Transformation’s Joint Health formula incorporates NEM® brand eggshell membrane for healthy cartilage and connective tissues.* This synergistic formula also includes systemic protease enzymes for inflammation, blood flow, production of energy, and a healthy immune response.*

**A natural alternative for pain, inflammation, and stiffness experienced with joint difficulties**

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The main clinical manifestations of arthritis are inflammation, pain, and blood resorption. New scientific data point to a beneficial effect of blocking specific molecular interactions, which can reduce local arthritic symptoms even in the presence of ongoing chronic inflammation due to the following necessary ingredients.

**INGREDIENT HIGHLIGHTS**

NEM® is a clinically proven eggshell membrane joint health ingredient manufactured by ESM TECHNOLOGIES® to help provide essential nutritional support for healthy cartilage and connective tissues.* This source of glucosamine, chondroitin, dermatan, keratan sulfate, hyaluronic acid, and other naturally occurring glycosaminoglycans and key bioactive proteins such as collagen has been shown to support joint comfort and flexibility.* A small, 500 mg dose has been shown to be nearly 5X more clinically effective than glucosamine and chondroitin with fast, 7-10 day results.

Transformation’s systemic protease enzymes have been proven to enhance muscle performance in a study with Baylor University which may reduce the amount of time involved and enhance the overall results.* Endo/exo peptidases are known to break the inner/terminal bonds of amino acid chains for more efficient hydrolysis of proteins. This helps promote improved protein digestion for the increased bio-availability of amino acids along with healthy elimination and overall cardiovascular, muscular, urinary, and immune system health.* The highly active GI stable and functional proteolytic enzymes included in this formula have a pH stability to work within the alkaline pH of the blood and organs.

**JOINT AND CONNECTIVE TISSUE HEALTH**

Two 30-day open label human clinical trials published in the journal *Clinical Interventions in Aging* were conducted to evaluate NEM® as a treatment for pain and inflexibility associated with joint and connective tissue disorders.1 Supplementation with NEM® produced a combined average of 25% reduction in pain in just 7 days.

- **PAIN:** By the end of the 30-day trial, patients in Study 1 had an average reduction in pain of more than 72%, and nearly half of these patients reported being completely pain-free by the end of the trial.

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**Supplement Facts**

<table>
<thead>
<tr>
<th>Serving Size 1 Capsule</th>
<th>Servings Per Container 15/30</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Amount Per Serving</strong></td>
<td><strong>% Daily Value</strong></td>
</tr>
<tr>
<td>Tzyme™ Protease Blend</td>
<td>175 mg †</td>
</tr>
<tr>
<td>(Protease and peptidase) (68,750 HUT)</td>
<td></td>
</tr>
<tr>
<td>Lipase (250 FIP)</td>
<td>25 mg †</td>
</tr>
<tr>
<td>NEM® brand eggshell membrane</td>
<td>500 mg †</td>
</tr>
<tr>
<td>† Daily Value not established</td>
<td></td>
</tr>
</tbody>
</table>

Other Ingredients: Cellulose, Water & Beet Root Fiber

Enzyme activity is measured in Food Chemicals Codex (FCC) units.

Store tightly sealed in a cool, dry place. Keep out of reach of children.

**Recommended Usage**

Take one (1) capsule once daily or as directed by healthcare practitioner.

Available in bottles of 15 and 30 capsules

NO ARTIFICIAL INGREDIENTS

**INDICATIONS**

NEM® brand eggshell membrane products are approved for the following claims by the Natural Health Products Directorate (NHPD):

- Helps to relieve joint pain associated with osteoarthritis*
- Helps to relieve pain associated with osteoarthritis of the knee*
- Helps to relieve joint stiffness associated with osteoarthritis*
- Helps to reduce pain and reduce stiffness*

The current mainstream medical treatments for arthritis involve pain management, anti-inflammatory drugs (nonsteroidal anti-inflammatory drugs, steroids, cycloxygenase-2 inhibitors), and also exploration of chemokine receptor antagonists to stop cell migration into the inflamed areas.

In contrast, nutraceutical products widely used for joint health include glucosamine, chondroitin, and hyaluronic acid while ignoring a multifaceted action of complex natural products. Even the spotlight on hyaluronic acid seems to limit its focus on replenishing the synovial fluid and on stimulating chondrocytes to produce more hyaluronic acid, thus ignoring the many complex ways that hyaluronic acid can modulate cells and their behavior.

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end of the study. Patients in Study 2 experienced an average 30% reduction in pain at the completion of the trial, while 1/3 of them experienced more than a 50% reduction in pain.

- **FLEXIBILITY:** In study 1, NEM® produced an average 28% increase in flexibility in just 7 days and an average 44% improvement by the end of the study. More than half the patients experienced greater than 50% improvement in flexibility by day 30. NEM® also reduced the pain patients experienced while flexing the affected joint in a range of motion (ROM) evaluation. At day 7, patients had 43% less pain while flexing, and by day 30, there was 76% less pain while flexing. No side effects were reported.

