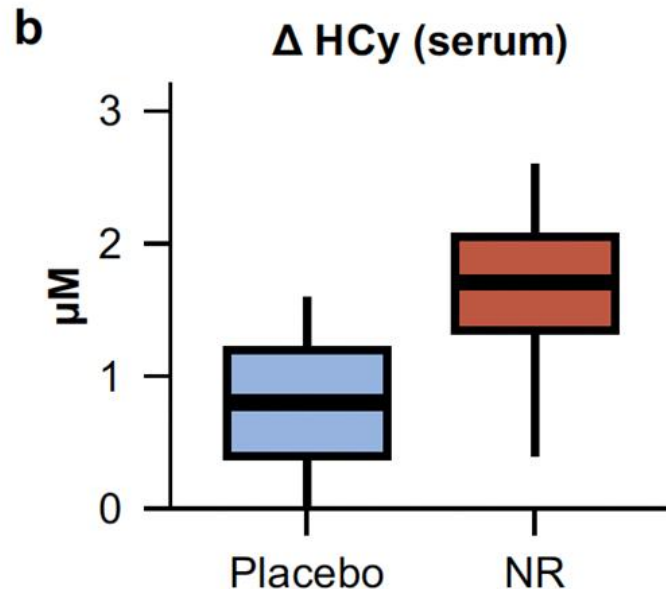
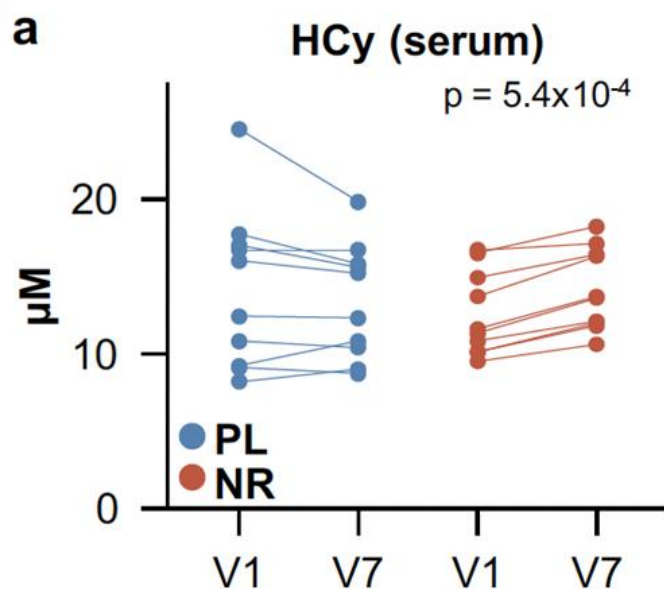
NR-SAFE: a randomized, double-blind safety trial of high dose nicotinamide riboside in Parkinson's disease

