

# BORN nutrition

Multidimensional Support for Cardiometabolic Health | Enhances Cell Signaling for Efficient ATP Production | Supports Blood Sugar Balance Already Within Normal Levels | Maintains Healthy Cholesterol Levels Already Within the Normal Range



## C Metab

This product, a formula backed by extensive clinical research, is designed to address several factors associated with ideal cardiometabolic health. The powerful combination of berberine and alpha lipoic acid (ALA) helps maintain heart function, metabolism, antioxidant status, and lipid and glucose levels. This product provides a powerful formula for those seeking to optimize the multiple mechanisms of cardiovascular and metabolic health.

### Overview

Clinical research shows that maintaining optimal cardiovascular health should address multiple metabolic factors.<sup>1</sup> The unique this product formula offers multidimensional support for cardiovascular health. Among their numerous benefits, berberine and alpha lipoic acid activate the master metabolic switch, adenosine mono-phosphate kinase (AMPK). Activation of this powerful metabolic enzyme triggers a variety of genes that help improve metabolism, stabilize mitochondria, and enhance insulin sensitivity.<sup>3,4</sup>

### Berberine†

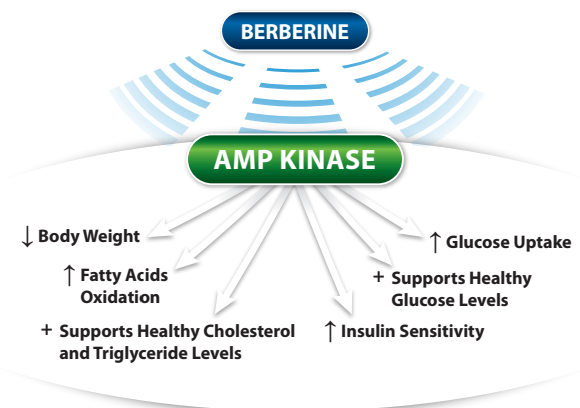
Berberine is a plant extract that has been used in Chinese and Ayurvedic medicine for over 2,500 years for its broad range of health-promoting properties. Berberine can be found in the roots and stems of plants such as *Hydastatis Canadensis* (goldenseal), *Coptis chinensis* (goldenthread), *Berberis aquifolium* (Oregon grape) and *Berberis vulgaris* (barberry).

Clinical trials have demonstrated that berberine administration supports cardiovascular health in a number of synergistic ways including maintaining blood pressure, supporting healthy heart contraction and rhythm and supporting healthy cholesterol levels.<sup>5,6</sup> A clinical trial with 32 subjects demonstrated that administration of 500 mg of berberine given twice daily for three

months helped maintain healthy LDL cholesterol and triglyceride levels, versus the control group.<sup>7</sup> Another recent study using 500 mg of berberine was able to produce similar results, confirming berberine's powerful effect on specific cardiovascular markers including LDL cholesterol, HDL cholesterol and triglyceride levels.<sup>8</sup>

In addition to maintaining healthy lipid levels, berberine has also been shown to maintain healthy blood glucose levels through activation of AMPK.<sup>9</sup> AMPK coordinates both long-term and short-term metabolic changes, leading to an improvement in energy production and a reduction of energy storage. AMPK improves insulin sensitivity, and down-regulates genes involved in fat storage while activating genes involved with burning fat.<sup>3</sup> Activation of AMPK has been shown to stimulate the transcription factor involved in replicating mitochondria for increased metabolic potential.<sup>10</sup>

Berberine has also been shown to promote the uptake of glucose through a mechanism that does not require insulin, promoting better glucose usage within the cell.<sup>11</sup> A study examining berberine's metabolic supporting effects found that berberine



improved glucose tolerance and maintained balanced insulin levels, while helping to maintain healthy total cholesterol and triglyceride levels after four weeks of berberine administration.<sup>12</sup>

### Alpha Lipoic Acid†

Alpha lipoic acid (ALA) is a nutrient required for cellular metabolism, specifically the breakdown of carbohydrates and fatty acids.<sup>13</sup> ALA has been shown to support blood sugar balance already within normal levels by activating AMPK, a major regulator of cellular energy.<sup>14</sup> A study using a dose of 600 mg/day of ALA over three months demonstrated that ALA helps support healthy lipid levels while improving oxidative stress (reducing free radical damage) by 38%.<sup>15</sup> An additional study examining the effects of ALA on 74 subjects found that within the four-week, placebo-controlled trial, administration of 600 mg of ALA per day significantly enhanced glucose transport and utilization.<sup>16</sup> ALA is also a potent antioxidant. It scavenges free radicals while aiding in the regeneration of the body's antioxidants including vitamin C, vitamin E and glutathione.<sup>17</sup> Through its antioxidant-boosting mechanisms, ALA helps maintain healthy blood vessel and circulatory health.

### Directions

3 capsules per day or as recommended by your health care professional.

### Does Not Contain

Does not contain gluten, corn, yeast, animal or dairy products, artificial colors, artificial flavors or preservatives.

