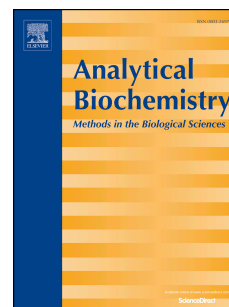


Accepted Manuscript

Development of a borreliosis assay: Mannan coated polyethylene sinter bodies as a new platform technology

Mohammed Alasel, Nina Dassinger, Doru Vornicescu, Michael Keusgen



PII: S0003-2697(17)30495-5

DOI: [10.1016/j.ab.2017.12.002](https://doi.org/10.1016/j.ab.2017.12.002)

Reference: YABIO 12860

To appear in: *Analytical Biochemistry*

Received Date: 7 August 2017

Revised Date: 18 November 2017

Accepted Date: 4 December 2017

Please cite this article as: M. Alasel, N. Dassinger, D. Vornicescu, M. Keusgen, Development of a borreliosis assay: Mannan coated polyethylene sinter bodies as a new platform technology, *Analytical Biochemistry* (2018), doi: 10.1016/j.ab.2017.12.002.

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.

Development of a borreliosis assay: mannan coated polyethylene sinter bodies as a new platform technology

Mohammed Alasel, Nina Dassinger, Doru Vornicescu, and Michael Keusgen

Institute of Pharmaceutical Chemistry, Philipps-Universität Marburg, Marbacher Weg 6, 35032 Marburg, Germany.

* Corresponding author. Tel.: +4964212825823; fax: +4964212826652. E-mail address: alasel.mohammed@gmail.com (Mohammed Alasel)

Abstract

Rapid diagnosis of Lyme borreliosis has been carried out on chemically modified porous polyethylene sinter bodies. Photografting of 2-propenol on sinter body's surface was performed as a first step, introducing active hydroxyl groups as a result of polyalcohol formation. The hydroxyl groups were used for further immobilization and could be linked via 3-aminopropyltriethoxysilane (APTES) to polysaccharides like mannan. Prone to coupling, mannan was activated using N, N'-disuccinimidyl carbonate (DSC) to allow smooth reaction with the primary amine groups of the silane layer. In a final preparation step, a recombinant fusion protein consisting of the mannan-binding domain of the lectin Concanavalin A (ConA) and a specific *Borrelia* surface antigen was immobilized by self-organization on the mannan surface. The fusion protein was used as biological interface structure. This strategy is highly efficient and resulted in a defined orientation of the antigen part of the fusion protein. Rapid and convenient differentiation could be then established between *Borrelia*-negative and a -positive serum even in 1000-fold diluted samples and detection of Lyme borrelioses in a rather early stage is likely. Furthermore, this generic strategy can be easily transferred to other bacterial or viral antigen structures.

Keywords: Serological diagnosis, Lyme borreliosis, polyethylene, recombinant fusion protein, immobilization, self organisation.

Download English Version:

<https://daneshyari.com/en/article/7557079>

Download Persian Version:

<https://daneshyari.com/article/7557079>

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