Seenergie

UNLOCKING THE POWER OF NAD+

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WHO WE ARE

Seenergie is a pioneering healthcare platform in the Philippines, dedicated to revolutionizing wellness by making cutting-edge, science-backed medical solutions accessible to all. With expert guidance from doctors and healthcare professionals, we offer advanced, personalized treatments that emphasize natural approaches for wellness.

Partnering with Seenergie provides doctors with access to innovative treatments and comprehensive support, enhancing patient outcomes and practice growth.

CORE SERVICES

- REGENERATIVE MEDICINE
- PEPTIDE THERAPY
- LONGEVITY PROGRAMS

OUR VISION

At Seenergie, our vision extends beyond product sales. We aim to provide guidance, knowledge, and education, empowering our clients with comprehensive support and expert insights.

We envision a future where cutting-edge medical innovations are seamlessly integrated into everyday wellness, transforming lives and communities.

By prioritizing education and personalized care, we strive to create a proactive, preventive, and profoundly impactful healthcare ecosystem.

Our commitment is to lead in holistic wellness, ensuring everyone has access to the best treatments and the knowledge to maintain their health naturally.

I. INTRODUCTION

WHAT IS NAD+?

Probably One of the Most Important Molecules for Life

Supplementing NAD+ Levels have been shown to improve the way multiple tissues and cell types age, including:

1. The heart
2. Skeletal muscle
3. The brain
4. Stem cells
5. White blood Cells (research on reports)

Replenishment of Age-associated decline in NAD+ Levels may bolster cellular processes that contribute to healthy aging.

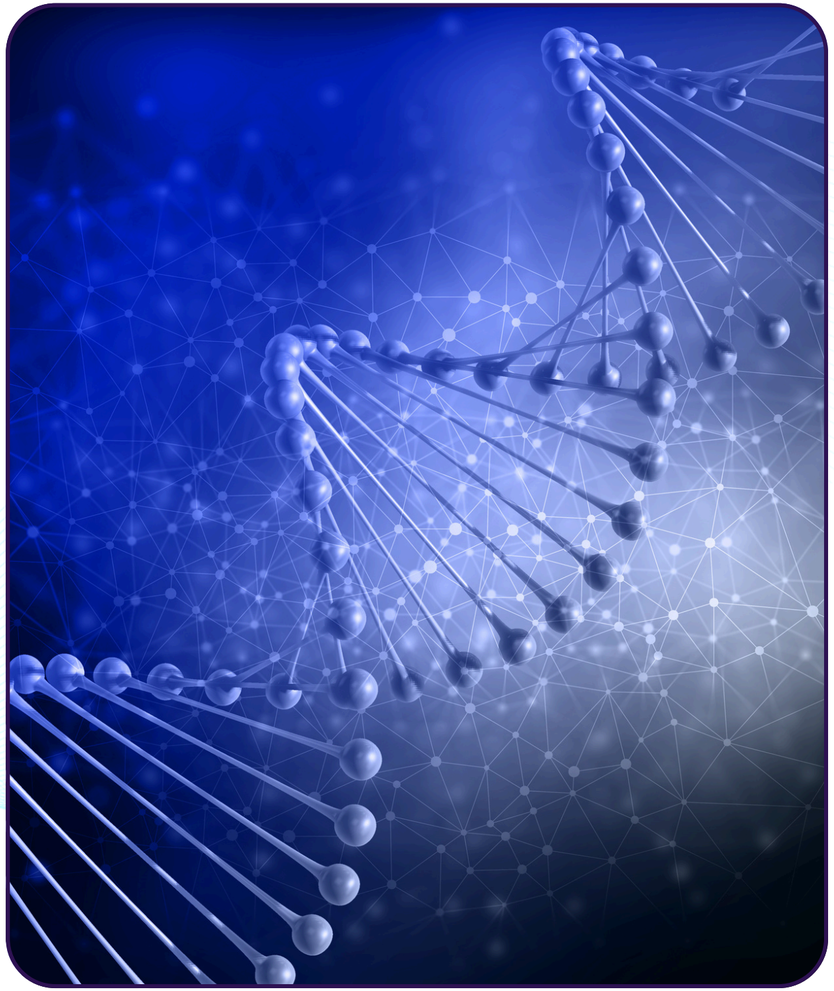
Associated with many hallmarks of aging:

1. Loss of Proteostasis
2. Mitochondrial Dysfunction
3. Glucose Intolerance
4. Insulin Insensitivity
5. Cellular Senescence
6. Altered Epigenetics

Partly Because NAD+ promotes DNA Repair Capacity and its decline is associated with DNA damaging reactive oxygen species.

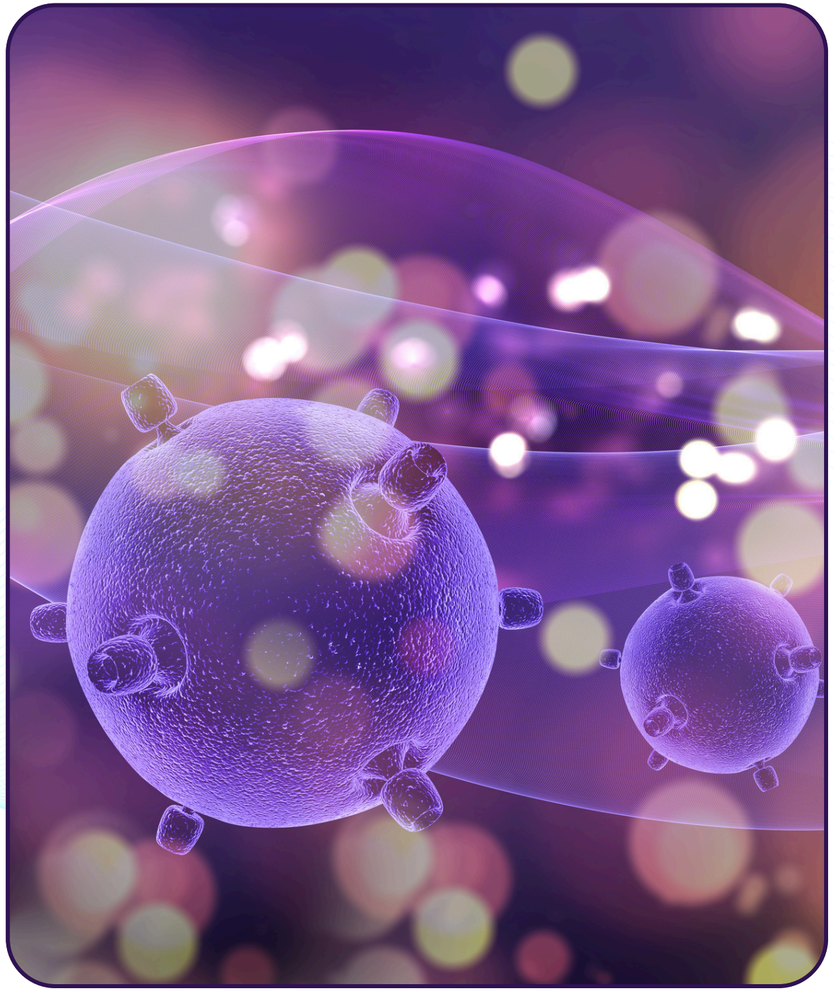
- PARP (Poly (ADP-Ribose) Polymerase:
  A family of proteins that use NAD+ as a substrate in their role of DNA repair and genomic stability.

As we grow older, the burden of DNA damage grows and is thought to contribute to aging and cancer.



Another reason is because NAD+ is required for energy production in every tissue. When NAD+ levels decline, as they do in age, that means those tissues don't function properly like they did in youth during when those energy levels were maintained.

1. In the brain
2. In immune cells
3. In muscle tissue



NAD+ is also required to activate a very important family of enzymes involved in longevity called Sirtuins.

- Sirtuins: A class of enzymes that influence aging and longevity through multiple molecular pathways. Sirtuins regulate a variety of metabolic processes, including the release of insulin, mobilization of lipids, response to stress, and modulation of lifespan. They also influence circadian clocks and mitochondrial biogenesis. Sirtuins are activated when NAD+ levels rise. There are seven known sirtuins designated as Sirt1 to Sirt7.

The complete answer to why NAD+ levels decline with age is not wholly understood, but here's what we do know.

Contributing factors in age-associated decline in NAD+

1. Increased chronic inflammation - consumes NAD+
2. Increased immune activation - consumes NAD+

2 processes that consume NAD+ tend to go up with age, and with them our need for DNA repair, placing an immense demand on the NAD+ pool.

3. Decreased Activity from the Salvage Pathway and NAMPT (nicotinamide phosphoribosyltransferase) activity leads to decreased NAD+ production.

