

Redox Regulation by Thioredoxin System via Lipid Rafts

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Thioredoxin-1 (TRX) plays important roles in cellular signaling through redox control of cysteine residues in proteins. TRX was originally cloned as an adult T-cell leukemia (ATL)-derived factor (ADF) has cytokine-like activity from human T-cell leukemia virus-I (HTLV-I) transformed T-cells. TRX induced by several stimulations including oxidative stress is redox-sensitively released from various types of mammalian cells despite no typical secretory signal sequence, and regulates not only its own release, but also cellular redox states³⁾. One of the mechanisms is considered that TRX is internalized into the cells. We approached the detailed mechanism by using TRX derivative, in which Cys35 in the active site was replaced with serine used as a tool. TRX-C35S is bound on the cell surface and rapidly internalized in HTLV-I-transformed T cells as well as the activated T cells including Jurkat T cells stimulated by PMA/ionomycin. Moreover, the TRX-C35S is bound and localized in lipid rafts microdomain of plasma membrane in the activated T cells. Here, recent progress of the study of TRX internalization, and its regulation in cell signaling, especially focused on the correlation with lipid rafts will be discussed.