Clinical Applications

» Supports Cell Membrane Composition and Normal Membrane Repair Mechanisms*
» Supports Fluidity of Cell Membranes*
» Supports Nervous System Health*
» Helps Protect Hepatocytes, Pancreatic Beta Cells, and Gastric Mucosa*
» Supports Cardiovascular Health*
» Supports Detoxification Enzymes*

Phosphatidylcholine (PC) is perhaps the most important molecule among tens of thousands of molecules that comprise a cell. It makes up approximately 50% of the cell membrane, which holds the balance of life in every cell. The pure phospholipids in PhosphaLine 4:1™ form liposomes in the body’s watery environment.

Whereas many other PC formulas on the market contain an approximate ratio of 12:1 between omega 6 and omega 3 fatty acids, PhosphaLine 4:1 contains a 4:1 ratio, which has been endorsed as optimal by the World Health Organization.

Available in 100 softgels, 300 softgels & 8 oz (240 mL) liquid

Discussion

Phospholipids are the basic building blocks of cellular membranes. Every phospholipid contains two fatty acid tails (triglycerides contain three) linked to a group of molecules containing phosphorus. The phosphorus-containing “head” of a phospholipid is hydrophilic; the “tails” are hydrophobic and love oil. When phospholipids come in contact with water, the hydrophobic tails line up soldier-fashion next to each other with the hydrophilic head groups on either side forming a very thin flexible (or “fluid”), partially permeable bi-layer structure—the cell membrane.*

The cell membrane is where virtually all the important metabolic reactions occur. But lowered phospholipid availability may sometimes limit these essential functions. While the body can biosynthesize phospholipids from other substances, the process requires many enzymes and a great deal of energy. Consequently, exogenous sources of phospholipids can supplement biosynthesis for more optimal membrane composition and function. Research suggests that supporting phospholipid availability is important in cellular protection and repair and in membrane fluidity. Furthermore, the roles of phospholipids in organ and system health continue to expand as findings point to how phospholipids protect hepatocytes and pancreatic beta cells, and also support nervous and cardiovascular system health.*[1-10]

Phosphatidylcholine (PC) is the most abundant phospholipid component in all cells. In fact, it constitutes ~50% of the membrane surrounding every cell as well as the membranes protecting intracellular organelles. It is the most prominent and important among the tens of thousands of molecules comprising a cell. To date, a MEDLINE® database search for “phosphatidylcholine” yields more than 47,000 citations. Noteworthy is one that focuses on PC’s ability to support healthy cellular biochemistry and normal cellular life cycle. This study further elucidates the negative impact of perturbations in PC homeostasis and how PC replacement can be critical in cell viability.[1] Phosphatidylcholine is most concentrated in the liver. In fact, all detoxification enzymes need phospholipids for their activity. PC significantly reduces levels of inflammatory substances, increases antioxidant activity, and decreases lipid peroxidation.[2]

Phosphatidylethanolamine (PE) constitutes ~35% of the membrane and is a precursor of PC. It contributes ~30% of PC biosynthesis through a triple methylation process. Supplementation with a methyl donor, such as folate, B12, or S-adenosylmethionine (SAMe), will support PC biosynthesis. An important characteristic of PE is its ability to “anchor” arachidonic acid (AA). Although AA tends to be associated with the inflammatory cascade, it has critical functions in the body. [3] For example, along with docosahexaenoic acid (DHA), AA is key to brain development and visual acuity.[4] AA is also able to “dock” onto phospahatidylinositol (PI), another membrane phospholipid present in PhosphaLine 4:1.*

Fatty Acids are another benefit the body derives from phospholipid supplementation. Each of our cells can produce many of the lipid tails, such as saturated (palmitic and stearic) fatty acids and monounsaturated (oleic and nervonic) fatty acids, but not the omega-6 or the omega-3 fatty acids. PhosphaLine 4:1 contains these two types of essential fatty acids in the critically important ratio of four parts omega-6 to one part omega-3. *[11]
**PhosphaLine 4:1™ Softgels Supplement Facts**

**Serving Size:** 2 Softgels

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<th>Amount Per Serving</th>
<th>%Daily Value*</th>
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<tr>
<td>Calories</td>
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<tr>
<td>Calories from Fat</td>
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<tr>
<td>Total Fat</td>
<td>0.9 g</td>
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<tr>
<td>Saturated Fat</td>
<td>0.2 g</td>
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<tr>
<td>Polyunsaturated Fat</td>
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<td>Monounsaturated Fat</td>
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<tr>
<td>Phospholipid Complex</td>
<td>900 mg</td>
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* Percent Daily Values are based on a 2,000 calorie diet.

**DOES NOT CONTAIN:** Wheat, gluten, corn protein, yeast, dairy products, fish, shellfish, peanuts, tree nuts, egg, artificial colors, artificial sweeteners, or preservatives.

**CAUTION:** Consult your healthcare practitioner before use. Avoid if allergic to any ingredient. Keep out of reach of children.

**STORAGE:** Keep tightly closed in a dry place at controlled room temperature 15°-30°C (59°-86°F).

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**PhosphaLine 4:1™ Liquid Supplement Facts**

**Serving Size:** One Teaspoon (5 mL)

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<th>Amount Per Serving</th>
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<td>Phospholipid Complex</td>
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<tr>
<td>Vitamin E</td>
<td>7 IU</td>
</tr>
</tbody>
</table>

* Percent Daily Values are based on a 2,000 calorie diet.

**Other Ingredients:** Phosphatidylcholine, phosphatidylethanolamine, phosphatidylinositol, minor glycolipids, a proprietary blend of essential fatty acids linoleic and alpha-linoleic, oleic acid, minor fatty acids, ethanol, and gelatin.

**Directions:** As a dietary supplement, take 1-2 teaspoons per day or as directed by your healthcare practitioner.

**DOES NOT CONTAIN:** Wheat, gluten, corn protein, yeast, dairy products, artificial colors, sweeteners, or preservatives.

**CAUTION:** Keep out of reach of children.

**STORAGE:** Keep tightly closed in a dry place at controlled room temperature 15°-30°C (59°-86°F).

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**References**


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All XYMOGEN® Formulas Meet or Exceed cGMP Quality Standards.

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*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.*

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