

# Arterosil®\* and Endocalyx™ Fact Sheet

A side-by-side comparison

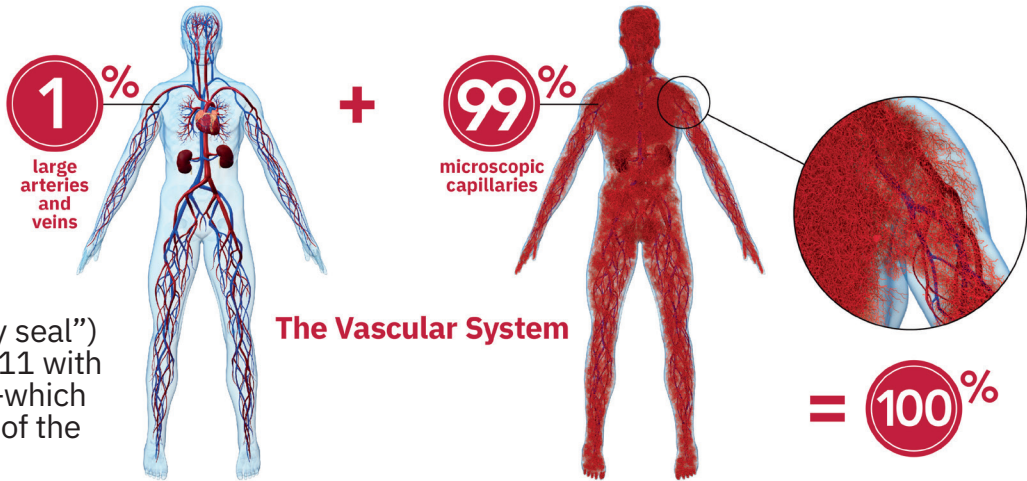


\* The trademark and inventory for Arterosil was sold to Calroy Sciences LLC in 2014. In 2014, Endocalyx was developed. Endocalyx was granted a Method of Treatment for the Endothelial Glycocalyx patent (U.S. Patent Number 9,943,572), based on the synergistic action of three classes of compounds. The patent was issued April 17, 2018.

# Product Focus

In 2013, Robert M. Long and his team shifted their focus to the entire vascular system, including arteries, veins, and capillaries, and developed Endocalyx™

Robert M. Long and his team originally developed Arterosil (named from “artery seal”) in approximately 2011 with a focus on arteries—which comprise about 1% of the vascular system.



## Arterosil®

## Endocalyx™

<b>Recommended daily dose</b>	Two 00 capsules, 910 mg.	Four 00 capsules, 2,475 mg.
<b>Bottle size</b>	150 cc	300 cc
<b>Retail price</b>	\$99.00	\$99.95 Minimum Advertised Price

# Timeline and Patents

	Arterosil®	Endocalyx™
<b>Origin</b>	Robert M. Long and Team created Arterosil in 2011-12.	Robert M. Long and Hans Vink, PhD, created Endocalyx in 2013.
<b>U.S. Patent Number</b>	Provisional patent filed on the product by Robert M. Long on 1-9-2013; the application expired 1-9-2014. Calroy obtained U.S. Patent No. 11,125,238 covering a method of treating vulnerable atherosclerotic plaque by administration of rhamnan sulfate extracted from marine algae of <i>Monostroma nitidum</i> on October 5, 2021. This patent does not mention the glycocalyx.	Provisional patent application filed 4-8-2015; Method of Treatment for the Endothelial Glycocalyx granted 4-17-2018 as U.S. Patent 9,943,572, based on the synergistic action of three classes of compounds. This patented anti-aging supplement formula has been clinically shown to improve the health of the glycocalyx using seven synergistic ingredients from three classes of compounds: <ul style="list-style-type: none"> <li>• <b>RESTORE:</b> <i>Polysaccharides</i> – enable repair of glycocalyx matrix (fucoidan sulfate and HMW hylaronan)</li> <li>• <b>REGENERATE:</b> <i>Amino sugars</i> – precursor for polysaccharide biosynthesis (veggie glucosamine)</li> <li>• <b>PROTECT:</b> <i>Antioxidants</i> – protect endothelial polysaccharide from breakdown (polyphenol, flavonoids, SOD, heparanase inhibitor)</li> </ul>
<b>Japan Patent</b>	None granted	Granted Japan Patent No. 6518796
<b>S. Korea Patent</b>	None granted	Granted South Korea Patent No. 10-1972691
<b>China Patent</b>	None granted	Granted China Patent No. CN 107771080 B
<b>Additional Patents</b>	Applications pending since 2017, but none granted.	Additional patent applications pending in the European Union and Canada.



