Synopsis of Original Research Paper

Development of novel analytical method for skin cholesterol

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Control of the skin cholesterol level plays an important role for preventing the life-style related diseases and goes a long way in skin health. However, the conventional method is troublesome due to its sensitivity and the necessity of using the enzyme reaction through many procedures. Therefore, we focus on the simple electrochemical measurement of cholesterol using the molecularly imprinted self-assembled monolayer (SAM). A detection of the electroinactive cholesterol has been achieved by electrochemical method with a potassium ferrocyanide as a redox marker. The change of the oxidation peak current (I) has shown a linear relationship with the concentration of cholesterol. The change of I related to the cavity concentration for the mass-transport of redox marker on the molecularly imprinted SAM. When the cholesterol-sensitive SAM recognizes cholesterol, the I decreases due to the rejection of diffusion of the marker to the gold electrode surface. On contrary, when the SAM extracts cholesterol, the marker diffuses to the electrode surface, and the I increases. The sensing properties of molecularly imprinted SAM, such as sensitivity, selectivity, and reproducibility, have been examined and it has been applied for simple and speedy electrochemical sensor development.