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**Heyes et al.**(10) **Pub. No.: US 2013/0116307 A1**(43) **Pub. Date: May 9, 2013**(54) **NOVEL CYCLIC CATIONIC LIPIDS AND  
METHODS OF USE****Publication Classification**(75) Inventors: **James Heyes**, Vancouver (CA); **Mark  
Wood**, Port Moody (CA); **Alan Martin**,  
Vancouver (CA)(51) **Int. Cl.**  
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**A61K 38/17** (2006.01)(73) Assignee: **PROTIVA BIOTHERAPEUTICS  
INC.**, Burnaby (CA)(52) **U.S. Cl.**  
USPC ..... **514/44 A**; 560/173; 514/785; 514/44 R;  
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(2), (4) Date: **Jan. 17, 2013**(30) **Foreign Application Priority Data**

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(57) **ABSTRACT**

The present invention provides compositions and methods for the delivery of therapeutic agents to cells. In particular, these include novel cationic lipids and nucleic acid-lipid particles that provide efficient encapsulation of nucleic acids and efficient delivery of the encapsulated nucleic acid to cells in vivo. The compositions of the present invention are highly potent, thereby allowing effective knock-down of a specific target protein at relatively low doses. In addition, the compositions and methods of the present invention are less toxic and provide a greater therapeutic index compared to compositions and methods previously known in the art.

