

Single Cell Cholesterol Detection

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Platinum microelectrodes modified with a lipid bilayer membrane incorporating cholesterol oxidase are used for simultaneous extraction and detection of cholesterol contained in the plasma membrane of a single cell. Steady state current responses are obtained with the oxidase modified microelectrodes contacting the cell plasma membrane. Electrode response correlates with the cholesterol content of the cell plasma membrane which suggests that these electrodes should be useful in tracking changes in the cholesterol content of the cell plasma membrane that occur during atherogenesis. Specifically these enzyme modified electrodes should allow direct characterization of adenosine triphosphate(ATP)- binding cassette- A1 (ABCA1) transporter protein activity. ABCA1 transports intracellular cholesterol out of macrophages. Genetic aberrations in ABCA1 are known to alter lipoprotein metabolism and to contribute to the onset of arteriosclerosis.