

# Active Sustain™



Available in 120 vegetarian capsules

- Provides antioxidants for the maintenance of good health
- Helps to maintain and/or support cardiovascular health

## Discussion

Active Sustain™ provides an array of micronutrients and antioxidants that are essential to the structure, metabolism, and function of the brain and nervous system. This neurosupportive formula provides a foundational approach to sustaining neurological activity and integrity.\*

**N-Acetyl-Cysteine (NAC)** As a source of the conditionally essential amino acid cysteine, NAC is a precursor to one of the brain's most important antioxidants—glutathione. NAC itself is an effective antioxidant and has been shown to reduce the formation of free radicals that can contribute to oxidative damage in the brain.\*<sup>[1]</sup>

**Phosphatidylserine** A phospholipid that is highly concentrated in the brain, phosphatidylserine (PS) plays a key role in neuronal energy production and communication. Since very little PS is found in food, we must synthesize or supplement the amount we need for optimal brain health. Improvements in cognitive function and memory have been observed following supplementation with PS.<sup>[2-4]</sup> For some individuals, cognitive decline may be related to “age-related decline in nutrition,”<sup>[5]</sup> and early nutrition intervention may be warranted. Active Sustain contains safe-source PS from non-GMO soy and contains no animal products.\*

**Acetyl-L-Carnitine (ALCAR)** The ALCAR form of the amino acid L-carnitine is found to have multifaceted roles in neuroprotection.<sup>[6]</sup> It is able to cross the blood-brain barrier where it stabilizes cell membranes, acts as an effective antioxidant, and protects brain cells from toxic chemicals and stress-induced damage.<sup>[7-9]</sup> In addition, ALCAR enhances neuronal energy production, facilitates transport of fuel and waste products into and out of mitochondria, and supports production of acetylcholine, a neurotransmitter essential to the processes of learning and concentration.\*<sup>[8-10]</sup>

**Alpha-Lipoic Acid** Acting as both a fat- and water-soluble antioxidant, alpha-lipoic acid provides intracellular and extracellular protection against oxidative stress. With its low molecular weight, alpha-lipoic acid is easily absorbed in the gastrointestinal tract. It then enters circulation, crosses the blood-brain barrier, and reaches the brain where it can regenerate other important

antioxidants, including glutathione, vitamin E, and vitamin C.\*<sup>[11,12]</sup>

**Coenzyme Q10 (CoQ10)** As a ubiquinone, CoQ10 facilitates the transfer of electrons in the electron transport chain (ETC), playing a crucial role in the formation of ATP (adenosine triphosphate) and the generation of energy within the cell. CoQ10 also donates electrons, making it an effective antioxidant. As such, CoQ10 protects cells, cell membranes, and tissues from damaging free radicals and pro-oxidants. The antioxidant activity of CoQ10 may protect the brain from the oxidative stress that is believed to be partially responsible for the degeneration of neuronal cells.\*<sup>[13]</sup>

**Broccoli Seed Extract** The patented form of the phytochemical in broccoli called sulforaphane glucosinolate (SGS™) is a key ingredient in Active Sustain. Extensive research demonstrates that when SGS is broken down to sulforaphane (its active form), it safely and effectively upregulates the Nrf2 system, enhances antioxidant production, and activates vital phase II detoxification enzymes.<sup>[14,15]</sup> This process provides protection from common toxins and xenobiotics.\*

Adequate antioxidant protection from ongoing free radical damage is crucial to maintaining the health and function of the cell and, hence, tissues and organs, especially the brain. Unbridled oxidative damage can lead to metabolic disruption and organ dysfunction over time. Antioxidant-promoting phytochemicals such as SGS are considered “lifespan essentials” because they assist in maintaining health throughout adult life.\*<sup>[16]</sup>

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## Active Sustain™

### Medicinal Ingredients (per vegetarian capsule)

N-Acetyl L-carnitine hydrochloride.....	100 mg
N-Acetyl-L-cysteine .....	37.5 mg
truebroc™ Broccoli ( <i>Brassica oleracea</i> var. <i>italica</i> , Seed).....	28.85 mg (3.75 mg Glucoraphanin)
Sharp•PS® GREEN Phosphatidylserine ( <i>Helianthus annuus</i> ) .....	25 mg
Coenzyme Q10 (CoQ10 Microorganisms - Whole Cell for Biosynthesis) .....	25 mg
DL-alpha-lipoic acid.....	25 mg

### Non-Medicinal Ingredients

Calcium phosphate tribasic, hypromellose, stearic acid, magnesium stearate, silicon dioxide, calcium silicate.

### Recommended Dose

**Adults:** Take 2 capsules once daily with a meal providing protein, or as directed by a healthcare practitioner.

Consult a healthcare practitioner for use beyond 6 months.

Consult a healthcare practitioner prior to use if you are pregnant or breastfeeding; if you are taking blood pressure medication, nitroglycerin, or antibiotics; or if you have diabetes or cystinuria.

