Topic: Targeted cancer therapy

Title: Use of biomolecules delivery vector, adenovirus dodecahedron, for targeted cancer therapy.

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Adenoviral dodecahedron (Dd) is a non-enveloped symmetrical virus-like particle (VLP). VLPs are multimeric stable proteinaceous nanostructures devoid of any genetic material, formed from functional viral proteins responsible for cell penetration, which ensures VLPs efficient cell entry. Dd, composed of twelve copies of the pentameric penton base (Pb) protein, is spontaneously generated in the baculovirus system upon the expression of the Pb gene of adenovirus serotype 3 (Ad3). The particle shows remarkable cell penetration ability with 200,000–300,000 Dd internalized into one cell in culture, conceivably delivering several millions of foreign cargo molecules to the target cell. For this reason, they are of great interest as a delivery vector. Stability studies show that Dds can be conveniently stored and transported, and can potentially be used for therapeutic purposes under various climates. We have used Dd for delivery of small drugs for targeted cancer therapy. A cell-impermeant oncogene inhibitor or anti-cancer antibiotics doxorubicin and bleomycin were delivered as Dd conjugates, demonstrating significantly improved drug bioavailability. Recently we undertook some improvements in the protocols of Dd expression and purification, leading to considerable savings in time, improved yield and allowing the scaling-up of the protein production.