Meetings International
SciTechnol

Umut Kokbas, J Diagn Tech Biomed Anal 2018, Volume: 7
DOI: 10.4172/2469-5653-C3-017

World Congress On

BIOSENSORS AND BIOELECTRONICS

August 20-21, 2018 | Chicago, USA

Detection of β-thalassemia mutations by using piezoelectric biosensor for non-invasive prenatal diagnosis

Umut Kokbas
Cukurova University, Turkey

β-Thalassemia is one of the most monogenic autosomal recessive disorder characterized by defective production of the β-chain of hemoglobin. Definition of the β-globin genotype is necessary for genetic counselling in the carriers, and for predicting prognosis and management options in the patients with thalassemia. DNA-based prenatal diagnosis of β-thalassemias routinely relies on polymerase chain reaction (PCR) and gel electrophoresis. The aim of this study is to develop a new procedure, a DNA-based piezoelectric biosensor, for the detection of β-thalassemia mutations fetus' cell-free DNA from maternal blood, the most common β-thalassemia mutation in Turkey. Cell-free fetal DNA can take from maternal whole blood. Bioactive layer may constituted by binding 2-Hidroxymetacrilate Metacriloamidoscystein (HEMA-MAC) nanoploymers on the electrode's surface. Single oligonucleotide probes specific for mutations of β-thalassemia will attached to the nanopolymer. The measurements will execute by piezoelectric resonance frequency which is caused by binding of the cell-free fetal DNA in media with single oligonucleotide probe on the electrode surface. The results must confirmed by the conventional molecular method as ARMS. The piezoelectric resonance frequencies can obtain by hybridization of the cell-free fetal DNA on bioactive layer will found for the samples of normal β-globin, heterozygote, and homozygote of mutations. The developing biosensor will serve as a specific result to mutations. It could accurately discriminate between normal and mutations samples. Because of low costs, fast results, specificity and high detection/information effectiveness as compared with conventional prenatal diagnosis methods, we can be offered this technique as an alternative to conventional methods.

Biography

Umut Kokbas has studied biotechnological biochemistry at Ege University. His profession is in medical biosensor applications. He is a Research Assistant at Medical Biochemistry Department at Cukurova University and working about genetic and, enzymatic biosensors. He has completed the PhD at Cukurova University, Turkey.

ukokbas@cu.edu.tr

Notes: