

# Amazing Amino Acids

Another in Dr. Smith's Client Education Series

## The Amazing Amino Acid Stack



Amino Acids are the "building blocks" of the body. Besides building cells and repairing tissue, they form antibodies to combat invading bacteria & viruses; they are part of the enzyme & hormonal system; they build nucleoproteins (RNA & DNA); they carry oxygen throughout the body and participate in muscle activity. When protein is broken down by digestion the result is 22 known amino acids. Eight are essential (cannot be manufactured by the body) the rest are non-essential (can be manufactured by the body with proper nutrition).

We had a mother and her 16 year old daughter come to our facility. The daughter had been diagnosed with bi-polar disorder and was on heavy anti-depressants. She had gained 20 pounds since taking the pharmaceuticals.

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We put her on a regimen that included 2 free form amino acid stacks 3x daily. Within a week she was tapering off the anti-depressant and within two months had lost the excess weight. "I can't believe it. We have our daughter back" the mother commented.

Amino acid derivatives have been known for years by the pharmaceutical industry. For example, L-dopa is a synthesized dopamine to help individuals with Parkinson's Disease.<sup>1</sup> Amino acids have been used as hormonal treatments and more.<sup>2</sup> Research has shown that diets resulting in a deficiency of the amino acid tryptophan can significantly aggravate premenstrual symptoms, especially irritability. One team of investigators specifically linked the severity of PMS symptoms with the decrease in tryptophan relative to other amino acids. A recent pilot study found that when patients suffering from PMS characterized by late-luteal phase dysphoria (depression, irritability, insomnia) were treated with L-tryptophan, they realized "a significant amelioration of symptoms with only mild side effects."<sup>3</sup> These results are supported by a double-blind crossover study from Harvard showing that many symptoms of PMS were reduced in women who consumed a carbohydrate drink designed to increase their serum tryptophan levels.

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<sup>1</sup> Parkinson's Disease was first named in 1817 by James Parkinson in a paper entitled "An Essay on the Shaking Palsy"

<sup>2</sup> Menkes DB, Coates DC, Fawcett JP. Acute tryptophan depletion aggravates premenstrual syndrome. J Affect Disord 1994;32(1):37-44.

<sup>3</sup> Steinberg S, Annable L, Young SN, Belanter MC. Tryptophan in the treatment of late luteal phase dysphoric disorder: a pilot study. J Psychiatry Neurosci 1994;19(2):114-9.

Dr. Candace Pert believes “The vehicle that the mind and body use to communicate with each other is the chemistry of emotion.”<sup>4</sup> The chemicals in question are molecules, short chains of amino acids called peptides and receptors, that she believes to be the “biochemical correlate of emotion.”

But most of us think of amino acids as that stuff athletes use to build muscle.

Yes, amino acids are beneficial to athletes. But they are also important additions to a dietary supplement program for other reasons as well. Amino acids are considered the building blocks that comprise protein. Protein cannot exist without the correct combination of amino acids. If any essential amino acid is low or missing, the effectiveness of all others will be proportionately reduced. In the body, adequate protein intake is vital for virtually everything from healthy muscles, ligaments, tendons, organs, glands, nails, hair and most body fluids. Besides water, protein comprises the largest portion of our body weight, and as such, the body's requirement for protein is directly related to good health. Additionally, the central nervous system cannot function properly without amino acids, which are necessary for the brain to both send and receive information. In fact, not only does every cell in the body contain protein, but protein makes up half of the body's dry weight. Protein is found in muscle, bone, cartilage and blood, as well as enzymes and hormones. Protein essentially allows muscles to contract and hold water, gives hair and skin a protective coating, and provides the rigid framework of bones and teeth. Protein also helps tissue form, regulates the body's water and acid-base balance, and stimulates the production of antibodies.

