

# TYROSINE, THE DEPRESSION AMINO ACID

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Recent clinical findings that the natural amino acid, L-tyrosine, is helpful in overcoming depression, improving memory and increasing mental alertness, has stimulated interest in the nutritional role of this dietary factor. Of particular interest is the research linking L-tyrosine deficiency to the increased craving of cocaine and alcohol.

The body needs L-tyrosine to build many complex structural proteins and enzymes, but the recent clinical research has centered on the simpler compounds used by the body to transmit nerve impulses and to determine one's mental mood and alertness. These compounds are called neurotransmitters, and they are readily formed in the body by minor alteration of the L-tyrosine molecule. It is very likely that deficiencies of L-tyrosine can impair the body's ability to produce the proper balance of these neurotransmitters.

In assessing the dietary quantity of L-tyrosine, the L-phenylalanine content of the diet should also be determined, as the body can make L-tyrosine out of "left-over" L-phenylalanine. Dietary L-tyrosine can spare the body of some (but not all) of its L-phenylalanine need. The best food sources of L-tyrosine are meats, eggs, and dairy products. Clinical researchers prefer to use L-tyrosine supplements rather than rely on whole foods because it is difficult to obtain such amounts in normal diets.

L-tyrosine (or its precursor, L-phenylalanine) is used by the body to produce several compounds which are important to nerve transmission. The adrenal medulla and nerve cells can quickly produce these compounds from L-tyrosine. The conversions proceed as follows:

L-tyrosine → dopa → dopamine →  
norepinephrine → epinephrine

Two of these compounds, epinephrine and norepinephrine, have wide ranging activities that effect brain and nerve cells. Both compounds are produced in nerve cells, as well as in the adrenal

medulla where they can be stored. A third compound produced from L-tyrosine, dopamine, affects nerve tracts in the brain, in addition to its role in the production of the other two.

Neurotransmitters control the basic process of impulse transmission between nerve cells and are called chemical language of the brain. Epinephrine is secreted at nerve terminals in the hypothalamus. Norepinephrine is released at sympathetic nerve (fight or flee response) endings, and thus affects the immediate postsynaptic cells. Dopamine transmission appears to be defective in Parkinson's Disease.

These neurotransmitters are responsible for an elevated and positive mood, alertness, and ambition. Medical researchers in the past have relied on increasing the brain and nerve levels of norepinephrine by using drugs, such as phenylpropanolamine and amphetamines, which cause the release of norepinephrine, block its return to storage, or slow the destruction of L-tyrosine. However, such artificial manipulation often leads to depletion of the neurotransmitter and the aggravation of the original problem. The natural solution is to normalize brain and nerve levels of norepinephrine by providing adequate levels of dietary L-tyrosine.

Clinical studies demonstrate L-tyrosine controls medication-resistant depression. Two studies published in 1980 in the *American Journal of Psychiatry* by Dr. Alan J. Gelenberg of the Department of Psychiatry at Harvard Medical School. Dr. Gelenberg discussed the role of L-tyrosine in controlling anxiety and depression. He postulated that a lack of available L-tyrosine results in a deficiency of the hormone norepinephrine at a specific brain location, which in turn, relates to mood problems, such as depression, substance abuse and hyperactivity.

Dr. Gelenberg treated patients having long-standing depression not responding to standard therapy by administering dietary supplements of L-tyrosine. Within two weeks of daily intakes of 100 milligrams per day of a L-tyrosine supplement, tremendous improvement was noted. Patients were

able to discontinue or reduce amphetamines to minimal levels in a matter of weeks.

The second study was published in *Lancet* by Dr. I. Goldberg. Allergy sufferers have also responded well to L-tyrosine supplementation, as well as those on weight loss programs. Reports that L-tyrosine supplementation is a preferred way to control appetite, rather than phenylpropanolamine or amphetamine administration which causes norepinephrine release only.

If taken properly L-tyrosine can benefit those who suffer from chronic depression. Our protocol at the Pain & Stress Center is 850 milligrams with vitamin B-6 every morning. For those who are 100 lbs. or under - 500 milligrams with vitamin B-6 daily has given them the lift needed. L-tyrosine is now used in many drug rehabilitation programs to stop the craving of cocaine.

If your problem is depression and chronic pain use DLPA 375 milligrams with meals three times daily.

**CAUTION:** Do not take tyrosine or DLPA if you are taking a prescription medication that is an MAO or tricyclic. Do not take tyrosine or DLPA if you have a cancerous melanoma present.

For more information read ***BREAKING YOUR PRESCRIBED ADDICTION HABIT*** by Billie J. Sahley, Ph.D. and Katherine M. Birkner, Ph.D.

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