Accepted Manuscript

Functionalized glycolipids for potential bioconjugation of vesicles

Mojtaba Tabandeh, Ean Wai Goh, Abbas Abdulameer Salman, Thorsten Heidelberg, Rusnah Syahila Duali Hussen

PII: S0008-6215(18)30436-1

DOI: 10.1016/j.carres.2018.08.016

Reference: CAR 7602

To appear in: *Carbohydrate Research*

Received Date: 24 July 2018

Revised Date: 28 August 2018

Accepted Date: 28 August 2018

Please cite this article as: M. Tabandeh, E.W. Goh, A.A. Salman, T. Heidelberg, R.S. Duali Hussen, Functionalized glycolipids for potential bioconjugation of vesicles, *Carbohydrate Research* (2018), doi: 10.1016/j.carres.2018.08.016.

Functionalized glycolipids for potential bioconjugation of vesicles

Mojtaba Tabandeh,[a] Ean Wai Goh,[a] Abbas Abdulameer Salman,[a,b] Thorsten Heidelberg,[a]* Rusnah Syahila Duali Hussen [a]

[a] Chemistry Department, Faculty of Science, University of Malaya, 50603 Kuala Lumpur, Malaysia; heidelberg@um.edu.my

[b] College of Pathological Analysis Technology, Al-Bayan University, Bhagdad, Iraq

Abstract

Two azide-terminated oligoethylene oxide spacered glycolipids have been synthesized, and their assembly behavior has been studied in comparison to the corresponding base surfactants. The results suggest potential of the Guerbet lactoside-based compound for targeted drug delivery, while a coiling of the ethylene oxide linker disfavors the application of the glucoside.

Keywords: Biantennary glycolipid, targeted drug delivery, vesicle bioconjugation, CLICK chemistry coupling, ethylene oxide spacer, surfactant assembly

1. Introduction

Unwanted side effects of pharmaceutically active compounds constrain their application in medicine. The complexity of biological cells and close interspecies relations of biochemical processes make the development of active compounds specifically targeting a single host an almost impossible task. Even more challenging is cancer therapy, which targets cells of the host organism, sharing the same biochemical processes with healthy cells. In view of this, the development of drug delivery systems has gained increasing interest.[1,2] Aspects cover avoidance of untimely degradation of the active compounds and maintenance of a steady drug concentration,[3,4] as well as attempts to limit the location of drug interaction.[5,6,7] Most interesting, however, is a direction of a drug towards the target cell.[8,9] Owing to significant interspecies deviations of biological receptors on the surface of the cellular membrane,[10] and even between healthy and malign cells within an organism,[8] cellular receptors are considered significantly more selective targets than specific biochemical processes.

A perfect drug delivery system should shield the drug from interaction with non-targeted cells, while ensuring a prompt and effective delivery of the drug into target cells. In terms of an