Because of advanced research and technologies, amino acids are now cost effective to produce for the general public. But just 25 years ago, a small 150 cc bottle (about ½ cup) of an amino acid cost as much as \$20,000.00. Because they were so extremely expensive, no one could afford to use them in research, or even begin to understand how powerful they really were, much less supplement their diet with them. Yet now, thanks to recent breakthroughs in manufacturing techniques, all of that has changed. Research has demonstrated how powerfully effective they are in governing the body's welfare. And, like the “computer chip,” amino acids are finally inexpensive enough for the public to buy.

Amino acids are also intimately involved in the metabolism of hormones and hormone excretion. Their presence and activity is mandatory for any glandular activity associated with the process of cellular rejuvenation. In their proper proportions, they allow youth to be prolonged. When the correct amino acids are not present, cells die and are not replenished. For you see, a poverty of amino acids is never tolerated long by the body; there are always consequences.

The brain is the most important organ of our body and ultimately controls every known biochemical pathway throughout the body, including the processes of aging and beauty. The brain contains as many as 100 billion nerves or neurons. These nerve cells interconnect with each other in an overwhelming combination numbering one quadrillion, and possibly more. Through many complicated steps, the brain sends complex messages and instructions to various parts of our body. These messages are chemical in nature and are called “neurotransmitters” and

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<sup>4</sup> Dr. Candace B. Pert was awarded her Ph.D. in pharmacology, with distinction, in 1974, from The Johns Hopkins University School of Medicine, Baltimore, Maryland.

neuropeptides. These transmitters send “neuro-signals,” or nerve impulses (hence: “neuro-transmitter”). They are chemical “switches” which actually “turn on” and “turn off” functions of the body, speed up or slow down biological processes, and govern the natural well-being of the body, all from within the brain itself.

Neurotransmitters then are actually chemicals, and they accumulate at the tip of each nerve cell. When instructed, these microscopic chemical sacs release their contents into the area between nerve cells working in a lock and key type of fashion. Enzymes (made from amino acids) in the area are also required to neutralize as well as catalyze neurotransmitter activity. The action caused by such neuro-biochemical action may ultimately give instructions for a muscle to contract, a gland to release its contents, or simply carry the message on to another nerve for further processing.

Neurotransmitters carry very specific instructions. Some promote feelings of thirst, hunger and satiety, whereas others promote those of sleepiness, alertness, anger and anxiety. Still others are known to be largely responsible for sexual interest, feelings of well-being and even euphoria. Many neurotransmitters have multiple purposes and function differently, yet specifically, when used in combination with each other. They are the chemical controlling agents of the body.

So, where do amino acids come into all of this? Well, amino acids are either *the* neurotransmitters themselves, or are essential precursors (building blocks) to other neurotransmitters (i.e., they are an essential part of the biochemical pathways that manufacture neurotransmitters). Amino acids are indispensable. They allow our brains to both send and receive messages. Furthermore, amino acids must be present and in sufficient number throughout the entire central nervous system or messages cannot be communicated. The consequences of this cannot be overstated.

It is important that these essential aminos be present in the proper proportion. A diet of vegetables and fruits supplies all the needed aminos and in the proper proportion. We wish to stress that if you eat this kind of diet you need not worry about amino acids.

However, you should consider another aspect of the aminos: their medicinal value as supplements. Taken in concentrated form, these substances can produce remarkably beneficial effects countering many of the effects of aging. Each capsule should contain at least the following in a specific proportion. Let us talk about each ingredient one by one.

5-L-hydroxytryptophan	L-Alanine
L-Arginine	L-Cystine
L-Glutamine	L-Glycine
L-Histidine	L-Isoleucine
L-Leucine	L-Lysine
L-Methionine	L-Phenylalanine
L-Serine	L-Taurine
L-Threonine	L-Tyrosine
L-Valine	

**5-L-hydroxytryptophan** is used by the brain along with niacin (B<sub>6</sub>) and magnesium to produce serotonin, a neurotransmitter. 5-HTP is more effective than L-tryptophan because it is one step closer to serotonin and has been shown to help induce natural sleep, reduce pain sensitivity, act as an antidepressant, reduce anxiety, enhance weight loss and aid in the control of alcoholism.<sup>5</sup>

**L-alanine** is an important source of energy for muscle tissue, the brain and central nervous system and strengthens the immune system by producing antibodies. It also helps in the metabolism of sugars and organic acids.<sup>6</sup>

**L-arginine**<sup>7</sup> L-arginine is converted to nitric oxide by an enzyme called nitric oxide synthase. Upper back tension responds particularly well to L-arginine. Nitric oxide<sup>8</sup> serves to keep pathogens out of the digestive tract; it serves to dilate blood vessels, and it is a potent source of energy and a sexual stimulant as well.