# Studies, Papers, and Research

## Arterosil®

## Endocalyx™

### STUDIES SPECIFIC TO THE GLYCOCALYX AND MICROCIRCULATION\*

<b>Cultured cell studies</b>	One study (effect of glucose)	Four studies (effect of sepsis, diabetes, kidneys, and COVID-19). See list at <a href="https://microvascular.com/endocalyx-pro-studies">https://microvascular.com/endocalyx-pro-studies</a>
<b>Animal studies</b>	None known	Four studies (aging, diabetes, kidney, inflammation). See list at <a href="https://microvascular.com/endocalyx-pro-studies">https://microvascular.com/endocalyx-pro-studies</a>
<b>Human studies</b>	None known	Three human studies (kidney, Microvascular Health Solutions pilot, external contract). See list at <a href="https://microvascular.com/endocalyx-pro-studies">https://microvascular.com/endocalyx-pro-studies</a>
<b>In-vitro studies</b>	None known	Inhibition of heparanase
<b>GlycoCheck® validation</b>	No validation by GlycoCheck	Ongoing validations using GlycoCheck (two full clinical studies on humans completed, three complete in-vivo mouse studies)
<b>Peer-reviewed published papers using GlycoCheck</b>	None known	More than 90 (listed at <a href="https://glycocheck.com/research-and-studies">https://glycocheck.com/research-and-studies</a> )
<b>Ongoing glycoocalyx and microvascular research</b>	None known	MVHS Chief Science Officer: <b>Hans Vink, PhD</b> . 32 years. Over 100 peer-reviewed published papers. More than 17,500 citations. More than 10 past and ongoing contributions to glycoocalyx research programs. See Dr. Vink's CV at <a href="https://glycocheck.com/company-story">https://glycocheck.com/company-story</a>

\*Arterosil has conducted one study on carotid plaque regression, one study on endothelial function measured by EndoPat, one study measuring arterial elasticity, and one study on leukocyte adhesion. None of these studies have looked specifically at the glycoocalyx.

# Ingredient Comparisons

## Arterosil®

**Seaweed extract ingredients** According to [arterosil.com](http://arterosil.com), Arterosil contains rhamnan sulfate, a specialized sulfated polysaccharide derived from the green seaweed **Monostroma nitidum**. Rhamnan sulfate is a glycoocalyx regenerating compound (GRC) and has been reported to possess anticoagulant and antithrombotic activity. However, Arterosil does not disclose the rhamnan sulfate content or rate of concentration for Monostroma nitidum. These amounts are unknown.

**Antioxidant ingredients** Arterosil does not claim or cite to any study showing that its polyphenol and flavonoids are clinically proven to produce antioxidant activity in the amounts and/or combinations provided, or arrive in the vascular compartment at clinically-effective dosages. Ingredients on their label include: Green Seaweed (monstroma sp.) extract, grape seed (fruit) extract, green tea (leaf) extract, grape pomace (fruit) extract, tomato (fruit), carrot (root) juice, bilberry (fruit), broccoli (aerial parts), green cabbage (leaf), onion (bulb), garlic (bulb), grapefruit (fruit), asparagus (stalk), payaya (fruit), pineapple (fruit), strawberry (fruit), apple (fruit), apricot (fruit), cherry (fruit), orange (fruit), blackcurrant (fruit), olive (fruit) extract, cucumber (fruit).

**Amino sugar ingredients** None

## Endocalyx™

The type of brown seaweed used in Endocalyx is **Laminaria Japonica**. An extract is produced which is certified to have a **minimum extract rate of 85%** of the compound fucoidan sulfate. **Fucoidan sulfate** is validated as a hybrid of heparan sulfate and chondroitin sulfate, and has a high binding affinity for heparanase. The fucoidan repairs the glycoocalyx and prevents breakdown by inhibiting the heparanase activity. In addition to the fucoidan sulfate, Endocalyx also contains high molecular weight **hyaluronan** which is essential to provide the glycoocalyx with its structural stability and dimension.

**Polyphenol and flavonoids.** Microvascular Health Solutions worked with our ingredient supplier to develop a next-generation and improved proprietary blend consisting of the most efficacious fruits and vegetables clinically shown to produce antioxidant activity—olive (fruit) extract, artichoke (leaf) extract, red and white grapes (fruit) extract. We increased the amounts of these ingredients to provide evidence-based effective doses. We added superoxide dismutase (from bitter melon concentrate). It is also verified that **these antioxidant ingredients survive oral intake** and arrive in the vascular compartment at clinically-effective dosages.

A high dose of glucosamine sulfate, 1,500 mg (vegetarian). Glucosamine provides the building blocks for glycoocalyx synthesis. **Research confirms that glucosamine at this concentration boosts endothelial cell glycoocalyx production.**