

# High Molecular Weight Hyaluronic Acid ( $\approx 1$ Million Daltons): Scientific Perspectives on Joint Health, Skin Wellness, and Everyday Vitality

## Introduction

Hyaluronic acid (HA) is a naturally occurring substance found throughout the body, particularly in joints, connective tissues, skin, eyes, and other tissues that require hydration and lubrication. It plays an important structural role by helping tissues retain water, maintain elasticity, and support normal function.

High Molecular Weight Hyaluronic Acid (HMW-HA), typically defined as hyaluronic acid with a molecular weight of approximately one million Daltons or greater, has attracted scientific interest because of its unique biological properties and its role in supporting healthy tissue function.

High Molecular Weight Hyaluronic Acid is included as an ingredient in **IRx-ZEUS**<sup>®</sup> for humans and **ActivPower ATLAS**<sup>®</sup> for dogs as part of comprehensive nutritional formulations designed to support mobility, joint wellness, skin health, and overall quality of life.

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## What Makes High Molecular Weight Hyaluronic Acid Unique?

Hyaluronic acid exists in a range of molecular sizes. Research suggests that molecular weight may influence biological behavior.

High Molecular Weight Hyaluronic Acid is naturally abundant in healthy tissues and has been associated with:

- Joint lubrication
- Tissue hydration
- Connective tissue integrity
- Skin moisture retention

- Support of normal inflammatory balance

Researchers have observed that higher molecular weight forms of HA may interact differently with tissues compared with fragmented or low molecular weight forms, particularly in relation to tissue homeostasis and normal cellular signaling (Litwiniuk et al., 2016; Cowman et al., 2015).

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## **Joint Health and Mobility**

The strongest scientific rationale for oral hyaluronic acid supplementation relates to joint health and mobility.

Hyaluronic acid is a major component of synovial fluid, the fluid that helps lubricate joints and facilitate smooth movement. Concentrations and quality of endogenous hyaluronic acid may decline with aging and joint degeneration.

Several human clinical studies have reported improvements in measures related to:

- Joint comfort
- Mobility
- Physical function
- Activities of daily living

following oral hyaluronic acid supplementation (Tashiro et al., 2012; Kalman et al., 2008).

Researchers propose that supplemental hyaluronic acid may support joint wellness by helping maintain normal lubrication and supporting healthy connective tissue function.

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## **Supporting the Body's Normal Inflammatory Response**

High Molecular Weight Hyaluronic Acid has been studied for its role in maintaining tissue homeostasis and supporting normal inflammatory balance.

Laboratory studies have demonstrated that high molecular weight HA may interact with receptors involved in cellular signaling, including CD44 and toll-like receptor pathways, helping maintain normal tissue responses under physiological conditions (Litwiniuk et al., 2016).

High Molecular Weight Hyaluronic Acid has been studied for its role in supporting healthy tissue function and the body's normal inflammatory balance. Researchers have proposed that higher molecular weight forms of HA may contribute to a healthy tissue environment by supporting normal inflammatory regulation and tissue resilience.

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## **Skin Health and Appearance**

Skin contains approximately half of the body's hyaluronic acid reserves.

One of HA's primary functions is maintaining hydration within the extracellular matrix, helping support:

- Skin moisture
- Skin elasticity
- Skin smoothness
- Healthy skin appearance

Several human studies have reported improvements in skin hydration and skin appearance following oral hyaluronic acid supplementation (Oe et al., 2017; Kawada et al., 2014).

Because hydration is closely linked to visible skin quality, hyaluronic acid has become a popular ingredient in nutritional and cosmetic wellness products.

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## **Allergy-Related Wellness and Respiratory Health**

Researchers have investigated hyaluronic acid's role in maintaining healthy mucosal surfaces and tissue hydration.

High Molecular Weight HA contributes to the integrity of epithelial tissues and mucosal barriers, which are important components of normal respiratory and immune system function.