- Metabolic pathway that involves the synthesis of nicotinamide adenine dinucleotide (NAD) and its role in regulating cellular processes.
- Our ability to produce and recycle NAD+ also decreases with age.

II. OVERVIEW OF NAD+

NAD+ PLAYS A CRITICAL ROLE IN ENERGY METABOLISM

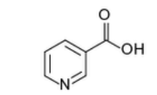
1. NAD+ can be synthesized in the body from a variety of dietary sources, but the major source is through a recycling mechanism called the SALVAGE PATHWAY.

   - Dietary Sources including tryptophan (salmon, spinach, nuts) and the 3 forms of niacin which is vitamin b3 (lean meats, legumes, vegetables).

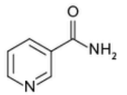
   - DIETARY SOURCES ARE NOT THE MAJOR SOURCE OF NAD+ - the major source if the recycling mechanism.

     1. The reason for that is because our organs require such large quantities of NAD+ that it would be impossible to consume enough from our diet.
     2. So why do we require such large quantities of NAD+?

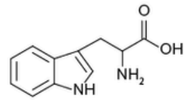
        - NAD+ plays such a critical role in energy metabolism: Meaning without it, you can't make energy.



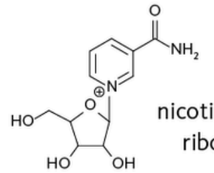
nicotinic acid
(pyridine-3-carboxylic acid;
often referred to as 'niacin')



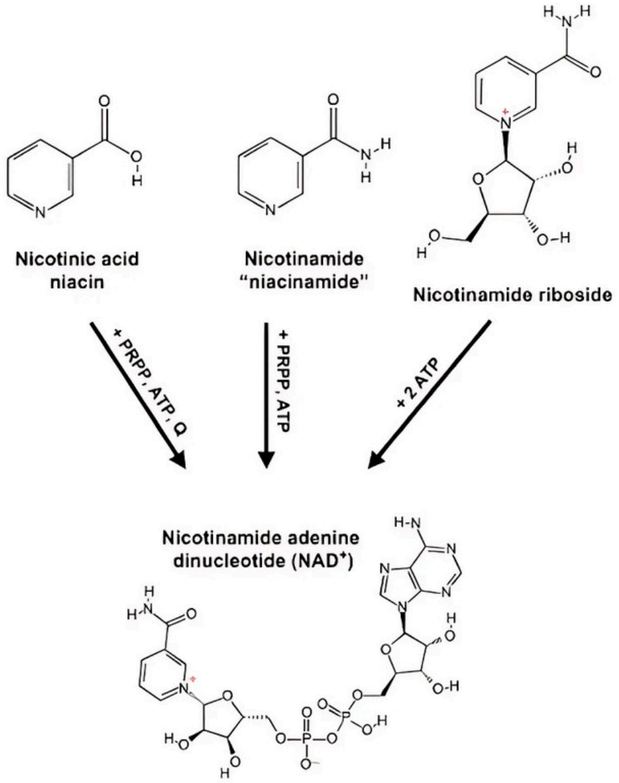
nicotinamide
(pyridine-3-carboxamide, niacinamide)



tryptophan

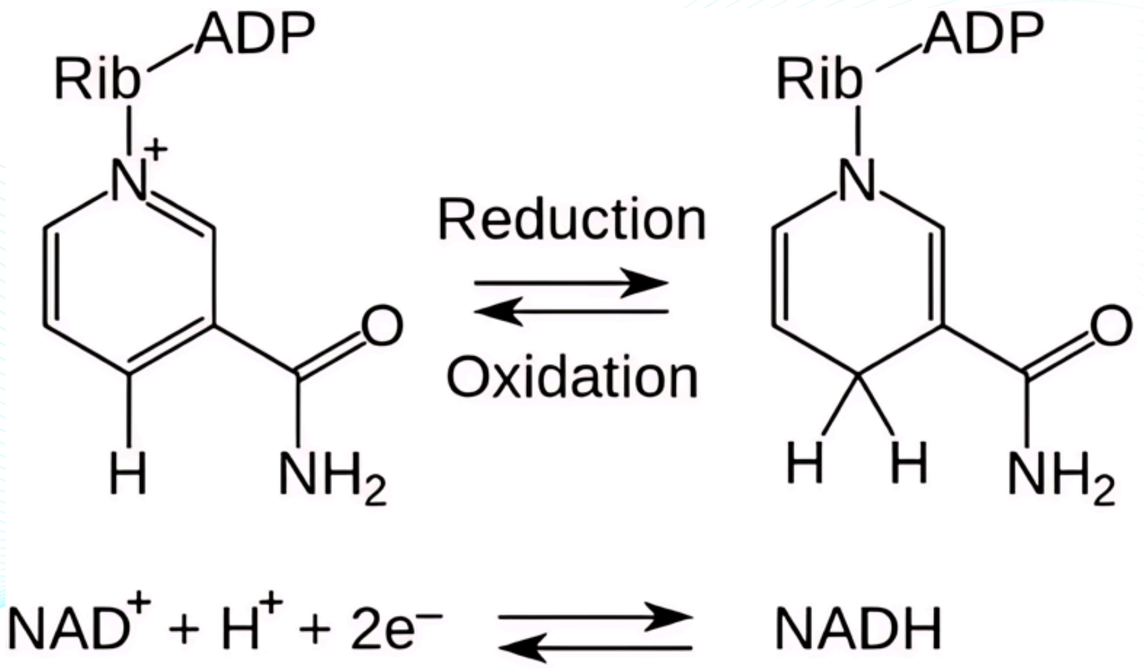


nicotinamide
riboside



2. NAD+ participates in the back-and-forth processes of reduction and oxidation - often referred to as redox reactions. These alternating conversions of NAD's oxidized form (NAD+) to its reduced form (NADH) are crucial for the metabolism of glucose and fatty acids and the formation of ATP.

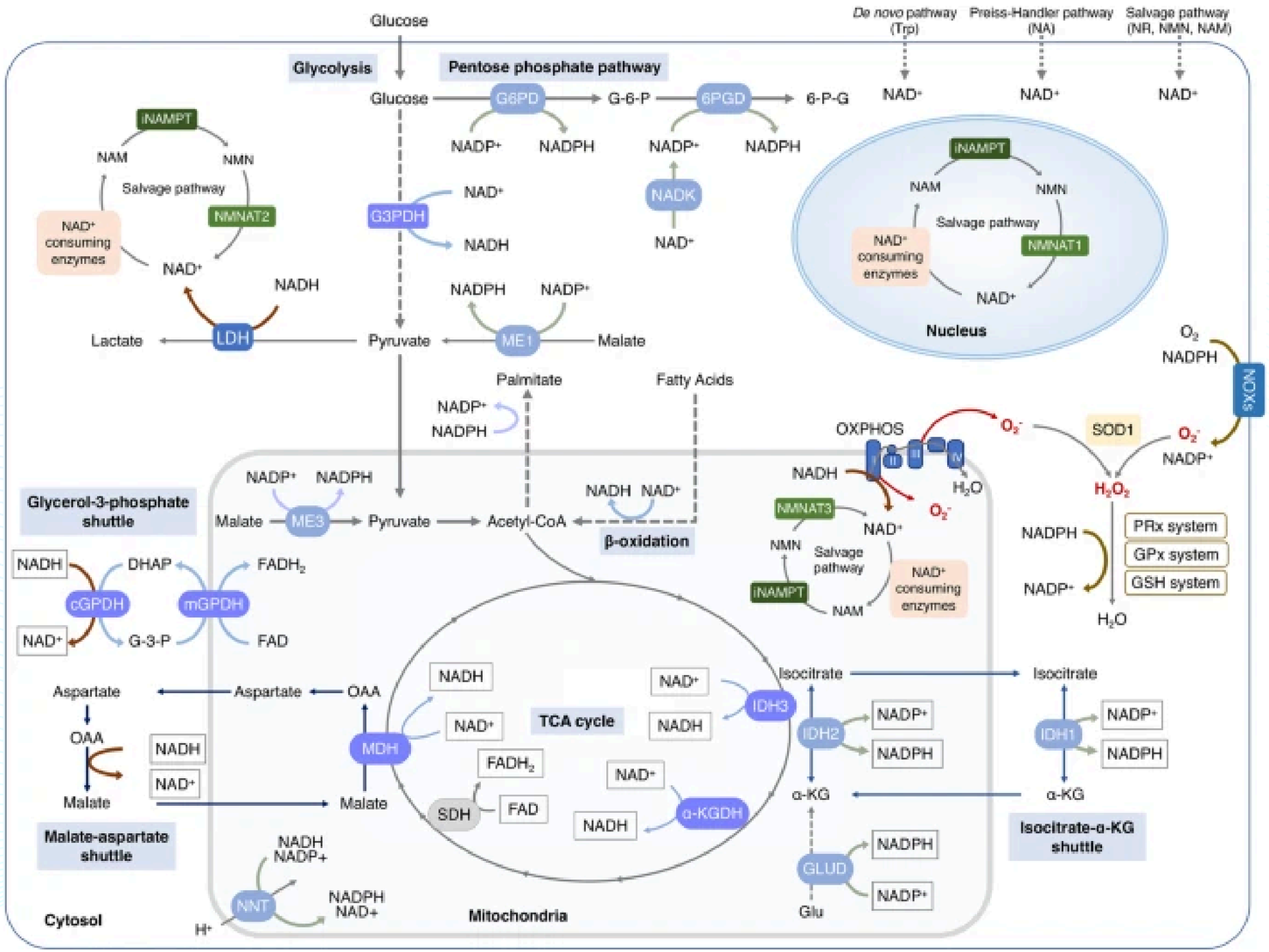
- Since both the oxidized and reduced forms of NAD are essential for these linked sets of reactions, cells need to maintain massive concentrations of both NAD+ and NADH. Without these molecules, life would cease to exist.



