

Arterosil® HP



Supports the Structure and the Normal Functions of the Endothelial Glycocalyx*

By David M. Brady ND, DACBN, IFMCP, FACN and Caitlin H. Higgins, MS, CNS

This information is provided as a medical and scientific educational resource for the use of physicians and other licensed health-care practitioners ("Practitioners"). This information is intended for Practitioners to use as a basis for determining whether to recommend these products to their patients. All recommendations regarding protocols, dosing, prescribing, and/or usage instructions should be tailored to the individual needs of the patient considering their medical history and concomitant therapies. This information is not intended for use by consumers.

Arterosil® HP is a proprietary blend of compounds including a rare seaweed (*Monostroma nitidum*) that contains specialized polysaccharides clinically shown to support arterial and endothelial health by providing the building blocks to protect and restore the integrity and full function of the glycocalyx.* Each 2-capsule serving provides 900 mg of a phytonutrient blend comprised of fruit, vegetable, and seaweed extracts that promote arterial and endothelial health.* Arterosil® HP provides a novel approach in supporting the regeneration of the endothelial glycocalyx.* This formula is ideal for individuals who may have a compromised vascular system or those seeking support for healthy aging, as it has been shown to help slow the normal change of artery walls caused by aging, genetics, and lifestyle factors.*

Highlights

- Features MonitumRS™ green seaweed extract to strengthen the artery wall's protective barrier*
- Provides a synergistic blend of fruit and vegetable extracts rich in phytochemicals (e.g., polyphenols, flavonoids, catechins) to support antioxidant status and a healthy inflammatory response*
- Delivers a clinically trialed 900 mg dose per 2-capsule serving
- Vegan formula
- High tolerability for individuals with food sensitivities and allergies — does not contain gluten, dairy, soy, eggs, fish, shellfish, tree nuts, peanuts, sesame seeds, celery, mustard, lupine, or mollusks

The endothelium is a single-cell layer lining the arterial and venous walls, separating the tissue from circulating blood. The endothelium lines each blood vessel in the body and modulates many critical physiological functions, including regulating vascular tone and the transport of various substances across the vascular endothelial barrier. Circulation is fundamental to every organ and every system in the body. Any molecule for exchange must move through the blood, pass through the glycocalyx, and cross through the endothelial barrier to reach its target tissue.

The endothelial glycocalyx (EGX) is a major contributor to endothelial function. The EGX is a slippery, thin gel-like layer with a mesh of glycoproteins, proteoglycans, glycosaminoglycans (GAGs), and associated plasma proteins that line every artery, vein, and capillary in the body. These glycans provide binding sites for numerous enzymes and signaling molecules.¹⁻³ Poor diet, aging, smoking, and inflammation have been associated with damage to this delicate and fragile structure of glycoproteins, proteoglycans (e.g., with heparan sulfate and chondroitin sulfate chains), GAGs, and to the normal functions of the EGX.⁴⁻⁷

In healthy individuals, the scaffolding nature of the EGX limits access to circulating plasma components (e.g., leukocytes [white blood cells], platelets, lipoproteins) to the endothelial cells (ECs), allowing only a small amount of adhesion receptors to be readily available for these components to bind. However, a damaged or thinning EGX allows more of these receptors to be exposed, potentially resulting in increased leukocyte adhesion to the vascular walls and their penetration leading to subsequent edema, inflammation, arterial plaque development, and vascular wall remodeling — the hallmarks of many cardiovascular conditions.^{8,9} EGX structural damage can also lead to vascular leakage and poor circulation of vital nutrients.

The EGX is the first line of defense and plays a vital role in vascular regulation and the activation and migration of blood cells by: (1) controlling the permeability of fluids and solute filtration and access of other circulating substances, such as low-density lipoproteins (LDL) to the endothelium; (2) modifying and amplifying the shear stress exerted on ECs by the circulating blood; (3) harboring antioxidant enzymes (e.g., extracellular superoxide dismutase) to protect the endothelium from oxidative damage; (4) regulating the interactions between blood cells and vascular ECs (ie., adhesion of white blood cells, platelets, and coagulation factors, etc.); and (5) functioning as a mechanotransducer for the endothelial cytoskeleton to stimulate nitric oxide (NO) synthesis by endothelial NO synthase (eNOS).¹⁰⁻¹³

Benefits*

- Promotes a healthy heart
- Helps preserve normal, protective artery function
- Promotes endothelial health and function
- Supports arterial elasticity and maintains a healthy arterial wall
- Maintains healthy cholesterol levels already within normal range
- Supports a strong and vital glycocalyx

Supplement Facts

Serving Size 2 capsules
Servings Per Container 30

Amount Per Serving	% Daily Value
Arterosil® HP Blend	900 mg *
(Green seaweed extract [MonitumRS™] (<i>Monostroma nitidum</i>), grape extract (seed and skin), green tea extract (leaf), grape pomace extract (fruit), tomato (fruit), carrot juice (root), bilberry (fruit), broccoli (aerial parts), green cabbage (leaf), onion (bulb), garlic (bulb), grapefruit (fruit), asparagus (stalk), papaya (fruit), pineapple (fruit), strawberry (fruit), apple (fruit), apricot (fruit), cherry (fruit), orange (fruit), blackcurrant (fruit), olive extract (fruit), cucumber (fruit))	

*Daily Value not established.

