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**New Pre-Clinical Study on NEM<sup>®</sup> (Natural Eggshell Membrane)  
Published in the *Journal of Medicinal Food***

Carthage, Missouri, December 15, 2011 – ESM Technologies, the leading supplier of innovative, commercialized eggshell and eggshell membrane wellness ingredients, is excited to announce a new research study on NEM<sup>®</sup> (Natural Eggshell Membrane) has been published in the *Journal of Medicinal Food*. This new mechanism of action research was conducted to gain insight into NEM's clinical efficacy in reducing joint pain and stiffness.

Kevin J. Ruff, Ph.D., MBA, Director of Scientific & Regulatory Affairs for ESM Technologies, states "When human immune cells were exposed to a water extract of NEM<sup>®</sup> and subsequently compounds that are known to cause an inflammatory response, NEM<sup>®</sup> was shown to significantly reduce a number of pro-inflammatory cytokines." This effect was most pronounced for the cytokines Interferon-gamma (IFN- $\gamma$ ) and Tumor Necrosis Factor-alpha (TNF- $\alpha$ ). The reduction in TNF- $\alpha$  was further enhanced by a simulated gastric digestion, likely giving insight into the compounds produced in the stomach following digestion of NEM<sup>®</sup>. TNF- $\alpha$  plays an important role in inflammatory processes, particularly chronic joint inflammation. Dr. Ruff concludes, "This preliminary work demonstrates that NEM<sup>®</sup>'s ability to reduce joint pain and stiffness may well be a result of its ability to reduce TNF- $\alpha$  systemically or locally in the joints."

Of special interest is the methodology used in the publication. The bioactivity of NEM<sup>®</sup> was compared to a digested sample of the same product/lot. The digestion mimicked specific phases of the human digestive processes (acid/pepsin, followed by bile enzymes and salts) and was performed using an *in vitro* digest protocol at NIS Labs (Klamath Falls, OR).

The testing was performed to examine whether the biological properties of NEM<sup>®</sup> were preserved or enhanced after digestion. The data showed that specific anti-inflammatory properties were enhanced after the *in vitro* digest. Where the crude product suppressed the inflammatory cytokine TNF-alpha production in cultures of human immune cells, the NEM<sup>®</sup> after an *in vitro* digest produced similar effect at 100 times lower doses, suggesting stronger anti-inflammatory effects after digestion. It has been published online ahead of print, (<http://www.liebertonline.com/doi/pdfplus/10.1089/jmf.2011.0197>). The printed edition can be expected early 2012.

NEM<sup>®</sup> is a unique, natural ingredient derived from eggshell membrane that is composed of naturally occurring glycosaminoglycans such as chondroitin and hyaluronic acid and key proteins like collagen which are all essential for healthy joints. NEM<sup>®</sup> has been and continues to be extensively evaluated in both pre-clinical and clinical studies. In two separate open-label pilot clinical studies in humans (published in *Clinical Interventions in Aging*), NEM<sup>®</sup> was shown to be effective at relieving joint pain (18-26%) and increasing flexibility (28%) in as little as 7 days. The positive results of the pilot studies were confirmed in a follow-up randomized, double-blind, placebo-controlled trial

in humans (published in *Clinical Rheumatology*) in which NEM® was shown to reduce joint pain (16%) and stiffness (13%) versus placebo in just 10 days. By the end of the 60-day trial, nearly one-third of the patients in the treatment group reported a 50% or greater reduction in pain and more than half of these patients experienced a 50% or greater reduction in stiffness. The conclusions from these studies are that NEM® reduces joint pain and stiffness and increases flexibility both rapidly (7-10 days) and continuously (30-60 days) with just one small 500 mg dose per day. This most recent research further proves and explains NEM's effectiveness for joint issues. Please look for the print edition of the article published in the *Journal of Medicinal Food* early 2012.

### **About ESM Technologies**

ESM Technologies, the leading supplier of eggshell calcium and eggshell membrane wellness ingredients, is the recipient of the 2011 **North American Dietary Supplements for Joint Health New Product Innovation of the Year Award** for their NEM® (Natural Eggshell Membrane). Located in Carthage, Missouri, the company researches, develops and manufactures high-quality branded ingredients from a traceable and sustainable supply of USDA-inspected facilities. ESM, an NSF GMP certified facility, uses a chemical-free, patented process that allows the introduction of innovative and unique ingredients to the marketplace: **NEM® (Natural Eggshell Membrane)** and **ESC® (EggShell Calcium)**.

For more information on ESM Technologies' ingredients, please visit [www.ESMingredients.com](http://www.ESMingredients.com) or call **866.804.8034**.