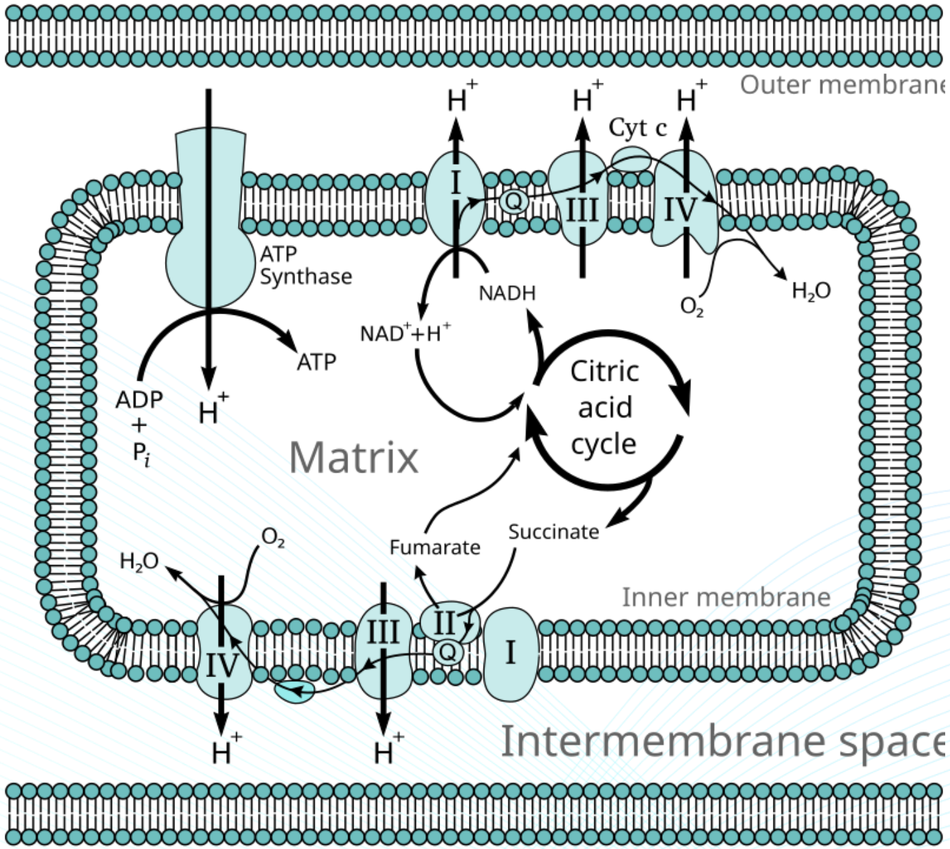
3. NAD+ acts as a cofactor for enzymes.

a.) Cofactor means something that is important for an enzyme to work. It has to bind to an enzyme, which activates that enzyme so it can perform its function

b.) Let's talk about these Enzymes.

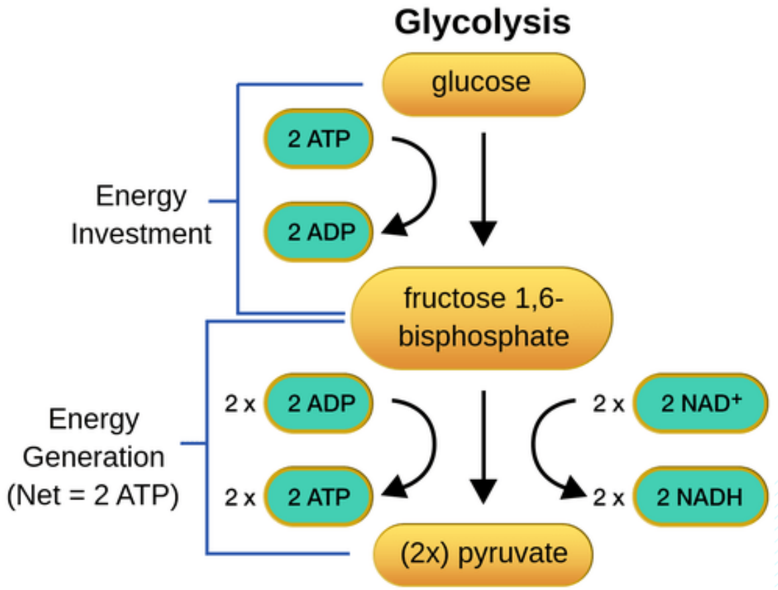


Oxidative Phosphorylation

- 

- Oxidative phosphorylation is made up of two closely connected components: the electron transport chain and chemiosmosis. The electron transport chain in the cell is the site of oxidative phosphorylation. The NADH and succinate generated in the citric acid cycle are oxidized, releasing the energy of O2 to power the ATP synthase.

Glycolysis



- Glycolysis is a metabolic pathway by which the 6-carbon molecule of glucose is broken down into a 3-C molecule called pyruvate in a series of complex oxidizing biochemical reactions. The byproduct of these reactions is the release of free energy, which is stored in the high-energy phosphate bonds of ATP and other reducing equivalents, such as NADH/H+ that are further used to produce more ATP in the mitochondria.

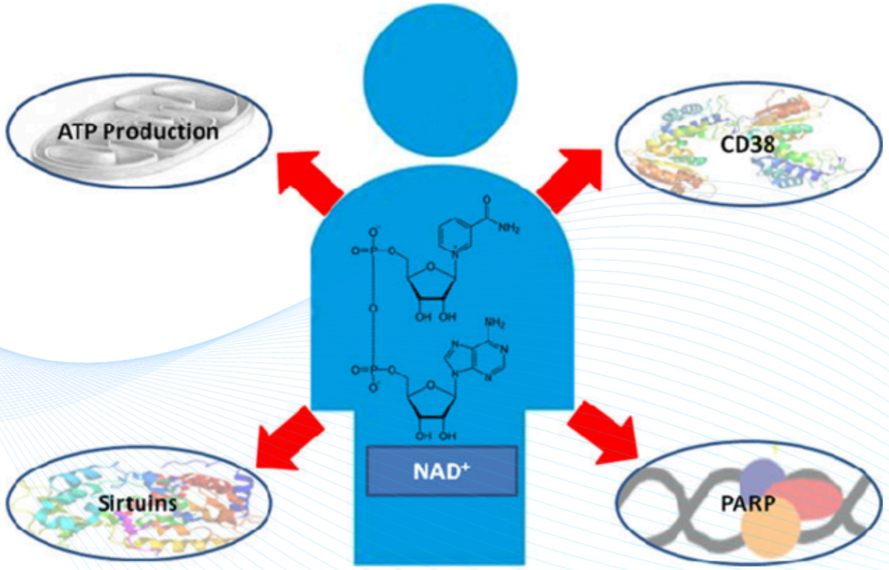
- Many types of cells use Glycolysis as its main source of energy, for example Red Blood cells do not have any mithcondria, so 100% of the energy that they require to perform their function comes from Gylcolysis.