The study concluded that supplementation with NEM® significantly reduced pain and improved flexibility, both rapidly (7 days) and continuously (30 days).

**OSTEOARTHRITIS**

A randomized, double-blind, placebo-controlled human clinical trial published in the journal *Clinical Rheumatology* was conducted for 60 days to evaluate NEM® as a treatment for pain and stiffness associated with osteoarthritis of the knee.²

- **PAIN:** Supplementation with NEM® produced an average 16% reduction in pain versus placebo with about 1/3 of these patients having greater than 30% reduction in pain in just 10 days. By the end of the 60-day trial, patients had maintained an average 15% reduction in pain versus placebo and nearly 1/3 of these patients reported a 50% reduction in pain.

- **STIFFNESS:** NEM® produced an average 13% reduction in joint stiffness versus placebo with about 1/3 of these patients experiencing a more than 50% reduction in stiffness in just 10 days. Stiffness had improved by an average 27% versus placebo by the end of the study with more than half of these patients experiencing greater than 50% reduction in stiffness by day 60. Once again, no side effects were reported.

The study concluded that NEM® significantly reduced both joint pain and stiffness compared to placebo, both rapidly (10 days) and continuously (60 days).

**INFLAMMATION (SYSTEMIC ENZYMES)**

Researchers at Baylor University conducted a double-blind, placebo-controlled study published in the journal *Medicine and Science in Sports and Exercise* to assess the effects of Transformation’s protease enzymes on acute inflammation.³ In this study, the participants were subjected to a strenuous exercise bout to induce acute inflammation.

- The laboratory findings for the protease group showed lower levels of pro-inflammatory cytokines (TNFα, IL1β, IL6, and IL12), lower levels of COX2 activity, and improved muscle strength when compared to the same values in the placebo group. While this study used strenuous exercise to induce inflammation, the data points are characteristic of any condition that causes cellular injury, such as trauma, infection, stress, environmental toxins, or tumor growth, for example.

- Additionally, a controlled secretion of TNFα helps pro-inflammatory cytokines IL1 and IL6 respond appropriately, helping to modulate acute inflammation and control chronic inflammation. Modulated inflammation also reduces COX2 levels, which can result in less pain. This combination of decreased inflammation and lessened pain has the potential to enhance muscle performance.

A followup 12-week clinical trial measured the effects of Transformation’s protease enzymes on the inflammatory markers C-reactive protein (CRP), homocysteine, fibrinogen, and erythrocyte sedimentation rate (ESR) as a representative group of blood markers for assessing changes in the level of inflammation in the participants.⁴ Participants with the highest CRP and fibrinogen levels at baseline (correlated with a significant increased risk of future heart attacks) were given the highest dose of protease.

- CRP is an acute phase reactant which increases sharply in response to states of inflammation or tissue damage. It binds to phosphocholine expressed on the surface of dead or dying cells (and some types of bacteria) in order to activate the complement system. It is synthesized by the liver in response to cytokines such as IL1β, IL6, IL12, and TNFα released by macrophages and fat cells. The high protease group demonstrated a significant decrease in CRP.

- Fibrinogen is an acute phase reactant which increases sharply in states of inflammation and the presence of IL6. It is a key factor in blood viscosity and promotes the formation of blood clots inside coronary arteries. The high protease group demonstrated the greatest improvement in fibrinogen levels.

**INFLAMMATION (NEM®)**

The anti-inflammatory properties of NEM® have also been shown to significantly reduce a number of pro-inflammatory cytokines in an in vitro study using human immune cells published in the *Journal of Medicinal Food*.⁵

- This effect was most pronounced for the cytokines Interferongamma (IFN-g) and Tumor Necrosis Factor-alpha (TNFα). Results from in vivo studies showed substantial reductions of a variety of pro-inflammatory cytokines while, importantly, having little effect on the anti-inflammatory cytokines evaluated.

- A followup study in inflammatory-challenged rats published in the journal *Modern Research in Inflammation* demonstrated significant reductions (40-44%) in IL-1.⁶ The studies in healthy rats demonstrated large reductions (up to 88%) in cytokines that occur later in the inflammatory cascade (e.g. MCP-1, MIP-1, RANTES, VEGF).

This preliminary work gives insight to the mechanism of action and the ability of NEM® to support a healthy inflammatory response.

**Works Cited**


NEM® is a trademark of ESM Technologies, LLC and is registered in the United States and other countries. ESM TECHNOLOGIES® is a trademark of ESM Technologies, LLC and is registered in the United States and other countries. ESM TECHNOLOGIES® is the source of the eggshell membrane research in this paper.

Tzyme™ is a trademark of Transformation Enzyme Corp. This proprietary blend of highly active, functional, pH balanced, and GI tract stable enzymes is formulated to enhance the digestive process and impart systemic benefits.*

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