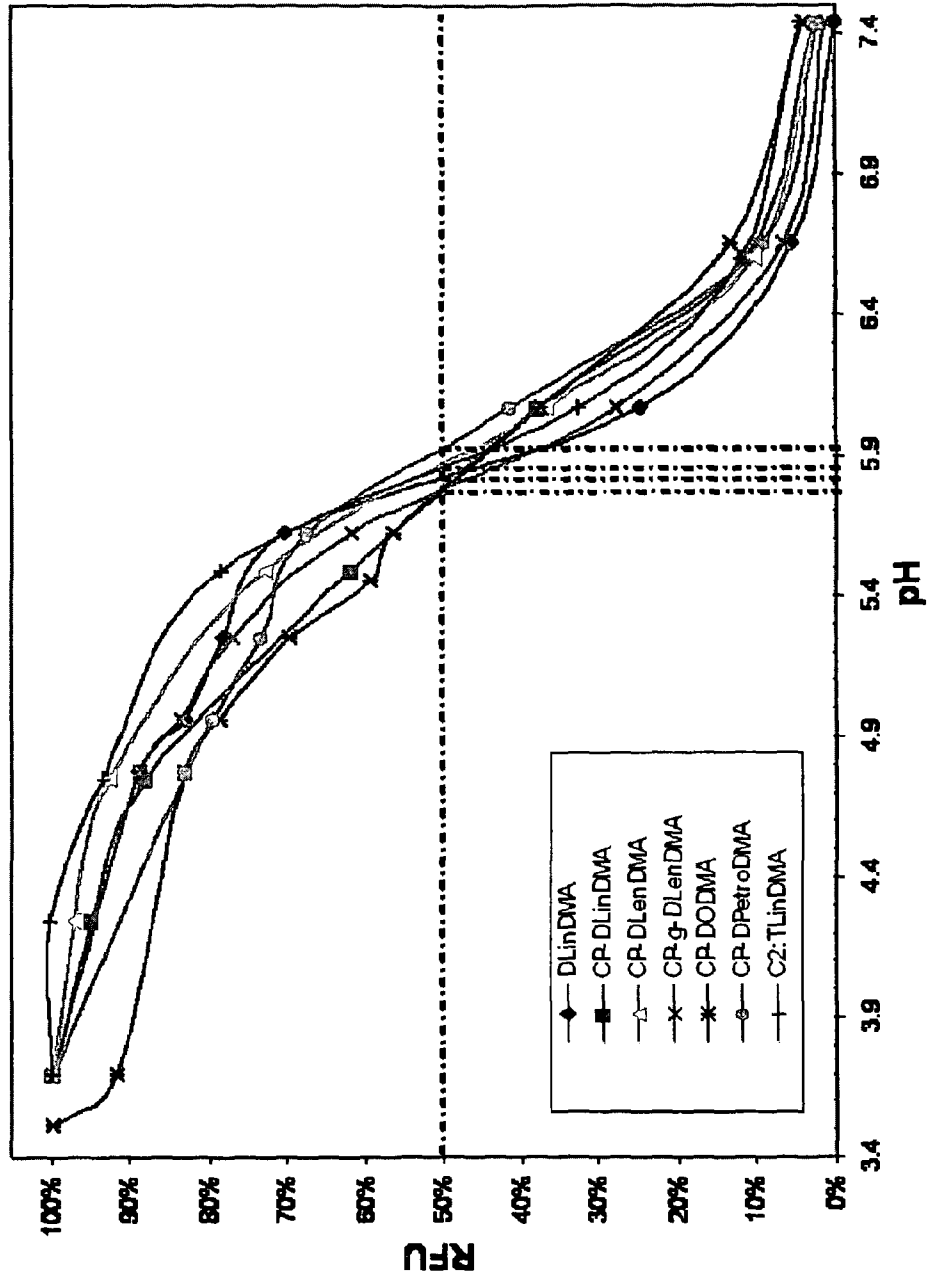


FIG. 1

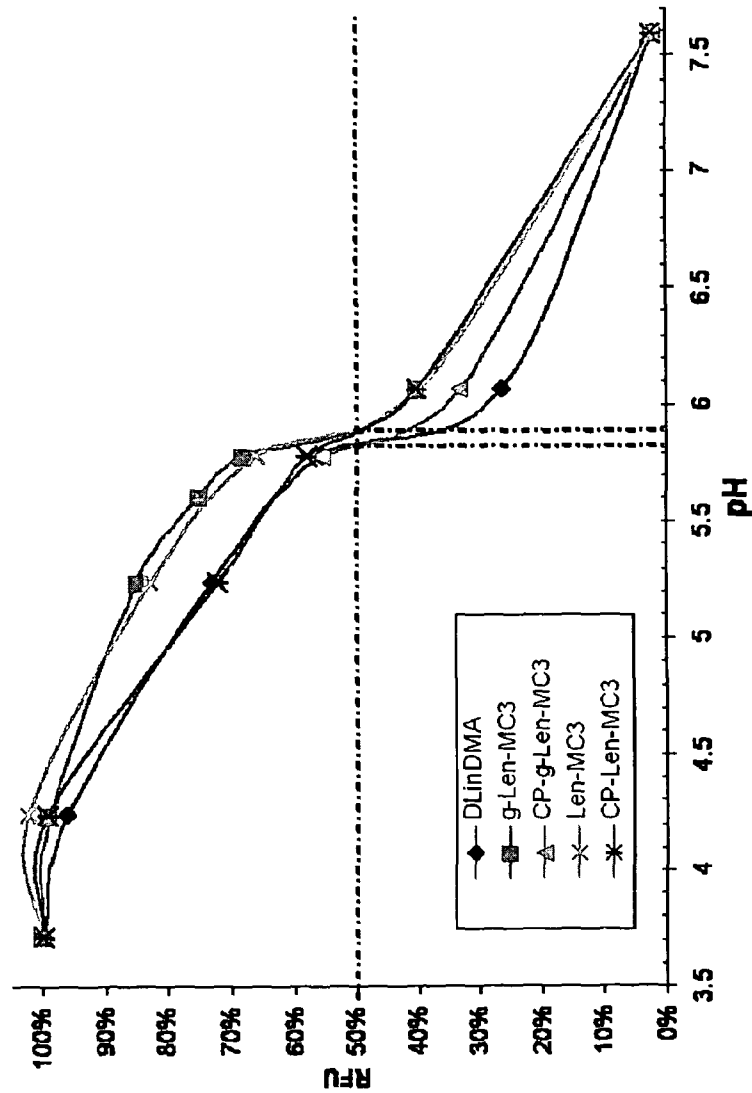


