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Apoptosis and eryptosis: striking differences on biomembrane level

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ABSTRACT

The cell plasma membrane plays an essential role in programmed cell death of nucleated cells (apoptosis) and erythrocytes (eryptosis), and its changes due to loss of transmembrane asymmetry are quite similar. However, nucleated cells possess the network of intracellular membranes, which are missing in erythrocytes. Providing comparative studies with series of molecular probes, we observe dramatic differences in membrane lipid order in the course of apoptosis and eryptosis. In contrast to nucleated cells, in which a significant drop of the lipid order in the plasma membrane is observed, the erythrocyte membrane retains the relatively high level of the lipid order. Observation in nucleated cells of significant differences between inner and plasma membranes and detection of apoptotic bodies with different organization suggest that the decrease in the lipid order of their plasma membrane could be at least partially explained by the phospholipid and/or cholesterol exchange between membranes. Such features are absent in erythrocytes.

Key words: apoptosis, eryptosis, membrane asymmetry, lipid phases

1. INTRODUCTION

Apoptosis, or programmed cell death, is associated with a number signaling reactions related to energy metabolism, degradation of molecules and exposure of

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