Received: 24 March 2023

Accepted: 13 November 2023

Published online: 18 November 2023

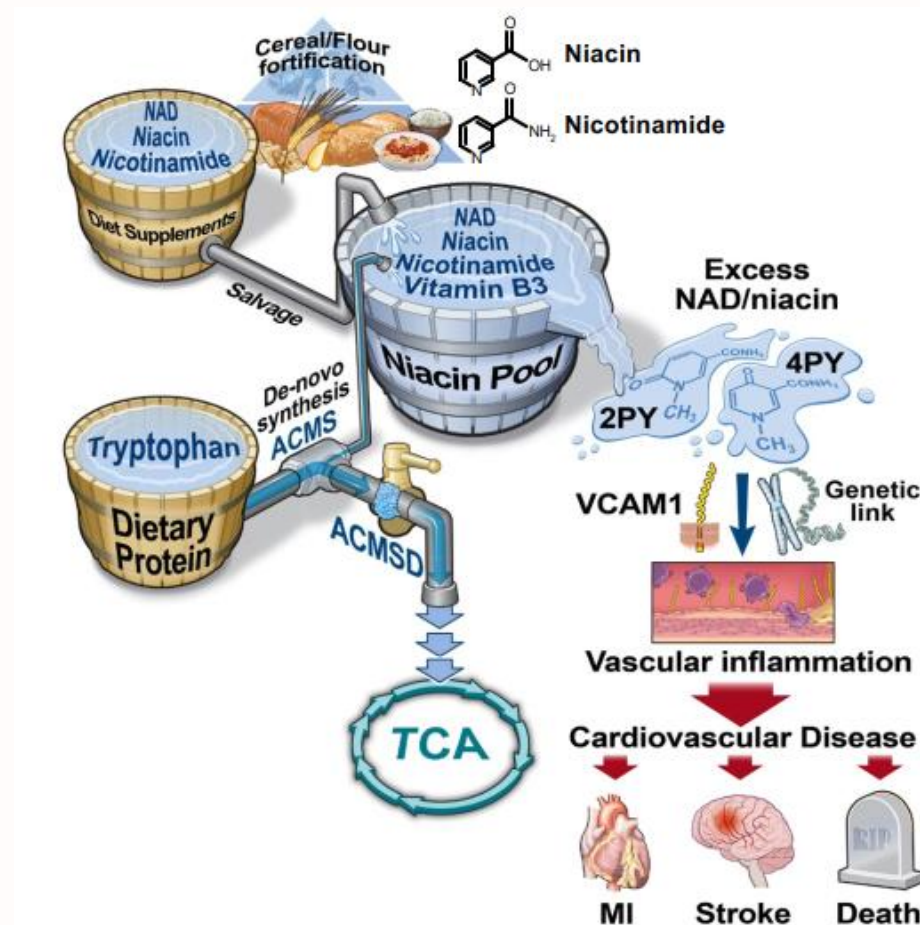
Haakon Berven^{1,2,3}, Simon Kverneng^{1,2,3}, Erika Sheard², Mona Sægren², Solveig Amdahl Af Geijerstam¹, Kristoffer Haugavold⁴, Geir-Ole Skeie^{1,2}, Christian Döller^{5,6,7} & Charalampos Tzoulis^{1,2,3}



45–50 µM NAD+



NIACIN CONTRIBUTES TO CARDIOVASCULAR DISEASE RISK



Ferrell M., Wang Z., Anderson J.T., et al. (2024). A terminal metabolite of niacin promotes vascular inflammation and contributes to cardiovascular disease risk. *Nature Medicine*. 30, 424–434



GUIDED PRACTISE

Baseline Characterization

Establish pre-
intervention
NAD⁺/NADH
status

Individualized Dosing

Tailor intervention
to
measured deficits

Response Monitoring

Assess
intervention
effectiveness
objectively

Iterative Reassessment

Adjust based on
longitudinal data



INTERPRETATION OF METABOLIC SIGNALS

NAD⁺ Below Range

Metabolic or cellular stress

Altered redox balance

Increased NAD⁺ consumption

Decreased synthesis

Lifestyle-related factors

NADH Above Range

High glycolytic/substrate load

Impaired mitochondrial
energy production

Metabolic stress
(hypoxia, ischemia)

Decreased Ratio

Reduced NAD⁺, elevated
NADH, or combination

May indicate imbalance in
cellular energy metabolism
and redox state



CLINICAL INTERPRETATION

Step 1

**Correlate with
Clinical Presentation**

Step 2

**Evaluate
Contributing Factors**

Step 3

**Avoid Over-
Interpretation**



SUMMARY

- NADMED tech allows analysis of NADs and glutathione from a single sample, including blood
- Individuals with verified NAD deficiency can benefit from NAD supplementation
- Healthy individuals show a negative association with glucose metabolism
- NADs in blood remain stable in healthy aging
- Blood NAD testing is critical for diagnostics, supplementation guidance, and dose adjustment
- NADs are not stand-alone markers



Advanced NAD tests are available from Altheome
Visit Altheome's booth (W34) to discuss and get tested



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- Liliya Euro, PhD
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- Kimmo Haimilahti, MD
- Finnish Red Cross Blood Service

THANK YOU FOR YOUR ATTENTION