**L-cysteine**<sup>9</sup> is a sulfur-containing amino acid and aids in detoxification by boosting the biosynthesis of the endogenous antioxidant, glutathione. Cysteine can chelate, and protect the body from, excess copper and other harmful metals. It also binds free radicals and serves as an antioxidant.<sup>10</sup> It is best supplied as N-acetyl-L-cysteine (or NAC), because a portion of straight cysteine is converted to cystine, which is not bio-available.

**L-glutamine**<sup>11</sup> is the precursor of glutamic acid, which serves the brain by neutralizing excess ammonia (a byproduct of brain metabolism), thus creating a clearer space for brain activity. L-glutamine has been shown to improve IQ, alleviate fatigue, depression and impotence, as well as speed healing. It also is well-known to decrease the craving for alcohol and is a valuable adjunct in the treatment of alcoholism. These effects may be due to the HGH-releasing (human growth hormone-releasing) properties of the L- form of glutamine, which is, of course, popular with body-builders.

**L-glycine**<sup>12</sup> aids in treatment of low pituitary gland function and is useful in the treatment of muscular dystrophy. It also is used in the treatment of hyperglycemia and hyperacidity of the stomach, as well as a biochemical disorder in which there is a Leucine imbalance, causing an offensive body and breath odor. It has also proved useful in the treatment of B16 tumors and schizophrenia.<sup>13</sup> L-glycine also has HGH-releasing properties similar to L-arginine.

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<sup>5</sup> Earl Mindell, R.Ph, Hester Mundis, The New Vitamin Bible, 2004 Time Warner Book Group, New York

<sup>6</sup> In a pilot trial in patients with Nonalcoholic steatohepatitis (NASH) Mayo Clinic School of Medicine will work to assess the therapeutic efficacy of L-alanine in improving biological and histological findings by administering 6-18g/day L-alanine for one year.

<sup>7</sup> Earl Mindell, R.Ph, Hester Mundis, The New Vitamin Bible, 2004 Time Warner Book Group, New York

<sup>8</sup> NO More Heart Disease, Dr. Louis J, Ignarro Nobel Laureate, St. Martin's Press, New York

<sup>9</sup> Earl Mindell, R.Ph, Hester Mundis, The New Vitamin Bible, 2004 Time Warner Book Group, New York

<sup>10</sup> Journal of Lipid Research, Vol 34, 2051-2061, Copyright © 1993 by Lipid Research, Inc.

<sup>11</sup> Ensminger, A.; Ensminger, M.; Konlande, J. and Robson, J. (1994). Foods & Nutrition Encyclopedia. Vol 2. Boca Raton. CRC Press, Inc

<sup>12</sup> Earl Mindell, R.Ph, Hester Mundis, The New Vitamin Bible, 2004 Time Warner Book Group, New York

<sup>13</sup> Javitt DC, Zylberman I, Zukin SR, et al. Amelioration of negative symptoms in schizophrenia by glycine. Am J Psychiatry 1994;151:1234-6.

**L-Histidine**<sup>14</sup> is required by the body to regulate and utilize essential trace minerals such as copper, zinc, iron, manganese and molybdenum. L-histidine is essential in forming many metal bearing enzymes and compounds, examples being the antioxidant super oxide dismutase, the iron storage protein ferritin, the iron uptake regulation protein -FUR, the copper storage and iron metabolism cofactor ceruloplasmin, red blood cell hemoglobin, the toxic metal storage protein metallothionein, and the cysteine regulating enzyme cysteine dioxygenase - to name but a few important enzymes dependent on L-histidine being available for formation and function.

