Abstract

In recent years, our understanding of the plasma membrane has changed considerably as our knowledge of lipid microdomains has expanded. Lipid microdomains include structures known as lipid rafts and caveolae, which are readily identified by their unique lipid constituents. Cholesterol, sphingolipids and phospholipids with saturated fatty acyl chain moieties are highly enriched in these lipid microdomains. Lipid rafts and caveolae have been shown to play an important role in the compartmentalization, modulation and integration of cell signaling. Therefore, these microdomains may have an influential role in human disease. Dietary n-3 polyunsaturated fatty acids (PUFA) ameliorate a number of human diseases including coronary heart disease, autoimmune and inflammatory disorders, diabetes, obesity and cancer, which has been generally linked to its membrane remodeling properties. Recent in vitro evidence suggests that perturbations in membrane composition alter the function of resident proteins and, consequently, cellular
responses. This review examines the role of \( n^{-3} \) PUFA in modulating the lipid composition and functionality of lipid microdomains and its potential significance to human health.

Keywords
Caveolae; Caveolin-1; Cholesterol; Colon; EPA; DHA; Lipid rafts; \( n^{-3} \) PUFA; T cells

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