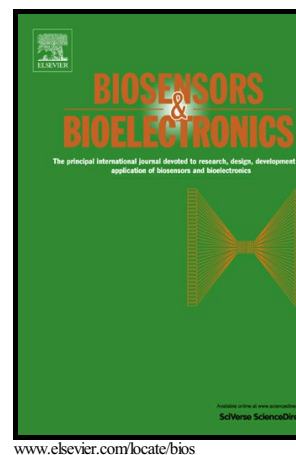


Microwave-accelerated bioassay technique for rapid and quantitative detection of biological and environmental Samples

Muzaffer Mohammed, Maleeha F. Syed, Kadir Aslan



PII: S0956-5663(15)30386-9
DOI: <http://dx.doi.org/10.1016/j.bios.2015.08.061>
Reference: BIOS7957

To appear in: *Biosensors and Bioelectronic*

Received date: 23 June 2015
Revised date: 18 August 2015
Accepted date: 28 August 2015

Cite this article as: Muzaffer Mohammed, Maleeha F. Syed and Kadir Aslan Microwave-accelerated bioassay technique for rapid and quantitative detection of biological and environmental Samples, *Biosensors and Bioelectronic* <http://dx.doi.org/10.1016/j.bios.2015.08.061>

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 galley proof before it is published in its final citable 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

Microwave-Accelerated Bioassay Technique for Rapid and Quantitative Detection of Biological and Environmental Samples

Muzaffer Mohammed, Maleeha F. Syed and Kadir Aslan*

Morgan State University, Department of Chemistry, 1700 East Cold Spring Lane,
Baltimore MD 21251.

Corresponding Author: Kadir.Aslan@morgan.edu

1. ABSTRACT

Quantitative detection of molecules of interest from biological and environmental samples in a rapid manner, particularly with a relevant concentration range, is imperative to the timely assessment of human diseases and environmental issues. In this work, we employed the microwave-accelerated bioassay (MAB) technique, which is based on the combined use of circular bioassay platforms and microwave heating, for rapid and quantitative detection of Glial Fibrillary Acidic Protein (GFAP) and Shiga like toxin (STX 1). The proof-of-principle use of the MAB technique with the circular bioassay platforms for the rapid detection of GFAP in buffer based on colorimetric and fluorescence readouts was demonstrated with a 900 W kitchen microwave. We also employed the MAB technique with a new microwave system (called the iCrystal system) for the detection of GFAP from mice with brain injuries and STX 1 from a city water stream. Control bioassays included the commercially available gold standard bioassay kits run at room temperature. Our results show that the lower limit of detection (LLOD) of the colorimetric and fluorescence based bioassays for GFAP was decreased by ~1,000 times using the MAB technique and our circular bioassay platforms as compared to the commercially available bioassay kits. The overall bioassay time for GFAP and

Download English Version:

<https://daneshyari.com/en/article/7231501>

Download Persian Version:

<https://daneshyari.com/article/7231501>

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