

## **Ingredient Rationale: ProNeurozone®**

**Vitamin E** – Vitamin E is an effective antioxidant for protecting cells from oxidation. It may slow the process of lipid peroxidation in cell membranes and slow brain aging.

**Thiamine B1** – Thiamine B1 enhances brain activity and cognitive function and acts as an antioxidant.

**Riboflavin B2** – Riboflavin B2 helps activate vitamin B6 and folic acid.

**Niacin B3** – Niacin B3 is important for production of chemical signal molecules and for proper function of the nervous system. It is often used to support memory.

**Vitamin B6** – Vitamin B6 plays a major role in the production of neurotransmitters. It is necessary for normal brain function and the absorption of vitamin B12, and it inhibits increases in homocysteine, which can cause DNA damage, oxidative stress, and neuronal cell death.

**Vitamin B12** – Deficiencies of vitamin B12 are associated with poor cognition, specifically the speed at which information is processed. Vitamin B12 works together with vitamin B6 and folic acid to normalize homocysteine levels. It is also involved in the production of acetylcholine (a chemical messenger).

**Folic acid** – Folic acid regulates neurogenesis, programmed cell death, and may normalize homocysteine levels.

**N-acetyl-cysteine (NAC)** – NAC is a free radical scavenger and reduces lipid peroxidation. It also helps the body make glutathione, which is an important antioxidant for protecting against neuronal toxicity and improving cell-mediated immunity.

**Alpha-Lipoic Acid** – Shown to support memory in animals, alpha-lipoic acid lowers age-associated increase of oxidative damage and the loss of brain mitochondrial function. Alpha-lipoic acid is unique in its effectiveness against both fat- and water-soluble free radicals, and it prevents depletion of vitamins E and C. It can reduce neuronal damage and may enhance detoxifying agents such as glutathione.

**Acetyl-L-Carnitine (ALCAR)** – A mitochondrial metabolite, acetyl-L-carnitine protects the brain from mitochondrial dysfunction and neurotoxicity and enhances brain energy metabolism. ALCAR efficiently crosses the blood-brain barrier and supports cognitive function and short-term memory.

**Bioflavanol/Polyphenols** – Protects brain tissue by reducing neuronal damage from oxidative stress. This is one of the few antioxidants, which cross the blood-brain barrier to protect brain cells. It reduces lipid peroxidation and supports healthy DNA in the brain. Together the bioflavanol and soy lecithin form a complex, which reduces capillary permeability and fragility providing vascular protecting activity. US Patent Numbers 4,963,527 and 4,698,360.

**Rosemary extract** – Rosemary promotes acetylcholine, supports memory, and contains as many as 10 choline-sparing compounds.

**Sage powder** – Sage supports acetylcholine. People have been taking sage for memory loss for centuries. In 1597, well-known herbalist John Gerard said that sage “is singularly good for the head and brain and quickeneth the nerves and memory.”

**Cranberry extract** – Cranberry, a powerful antioxidant, protects cell membrane lipids from oxidation and has been shown to protect brain cells.

**Bilberry extract** – Bilberry is another potent free radical scavenger. It increases production of memory cells and protects the brain from age-related neurological deficits. Bilberry supports capillary health, and the health of the blood-brain barrier. It protects healthy cell membranes from lipid peroxidation and supports healthy retinal function. US Patent Numbers 4,258,055 and 5,196,449.

**Spirulina** – Spirulina is a highly bioavailable free radical scavenger that supports brain health. Spirulina enhances formation of neurotransmitters, and it is an additional source of essential minerals, B and E vitamins, choline, amino acids, and essential fatty acids. It is also the richest source of beta-carotene.

**Soy lecithin** – Soy lecithin promotes cognitive health by protecting the cell membrane structure, and it helps preserve mitochondrial function.

**Omega-3 fatty acids** – Fatty acids are one of the primary structural components of the brain. they promote the bioavailability of fat-soluble antioxidants such as vitamin E, and support brain health as we age.