D-Aspartate stimulation of testosterone synthesis in rat Leydig cells

李仁愛
Yoshiko Nagata;Hiroshi Homma;Jen-Ai Lee;and Kazuhiro Imai

Abstract

D-Aspartate increases human chorionic gonadotropin-induced testosterone production in purified rat Leydig cells. L-Aspartate, D-,L-glutamate or D-,L-asparagine could not substitute for D-aspartate and this effect was independent of glutamate receptor activation. Testosterone production was enhanced only in cells cultured with D-aspartate for more than 3 h. The increased production of testosterone was well correlated with the amounts of D-aspartate incorporated into the Leydig cells, and L-cysteine sulfinic acid, an inhibitor of D-aspartate uptake, suppressed both testosterone production and intracellular D-aspartate levels. D-Aspartate therefore is presumably taken up into cells to increase steroidogenesis. Intracellular D-aspartate probably acts on cholesterol translocation into the inner mitochondrial membrane, the rate-limiting process in steroidogenesis.