

Development of Biocompatible and PH Responsive Catatonic Vesicles for Drug Delivery

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Abstract: Our current research investigates a class of vesicles known in the literature as “catanionic” vesicles. Catanionic vesicles form from mixtures of cations and anions. They are distinctly different from phospholipid vesicles in that they form spontaneously from inexpensive single tailed surfactant molecules and are indefinitely stable over a range of pH and ionic strengths. The vesicle bilayers have a net charge that allows an electrostatic attraction between the vesicle and organic ions in solution, making our vesicles useful for applications such as molecular electrostatic sequestration. These vesicles can be functionalized with carbohydrates. The ability to sequester and carry drugs and the functionalization with biomolecules makes these materials interesting candidates as chemotherapy drug delivery systems. The current vesicle preparations are formed from mixes of cationic and anionic surfactants. A problem with cationic surfactants is that many of them are toxic. This poster describes development of new vesicle formulations using pyrdinium-based surfactants that are found in many pharmaceutical preparations with the aim of lowering the potential toxicity of catanionic preparations. Combining biocompatible cationic surfactants with titratable anionic surfactants will create less-toxic pH responsive vesicles.

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