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Impact of the surface charge of polydiacetylene micelles on their interaction with human innate immune protein C1q and the complement system

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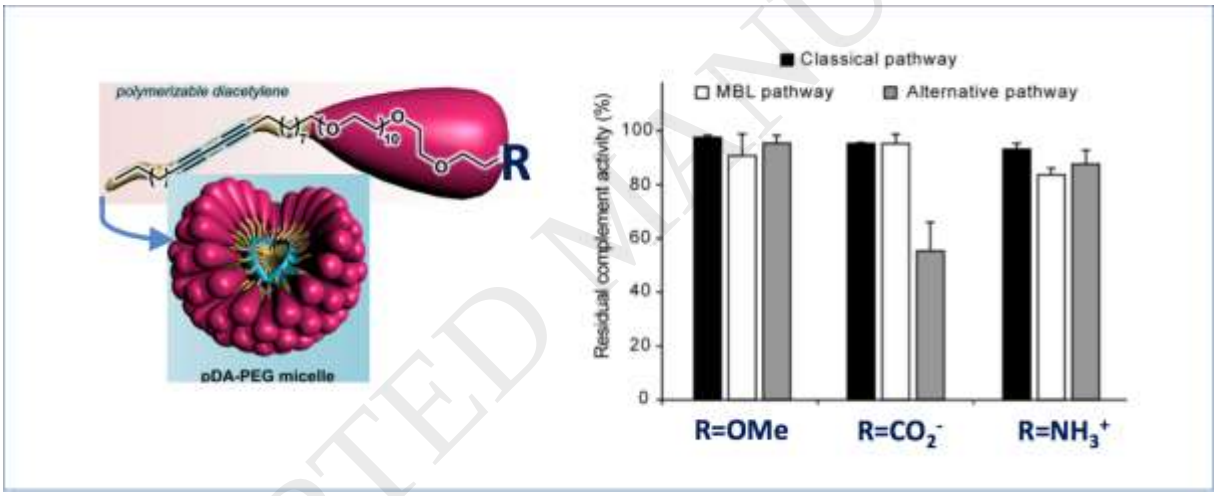
Graphical abstract



Abstract

Polydiacetylene (pDA) micelles have been demonstrated to be effective drug carriers for cancer therapy in mouse model. However, little is known about their interaction with the human complement system, which constitutes an important part of the innate immune system and can cause severe hypersensitivity reactions. Herein, we investigate the influence of micelle surface charge on the binding of complement protein C1q, the target recognition unit that activates the classical complement pathway and performs a range of other important physiological functions. Besides the classical pathway, we also investigate the surface charge effect on complement activities through the other activation pathways, namely, the MBL-dependent lectin pathway and the alternative pathway. We