CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)
Edward Park

Project Number
35434

Project Title
Hybrid Biosensor Capable of Early Diagnosing and Rapidly Monitoring Breast Cancer

Abstract

Objectives/Goals
I plan to develop an enzyme free hybrid biosensor with ODI-CL detection using HRP-mimicking DNAzyme for the early diagnosis of breast cancer.

Methods/Materials
Hemin and bovine serum albumin were purchased from Sigma Aldrich.

Bis (2,4,6-trichlorophenyl) oxalate (TCPO) and 4-methylimidazole (4MImH) were purchased from TCI America. 3 and 30 %

H2O2 were purchased from VWR. Amplex Red was purchased from Cayman Chemical.

Deionized H2O, Ethyl acetate, and Iospropyl alcohol were purchased from EMD.

CEA diagnostic kit for ELISA and 0 calibrator were purchased from Monobind, Inc.

CEA antigen (25 μg) was purchasedfrom Lee Biosolutions.

8-well EIA/RIA strip-well plate was purchased from Costar.

Results
The hybrid biosensor with ODI-CL detection can beapplied as a new tool for the diagnosis of breast cancer.
It is possible to develop hybrid biosensors capable of diagnosing various human diseases such as cancer and infectious diseases, as well as monitoring toxic materials in food and drink.

Conclusions/Discussion
The hybrid biosensor with ODI-CL detection can beapplied as a new tool for the diagnosis of breast cancer.
It is possible to develop hybrid biosensors capable of diagnosing various human diseases such as cancer and infectious diseases, as well as monitoring toxic materials in food and drink.

Development of hybrid biosensor capable of early diagnosing other cancers such as prostate cancer, ovarian cancer, and lung cancer

Summary Statement
My project is about a novel and cost-effective method of diagnosing breast cancer early, so that the patient has a higher rate of survival.

Help Received
Used the equipment provided by Lumi MD under the supervision of Dr. Ji Hoon Lee.