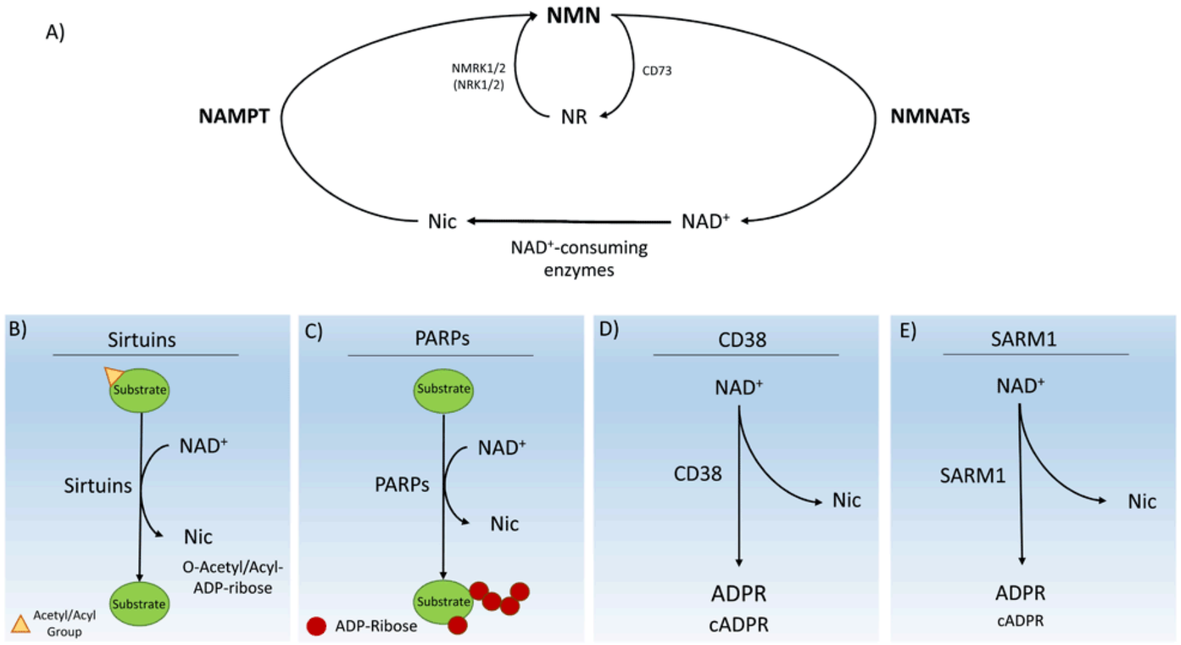
NAD+ ALSO SERVES AS THE SOLE SUBSTRATE FOR A NUMBER OF IMPORTANT ENZYMES INCLUDING:

- DNA repair enzyme.
- PARP
- histone deacetylation by sirtuin enzymes associated with transcriptional regulation, ageing and longevity,
- and CD38, the main generator of the secondary messenger molecule, cADPR.

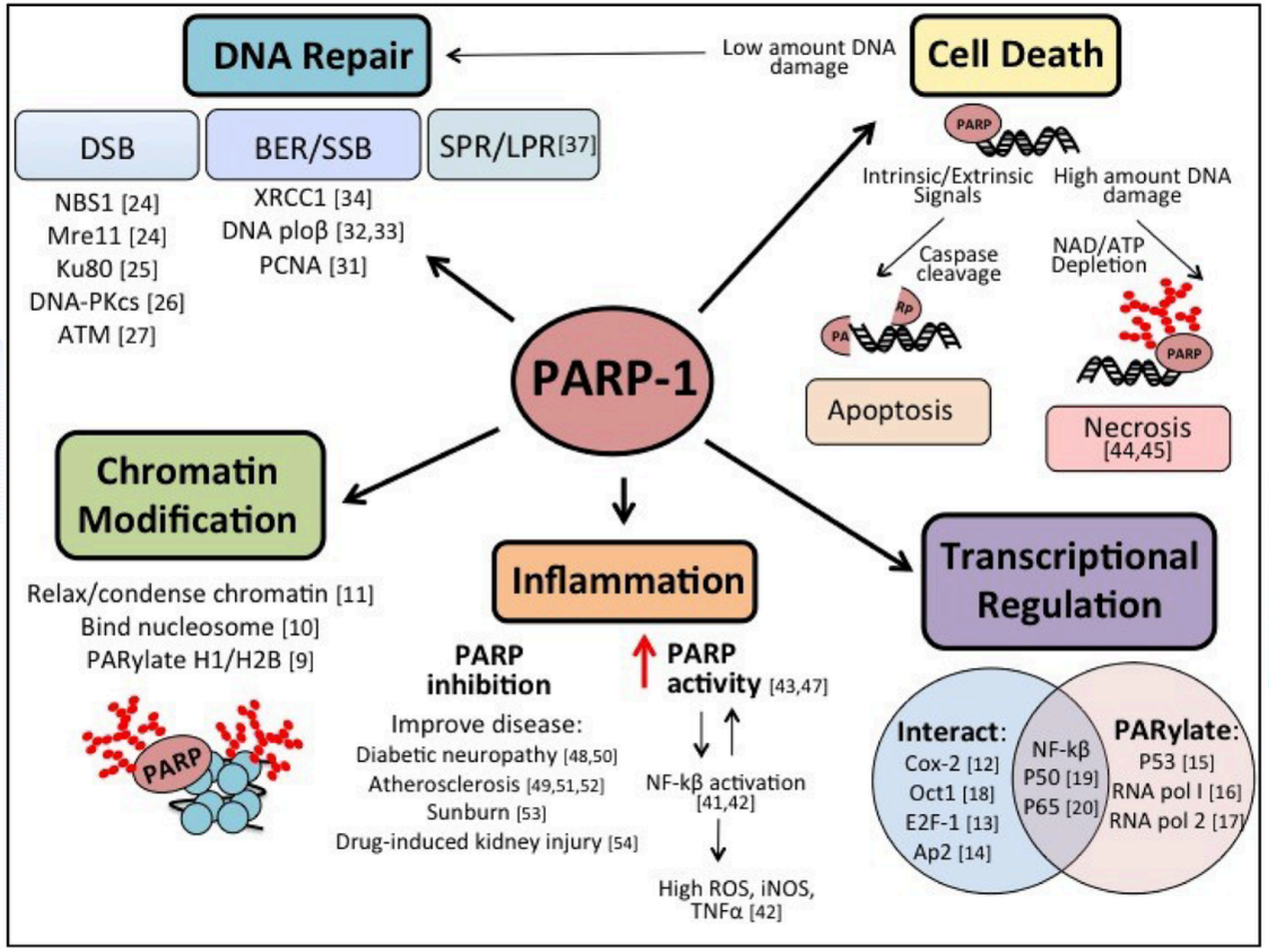
BIOLOGICAL FUNCTIONS ASSOCIATED WITH NAD+ APART FROM ENERGY PRODUCTION

Fig. 1 Biological functions associated with NAD^+. Apart from its role in oxidative phosphorylation and ATP production, NAD^+ also serves as the sole substrate for a number of important enzymes including the DNA repair enzyme, PARP, histone deacetylation by sirtuin enzymes associated with transcriptional regulation, ageing and longevity, and CD38, the main generator of the secondary messenger molecule, cADPR





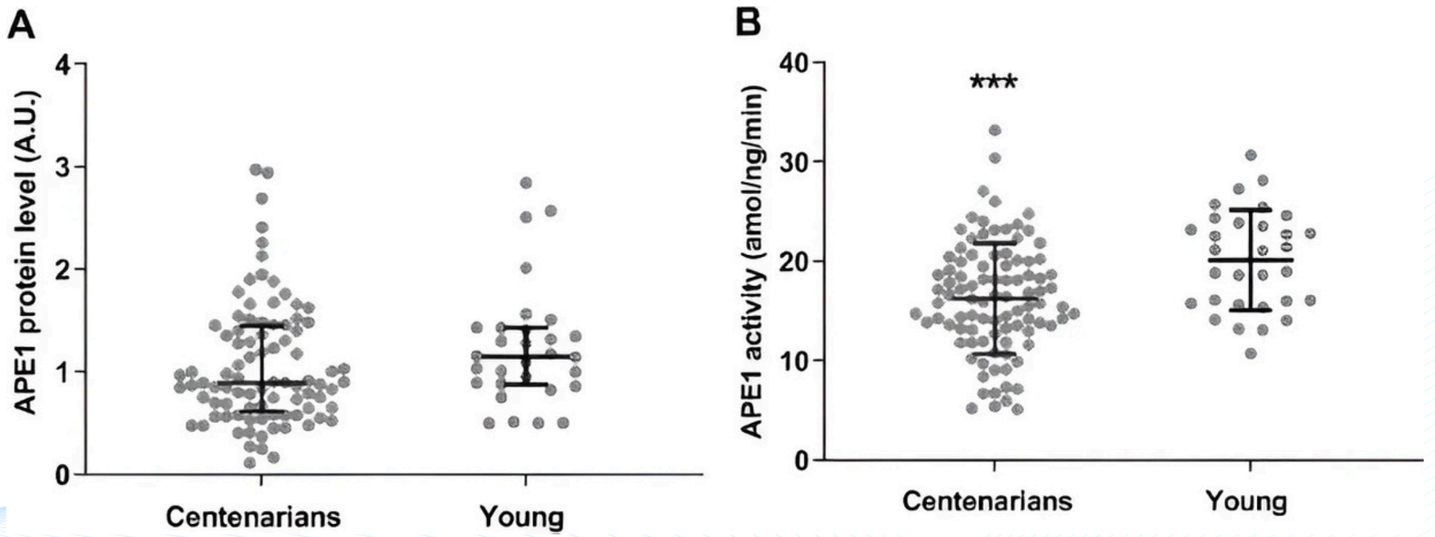
PARPS: NAD+ IS A COFACTOR FOR AN INDISPENSABLE ENZYME IN THE REPAIR OF DNA DAMAGE.



a.) NAD+ facilitates genomic stability which may be very important for longevity.

b.) NAD+ is a cofactor required to activate the enzyme PARP-1, which is required for DNA repair. The need for DNA repair increases with age.

