B02

Remnant Cationic Dendrimers Block RNA Migration in Electrophoresis after Monophasic Lysis
RNA純化經單相打碎後殘留之陽離子性樹枝體抑制電泳移動之影響

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Abstract

Background and Purpose: Cationic dendrimers such as poly(amidoamine) (PAMAM) and poly(propyleneimine) (PPI) have attractive characteristics for the delivery of nucleic acid and various biomedical applications. Most studies have focused on cationic dendrimer-based intracellular delivery, and very few studies have focused on the non-specific interaction of remnant cationic dendrimers with total RNA after isolation directly from cells *in vitro*. **Methods:** We examined RNA isolation using the common method of monophasic lysis from human macrophage-like cells (U937) and mouse fibroblast cells (NIH/3T3) that had been exposed to dendrimers and DNA/dendrimer complexes using gel electrophoresis. **Results:** We found that PAMAM and PPI dendrimers strongly altered the mobility of RNA in the gels. In addition, the extent of dendrimer-induced alteration in RNA mobility was directly dendrimer-generation-dependent: the alteration was greater with higher-generation dendrimers. We also found that DNA/dendrimer complexes at higher dendrimer to DNA ratios interacted with RNA after isolation while gene expression was maintained. The interactions between RNA and remnant dendrimers after isolation were caused by electrostatic bindings, and we recovered total RNA using high ionic strength solvents (2M NaCl solution) to disrupt the electrostatic forces binding dendrimers to RNA. **Conclusions:** Because RNA isolation is routinely used for biological applications, such dendrimer-induced alteration in RNA mobility should be accounted for in the further processing of RNA-related applications.

Keywords: Cationic dendrimer; RNA isolation; DNA/dendrimer complexes; Monophasic lysis; Gel electrophoresis