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 9943572), based on the synergistic action of three classes of compounds. The patent was issued April 17, 2018.

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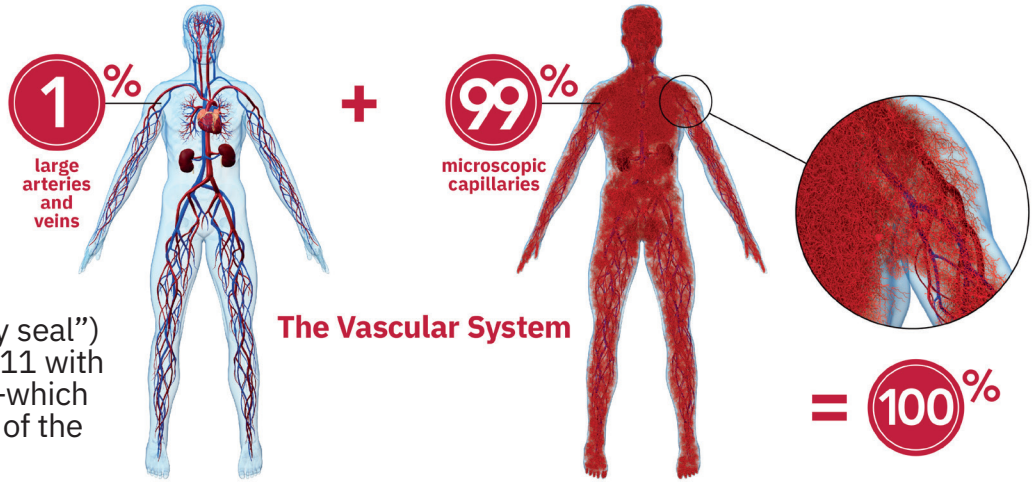
Product Focus

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

Timeline and Patents

	Arterosil®	Endocalyx™
Origin	Robert M. Long and Team created Arterosil in 2011-12.	Robert M. Long and Hans Vink, PhD, created Endocalyx in 2013.
U.S. Patent Number	Provisional patent application filed on the Arterosil formula 1-9-2013; that application expired 1-9-2014. No patent has been issued for Arterosil.	Provisional patent application filed 4-8-2015; Method of Treatment for the Endothelial Glycocalyx granted 4-17-2018 as U.S. Patent 9,943,357, 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: • **RESTORE:** *Polysaccharides* – enable repair of glycocalyx matrix (fucoidan sulfate and HMW hylaronan) • **REGENERATE:** *Amino sugars* – precursor for polysaccharide biosynthesis (veggie glucosamine) • **PROTECT:** *Antioxidants* – protect endothelial polysaccharide from breakdown (polyphenol, flavonoids, SOD, heparanase inhibitor)
Japan Patent	None granted	Granted Japan Patent No. 6518796
S. Korea Patent	None granted	Granted South Korea Patent No. 10-1972691
Additional Patents	Applications pending since 2017, but none granted.	Additional patent applications pending in the European Union, Canada and China.

Studies, Papers, and Research

	Arterosil®	Endocalyx™
STUDIES SPECIFIC TO THE GLYCOCALYX AND MICROCIRCULATION*		
Cultured cell studies	One study (effect of glucose)	Four studies (effect of sepsis, diabetes, kidneys, and COVID-19)
Animal studies	None	Four studies (aging, diabetes, kidney, inflammation)
Human studies	None	Three human studies (kidney, Microvascular Health Solutions pilot, external contract)
In-vitro studies	None	Inhibition of heparanase
GlycoCheck® validation	No validation by GlycoCheck	Ongoing validations using GlycoCheck (two full clinical studies on humans completed, three complete in-vivo mouse studies)
Peer-reviewed published papers using GlycoCheck	None	78 (listed at *GlycoCheck.com*)
Ongoing glycocalyx and microvascular research	None	MVHS Chief Science Officer: **Hans Vink, PhD.** 32 years. Over 100 peer-reviewed published papers. More than 12,500 citations. More than 10 past and ongoing contributions to glycocalyx research programs. See Dr. Vink's CV at *https://glycocheck.com/company-story*

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

Ingredient Comparisons

	Arterosil®	Endocalyx™
Seaweed extract ingredients	According to *arterosil.com*, Arterosil contains rhamnan sulfate, a specialized sulfated polysaccharide derived from the green seaweed **Monostroma nitidum.** Rhamnan sulfate is a glycocalyx 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.	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 glycocalyx 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 glycocalyx with its structural stability and dimension.
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).	**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.
Amino sugar ingredients	None	A high dose of glucosamine sulfate, 1,500 mg (vegetarian). Glucosamine provides the building blocks for glycocalyx synthesis. **Research confirms that glucosamine at this concentration boosts endothelial cell glycocalyx production.**