

Accepted Manuscript

Cholesterol and phosphatidylserine are engaged in adenoviral dodecahedron endocytosis

Marta Jedynek, Remigiusz Worch, Małgorzata Podsiadła-Białoskórska, Jadwiga Chroboczek, Ewa Szolańska



PII: S0005-2736(18)30266-9
DOI: doi:[10.1016/j.bbamem.2018.09.002](https://doi.org/10.1016/j.bbamem.2018.09.002)
Reference: BBAMEM 82843
To appear in: *BBA - Biomembranes*
Received date: 18 April 2018
Revised date: 14 August 2018
Accepted date: 5 September 2018

Please cite this article as: Marta Jedynek, Remigiusz Worch, Małgorzata Podsiadła-Białoskórska, Jadwiga Chroboczek, Ewa Szolańska, Cholesterol and phosphatidylserine are engaged in adenoviral dodecahedron endocytosis. *Bbamem* (2018), doi:[10.1016/j.bbamem.2018.09.002](https://doi.org/10.1016/j.bbamem.2018.09.002)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Cholesterol and phosphatidylserine are engaged in adenoviral dodecahedron endocytosis

Marta Jedynak¹, Remigiusz Worch^{2*}, Małgorzata Podsiadła-Białoskórska¹, Jadwiga Chroboczek^{1,3},
Ewa Szolańska^{1*}

1 Institute of Biochemistry and Biophysics, Polish Academy of Sciences, ul. Pawińskiego 5a, PL 02-106 Warsaw, Poland

2 Institute of Physics, Polish Academy of Sciences, Al. Lotników 32/46, PL 02-293 Warsaw, Poland

3 TheREx TIMC-IMAG UJF-CNRS UMR 5525, 38706 La Tronche Cedex, France

* corresponding authors: EwaSzolańska, ewasz@ibb.waw.edu.pl, tel. +48 22 592 24 20;

RemigiuszWorch, remiwo@ifpan.edu.pl, tel. +48 22 843 66 01, ext. 2204

Abstract

Adenoviral dodecahedron is a virus-like particle composed of twelve penton base proteins, derived from the capsid of human adenovirus type 3. Due to the high cell penetration capacity, it was used as a vector for protein, peptide and drug delivery. Two receptors are known to be involved in the endocytic dodecahedron uptake, namely α v integrins and heparan sulfate proteoglycans. Since it has been observed, that dodecahedron efficiently penetrates a wide range of cancer cells, it suggests that other cellular compounds may play a role in the particle endocytosis. To shed some light onto the interactions with membrane lipids and their potential role in dodecahedron entry, we performed a series of experiments including biochemical assays, fluorescence confocal imaging of giant unilamellar vesicles and surface plasmon resonance, which indicated specific preference of the particle to anionic phosphatidylserine. Experiments performed on cholesterol-depleted epithelial cells showed that cholesterol is essential in the endocytic uptake, however a direct interaction was not observed. We believe that the results will allow to better understand the role of lipids in dodecahedron entry and to design more specific dodecahedron-based vectors for drug delivery to cancer cells.

Abbreviations: BSA - bovine serum albumin; CL - cardiolipin; Dd - dodecahedron; ECL - enhanced chemiluminescence; FBS - fetal bovine serum; GUV - giant unilamellar vesicle; HAd3 - human adenovirus serotype 3; HRP - horseradish peroxidase; HSPG - heparan sulphate proteoglycan; LUV - large unilamellar vesicles; m β CD - methyl- β -cyclodextrin; NHS - N-hydroxysulfoxuccinimide; PA- phosphatic acid; Pb - penton base protein; PBS - phosphate buffered saline; PC - phosphatidylcholine; PE- phosphatidylethanolamine; PG - phosphatidylglycerol; PI- phosphatidylinositol (PtdIns4); PIP₂- PtdIns(4,5)P; PIP₃- PtdIns(3,4,5)P; PIP₄- PtdIns(4)P; PS- phosphatidylserine; RU- response units; SA- 3-sulfogalactosylceramide (sulfatide); SDS-PAGE - sodium dodecyl sulfate polyacrylamide gel electrophoresis; SPR - surface plasmon resonance; TMB - 3,3',5,5'-tetramethylbenzidine; VLP - virus-like particle

Download English Version:

<https://daneshyari.com/en/article/10142892>

Download Persian Version:

<https://daneshyari.com/article/10142892>

[Daneshyari.com](https://daneshyari.com)