Fluorescence Correlation Spectroscopy:  
A Quantitative Study of pH Responsive Catanionic Surfactant Vesicles for Drug Delivery

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Catanionic surfactant vesicles form spontaneously from mixtures of single-tailed cationic and anionic surfactants. Catanionic vesicles can be formed from inexpensive components and are more stable than conventional liposomes formed from phospholipids. Catanionic vesicles are stable in solution, and in some instances, indefinitely. Hence they are promising materials for many of the applications currently fulfilled by liposomes including models of biological membranes, drug delivery and solubilizing agents. The surfactant n-tridecanoic (TDA) acid confers pH responsiveness to vesicles formed from mixtures of sodium dodecylbenzenesulfonate (SDBS) and cetyltrimethylammonium tosylate (CTAT) (TDA- SDBS/ CTAT). This ternary mixture is a function of pH and shows that anion-rich catanionic vesicles are promising pH-responsive carriers of cationic drug molecules. A new fluorescence correlation spectroscopy (FCS) method is promising as a measure of the binding constant of a cationic drug /dye molecule (doxorubicin) with three different vesicles formulations at the different pH.