



## Humanin

### About

Humanin is a mitochondria-derived peptide being studied for its cell-protective, neuroprotective, and anti-aging potential. It may help shield neurons and tissues from oxidative stress and inflammation, while supporting mitochondrial function, metabolic health, and cognitive performance.

\*These products are for research use only and are not intended for human consumption, medical use, therapeutic use, or diagnostic purposes. They are not to be used in foods, drugs, cosmetics, dietary supplements, or any products intended for humans or animals. Peptides are not sterile, have not been tested for safety or efficacy in humans, and must not be injected, ingested, inhaled, applied to the skin, or administered in any form. No product sold is intended to treat, cure, mitigate, or prevent any disease.

## What's Included

- One vial, concentration: 5mg/4mL
- One vial will last 10 days

### Reconstitution kit

- (20) 29-30G subq needles
- (1 ) 5mL syringe
- (1) 25G needle with syringe
- (1) 10 mL bacteriostatic water

### Clinical Research Potential Benefits:

- May protect cells and neurons from oxidative stress and apoptosis
- May support mitochondrial function and metabolic regulation
- May enhance cognitive health and memory
- May promote longevity and healthy aging
- May reduce inflammation

### Clinical Research Suggested Use:

- Draw 40 units (500mcg) into the syringe
- Administer daily in the evening
- Duration: 10 day cycle
- Reconstitute: add 4mL bacteriostatic water to the to the lyophilized powder vial
- Injection type: subcutaneous injection

## Reconstitution & Administration\*

\*Instructions start on page 2



## Humanin Reconstitution

### One

#### Prepare

**STEP 1:** Remove plastic covers, clean vial and bacteriostatic water top with alcohol pad for 15 seconds

**STEP 2:** Using the large syringe from your administration kit, pull out 4mL of Bacteriostatic water

- It may take a few repetitions to load your syringe with the 4mL with no air pockets

**STEP 3:** Once you've loaded your syringe, slowly inject the 4mL of Bacteriostatic water into your Humanin vial:

- On its side to not damage the bonds of the product
- Do not shake, gently swirl if needed
- Allow the solution to sit for at least 5 minutes

**\*Supplies:** 5 mL syringe (large), 25G needle, Bacteriostatic water, Humanin vial, Alcohol pad

### Two

#### Pull

**STEP 1:** With the smaller needle draw up 40 units of the Humanin into the small syringe from your kit

**\*Supplies:** 29G-30G subcutaneous syringe with needle (small), Alcohol pad

### Three

#### Inject

**STEP 1:** Clean the injection area with an alcohol pad

**STEP 2:** Inject subcutaneously (see pg 3)

- Repeat daily for 10 days
- Duration: 10 days
- Each vial lasts 10 days



## Injection Steps

### Subcutaneous Injection steps:

#### 1 Choose & Clean the Injection Site

- Use the abdomen (3 inches from the belly button), thigh, or upper arm. Rotate sites to prevent irritation. Clean the area with an alcohol swab and let it dry.

#### 2 Inject

- Pinch 1 to 2 inches of skin, insert the needle at a 90° angle, and slowly push the plunger down.

#### 3 Remove the Needle & Dispose

- Pull the needle out at the same angle, apply light pressure with gauze (don't rub), and dispose of the syringe in a sharps container.

#### 4 Monitor for Reactions

- Mild redness or soreness is normal. Seek medical help if you experience severe pain, swelling, or an allergic reaction.

### Intramuscular Injection steps:

#### 1 Choose & Clean the Injection Site

- Use the thigh (vastus lateralis), upper arm (deltoid), or glute (ventrogluteal or dorsogluteal muscle).
  - Rotate sites to prevent soreness. Clean the area with an alcohol swab and let it dry.

#### 2 Inject

- Stretch the skin taut, hold the syringe like a dart at a 90° angle, and insert the needle quickly and smoothly. Slowly push the plunger down to inject.

#### 3 Remove the Needle & Dispose

- Pull the needle straight out, apply light pressure with gauze (don't rub), and dispose of the syringe in a sharps container.

#### 4 Monitor for Reactions

- Mild soreness or redness is normal. Seek medical help if you experience severe pain, swelling, or an allergic reaction.



## Humanin Mechanism of Action

- **Mitochondrial-Derived Cytoprotective Peptide:**
  - Humanin is a 24–amino acid mitochondrial-derived peptide (MDP) that functions as a potent cytoprotective and neuroprotective signaling molecule. It operates through both intracellular and extracellular mechanisms to preserve mitochondrial integrity, enhance stress resilience, and activate longevity-associated pathways.
- **Intracellular Mitochondrial Stabilization:**
  - Within the cell, Humanin binds to pro-apoptotic Bcl-2 family proteins such as Bax, tBid, and Bak. This binding inhibits their translocation to the mitochondrial outer membrane, preventing cytochrome c release and apoptosis. By maintaining mitochondrial membrane potential, Humanin preserves ATP production and cellular energy metabolism under oxidative or inflammatory stress.
- **Extracellular Receptor-Mediated Signaling:**
  - Extracellularly, Humanin functions in a hormone-like manner by binding to a trimeric receptor complex composed of CNTFR, WSX-1, and gp130. This interaction activates pro-survival signaling cascades including STAT3, PI3K/Akt, and ERK1/2, which enhance cell survival, inhibit inflammatory signaling, and mitigate oxidative injury.
- **Neuroprotective and Anti-Apoptotic Effects:**
  - Humanin confers protection against neurotoxic and amyloidogenic stress by reducing oxidative damage and inhibiting apoptotic pathways. These neuroprotective mechanisms have been shown to preserve neuronal viability and function in models of Alzheimer’s disease, ischemia, and age-related neurodegeneration.
- **Mitochondrial Biogenesis and Redox Regulation:**
  - By modulating mitochondrial biogenesis and reducing reactive oxygen species (ROS) accumulation, Humanin enhances mitochondrial quality control and cellular redox balance. These effects promote improved energy metabolism, stress adaptation, and protection against mitochondrial dysfunction.
- **Metabolic and Endocrine Effects:**
  - Systemically, Humanin exerts endocrine-like actions across multiple organs—including the brain, heart, skeletal muscle, and pancreas. It improves glucose utilization, supports insulin sensitivity, and contributes to overall metabolic stability. These coordinated effects align Humanin with key longevity and homeostatic signaling pathways.