Although scientific interest exists in these areas, evidence remains preliminary.

Research continues to explore hyaluronic acid's role in supporting healthy tissues throughout the body, including mucosal surfaces.

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## Tissue Health and Wound Healing Research

Hyaluronic acid plays a recognized physiological role during normal tissue repair processes.

Researchers have studied HA in relation to:

- Cellular migration
- Tissue hydration
- Extracellular matrix organization
- Connective tissue remodeling

Numerous laboratory and clinical studies have demonstrated that hyaluronic acid participates in the body's natural tissue-repair processes (Litwiniuk et al., 2016).

Hyaluronic acid is a naturally occurring component involved in normal tissue repair and connective tissue function. However, oral supplementation studies specifically demonstrating accelerated wound healing remain limited.

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## Healthy Aging and Longevity

Hyaluronic acid has attracted interest in healthy-aging research because of its roles in:

- Joint lubrication
- Skin hydration
- Connective tissue function
- Tissue resilience

These functions may contribute to mobility, physical activity, and overall quality of life as individuals age.

Some observational research has generated scientific interest regarding populations with naturally high tissue hyaluronic acid levels; however, there is currently no clinical evidence demonstrating that oral hyaluronic acid extends lifespan or directly promotes longevity in humans or animals.

The strongest healthy-aging rationale remains support of:

- Mobility

- Skin wellness
- Physical function
- Active lifestyles

High Molecular Weight Hyaluronic Acid may support healthy aging by helping maintain mobility, tissue hydration, and overall physical wellness.

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## Use in Companion Animals

Hyaluronic acid is frequently incorporated into companion animal nutritional products intended to support mobility, activity, and joint wellness.

Within the ActivPower product portfolio, High Molecular Weight Hyaluronic Acid is included in **ActivPower ATLAS®** for dogs as part of a comprehensive nutritional strategy supporting mobility, physical function, and quality of life.

As with all nutritional ingredients, hyaluronic acid is most appropriately viewed as one component of a broader wellness program that includes nutrition, exercise, veterinary care, and lifestyle management.

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## Safety Profile

Published research generally reports oral hyaluronic acid supplementation to be well tolerated.

Reported side effects are uncommon and typically mild.

Individuals with medical conditions, those taking medications, and pet owners managing veterinary conditions should consult qualified healthcare professionals or veterinarians before introducing new supplements.

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## ActivPower Perspective

High Molecular Weight Hyaluronic Acid remains one of the most extensively studied structural molecules involved in joint lubrication, connective tissue function, and skin hydration.

For this reason, ActivPower includes High Molecular Weight Hyaluronic Acid in:

- **IRx-ZEUS®** for humans
- **ActivPower ATLAS®** for dogs

as part of comprehensive formulations intended to support mobility, healthy movement, skin wellness, and overall quality of life.

The current scientific literature supports continued interest in High Molecular Weight Hyaluronic Acid as a nutritional ingredient that may contribute to joint comfort, tissue hydration, skin appearance, and active living.

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## **Selected Scientific References**

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## **Educational Literature Disclaimer**

This article is provided solely for educational and informational purposes and summarizes selected scientific literature concerning High Molecular Weight Hyaluronic Acid and its use as a nutritional ingredient in humans and animals.

References to mobility, joint health, skin wellness, connective tissue support, healthy aging, tissue health, inflammatory balance, wound healing, allergy-related wellness, or scientific studies are presented for educational discussion only.

Nothing in this article is intended to diagnose, treat, cure, mitigate, or prevent any disease, injury, arthritis, psoriasis, dermatitis, wound, allergy, inflammatory disorder, or medical condition in humans or animals.

Statements regarding dietary supplements have not been evaluated by the U.S. Food and Drug Administration. Individual responses may vary. Consumers should consult qualified healthcare professionals or veterinarians before introducing any new supplement into a human or animal wellness program.

No claim beyond the educational discussion of current scientific literature is stated or implied.