Contructive delivery of cancer chemotherapeutics using virus inspired liposomes.

Larsen, Jannik Bruun; Clergeaud Veiga, Gael; Eliasen, Rasmus; Melander, Fredrik; Kirchhausen, Tom; Andresen, Thomas Lars

Publication date:
2016

Document Version
Publisher's PDF, also known as Version of record

Link back to DTU Orbit

Citation (APA):

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.
Constructive Delivery of Cancer Chemotherapeutics Using Virus Inspired Liposomes

Jannik Bruun Larsen1, Gael Veiga1, Rasmus Eliasen1, Fredrik Melander1, Tom Kirchhausen2 & Thomas L. Andresen1

1Department of Micro- and Nanotechnology, Centre for Nanomedicine and Theranostics, Productionstorvet, Building 423, Kgs. Lyngby, Denmark; 2Department of Cell Biology, Harvard Medical School and Program in Cellular and Molecular Medicine at Boston Children’s Hospital, Boston, MA USA

Contact: jannla@nanotech.dtu.dk

Conclusion and Perspectives

Enzymatic responsive charge-switch

The MMP enzyme treatment shifts the liposomes surface charge from negative to positive due to removal of PEG and the four glutamic acid residues.

Enzymatic responsive uptake

The shift in surface charge facilitates interaction with the negatively charged cell membrane leading to increased uptake of MMP enzyme treated liposomes in HT1080 cells after 3 h incubation.

Incorporation of PCL makes the liposomes responsive to enzyme environment and provides them with a charge switch that controls their interaction with cells and thereby the drug delivery. PCL is cleaved by MMP which is overexpressed in the brain under inflammatory conditions. The delivery system is thereby optimized for drug delivery following stroke and will be tested in stroke models. We are now implementing novel single liposome characterization assays to facilitate a deeper mechanistic understanding and provide new insights for optimizing the drug delivery system, potentially allowing us to create membrane fusogenic liposomes.