**L-Isoleucine**<sup>15</sup> is found in many proteins; it is important in hemoglobin synthesis and regulation of blood sugar and energy levels. It helps the body endure and recover from stress such as pre & post operative individuals. It reduces the tissue breakdown of cirrhosis and other liver diseases. Support tissue in chronic kidney failure. It may help alleviate symptoms associated with Parkinson's disease, overactive thyroid and Amyotrophic lateral sclerosis (Lou Gehrig's disease).

**L-Leucine** See above. L-Leucine is a "backup" for Isoleucine.

**L-lysine** is used to treat herpes simplex infections (cold sores), enhance concentration, aid in fat metabolism and alleviate some infertility problems. L-lysine inhibits the replication of the herpes virus and, while it does not kill the virus and wipe it out, it will suppress the symptoms in some people.<sup>16</sup>

**L-methionine**<sup>17</sup> is another sulfur-containing amino and protects against certain tumors. It also helps in the treatment of some schizophrenics and helps the liver produce bile more efficiently.

**L-phenylalanine**<sup>18</sup> is an amino acid which is used by the body to produce the neurotransmitters norepinephrine and dopamine which promote alertness. L-phenylalanine can reduce hunger, increase sexual interest, improve memory and mental alertness and alleviate depression.<sup>19</sup>

**L-serine**<sup>20</sup> is a storage source of glucose by the liver and muscles; helps strengthen the immune system by providing antibodies; synthesizes fatty acid sheath around nerve fibers.

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<sup>14</sup> Snedeker SM; Greger JL. Metabolism of zinc, copper and iron as affected by dietary protein, cysteine and histidine. *J Nutr*, 1983 Mar;113:3, 644-52

<sup>15</sup> Marchesini G, Marzocchi R, Noia M, Bianchi G. Branched-chain amino acid supplementation in patients with liver diseases. 1: *J Nutr*. 2005 Jun;135(6 Suppl):1596S-601S.

<sup>16</sup> Gelenberg, AJ. Tyrosine For The Treatment of Depression. *American Journal of Psychiatry* 137(5): 622-3, May, 1980

<sup>17</sup> Evidence Report/Technology Assessment: Number 64. AHRQ Publication No. 02-E033, August 2002. Agency for Healthcare Research and Quality, Rockville, MD.

<sup>18</sup> Those people using MAO inhibitors and those allergic to phenylalanine should not take amino acids.

<sup>19</sup> Cooper, Dr. Kenneth H. *Advanced Nutritional Therapies*, 1996

<sup>20</sup> A Texas study results published in 1989 showed that " patients with fibromyalgia exhibited significantly lower levels of total serum tryptophan as well as six other amino acids" including serine. Likewise in 1992 it was reported that the Illinois study found that in addition to low plasma levels of tryptophan "plasma ... serine levels were significantly decreased"

**L-taurine**<sup>21</sup> is useful in the treatment and prevention of macular degeneration. Macular degeneration is the slow wearing out of the retina of the eye, including the focal point on the retina, which is called the "macula," eventually leading to blindness. There are two types of macular degeneration: the accelerated type and the age-related type. We all have age-related macular degeneration (AMD) and if you live long enough you will go blind! That is the bad news. The good news is that you can slow down macular degeneration with taurine,<sup>22</sup> perhaps to the point that something else gets you *before* you go blind.