Other Ingredients: Hypomellose (capsule), microcrystalline cellulose, vegetable stearate, natural peppermint flavor, silicon dioxide.

Rhamnan Sulfate as MonitumRS™

Arterosil® HP supports the structure and the normal functions of the endothelial glycocalyx and thus, the endothelium and vessel walls.* Specifically, by providing exogenous sulfated polysaccharides, the bioactive compounds in Arterosil® HP help repair and regenerate the endothelial glycocalyx.¹⁴ The main bioactive component in Arterosil® HP is rhamnan sulfate (RS), a polysaccharide extracted from a unique green seaweed, *Monostroma nitidum*. RS is a heteropolysaccharide with L-rhamnose that may be covalently bonded to sulfate providing the primary repeating monosaccharides on both the linear and branched chains that occur in the EGX.

RS has been studied extensively for its cardiovascular health benefits.¹⁵⁻²⁶ In human and animal studies, RS has demonstrated beneficial effects on hypercholesterolemia, hyperglycemia, hypertension, obesity, and inflammation.²⁵⁻³⁰ RS isoforms significantly reduced LDL permeability of EC monolayers in human coronary artery cells.²⁵ In a randomized controlled trial, 4 weeks of Arterosil® HP supplementation ameliorated the damage of the EGX and loss of endothelial function caused by a high-fat/high-sugar meal in 20 healthy human subjects.³¹ Daily RS supplementation for 6 weeks was shown to significantly reduce total and LDL cholesterol in borderline or mild hypercholesterolemia patients.²⁷

RS acts as a building block for the glycocalyx, helping the biosynthesis of GAGs, and inhibiting EGX-degrading enzymes. In an in vitro study where ECs were treated with heparinase II (a bacterial enzyme that degrades heparan sulfate), cells treated with RS maintained significantly higher content of heparan sulfate compared to the controls, indicating that RS may prevent the degradation of heparan sulfate.³² The RS-treated cells also had lower permeability to LDL compared to the control cells.³² In apolipoprotein E (ApoE) knockout mice fed a high-fat diet, RS significantly enhanced endothelial nitric oxide synthase (eNOS) production in the aortic arch and significantly reduced proliferation and migration of vascular smooth muscle cells, decreased lipid deposition in the aorta, decreased blood velocity, and reduced plaque angiogenesis.³² Plasma cholesterol was 22.5% lower in female ApoE knockout mice fed a high-fat diet and RS compared to the controls.³² Experimental animal models with hyaluronidase-induced degraded EGX showed that the RS in Arterosil® HP normalized leukocyte adhesion and leukocyte patrolling activity.^{33,34}

Proprietary Fruit and Vegetable Blend

The addition of fruit and vegetable extracts that contain polyphenolic compounds known to impart antioxidant activities may help inhibit the degradation of endothelial glycocalyx by reactive oxygen species and enzymes.³ Polyphenols such as resveratrol, quercetin, and catechins (found in plants, such as grape skins, onions, and green tea, respectively) are well-known for their ability to help protect cells from free radical damage and activate pathways that support a healthy inflammatory response.³⁵ Resveratrol, which is found in grapes, supports endothelial function by activating numerous molecular targets such as sirtuin (SIRT)1, eNOS, nuclear factor erythroid 2-related factor (Nrf2), and peroxisome proliferator-activated receptor (PPAR).³⁶ The PPAR family of receptors plays an important role in regulating metabolic function and energy homeostasis. The Nrf2 pathway is the main regulator of the body's endogenous defense against oxidative stress and associated damage.

Recommended Use: Take 2 capsules per day with a meal or as directed by your health-care practitioner.

Warning: If pregnant, nursing, or taking prescription medications, consult your health-care practitioner prior to use.

For a list of references cited in this document, please visit:

<https://www.designsforhealth.com/api/library-assets/literature-reference---arterosil-tech-sheet-references>

Dosing recommendations are given for typical use based on an average 150 pound healthy adult. Healthcare practitioners are encouraged to use clinical judgement with case-specific dosing based on intended goals, subject body weight, medical history, and concomitant medication and supplement usage.

Arterosil® HP and MonitumRS™ trademarks and the product formula are property of Calroy Health Sciences, LLC. U.S. Patent 11,135,238.

***These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**

To contact Designs for Health, please call us at (860) 623-6314, or visit us on the web at www.designsforhealth.com.