Acetylcholine Formation

Referring to Chart 4, phosphatidylcholine is a constituent of lecithin, a well-known dietary supplement. Acetylcholine is simply choline to which has been attached an acetyl group (CH$_3$CO-). Lecithin is the source of choline and acetyl-L-carnitine (ALC) is the source of the acetyl group. Carnitine is synthesized by the body and requires several factors including the amino acid lysine and vitamin C (ascorbic acid). The supplement known as SAM (S-adenosylmethionine) supplies methyl groups (CH$_3$-) to lysine, forming trimethyllysine. This compound is further processed, requiring additional vitamin C, resulting in carnitine that supplies the necessary acetyl group. (8, 9)

Formation of Neurotransmitter Acetylcholine from Precursors and Dietary Supplements

Acetylcholine deficiency in Lyme disease leads to muscular pain, fatigue and depression/anxiety.

History of Lyme and Related Spirochetal Diseases

The discovery by Burgdorfer that Lyme disease was caused by a spirochete placed it in a category of other diseases known to be caused by spirochetes. An example of such a disease is syphilis, the scourge of Europe for hundreds of years. Arsenic and some of its compounds had been known for quite some time as a highly successful and popular means of fatally poisoning someone (remember the king in Shakespeare’s Hamlet). Following the discovery of the Germ Theory of Disease by Louis Pasteur (1822 – 1895), it was theorized that if arsenic was toxic enough to kill, it may also be effective in killing the organisms that cause disease. In the early 1900s, the German chemist-physician Paul Ehrlich (1854 – 1915) developed a chemical treatment for syphilis. By using a “shotgun” approach of trying hundreds of compounds in an effort to find one that worked, Ehrlich discovered what became known as Salvarsan or “606” after 606 compounds had been tested. Salvarsan is an organic compound of arsenic and may be highly toxic if not properly used. For his monumental discovery, Ehrlich was awarded the Nobel Prize in 1908. Salvarsan may be considered the first man-made antibiotic. (26)