

Editorial:

100 Years Research on Carnitine

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The carnitine story goes back to 1905. Nothing was known about the structure and the function of this compound for a long time. The absolute configuration of the physiological *L*-carnitine was established not until 1962, nearly 50 years later. However, already during this time discoveries of the main physiological functions of carnitine started to be made, leading to an outburst of data soon afterwards which continues until now. In the beginning of the 21st century the number of publications exploded to about 330 to 360 per year, almost one a day!

Carnitine is considered a conditionally essential nutrient, as, under certain conditions, its requirement may exceed the individual's capacity to synthesize it. It is a well-tolerated and generally safe therapeutic agent. No major negative or toxic effects were attributed to carnitine supplementation – only at doses of >3000 mg/day a fishy body odor may arise with certain patients. Therefore it has become an approved prescription drug for the treatment of primary and certain secondary carnitine deficiency syndromes, but it is also available over the counter in various formulations as a dietary supplement, often advertised as an aid to weight loss or to improve exercise performance. Still new findings are reported even now, showing that carnitine is by far more involved in metabolism, health care, fitness, and wellness than expected, provided that it is supplied in a pure, uncontaminated form and applied in correct and sufficient dosage. Concerning the latter, many myths have surfaced, which are still reported and cited by uncritical authors, “self appointed experts”, physicians and scientists not only in “yellow press articles” but unfortunately also in scientific papers.

Subsequent writers cited uncritically unreliable postulates, completely unproven by experiments thus transforming false data into dogmas. For prolonged periods carnitine was thus brought into ill repute, since many interested people did not know where to get correct and reliable information. Since there still exist misinterpretations of the various effects of *L*-carnitine and since on the other hand many new effects of carnitine were recently found, we decided to cope with the hard facts in a special issue “100 Years Research on Carnitine”. We were lucky to gain excellent experts in various disciplines as authors for this book, to cover the state of art of the “carnitine-story” in the fields organic chemistry, (bio)organic synthesis, analytics, diagnostics, bio- and pathobiochemistry, clinical chemistry, physiology, and pathology. All contributors were invited personally. The topics comprise the various physiological functions of carnitine, including the role in metabolism in several

organelles, other functions in the organism, synthesis, biosynthesis, turnover, requirement and concentration in tissues and the whole organism, resorption, distribution, transport in the body, and excretion. Beyond that carnitine related deficiencies in humans and mammals and pathological aspects are discussed. These topics are either presented in condensed reviews, critically covering well known as well as new data or *via* original papers, to cope with recent developments and findings to round off the whole carnitine story, lasting until now for already a hundred years.

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