

Charm and fascination of dendrimer nanotechnology in biomedical applications

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Abstract

The application of nanotechnology to engineer nanovectors for drug delivery is widely expected to bring breakthrough in nanomedicine and create entirely novel therapeutics.¹ Dendrimers are ideal nanocarriers for drug delivery by virtue of their uniquely well-defined and precisely controlled structure as well as the multivalent cooperativity confined within nanosized volume. We have recently established bio-inspired structurally flexible dendrimers and self-assembled supramolecular dendrimers as excellent nanocarriers for gene and drug delivery.²⁻⁶ In particular, self-assembling amphiphilic dendrimers are able to form adaptive supramolecular nanostructures,⁵⁻⁶ which encapsulate anticancer therapeutics with high loading efficiency for effective drug delivery to combat drug resistance. Our studies offer new perspectives in molecular engineering of functional dendrimers in nanotechnology-based biomedical applications.

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