

# Competitive Intelligence Advisor™ (CIA)

*A weekly window into the world of natural products research and intellectual assets™*

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## CIA™ Special Report: MEATing of the Minds—Autism

The following two research profiles are from a national meeting convening in the US next month. Because of the embargo nature of meeting abstracts, any reference to the authors, institution, or meeting is withheld.

Very little attention is given to the salutary benefits of an omnivore or meat-eater diet. Rather, the benefits of veganism in its orthodox or modified forms are extolled and the ravages of terrestrial meat consumption are belabored. Two very interesting reports coming from different laboratories in the US suggest that biochemicals found exclusively in animal products, especially terrestrial muscle meats, may impart clinical benefit in children presenting with autistic disorders. Interestingly, both of these compounds are also produced *de novo* in human metabolism. The Latin word for flesh serves as the root for these two non-protein nitrogen sources.

### Carnosine: Smells Like Spirited Pre-Teens

The oft-touted dipeptide L-carnosine ( $\beta$ -alanyl-L-histidine; LC), an antioxidant still seeking a *clinical* validation home, was used in this pilot randomized control trial with 21 boys and 10 girls (average age of 7.5). They received either 400 mg of LC or placebo (both as powder) twice daily for 8 weeks. Of the children taking LC (n = 14) significant improvements in several assessments of behavioral function were seen. Language comprehension also increased significantly. Because carnosine localizes within certain regions of the brain (including the olfactory center), it may exert a neuromodulatory effect. Note: CIA™ predicts a big “hype storm” with Internet commerce autism products after this gets out...

### Carnitine: Metabolic Unblocker

In an examination of 100 children with autism, significantly lower blood concentrations of free, acyl, and total carnitine were observed, along with significantly reduced concentrations of pyruvate (only 28 of the 100 had values available for pyruvate, lactate, alanine, and ammonia). Additionally, blood ammonia was elevated in 78% and alanine in 82%.

Almost one-third of these 28 kids had notably elevated blood lactate concentrations but this did not reach significance for the group as a whole. Accompanying the carnitine deficiency, the findings of deranged lactate, pyruvate, ammonia, and alanine hint at an impairment in mitochondrial function. Given the authors suggestions that such a mitochondrial respiration “block” could cause an effective carnitine deficiency it is likely that we’ll see a clinical trial out of this group, using L-carnitine, by next year’s meeting.



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30131 Town Center Dr., Suite 211, Laguna Niguel, CA 92677  
Ph: (949) 363-5858 Fax: (949) 363-1758 Email: CIA@imaginutrition.com

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## Ginkgo Goes Green

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*Before Christmas*—The quest for “green” botanical extraction methods that both produce robust phytochemical yields and are economically advantageous is the path to a nutraceutical Nobel prize. Supercritical and near-supercritical fluids have been advocated but are attended by a heftier price. Organic solvents, the mainstay of extraction houses, leave residues and, depending on the country and solvent of choice, incur not insignificant disposal or reclamation costs. Researchers at Columbia University describe a rapid, three step method involving boiling in dilute hydrogen peroxide (oxidation step, to destroy non-terpene compounds e.g. flavonoids—the terpenes are remarkably resistant to oxidation), extraction with ethyl acetate and salt solutions, and charcoal filtration. To remove ginkgolic acids, reverse phase chromatography was performed (resin or silica columns). In one day, an extract with 70% triterpene lactones (ginkgolides A, B, C, and J) and bilobalide, in ratios that approximate those found in native leaves, can be produced (bench scale; see **Figure**). Note: As the authors point out, these extracts can be used to produce low flavonoid/high terpene controls for clinical trials. There appear to be no published clinical trials that have compared *Ginkgo* extracts bearing low or high flavonoid concentrations but equal *terpene* concentrations. The active constituents in *Ginkgo* extracts in humans remain the subject of speculation, not observation.

**Figure.** This three panel graph describes the relative quantities of triterpene lactones in A) a commercial *Ginkgo* extract (Bio Ginkgo® 27/7, Pharmanex), B) yellow fallen *Ginkgo* leaves collected in NY in November 2000 and C) green *Ginkgo* leaves picked from the tree in June 2001. The lowest “content” line refers to the total triterpene lactone content before extraction. Note the nearly identical total terpene content in the different leaves, both before and after extraction. Each of the sequential extracts relate to successive extractions with ethyl acetate. Note: Pharmanex had a US patent issue in January of 2001, describing a multi-solvent method to produce Bio Ginkgo.