**L-Threonine** is important for the formation of collagen, elastin, and tooth enamel and enhances the immune system by aiding in the production of antibodies. L- Threonine is a precursor of the amino acids glycine and serine, which have effects on the central nervous system. Glycine acts as a neurotransmitter in the central nervous system (CNS). Glycine and gamma-aminobutyric acid (GABA) are the major inhibitory neurotransmitters in the CNS. Glycine also appears to enhance the activity of the N-methyl D-aspartate (NMDA) receptor complex in the brain, which is involved in memory and learning. Dysfunctions of NMDA receptors seem to play a crucial role in the neurobiology of disorders such as MS, Parkinson's disease, Alzheimer's disease, epilepsy and ischemic stroke.<sup>23</sup>

**L-tyrosine**<sup>24</sup> is effective as a mood elevator. It too has HGH-releasing properties similar to L-arginine.

**L-Valine** is an essential amino acid that is needed for muscle metabolism, tissue repair, and for the maintenance of proper nitrogen balance in the body. It can also be used as an energy source by muscle tissue. L-valine enhances neurotransmission and helps the body synthesize B<sub>12</sub> and iron. The lack of L-valine can account for anemia.

As you can see, a good amino acid stack is a powerful supplement and can aid in increasing energy, mental acuity, tissue repair and overall physical and emotional health.

Once dietary changes and/or results have been achieved, we recommend that you stop taking amino acids on a continuing basis, as prolonged amino acid use can overload the kidneys and liver. It is strongly recommended that those with allergies to phenylalanine or those on MAO inhibitors should not use amino acids. Pregnant or nursing mothers should consult with their physician or healthcare provider.

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<sup>21</sup> Jellin JM, Gregory P, Batz F, Hitchens K, et al. Pharmacist's Letter/Prescriber's Letter Natural Medicines Comprehensive Database. 3rd ed. Stockton, CA: Therapeutic Research Faculty; 2000

<sup>22</sup> We also suggest using Aptinol and Squalene. Please see the booklets Aptinol and Squalene for the research details.

<sup>23</sup> Lee A, Patterson V. A double-blind study of L-threonine in patients with spinal spasticity. *Acta Neurol Scand.* 1993;88:334-338. Hauser SL, Doolittle TH, Lopez-Bresnahan M, et al. An antispasticity effect of threonine in multiple sclerosis. *Arch Neurol.* 1992;49:923-926.

<sup>24</sup> Banderet, LE, and Lieberman HR. Treatment with tyrosine, a neurotransmitter precursor, reduces environmental stress in humans. *Brain Res Bull* 22: 759-762, 1989.

## Company Profile

BioCytonics is a division of Old Loft Enterprises, LLC, a Nevada Limited Liability Corporation.

Hugh Smith, Ph.D., founder Biocytonics is an internationally respected and well known researcher in chronic illnesses and mycoplasma infections. Many M.D.'s depend on Dr. Smith for consultation and often refer their "difficult" patients to him for help.

His background in microscopy represents over 25 years of research in nutrition, bio-psychology, bio-energetics and Targeted Nutritional Intervention-TNI. Dr. Smith writes for several magazines, researches for nutrition companies as well as the design of training programs for health care professionals interested in adding nutritional counseling to their practices. His expertise in nutrition is represented in nationwide seminars.

Based upon his clinical observations, Dr. Smith has developed several innovative products designed to slow the aging process and naturally combat chronic illnesses. Nutritional counseling is effective with ADD/ADHD, fibromyalgia, chronic fatigue syndrome, irritable bowel syndrome, weight loss, arthritis, candidiasis and more.

Dr. Smith specializes in Vital Hematology (or Real Time Microscopy) as a means of observing cell wall deficient forms and the living blood (BioCytonics) of clients to recommend nutritional interventions to reverse risk factors for chronic disease and nutritional deficiencies. If an individual is interested in scheduling a consultation, please e-mail for details and fee schedules to [Hugh@biocytonics.com](mailto:Hugh@biocytonics.com) or call the office at 760-613-8645.

Initial client visit includes the observation of living blood and nutritional counseling for chronic illness and potential risk factors.

Dr. Smith also trains healthcare practitioners in the study of living tissue. For details and information please e-mail [hugh@bioCytonics.com](mailto:hugh@bioCytonics.com) or call 760-809-4498.

Individuals interested in scheduling a seminar or group demonstration of Vital Hematology should address e-mail to Dr. Smith at [hugh@biocytonics.com](mailto:hugh@biocytonics.com) or call 760-613-8645

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