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ARTICLE *in* JOURNAL OF CHEMINFORMATICS · DECEMBER 2011

Impact Factor: 4.55 · DOI: 10.1186/1758-2946-4-S1-P47 · Source: PubMed

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Preliminary characterization of N-trimethylchitosan as a nanocarrier for malarie vaccine

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From 7th German Conference on Chemoinformatics: 25 CIC-Workshop
Goslar, Germany. 6-8 November 2011

Vaccination is considered to be most effective way of fighting infectious diseases like malaria etc [1]. N, N, N-trimethylchitosan (TMC) was synthesized from chitosan. Nanoparticles of the TMC were prepared in various media (milliQ water, Na_2CO_3 (pH 10.92), Na_2HPO_4 (pH 9.01) and alhydrogel® beads which were characterized as adjuvant for possible vaccine delivery. The nanoparticles were analyzed using microscopy (Phase contrast microscope and Confocal laser scanning microscope), and Malvern zetasizer Nano- ZS. Time-resolved particle size analysis was performed after one month storage of the TMC nanoparticles at 4 °C. The result of the study showed that PBS was the best medium that produced cationic, monodispersed and stable TMC nanoparticles of less than 65 nm forming a compatibly homogeneous system even upon storage. Microscopy of the polyelectrolyte doped nanoparticles showed a clear coating due to PSS at the periphery of the particles and a fluorescent core with some tiny central hollow cavities Confocal microscopy of the alhydrogel beads showed particle size of 1.6 μm. The fluorescent dye (PSSRhodamine) coated the entire particle surface suggesting a more or less adsorption process for the antigen delivery [2]. Hence, the hope of nanocarrier for malaria vaccine.

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Published: 1 May 2012

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doi:10.1186/1758-2946-4-S1-P47
Cite this article as: Nnamani *et al.*: Preliminary characterization of N-trimethylchitosan as a nanocarrier for malarie vaccine. *Journal of Cheminformatics* 2012 **4**(Suppl 1):P47.

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