L-Carnosine is a naturally occurring amino acid found in high concentrations in muscle, heart and brain tissues. L-Carnosine -not to be confused with the popular supplement, L-carnitine- is a highly effective anti-aging nutrient that possesses powerful antioxidant, free radical scavenging and neurotransmitter properties. Carnosine inhibits the formation of carbonyl groups, thereby reducing the formation of abnormal proteins. L-Carnosine extends maximum cell division capacity, protects against DNA oxidation, blocks glycosylation and reduces Advanced Glycation Endproducts (AGEs), as well as acting as a cell membrane stabilizer and an intracellular buffer.

L-Carnosine is already a well-established anti-aging nutrient that is used to treat liver disease, cataracts, Alzheimer's disease, and cancer. L-Carnosine has recently been shown to possess a tremendous potential for improving language and behavior in children diagnosed with Autistic Spectrum Disorders (ASD).

Results of Study
Researchers treated 31 autistic children, ranging from 3 to 12 years in age, with either 400 mg of L-Carnosine, BID, or a placebo, for 8 weeks. At the end of the study the children treated with L-Carnosine showed significant improvements in behavior, socialization, and communication, as well as increases in language comprehension based on CARS (Childhood Autism Rating Scale), vocabulary tests (E/ROWPVT) and biweekly parent reports. In the conclusion to their report the researchers state, "Oral supplementation with L-Carnosine resulted in demonstrable improvements in autistic behaviors, as well as increases in language comprehension that reached statistical significance."

Benefits of L-Carnosine in Autism
In the Chez, et al study the researchers report that L-Carnosine may improve receptive language, auditory processing, socialization, awareness of surroundings, and even help fine motor planning and expressive language when compared to placebo. Responses are usually seen between 1-8 weeks into treatment.

Dosage
Based on his clinical experience in treating autistic spectrum disorders Dr. Chez recommends 400 mg of Carnosine, twice daily, as an effective dose. L-Carnosine can be given with or without food, and since it is tasteless capsules may be opened to mix the white powder with foods and liquids. L-Carnosine is well tolerated with diabetics, and can be used with ketogenic and gluten-casein free diets.

Long-Term Use
Anecdotal evidence suggests that some autistic children regress in some of their language gains when treatment with L-Carnitine was stopped. All children regained function when dosing was restarted.

Safety
Carnosine is considered an extremely non-toxic and safe substance. As with other antioxidants, carnosine acts synergistically when taken with other antioxidants. (For example, when vitamin E was taken with carnosine, levels of both substances were higher in cardiac muscle than when either was taken alone.)

Side Effects
Chez reports that manic or hyperactive autistic patients may show signs of over stimulation, including increased irritability, hyperactivity, or insomnia, when given higher doses of L-Carnosine. Symptoms usually respond by decreasing either the dose of L-Carnosine or other medications concurrently. No permanent negative physical changes have been noted in over 1000 children treated with L-Carnosine since June of 2001. Furthermore Chez reports no signs of adverse liver, blood, kidney, or central nervous system side effects.

L-Carnosine does not appear to alter villproic acid levels, and no adverse effects with stimulants, anti-psychotic or SSRI medications have been reported. Acetylcholine esterase inhibitors may over stimulate in combination
with CARN-A WARE, but no physically adverse interactions have been noted. Acetaminophen, Ibuprofen, and antibiotics are not contraindicated to the best of the researchers knowledge.

2.) Abstract: Double-Blind, placebo-controlled Study of L-Carnosine supplementation in children with autistic spectrum disorder
Michael G. Chez, M.D., Cathleen P. Buchanan, Ph.D., Jamie L. Komen, M.A., Marina Becker, R.N.
Objective: L-Carnosine is an amino acid dipeptide that may enhance frontal lobe function. We therefore sought to investigate whether L-Carnosine supplementation for children with Autistic Spectrum Disorders (ASD) results in observable, objective changes in language and/or behavior in contrast to placebo.

Design/Methods: Thirty-one children (21 M, mean age= 7.45; range = 3.2-12.5-yr meeting inclusion criteria) were enrolled in an 8 week trial taking 400mg BTD of L-Carnosine or placebo. Children were assessed at a pediatric neurology clinic with the Childhood Autism Rating Scale (CARS), the Gilliam Autism Rating Scale (GARS), the Expressive and Receptive One-Word Picture Vocabulary tests (E/ROWPVT), and biweekly parental Clinical Global Impression of Change (CGI), at baseline and 8 week endpoint.

Results: Children who were on placebo (n=17) did not show statistically significant changes on any of the outcome measures. After 8 weeks on L-Carnosine, children (n=14) showed statistically significant improvements on the GARS total score, GARS Behavior, Socialization, and Communication subscales, and the ROWPVT (all p's<.05). EOWPVT and CARS showed trends in improvements, which were supported by parental CGI.

Conclusions: Oral supplementation with L-Carnosine resulted in demonstrable improvements in autistic behaviors as well as increases in language comprehension that reached statistical significance. Although the mechanism of action of the amino acid is not well understood, it is believed that it acts to modulate neurotransmission and affect metal ion transfer of zinc and copper in the entorhinal cortex. This may enhance neurological function or act in a neuroprotective fashion.