- The activation of PARP-1 requires an immense amount of NAD+. For example excessive decrease NAD+ levels to 20-30% of its normal levels.



c.) Cells from centenarians (100 years or older) have significantly higher PARP-1 activity levels than cells from younger individuals (70 years old).

e.) PARP-1 activity has also been correlated with maximum lifespan in mammals. The higher the PARP-1 activity, the longer the lifespan.

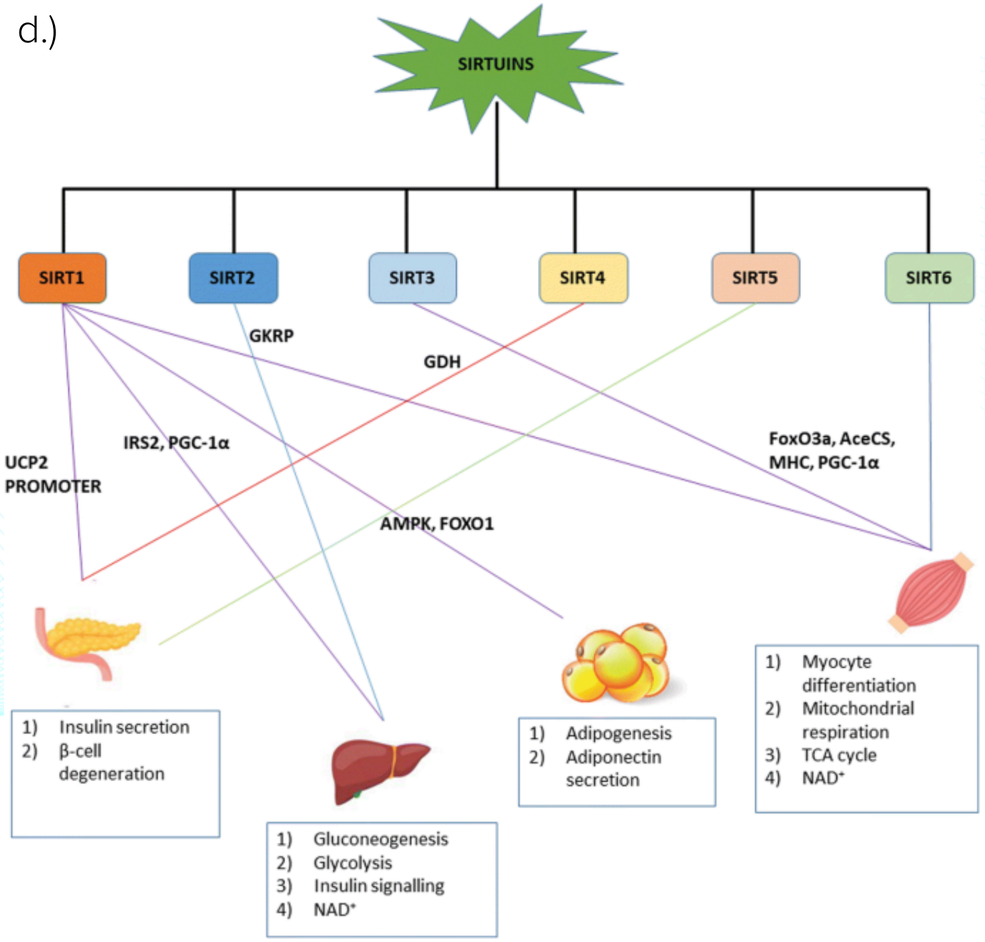
6. SIRTUINS: NAD+ is required to activate signaling proteins known as SIRTUINS.

a.) Sirtuins are linked to the regulation of a variety of metabolic processes such as the modulation of lifespan or the stress response.The way they do this is through epigenetic regulations.

b.) Sirtuins are a family of NAD+-dependent deacetylases/deacylases which have central roles in translating NAD+ changes to the regulation of many regulatory proteins for metabolism, DNA repair, stress response, chromatin remodeling, circadian rhythm, and other cellular processes.

c.) When cellular energy levels are low such as during exercise, fasting, or caloric restriction, NAD+ levels rise. Which also means that the ratio of NAD+ to its reduced for NADH increases and this serves as a sensor to switch on Sirtuin expression and subsequent activity.

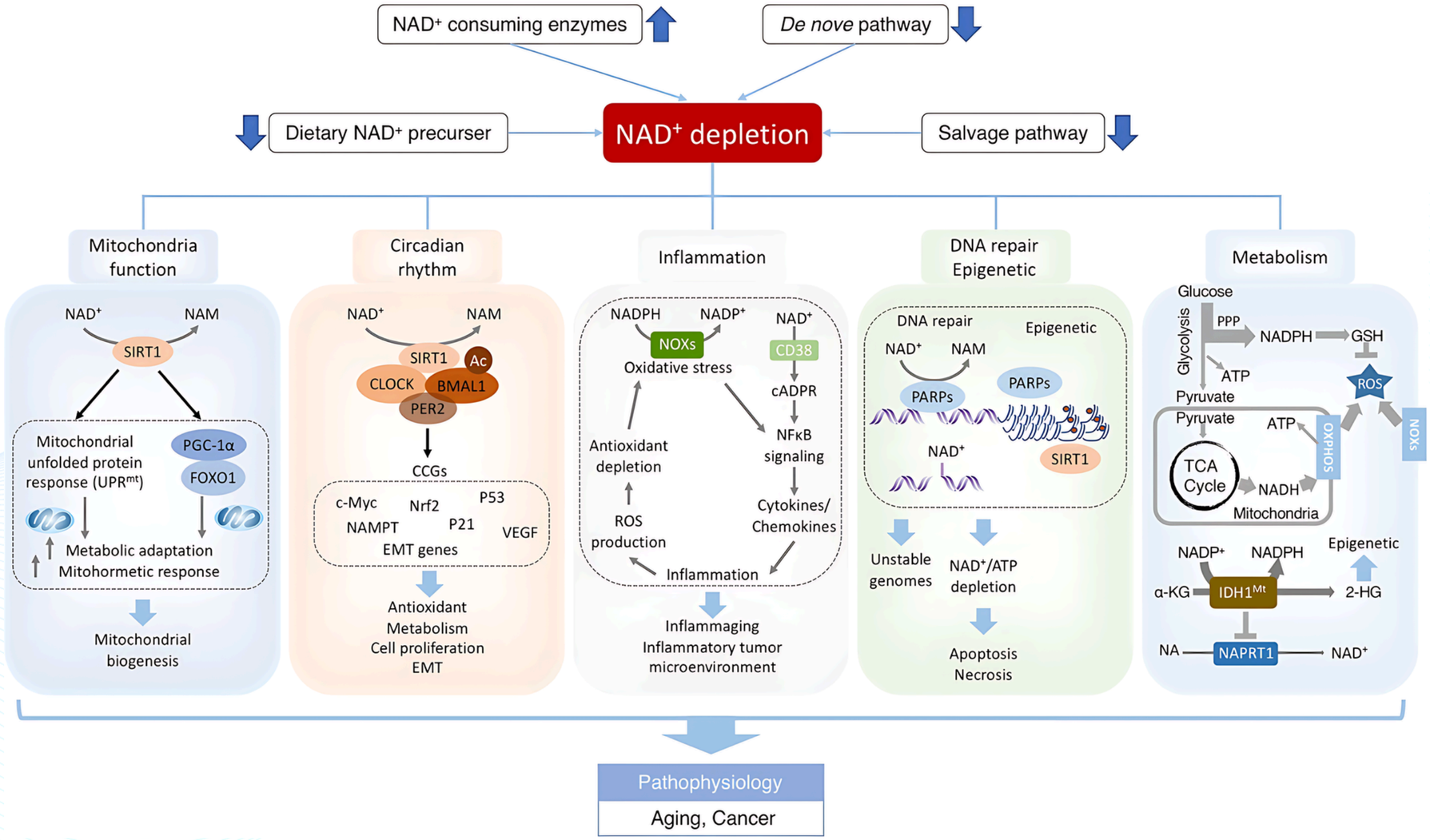
d.)



