

Li-Zyme™ & Li-Zyme Forte™

Lithium (Li) or “lithos” from the Greek word for “stone” was discovered in 1817 by Johan Arfwedson of Sweden. One of the several ultra-trace elements required in amounts of less than one mg/day, it has been recognized as an important mood stabilizer. Although found in a number of foods, numerous studies show that water supplies with the lowest lithium content were associated with higher rates of criminal activity and suicide,¹ suggesting natural levels of lithium in drinking water may provide a protective effect for people in need of mental health support.

Unlike other nutrients, the mechanisms of action are speculated to have effects on several pathways while inhibiting or impacting the function of several enzymes, hormones and vitamins, as well as growth and transforming factors to stabilize mood. One particular enzyme of interest is glycogen synthase kinase-3 (GSK-3). Dysfunction (hyperactivity) of this enzyme has been associated with cell death and the pathophysiology of many neurodegenerative conditions given its role in intracellular signaling. Lithium has been shown to inhibit this enzyme via competitive inhibition of magnesium (which is required for GSK-3 activity) as well as indirectly, resulting in the neuroprotective effects of lithium, including supporting healthy inflammation in the brain.

Researchers suggest that lithium works by altering signaling pathways and gene expression in the central nervous system; lithium's benefits usually appear after long-term use.² In addition, lithium increases telomere length,³ which helps preserve both physical and psychiatric health – the longer someone is on lithium the more normal the length becomes. Possible explanations for shortened telomeres include childhood stressors, increasing numbers of depressive episodes and relentless anger.

Brain-derived neurotrophic factor (BDNF), a neurotrophin essential to proper brain function, is associated with the survival of nerve cells whose expression/secretion



has been shown to be enhanced by long-term lithium supplementation.⁴ These examples indicate the possible positive effects low dose lithium has on cognitive function. Low dose lithium has been shown to increase serotonin turnover and enhance serotonin neurotransmission, leading to its use as augmentation along with medication for patients with compromised mood.⁵

While lithium is an often-overlooked element, recent studies have shown beneficial actions that suggest it should be reconsidered as a natural support for mood stabilization and cognitive function.

Plant Matrix Mineral

Li-Zyme™ and **Li-Zyme Forte™** provide elemental lithium from a whole food, phytochemically-bound vegetable culture source, which results in optimal bioavailability. At Biotics Research, we appreciate that trace minerals can be isolated or produced via chemical reactions as separate independent compounds. However, we believe trace minerals are best recognized and utilized by the body in the context of a whole plant matrix.



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Utilizing "The Best of Science and Nature," we grow our lithium with a proprietary plant matrix system. After years of trial and error to develop, our research and development resulted in a reliable and systematic process.

We begin by using organic whole non-soy legumes, germinated in a specially prepared lithium solution. Each plant absorbs the trace mineral, which is bound to its matrix. Grown under specialized conditions of light, temperature, pH and timing, each plant culture reaches its maximum mineral concentration, while still maintaining its viability.

The cultures are then harvested, rinsed and dried and low temperature to maintain the integrity of the whole plant, including the protein structure and enzyme activity. The lithium-bound plant is then gently milled and finally tested for specific mineral content.

Lithium has been extensively researched as a mood-stabilizing mineral. According to the Springer Group, a Psychiatric and Pain Management Center, Philip Spring, MD, found his patients describing the noteworthy effect of a "clearer head with better thinking" when taking Biotics Research **Li-Zyme™** and **Li-Zyme Forte™** product.

Recommended Use:

As a dietary supplement, take one tablet a day, or as prescribed by your healthcare professional.

References:

1. Hirochika Ohgami, Takeshi Terao, Ippei Shiotsuku, Nobuyoshi Ishii, Lithium levels in drinking water and risk of suicide. Cambridge University Press: 02 January 2018.
2. Chi-Tso CHIU, De-Maw CHUANG, Neuroprotective action of lithium in disorders of the central nervous system.
3. Robert M. Post, The New News about Lithium: An Underutilized Treatment in the United States, Neuropsychopharmacology. 2018 Apr; 43(5):1174-1179.
4. Hashimoto R, Takei N, Shimazu K, Christ L, Lu B, Chuang DM, Lithium induces brain-derived neurotrophic factor and activates TrkB in rodent cortical neurons: an essential step for neuroprotection against glutamate excitotoxicity. Neuropharmacology. 2002 Dec;43(7):1173-9.
5. Alevizos et al. Low dosage lithium augmentation in venlafaxine resistant depression: an open-label study. Psychiatratriki. 2012 Apr-June;23(2):143-8.

Supplement Facts

Serving Size: 1 Tablet

	Amount Per Serving
Lithium (from vegetable culture †)	50 mcg*

* Daily Value not established

Other ingredients: Cellulose, stearic acid (vegetable source), food glaze and magnesium stearate (vegetable source).

†Specially grown, biologically active vegetable culture containing Phytochemically Bound Lithium™ and other phytochemicals including polyphenolic compounds with SOD and catalase, dehydrated at low temperature to preserve associated enzyme factors.

This product is gluten, dairy and GMO free.

Recommendation: One (1) tablet one (1) to three (3) times each day as a dietary supplement or as otherwise directed by a healthcare professional.

KEEP OUT OF REACH OF CHILDREN

Store in a cool, dry area. Sealed with an imprinted safety seal for your protection.

Product #1706 Rev. 11/18

Supplement Facts

Serving Size: 1 Tablet

	Amount Per Serving
Lithium (from vegetable culture †)	150 mcg*

* Daily Value not established

Other ingredients: Cellulose, stearic acid (vegetable source), food glaze and magnesium stearate (vegetable source).

†Specially grown, biologically active vegetable culture containing Phytochemically Bound Lithium™ and other phytochemicals including polyphenolic compounds with SOD and catalase, dehydrated at low temperature to preserve associated enzyme factors.

This product is gluten, dairy and GMO free.

Recommendation: One (1) tablet one (1) to three (3) times each day as a dietary supplement or as otherwise directed by a healthcare professional.

KEEP OUT OF REACH OF CHILDREN

Store in a cool, dry area. Sealed with an imprinted safety seal for your protection.

Product #1724 Rev. 07/18



To place your order for **Li-Zyme™** or **Li-Zyme Forte™** or for additional information please contact us below.



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