

# Synthesis, liposomal formulation, and immunological evaluation of a minimalistic carbohydrate- $\alpha$ -galCer vaccine candidate.

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## Abstract

Fully synthetic glycan-based vaccines hold great potential as preventive and therapeutic vaccines against infectious diseases as well as cancer. Here, we present a two-component platform based on the facile conjugation of carbohydrate antigens to  $\alpha$ -galactosylceramide ( $\alpha$ -GalCer) to yield fully synthetic vaccine candidates. Formulation of the cancer-associated Tn antigen glycolipid model vaccine candidate into liposomes of different sizes and subsequent immunization of mice generated specific, high-affinity antibodies against the carbohydrate antigen with characteristics of T cell-dependent immunity. Liposome formulation elicited more reproducible glycan immunity than a conventional glycoconjugate vaccine bearing the same glycan antigen did. Further evaluation of the immune response revealed that the size of the liposomes influenced the glycan antibody responses toward either a cellular (Th1) or a humoral (Th2) immune phenotype. The glycolipid vaccine platform affords strong and robust antiglycan antibody responses in vivo without the need for an external adjuvant.

## Involved units

[Paleobiotechnology](#) [Pierre Stallforth](#) [Read more](#)

## Leibniz-HKI-Authors



**Pierre Stallforth**

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