

## David A. Carlson



David Carlson is the co-founder and Director of Research & Development GeroNova Research Inc., a company specializing in lipoic acid chemistry and products. He is the developer of the GeroNova Research product line and an authority on lipoic acid stereochemistry.

According to Professor Lester Packer, "David is a walking encyclopedia of lipoic acid. He knows as much about lipoic acid as anyone on the planet".

David gained an academic interest in mechanisms of aging and began exploring the possibility of pharmacological intervention into the aging process in 1998. Animal models indicated R-lipoic acid (RLA) may normalize several age-related markers to those of youthful animals. RLA was commercially unavailable at that time, so he began to work out industrially feasible routes to produce RLA and

stable-bioavailable dosage forms on a large scale, which evolved into GeroNova Research, Inc. David has played a key role in the introduction and development of R-Lipoic Acid, K-RALA, Na-RALA, Rala-Gel and R-DHLA for the nutraceutical industry.

David's latest research is the development of entirely "green" and asymmetric processes for the industrial scale synthesis of RLA and R-DHLA, and the contribution of stereochemistry and the metabolites to the overall mechanisms of action of RLA/R-DHLA. He is continuously testing and developing novel dosage forms, evaluating the plasma pharmacokinetics of RLA and various nutritional supplements and identifying new biomarkers for quantitation and intervention into the aging process.

GeroNova has compiled an extensive data base of English and foreign language lipoic acid articles and is actively translating foreign articles into English in order to facilitate future researchers. David is actively involved in numerous international collaborations involving the elucidation of the mechanisms of action of RLA, new product development and clinical trials.

David was an invited speaker at the Oxygen Club of California (OCC) & the Lipoic Acid workshop in Santa Barbara, CA (March 12-15, 2008) where he discussed the pharmacokinetics and pharmacodynamics of RLA in humans, the role of stereochemistry in the mechanisms of action of lipoic acid and unsolved problems in lipoic acid research. David has spoken at the American College for the Advancement of Medicine, American Association of Naturopathic Physicians (AANP) and Smart Life Forum on the use of R-Lipoic Acid & R-Dihydrolipoic acid in nutrition and clinical practice.

David is a member of The American Chemical Society, The New York Academy of Sciences, and the International Union of Pure and Applied Chemistry.

### Publications & Writings in Process:

Maczurek A, Hager K, Kenlies M, Sharman M, Martins R, Engel J, Carlson DA, Münch G. Lipoic acid as an anti-inflammatory and neuroprotective treatment for Alzheimer's disease. *Advanced Drug Delivery Reviews*. Volume 60, Issues 13-14, October-November 2008, Pages 1463-1470, *Mitochondrial Medicine and Mitochondrion-Based Therapeutics*.

Carlson DA, Young KL, Fischer SJ, Ulrich H. An Evaluation of the Stability and Plasma Pharmacokinetics of R-lipoic acid (RLA) and R-Dihydrolipoic acid (R-DHLA) Dosage Forms in Human Plasma from Healthy Volunteers. Chapter 10 in *Lipoic Acid: Energy Production, Antioxidant Activity & Health Effects*, eds. Lester Packer & Mulchand Patel, Taylor & Francis Publishers, London (2008) 235-270.

Carlson DA, Smith AR, Fischer SJ, Young KL, Packer L. The Plasma Pharmacokinetics of R-lipoic Acid Administered as Sodium R-(+)-lipoate to Healthy Human Subjects (2007) *Alternative Medicine Review* 12(4) 343-351.

Carlson DA, Smith AR, Ulrich H. The case against controlled release lipoic acid: a pharmacokinetic-mechanistic based argument.

Carlson DA. *Lipoic Acid: From the Bench Top to the Reactor; A comprehensive review and practical guide to the laboratory & industrial-scale synthesis of lipoic acid, metabolites and analogs*. This book is based on practical laboratory work conducted at GeroNova between 1998 and 2008 and is written in the format of the Organic Synthesis series. This monumental work outlines every published synthesis and patent concerning LA & DHLA (and metabolites) with reaction sequences, physical properties, and spectral data on each of the intermediates & analogs. Special emphasis is on the production of green & cost effective chiral intermediates, resolution strategies & racemizations. Projected release: winter 2009

Krone D. *The Pharmacokinetics and Pharmacodynamics of R-(+)-alpha lipoic acid*. Ph.D. Thesis, Johann Wolfgang Goethe University, Frankfurt am Main, Germany (2002). English translation by Annette Maczurek, & Heinz Ulrich, M.D. edited by David Carlson

*In Vitro Metabolism of a-Lipoic Acid Especially Taking Enantioselective Biotransformation into Account*. Lang G; Ph.D. Thesis, University of Münster, Münster, Germany (1992). English Translation: Annette Maczurek, edited by David A. Carlson (2008)