### Cautions

Do not consume if you are pregnant or nursing. Consult your physician for further information.

Supplement Facts <sup>v2</sup>		
Serving Size 3 Capsules		
Servings Per Container 30		
	Amount Per Serving	% Daily Value
Vitamin C (as Ascorbyl Palmitate)	10 mg	11%
Berberine Hydrochloride Hydrate	1 g	*
Alpha Lipoic Acid	200 mg	*

\* Daily Value not established.

### References

1. Grundy SM, Cleeman JI, Daniels SR, Donato KA, Eckel RH, Franklin BA, Gordon DJ, Krauss RM, Savage PJ, Smith SC. Diagnosis and management of the metabolic syndrome an american heart association/national heart, lung, and blood institute scientific statement. *Circulation*. 2005;112:2735-2752.
2. Jeong HW, Hsu KC, Lee J-W, Ham M, Huh JY, Shin HJ, Kim WS, Kim JB. Berberine suppresses proinflammatory responses through ampk activation in macrophages. *American Journal of Physiology-Endocrinology And Metabolism*. 2009;296:E955-E964.
3. Kemp B, Stapleton D, Campbell D, Chen Z-P, Murthy S, Walter M, Gupta A, Adams J, Katsis F, van Denderen B. Amp-activated protein kinase, super metabolic regulator. *Biochemical Society Transactions*. 2003;31:162-168.
4. Towler MC and Hardie DG. AMP-activated protein kinase in metabolic control and insulin signaling. *Circulation research*. 2007;100:328-341.
5. Lau CW, Yao XQ, Chen ZY, Ko WH and Huang Y. Cardiovascular actions of berberine. *Cardiovascular Drug Reviews*. 2001;19:234-244.
6. Brusq J-M, Ancellin N, Grondin P, Guillard R, Martin S, Saintillan Y and Issandou M. Inhibition of lipid synthesis through activation of AMP kinase: an additional mechanism for the hypolipidemic effects of berberine. *Journal of lipid research*. 2006;47:1281-1288.
7. Kong W, Wei J, Abidi P, Lin M, Inaba S, Li C, Wang Y, Wang Z, Si S and Pan H. Berberine is a novel cholesterol-lowering drug working through a unique mechanism distinct from statins. *Nature medicine*. 2004;10:1344-1351.
8. Derosa G, D'Angelo A, Bonaventura A, Bianchi L, Romano D and Maffioli P. Effects of berberine on lipid profile in subjects with low cardiovascular risk. *Expert opinion on biological therapy*. 2013;13:475-482.
9. Zhang H, Wei J, Xue R, Wu J-D, Zhao W, Wang Z-Z, Wang S-K, Zhou Z-X, Song D-Q and Wang Y-M. Berberine lowers blood glucose in type 2 diabetes mellitus patients through increasing insulin receptor expression. *Metabolism*. 2010;59:285-292.

10. Jäger S, Handschin C, Pierre JS- and Spiegelman BM. AMP-activated protein kinase (AMPK) action in skeletal muscle via direct phosphorylation of PGC-1 $\alpha$ . *Proceedings of the National Academy of Sciences*. 2007;104:12017-12022.
11. Zhou L, Yang Y, Wang X, Liu S, Shang W, Yuan G, Li F, Tang J, Chen M and Chen J. Berberine stimulates glucose transport through a mechanism distinct from insulin. *Metabolism*. 2007;56:405-412.
12. Zhang Q, Xiao X, Feng K, Wang T, Li W, Yuan T, Sun X, Sun Q, Xiang H and Wang H. Berberine moderates glucose and lipid metabolism through multipathway mechanism. *Evidence-Based Complementary and Alternative Medicine*. 2010;2011.
13. Shay KP, Moreau RF, Smith EJ, Smith AR and Hagen TM. Alpha-lipoic acid as a dietary supplement: molecular mechanisms and therapeutic potential. *Biochimica et Biophysica Acta (BBA)-General Subjects*. 2009;1790:1149-1160.
14. Lee WJ, Song K-H, Koh EH, Won JC, Kim HS, Park H-S, Kim M-S, Kim S-W, Lee K-U and Park J-Y.  $\alpha$ -Lipoic acid increases insulin sensitivity by activating AMPK in skeletal muscle. *Biochemical and biophysical research communications*. 2005;332:885-891.
15. Ruderman NB, Carling D, Prentki M and Cacicedo JM. AMPK, insulin resistance, and the metabolic syndrome. *The Journal of clinical investigation*. 2013;123:2764-2772.
16. Jacob S, Ruus P, Hermann R, Tritschler H, Maerker E, Renn W, Augustin H, Dietze G and Rett K. Oral administration of RAC- $\alpha$ -lipoic acid modulates insulin sensitivity in patients with type-2 diabetes mellitus: a placebo-controlled pilot trial. *Free Radical Biology and Medicine*. 1999;27:309-314.
17. Packer L, Witt EH, Tritschler HJ. Alpha-lipoic acid as a biological antioxidant. *Free Radical Biology and Medicine*. 1995;19:227-250.