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Electrochemiluminescence determination and removal of membrane choline in living cells

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Phosphatidylcholine (PC) and sphingomyelin (SM) are two important phospholipid components of cell membranes that are positively correlated with cardiovascular diseases. In the current enzymatic quantification method, PC and SM first react with specific enzymes to generate choline and then the choline is irreversibly catalyzed by choline oxidase into hydrogen peroxide and glycine betaine. The lipid content was measured by detecting the amount of peroxidase. However, plasma, tissue and cell membrane all contain a small amount of choline that may confound the measurement of PC and SM. Attempts were made utilizing lipid extraction methods to avoid possible interference of membrane choline, but they yielded conclusions that are often inaccurate. Herein, we describe a rapid, specific and sensitive method to measure membrane choline in living cells by using luminol electrochemiluminescence (ECL). We also employ a pretreatment strategy using choline oxidase to avoid possible interference from membrane choline. The successful removal of choline in the cell membranes was verified. This strategy may serve as a new method for the accurate determination of PC, SM, and membrane choline in the living cells, allowing a precise understanding of the biological roles of these molecules in cell membranes.

Biography

Shuohan Huang will attain her Master Degree in Medcine in June 30, 2019 from School of Pharmacy, Nanjing Medical University. Her current interest focuses on the single cell analysis, espeiclally the membrane lipids analysis in single cells in the lipid related dieases such as atherosclerosis.She has published three papers on international journals, including one on Analytical Chemistry.

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