FIG. 2

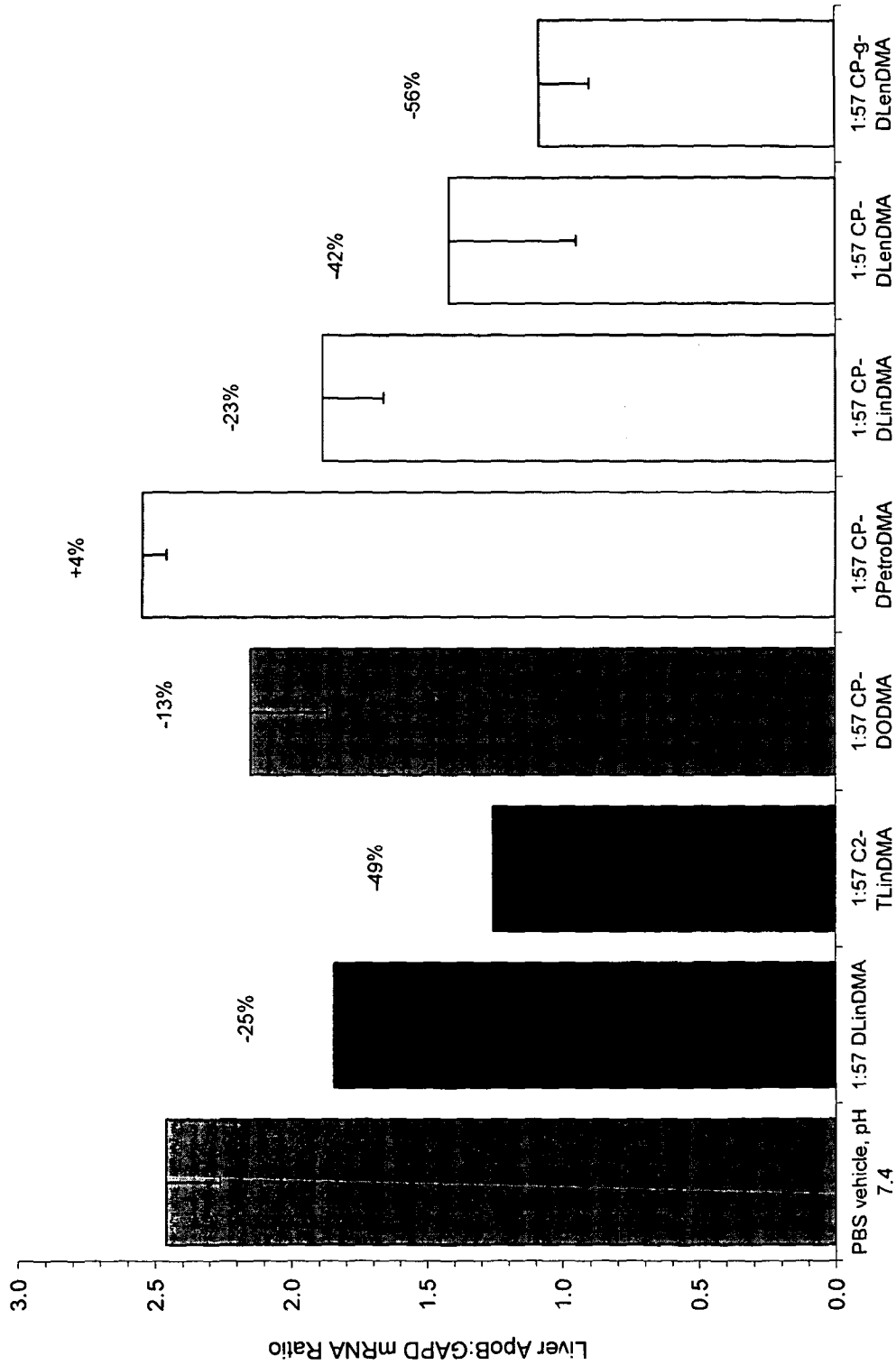


FIG. 3

