

Amine-Bearing Phospholipids (ABPs) as a Versatile Platform for Biomedical Engineering

Catchwords:

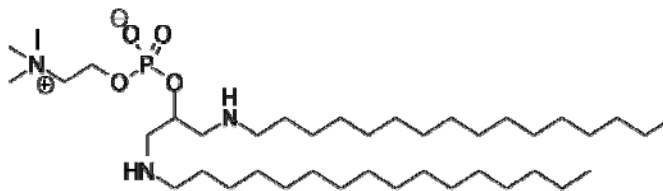
New type of phospholipid, phospholipids bearing at least one free amine, platform for biomedical engineering, RNA interference therapy using ABP cationic nanoparticles, gene therapy utilizing ABP cationic polymers, antimicrobial materials

Background

Natural phospholipids, major components for biological membranes, generally comprise a polar hydrophilic head group, an uncharged hydrophobic portion and an interface-region built of a glycerol-backbone. Phospholipids have been cross-linked either in the alkyl-chain or the head-group region of the molecule to provide polymerization products with a variety of uses. However, the scaffold of phospholipids does not allow for chemical modifications without severely affecting and/or destroying the structural and functional integrity, which poses a limitation on their usage.

Invention

The invention is directed to **Amine-Bearing Phospholipids (ABPs)**, a new class of synthesized phospholipids bearing at least one, preferably two free amines instead of ester moieties in the interface region.



Advantages

ABPs may form **homo-bilayers** and may **incorporate into natural membranes** and behave like natural phospholipids. The secondary amines may in certain embodiments also allow **substitution reactions** at the interface region, including **polymerization** of the lipids into cell-surface like materials, and may render the **molecule partially positively charged**, allowing for non-covalent interactions with negatively charged DNA and RNA. This opens a broad field of commercial applications.

Applications

Nanoparticle drug delivery systems- ABPs could be used as part of a cationic transfection lipid to form lipoplexes as transfection vectors, which could then be polymerized. Such stable vesicles may also incorporate target specific molecules at the interface region of the phospholipids, such as polynucleotides. **Antimicrobial surfaces-** Polymeric ABPs can serve as a new core material for anti-bacterial surfaces and coatings. **Cell-membrane mimics-** Cell-membrane-like polymers with enclosed (trans-membrane) proteins and cellular machines based on ABPs are potential applications of the invention for basic and applied research. The present approach and system may also open doors for other commercial applications.

IP-Position

Owner:	University of Basel
IP Status:	Patent Filed
Licensing Conditions	Exclusive or Non-exclusive License
Collaboration	Desired

Contact

Dr. Steffen Schwarz
Office of Technology Transfer
University of Basel
Schützenmattstrasse 16
CH-4003 Basel, Switzerland
Phone: +41/61/267 2760, Fax: +41/61/267 0997
E-mail: steffen.schwarz@unibas.ch
Please refer to **internal reference 07/082**