

Accepted Manuscript

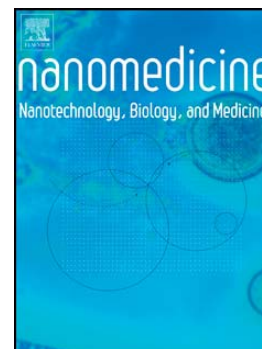
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PII: S1549-9634(17)30014-X
DOI: doi: [10.1016/j.nano.2017.01.012](https://doi.org/10.1016/j.nano.2017.01.012)
Reference: NANO 1515

To appear in: *Nanomedicine: Nanotechnology, Biology, and Medicine*

Received date: 12 October 2016
Revised date: 20 December 2016
Accepted date: 13 January 2017



Please cite this article as: Kalita Prasanta, Chaturvedula Lakshmi M., Sritharan Venkataraman, Gupta Shalini, In vitro flow-through assay for rapid detection of endotoxin in human sera: A proof-of-concept, *Nanomedicine: Nanotechnology, Biology, and Medicine* (2017), doi: [10.1016/j.nano.2017.01.012](https://doi.org/10.1016/j.nano.2017.01.012)

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In vitro flow-through assay for rapid detection of endotoxin in human sera: A proof-of-concept

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Word count for abstract: 150

Complete manuscript word count excluding references: 5979

Number of references: 34

Number of figures: 4

Number of tables: 3

This project was financially supported by the Design and Innovation Center grant (#CORP/SS436) received from IIT Delhi and the annual grants given by GMERF. PK acknowledges Council of Scientific and Industrial Research (CSIR), New Delhi, for senior research fellowship. An Indian patent (201611007932) has been filed for this work. The authors report no conflict of interest.

Abstract. An increase in endotoxin concentration in the bloodstream can trigger activation of innate immune response leading to septic shock. There is currently no method available for rapid endotoxin detection at a patient's bedside. We demonstrate a simple, portable and cost-effective strategy to measure endotoxin levels in human serum within 5 min using a flow-through assay. A drop of serum containing LPS was spotted on an endotoxin-affinity membrane placed over high-wicking absorbent pads. Subsequent addition of polymyxin B sulfate drug-conjugated gold nanoparticles allowed concentration-dependent visualization of spots by the naked eye in the clinically-relevant range of 10 pg/mL to 10 ng/mL. The results were quantified using a concentration-calibrated color chart and the assay performance was tested with archival plasma samples of 18 known septicemia patients. The results showed a reasonably good correlation with the patients' hematological data. This proof-of-concept study puts forth an interesting alternative for early septicemia diagnosis in future.

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