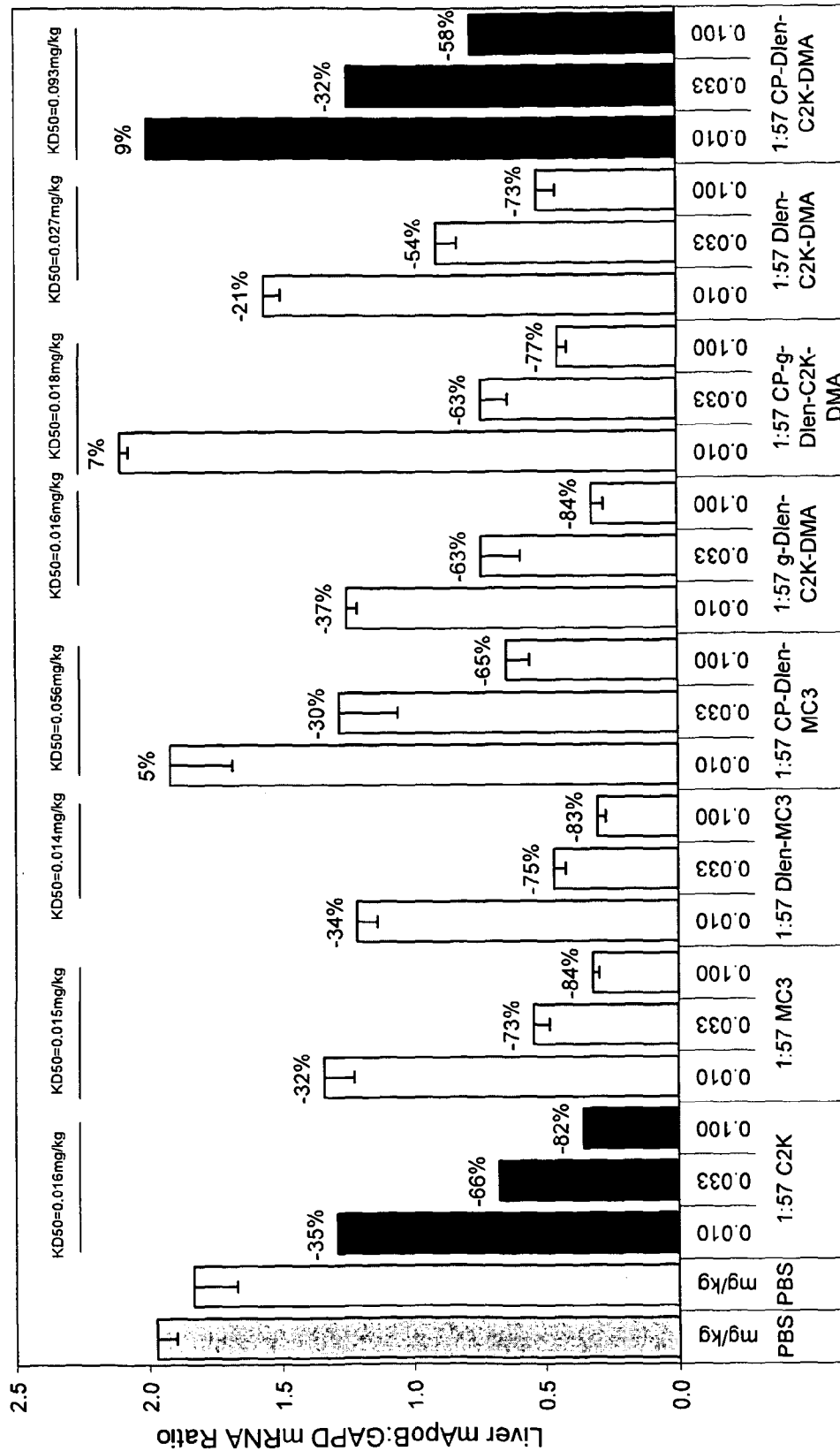


FIG. 4

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