**Caution:** Do not use if you have primary systemic L-carnitine deficiency or secondary L-carnitine deficiency (inborn errors of metabolism) for which supplementation is prescribed / monitored by a healthcare practitioner. Feelings of sleeplessness or over stimulation may occur; discontinue use if feeling persists or worsens. Discontinue use and consult a healthcare practitioner if symptoms persist or worsen.

If you experience sweating, paleness, chills, headache, dizziness and/or confusion, discontinue use and consult a healthcare practitioner.

Mild gastrointestinal symptoms (transient nausea, vomiting, abdominal cramps, and diarrhoea) have been reported. Low incidences of seizures have been reported with oral doses in individuals with or without pre-existing seizure disorders.

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Sharp•PS® GREEN is a registered trademark of Enzymotec Ltd.

## References

1. Sansone RA, Sansone LA. Getting a knack for NAC: N-acetyl-cysteine. *Innov Clin Neurosci*. 2011 Jan;8(1):10-4. [PMID: 21311702]
2. Kato-Kataoka A, Sakai M, Ebina R, et al. Soybean-derived phosphatidylserine improves memory function of the elderly Japanese subjects with memory complaints. *J Clin Biochem Nutr*. 2010 Nov;47(3):246-55. [PMID: 21103034]
3. Richter Y, Herzog Y, Cohen T, et al. The effect of phosphatidylserine-containing omega-3 fatty acids on memory abilities in subjects with subjective memory complaints: a pilot study. *Clin Interv Aging*. 2010 Nov 2;5:313-6. [PMID: 21103402]
4. Vakhapova V, Cohen T, Richter Y, et al. Phosphatidylserine containing omega-3 fatty acids may improve memory abilities in non-demented elderly with memory complaints: a double-blind placebo-controlled trial. *Dement Geriatr Cogn Disord*. 2010;29(5):467-74. [PMID: 20523044]
5. Suchy J, Chan A, Shea TB. Dietary supplementation with a combination of alpha-lipoic acid, acetyl-L-carnitine, glycerophosphocoline, docosahexaenoic acid, and phosphatidylserine reduces oxidative damage to murine brain and improves cognitive performance. *Nutr Res*. 2009 Jan;29(1):70-4. [PMID: 19185780]
6. Picconi B, Barone I, Pisani A, et al. Acetyl-L-carnitine protects striatal neurons against in vitro ischemia: the role of endogenous acetylcholine. *Neuropharmacology*. 2006 Jun;50(8):917-23. [PMID: 16500685]
7. Steffen V, Santiago M, de la Cruz CP, et al. Effect of intraventricular injection of 1-methyl-4-phenylpyridinium: protection by acetyl-L-carnitine. *Hum Exp Toxicol*. 1995 Nov;14(11):865-71. [PMID: 8588946]
8. Sorbi S, Forleo P, Fani C, et al. Double-blind, crossover, placebo-controlled clinical trial with L-acetylcarnitine in patients with degenerative cerebellar ataxia. *Clin Neuropharmacol*. 2000 Mar-Apr;23(2):114-8. [PMID: 10803803]
9. Jones LL, McDonald DA, Borum PR. Acylcarnitines: role in brain. *Prog Lipid Res*. 2010 Jan;49(1):61-75. Review. [PMID: 19720082]
10. Kobayashi S, Iwamoto M, Kon K, et al. Acetyl-L-carnitine improves aged brain function. *Geriatr Gerontol Int*. 2010 Jul;10 Suppl 1:S99-106. [PMID: 20590847]
11. Packer L, Tritschler HJ, Wessel K. Neuroprotection by the metabolic antioxidant alpha-lipoic acid. *Free Radic Biol Med*. 1997;22(1-2):359-78. Review. [PMID: 8958163]
12. Liu J. The effects and mechanisms of mitochondrial nutrient alpha-lipoic acid on improving age-associated mitochondrial and cognitive dysfunction: an overview. *Neurochem Res*. 2008 Jan;33(1):194-203. Review. [PMID: 17605107]
13. Mancuso M, Orsucci D, Volpi L, et al. Coenzyme Q10 in neuromuscular and neurodegenerative disorders. *Curr Drug Targets*. 2010 Jan;11(1):111-21. Review. [PMID: 20017723]
14. Ping Z, Liu W, Kang Z, et al. Sulforaphane protects brains against hypoxic-ischemic injury through induction of Nrf2-dependent phase 2 enzyme. *Brain Res*. 2010 Jul 9;1343:178-85. [PMID: 20417626]
15. Vauzour D, Buonfiglio M, Corona G, et al. Sulforaphane protects cortical neurons against 5-S-cysteinyl-dopamine-induced toxicity through the activation of ERK1/2, Nrf-2 and the upregulation of detoxification enzymes. *Mol Nutr Food Res*. 2010 Apr;54(4):532-42. [PMID: 20166144]
16. Holst B, Williamson G. Nutrients and phytochemicals: from bioavailability to bioefficacy beyond antioxidants. *Curr Opin Biotechnol*. 2008 Apr;19(2):73-82. [PMID: 18406129]

Additional references available upon request

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