III. SO WHAT HAPPENS WITH NAD+ DEPLETION?

The brain, the skeletal muscle, the heart, these are all tissues which a very high metabolic demand and thus require a lot of NAD+

So what happens when you can't meet that metabolic demand? Things start to degenerate and fall apart. They don't work as well.

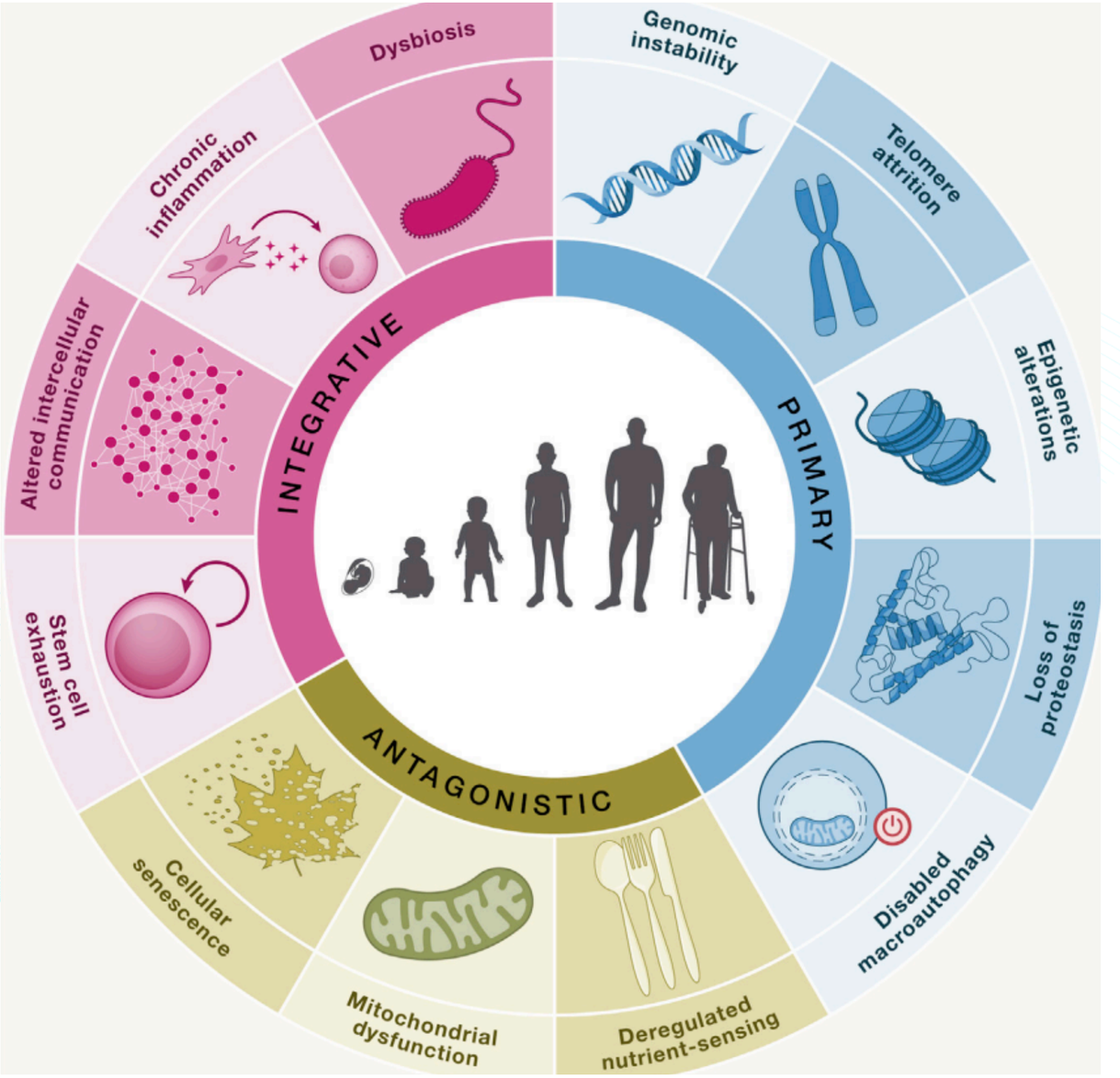


Implications of NAD+ Depletion During Aging

1. Associated with the hallmarks of aging

c.) NAD+ depletion has been associated with increased risk of neurodegenerative diseases and infections

- nerve degenerative diseases such as Alzheimer's Disease and Parkinson's Disease
- Cardiovascular disease
- Muscle atrophy
- Increase susceptibility to infections: because the immune system requires tons of NAD+



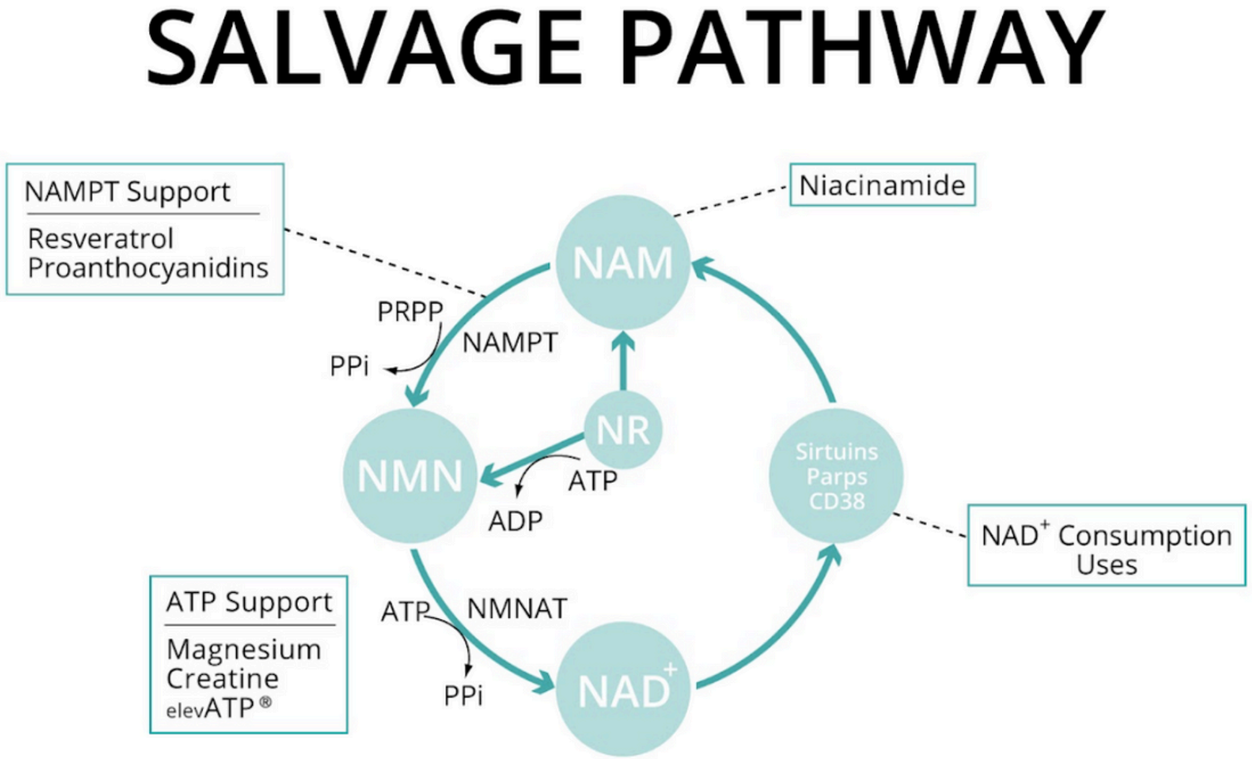
WHY IS THE SALVAGE PATHWAY SO IMPORTANT?

1. NAD+ can be synthesized from things in the diet like Tryptophan or Niacin Equivalents. But these are not your major source for NAD+, because the body's demand for NAD+ exceeds its capacity to produce it from this form. So your body's predominant source of NAD+ is by recycling Nicotinamide (NAM) through the salvage pathway.

