

QUANTUM DOTS FOR DELIVERY OF RNAI EFFECTOR SPECIES

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Since its discovery several years ago RNA interference has grown into a near standard method for specific gene knockdown. However, little progress has been made regarding delivery efficiencies and knockdown efficacy. Most products fall into one of three to four classes, and each offers only slight advantages over the others. Nanoparticle vectors provide a large surface area and the ability to conjugate different surface chemistries to tailor their purpose. Specifically, pH-buffering polymers can be incorporated to provide the vector with the ability for cellular delivery and endosomal escape, as well as minimizing damage to the electrostatically bound siRNA molecule. Nanoparticles, such as semiconductor quantum dots, can further serve as imaging modalities for confirmation of delivery also well as providing other possible conjugation sites to use for targeting purposes. Current work is geared towards optimization of siRNA binding and release, as well as early knockdown studies.