Docket #: S08-441

Oligocarbonate molecular transporters across biological barriers

Stanford University researchers have developed a new family of oligocarbonate molecular transporters (OMTs) that penetrate cell membranes and tissues. The invention, which includes the method for synthesizing these OMTs, may be used to enable or enhance the delivery of drugs, drug candidates, probes, imaging agents and other cargos across biological barriers. The oligomerization process can be expanded to generate co-oligomers of various functionalities, which may open the door for new types of drug cargo such as oligonucleotides.

Applications

- **Transportation across biological barriers** - enables or enhances delivery of cargo, including small molecule therapeutics, drug candidates, peptides, proteins, nucleic acids, biologics, plasmids, imaging agents, probes, metals, or vesicles across biological barriers
- **Control cargo release** - OMTs can be used to control the release of cargo in targeted cells and tissues
- **Improve cargo formulation** - OMTs can be used to improve formulation of cargos that are otherwise difficult to formulate

Advantages

- **Efficient** - the catalytic oligomerization process rapidly generates guanidine-rich oligomers in fewer steps than previous strategies
- **Precise** - an oligocarbonate backbone positions charged guanidines at defined distances along the backbone

- **Flexible** - catalytic oligomerization enables the covalent attachment of different molecules (therapeutic agents, imaging agents, proteins) to the beginning or the end of the oligomer and can be adapted to create attachments in between
- **Safe** - OMTs degrade to non-toxic small molecules at a rate that can be optimized for maximal therapeutic effect

Publications

- Cooley CB, Trantow BM, Nederberg F, Kiesewetter MK, Hedrick JL, Waymouth RM, Wender PA. Oligocarbonate molecular transporters: oligomerization-based syntheses and cell-penetrating studies. J Am Chem Soc. 2009 Nov 18;131(45):16401-3.

Patents

- Published Application: 20100280219
- Issued: 7,939,621 (USA)

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