2. The NAD+ salvage pathway is a two-step process:

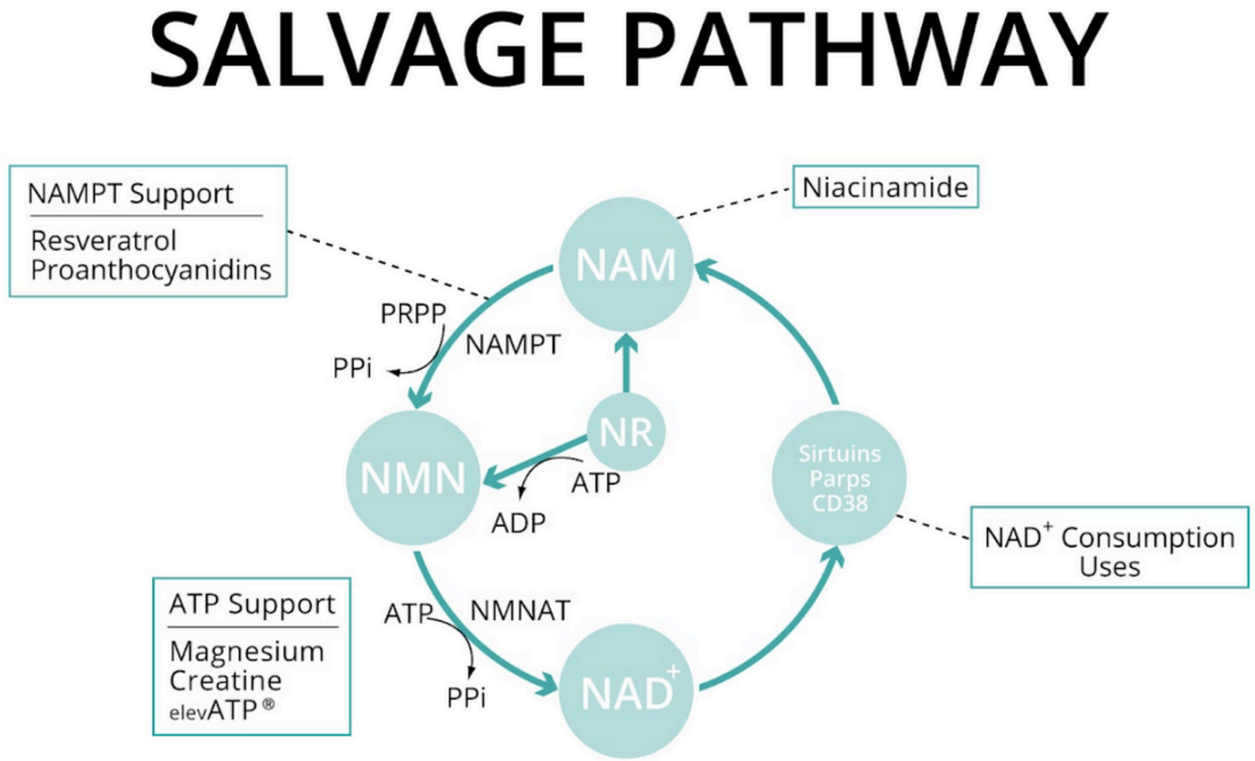
a.) NAM to NMN: The enzyme nicotinamide phosphoribosyltransferase (NAMPT) converts NAM into nicotinamide mononucleotide (NMN).

b.) NMN to NAD+: The NMNAT enzymes convert NMN directly into NAD+



WHY IS THE SALVAGE PATHWAY SO IMPORTANT?

Old and diseased cells exhibit excessive NAD+ consumption due to increased expression and activity of CD38 and PARPs. Consumption of NAD+ produces NAM as a breakdown product. Reduced expression of NAMPT means the Salvage pathway is less efficient at recycling this NAM back into NAD+.



IV. BIG QUESTION:

Can I Increase NAD+ Levels in my Body and if so will that turn me into a Superhero, or at the very least help me be free of disease and live longer and more gracefully?

DISEASES ASSOCIATED WITH NAD+ DECLINE

1. Diabetes

- SIRT1 is important for promoting glucose-stimulated insulin secretion in pancreatic β-cells. Additionally, SIRT1 has a protective effect against insulin resistance in peripheral tissues, including adipose tissue, liver, and skeletal muscle. These findings suggest that SIRT1 is important for glucose homeostasis and the prevention of type 2 diabetes.

2. Non-alcoholic fatty liver disease

- Non-alcoholic fatty liver disease (NAFLD) is characterized by steatosis of the liver and is linked with insulin resistance and metabolic syndrome. Overexpression of SIRT1 upregulates fatty acid oxidation pathways and downregulates lipogenic pathways, protecting the liver from steatosis.

3. Atherosclerosis

- SIRT1 has been shown to improve vascular function. SIRT1 is positioned to affect many pathways important for endothelial function. SIRT1 suppresses the expression of inflammatory factors, including interleukin-6 (IL-6), monocyte chemoattractant protein 1 (MCP-1), intercellular adhesion molecule 1 (ICAM-1), matrix metalloproteinase 14 (MMP14), and vascular cell adhesion molecule 1 (VCAM-1)64. Additionally, SIRT1 improves free fatty acid, triglyceride, total cholesterol, and blood glucose levels. These protective effects of SIRT1 indicate that it acts as an anti-atherosclerosis agent.

4. Alzheimer’s disease

- Alzheimer’s disease (AD) is marked by multiple pathologies, including neuroinflammation, amyloid-beta plaques, mitochondrial damage, and increased oxidative stress. Patients with AD have lowered expression of SIRT1, which is recapitulated in the hippocampus of AD model mice. Additionally, SIRT1 promotes neuronal function and survival in AD model mice. CA1-localized SIRT1 overexpression not only preserves learning and memory in AD mice but enhances cognitive function in non-AD model mice.

5. Retinal degeneration

- Retinal degeneration is prominent in diseases such as macular degeneration and diabetic retinopathy. A recent study reported the importance of SIRT3 and SIRT5 in the survival of retinal photoreceptors. In particular, mitochondrial SIRT3 activity is sensitive to the reduction in NAD+. Decreases in retinal NAD+ were detected in multiple retinal degenerative disorders, including age-associated dysfunction, diabetic retinopathy, and light-induced degeneration.

6. Depression

- Depression is a complex psychiatric disorder associated with a number of pathologies, including inflammation, synaptic dysfunction, metabolic syndrome, and cognitive deficit. Sirtuins have been shown to have a role in the development of depression. In the dentate gyrus region of the hippocampus, it has been shown that SIRT1 is decreased under conditions of chronic stress, which has been associated with depressive-like behaviors.

PRACTICAL WAYS TO INCREASE NAD+ LEVELS

1. Exercise. Exercise produces energy stress, which naturally increases the consumption of NADH to produce energy. This NADH depletion yields higher levels of NAD+. Interval training is ideal, but aerobic exercise can also create and sustain the energy stress to produce more NAD+.

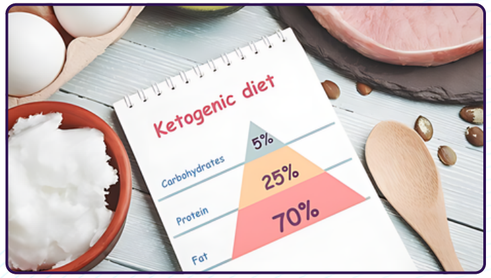
2. Diet. Excess carbohydrates can induce an accumulation of NADH, reducing the amount of NAD+. To increase the NAD+ levels, you need to decrease your caloric intake, perhaps through portion control, calorie counting, or fasting.

- *Whole grains*. Whole grains are rich in vitamin B3.
- *Milk*. Cow's milk is an excellent source of Nicotinamide riboside.
- *Fish*. Sardines, salmon, and tuna are rich sources of NAD+.
- *Yeast*. Nicotinamide riboside is also found in yeast.
- *Green Vegetables*. Peas and asparagus are two of the top green vegetables for our bodies, and they increase NAD+ levels.
- *Mushrooms*. Mushrooms, in particular the crimini mushrooms, increase NAD levels.

HEALTHSPAN PROMOTING ACTIVITIES INCREASES CELLULAR NAD+ INDEPENDENT OF AGE
NAD+ INCREASES DURING PERIODS OF FASTING AND DURING EXERCISE
INCREASED NAD+ LEVELS IN ANIMAL STUDIES ARE ASSOCIATED WITH INCREASED LIFESPAN.

3. Fermented foods and kombucha. Fermentation produces lactate by using NADH, resulting in the production of NAD+.

4. Ketosis. This fat-burning process increases NAD+ by burning up the NADH available.



5. Fructose. Fructose, found in honey and fruits, activates the enzyme — lactate dehydrogenase — that converts NADH to NAD+.

6. Heat shock and saunas. Not only do you sweat out toxins during a sauna, but you also increase your levels of NAD+.

C. SUPPLEMENTATION

1. In addition to these methods for increasing your levels of NAD+, there are also several supplements that have been linked, during human trials, to increasing NAD+ levels.

