

European Chemistry Congress

June 16-18, 2016 Rome, Italy

Selective and stoichiometric fatty acids sensing with a polydiacetylene liposome

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Fatty acids play important roles in biological processes, functioning as a cell membrane component, growth and survival pathways, signalling for metabolic regulation, and inflammatory and metabolic responses. Unsaturated fatty acids exert various biological processes depending on their overall shape due to cis and trans isomerism. Therefore, selective detection of fatty acids by their shape is of interest but is a challenging goal. Herein, we report the liposome sensing system as a simple yet efficient assay tool for discrimination of cis-fatty acids from trans- and saturated fatty acids. The liposome showed a turn-on type fluorescence change and distinct color change. The molecular interactions between the liposome and cis-fatty acids showed 1:2 and 1:1 (liposome component/fatty acids) binding stoichiometries in the cases of mono- and di-oleyl fatty acids, respectively. The colorimetric response indicated that it has good linearity up to the equivalent point. Furthermore, we applied liposome for monitoring residual cis-fatty acids in soybean oil product after heating at 200°C.

Biography

Chang Wook Song received his BS in 2013 from the department of Chemistry, Busan National University and MS in 2015 from POSTECH. He is currently pursuing his PhD at the department of Chemistry, POSTECH, under the supervision of Professor Kyo Han Ahn.

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