

Accepted Manuscript

Regular Article

Interaction of thermal responsive NIPAM nanogels with model lipid monolayers at the air-water interface

Huihui Sun, Marina Resmini, Ali Zarbakhsh

PII: S0021-9797(18)30198-X

DOI: <https://doi.org/10.1016/j.jcis.2018.02.050>

Reference: YJCIS 23322

To appear in: *Journal of Colloid and Interface Science*

Received Date: 14 December 2017

Revised Date: 15 February 2018

Accepted Date: 16 February 2018

Please cite this article as: H. Sun, M. Resmini, A. Zarbakhsh, Interaction of thermal responsive NIPAM nanogels with model lipid monolayers at the air-water interface, *Journal of Colloid and Interface Science* (2018), doi: <https://doi.org/10.1016/j.jcis.2018.02.050>

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.



Interaction of thermal responsive NIPAM nanogels with model lipid monolayers at the air-water interface

Huihui Sun, Marina Resmini*, Ali Zarbakhsh*

Department of Chemistry and Biochemistry, SBCS, Queen Mary University of London, Mile End Road, London E1 4NS, UK

E-mail: m.resmini@qmul.ac.uk and a.zarbakhsh@qmul.ac.uk

Keywords: lipid monolayer, neutron reflectivity, nanogels, lipids-nanoparticles interactions

Understanding the interaction of nanoparticles (NP) with ceramide lipids is important in developing strategies to overcome the formidable obstacle that is skin. This paper presents studies of interactions between N-isopropylacrylamide nanogels, crosslinked with 30% N,N'-methylenebisacrylamide, and model ceramide lipid monolayers at the air-water interface as a function of temperature. In the case of the mixed ceramide/cholesterol/behenic acid monolayer, the interaction of nanogels with the ceramide was strongly mediated by the fatty acids. This interaction between nanogels and monolayer components is dominated by hydrophobic-hydrophobic binding. The data show the important intermediary role of the fatty acid in facilitating transmembrane transport. For a pure ceramide lipid monolayer, the neutron reflectivity (NR), Brewster angle microscopy (BAM) and surface pressure results showed a lipid-nanogel complex formation and the subsequent depletion/solubilisation of the lipids from the interface when the area per molecule for the lipid was increased from 42 to 44 Å².

1. Introduction

The application of nanoparticles as delivery vehicles for small molecules and large biotherapeutics requires fundamental understanding of the nature of their interactions with biological membranes, characterized by their heterogeneous complex structures and varied permeation mechanisms. Among the different approaches, dermal drug delivery offers attractive advantages such as higher patient compliance and avoidance of first pass metabolism. However

Download English Version:

<https://daneshyari.com/en/article/6991478>

Download Persian Version:

<https://daneshyari.com/article/6991478>

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