- Resveratrol
- Niacinamide
- Nicotinamide riboside
- NMN

SEEERGIE NAD+ THERAPY SOLUTIONS

IV THERAPY

SUBQ PEN

NASAL SPRAY

NAD+ IV PROTOCOLS

250 mg / 500 mg
Sol. for Infusion

Anti-Aging Treatment

Initial Phase:

- **Dosage:** 250-500mg NAD+
  Frequency: 1-3 times a week
  Duration: 4-12 weeks

Maintenance Phase:

- **Dosage:** 500-1000mg NAD+
  Frequency: Once a month

NAD+ Recommended Dilution with NSS:
l Approximately 100 NSS for every 100 mg

Infusion Duration:
l 250mg takes approximately 1-2 hours

_____

It's always better to start smaller dose and slower drip rates.

Can be mixed with other essentials (Vitamin C, Glutathione, V Complex and other more)

*The content provided is a reference for common use cases only and should not be considered a replacement for professional medical advice, diagnosis, or treatment.

NAD+ IV PROTOCOLS

250 mg / 500 mg
Sol. for Infusion

General Fatigue

- **Initial Phase:**
  - **Dosage:** 250-500mg NAD+
    Frequency: 1-2 times a week
    Duration: 4 weeks
- **Maintenance Phase:**
  - **Dosage:** 500-1000mg NAD+
    Frequency: Once every 2-4 weeks

NAD+ Recommended Dilution with NSS:
I Approximately 100 NSS for every 100 mg

Infusion Duration:
I 250mg takes approximately 1-2 hours

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It's always better to start smaller dose and slower drip rates.

Can be mixed with other essentials (Vitamin C, Glutathione, V Complex and other more)

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NAD+ IV PROTOCOLS

250 mg / 500 mg
Sol. for Infusion

Cognitive Functions

- **For Alzheimer's Disease:** 6 Week Program
  - **Weeks 1-2:** 500mg of NAD+
    Weeks 3-4: 750mg of NAD+
    Weeks 5-6: 1000mg of NAD+
    Frequency: 3 times per week
- **For Parkinsons Disease:** 8 Week Program
  - **Weeks 1-4:** 750mg of NAD+
    Weeks 4-8: 1000mg of NAD+
    Frequency: 2 times a week
- **For ALS Disease:** 10 Week Program
  - **Dosage:** 1000mg of NAD+
    Frequency: 3 times per week

NAD+ Recommended Dilution with NSS:
I Approximately 100 NSS for every 100 mg

Infusion Duration:
I 250mg takes approximately 1-2 hours

It's always better to start smaller dose and slower drip rates.

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NAD+ IV PROTOCOLS

250 mg / 500 mg
Sol. for Infusion

Alcohol and Drug Withdrawal

10 Day Course:

- **Dosage:** 1000mg of NAD+
  Frequency: Every day for 10 days

Stabilization Phase:

- **Dosage:** 1000mg of NAD+
  Frequency: 3 times a week for 2 weeks

Maintenance Phase:

- **Dosage:** 1000mg of NAD+
  Frequency: 1 session a week for 4 weeks
  Long term maintenance: 1 session every 1-2 months depending on the patient response and craving.

NAD+ Recommended Dilution with NSS:
I Approximately 100 NSS for every 100 mg

Infusion Duration:
I 250mg takes approximately 1-2 hours

It's always better to start smaller dose and slower drip rates.

Can be mixed with other essentials (Vitamin C, Glutathione, V Complex and other more)

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NAD+ SUBQ PROTOCOLS

The NAD+ Subcutaneous (SUBQ) Pen is designed for home use following the completion of other initial protocols. This user-friendly device allows for self-administration of NAD+, providing flexibility and convenience for patients.

- **Storage:** Cold
- **Dosage:**
  - NAD+ 500mg pen / 3 ML
  - 1 unit = 0.01mL = 1.66mg NAD+
  - 10 units = 16.6 mg
  - 20 units = 33.2 mg
  - 30 units = 50 mg
  - 20mg = 12 units (approx 25 shots)
  - 30mg = 18 units (approx 16 shots)
  - 50 mg = 30 units (approx 10 shots)
- **Frequency:** 3-5 times a week depending on need
- **Timing of Administration:**
  - **Pre-Workout:** Enhance your workout performance by administering a dose before exercise
  - **Morning Energy Booster:** Kickstart your day with a morning injection for increased energy and vitality.
  - **Night time Recovery:** Some users may prefer to take it at night to aid in recovery and rejuvenation.

2 OPTIONS
300 mg / 500 mg Pen

VIAL AND SYRINGE
Compounded by request mg/ml

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NAD+ SUBQ PROTOCOLS

a.) Determining the perfect **NAD+ injection dosage requires considering a range of factors**, including age, overall health, and specific health goals.

b.) As a subcutaneous injection, **NAD+ is best administered on either your stomach or upper arm**. To avoid irritation, administer the injection in a different location than the last one.

c.) Finally, **choose a dosing schedule that works for you**. For example, if you'll be injecting 3 times per week, decide whether Monday/Wednesday/Friday is a viable schedule to keep on a consistent date. Try setting alarms or calendar reminders to keep you on track!

d.) The dosage range varies but is typically between **20 mg and 50 mg NAD+, taken 2-3 times per week**. This has been indicated as providing the best balance of improved energy and weight loss benefits for most users, with the most minimal occurrence of side effects.

e.) However, it's important to ease yourself into the target dose. To do this, you'll **start with a smaller dose and gradually ramp up to the target dose over time**. Pay careful attention to how your body responds to the initial dose to decide when it's best to ramp up.

2 OPTIONS
300 mg / 500 mg Pen

VIAL AND SYRINGE
Compounded by request mg/ml

NAD+ NASAL PROTOCOLS

The NAD+ Nasal Spray is designed for easy and effective administration of NAD+ through the nasal passage, providing rapid absorption and onset of effects. This method is particularly advantageous for individuals seeking a quick boost in NAD+ levels to support cellular function and overall vitality.

- **Storage:** Cold
- **Dosage:**
  - **500mg Spray:** 5mg per spray, administered once in each nostril.
    300mg Spray: 3mg per spray, administered once in each nostril.
- **Frequency:**
  - **Daily Use:** Recommended once or twice daily based on individual needs and healthcare provider guidance.
- **Timing of Administration:**
  - **Morning Use:** Ideal for those seeking to start their day with enhanced energy and focus.
  - **Pre-Activity Use:** Can be used before mental or physical activities for an added boost in performance and endurance.

2 OPTIONS:
300 mg / 500 mg

NAD+ NASAL PROTOCOLS

a.) NAD is given through the nasal tissue when it is given through the nose. People are intrigued in this method because it could be quickly absorbed and go straight into the body. By going around the digestive system, nasal NAD treatments might be more bioavailable and start working faster.

b.) Nasal Sprays: These usually contain 30 mg/spray in a 300 mg/ml bottle and are typically administered once daily.

2 OPTIONS:
300 mg / 500 mg

ARE NAD+ INJECTIONS SAFE?

NAD+ injections are generally **considered safe when administered by qualified healthcare professionals**. However, as with any medical treatment, there may be risks and potential side effects, such as injection site reactions, allergic reactions, or interactions with medications.

NAD IV Therapy Side Effects

a.) Flushing and Warm Sensation

- One of the most common side effects of NAD IV treatment is flushing, which causes the skin to turn red and feel warm all at once. This effect results from the rapid release of prostaglandins, which dilate blood vessels.

b.) Nausea and Gastrointestinal Disturbances

- During or after NAD IV treatment, some people may feel a little bit sick, have stomach pain, or have problems with their gastrointestinal tract. These effects are usually temporary and resolve without medical intervention. Maintaining adequate hydration and adjusting the infusion rate can help cut these symptoms.

c.) Headache

- Headaches are a side effect of NAD IV therapy. They are usually mild and temporary, disappearing shortly after the infusion. Proper hydration before and during the treatment helps reduce the likelihood of experiencing headaches.

HOW LONG DO NAD+ INJECTIONS LAST?

1. The duration of NAD+ injections' effects can vary depending on factors such as dosage, frequency, individual metabolism, and health status. Some people may experience immediate benefits, while others may require regular injections to maintain optimal NAD+ levels. It's essential to follow a personalized treatment plan and monitor progress over time.

2. NAD+ has a short half-life, ~1 h in mammalian cells,15 and limited ability to diffuse through cell membrane barriers.

V. CONCLUSION

A. IN CONCLUSION

The decline of NAD+ levels is emerging as a **critical molecular driver of aging and a potential limiter of lifespan**. The delicate balance between NAD+ biosynthesis, regulated by NAMPT, and its consumption by NAD+-dependent enzymes is crucial for cellular health. Disruptions to this balance can have profound consequences. However, mounting evidence suggests that interventions with NAD+ supplementation offer a promising strategy to restore NAD+ levels and mitigate the physiological decline associated with aging.

We're now at an exciting juncture, where ongoing research holds the potential to transform our approach to aging and age-related diseases, paving the way for new therapeutic possibilities in human health.

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