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TWO FACES OF CHOLESTEROL: PHYSIOLOGICAL IMPORTANCE AND ROLE IN DISEASE PATHOGENESIS

Summary

Cholesterol is a molecule build of 17-carbon cyclopentano-perhydro-phenanthrene structure and 6- carbon side chain, classified as steroid alcohol due to the presence of a single hydroxyl group. The main function of cholesterol is temperature-dependent modulation of cell membrane liquidity. Large amounts of cholesterol are found in membrane nanodomains (lipid rafts and caveolae) that are essential for endocytosis and intercellular signaling. Moreover, cholesterol is a substrate in steroid hormones biosynthesis in gonads and adrenal glands, and determines the proper course of embryonic development. Besides its physiological role, cholesterol may contribute to pathogenesis of different diseases, resulting from its accumulation in the system or from metabolic disorders. The significance of cholesterol has already been described in several neurodegenerative disorders, cardiovascular and renal diseases, and in cancer. Therefore, current research focus on providing some new therapeutic strategies, allowing for cholesterol level control, regulation of its metabolism, or for using cholesterol molecules as effective drug component.

Keywords: cancer, cardiovascular diseases, cholesterol, chronic kidney disease, lipoproteins, neurodegenerative diseases