

CELEBRATING  
COMMERCIALISATION  
YEAR 2014

# iiindex 2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

invention  
innovation  
& design  
exposition 2014

INNOVATEUR  
wannabe!  
2014

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UNIVERSITI TEKNOLOGI MARA  
MALAYSIA

*Bridging  
the valley of death :  
advancing the  
commercialisation  
of research*

RESEARCH BOOK

# iiindex2014

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innovation  
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## FOREWORD

The Honourable Minister of Science, Technology and Innovation (MOSTI) has launched 2014 as Malaysia Commercialisation Year 2014 (MCY2014) with the theme Science Technology and Innovation (STI) for Wealth Creation. In line with this theme, Invention, Innovation, Design & Exposition 2014 (iidex2014) is an annual exposition organized by UiTM and is the ultimate platform to highlight and commercialise new inventions and innovations. Researchers and inventors will exhibit their products which cater to the needs and wants of the community and the country.

The iidex2014 creates a new dimension by fusing two competitive concepts, a competition among innovative products and a competition to invite Innovateur Wannabes to perform live pitching of their products to the audience. The iidex2014 focuses on comprehensive commercialization and creating opportunities for entrepreneurs to carry out R&D as well as to provide avenue to commercialise their products. Through expositions such as iidex2014, MOSTI hopes to inculcate the culture of commercialisation of new technology designed and created by Malaysians.

I wish to congratulate all the participants of the iidex2014 and this is the opportunity for all researchers to show their ideas and exhibits their products and creativity. Apart from showcasing their products, innovators will have the opportunity to provide a window to the industry for business matching during the exposition.

Tan Sri Dato' Sri Sallehuddin Mohamed  
Pro-Chancellor, Universiti Teknologi MARA

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## PORTABLE HUMAN HBV DNA DETECTION AND QUANTIFICATION USING INVERTASE-BASED SYSTEM

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Hepatitis B virus (HBV) DNA detection and quantification has important roles in early disease discovery, disease progression monitoring, treatment, and management in the long-run. Many well developed methods and techniques used routinely in medical centres and research laboratories for the detection of the DNA are time-consuming and costly from samples preparation to result delivery. Glucose meters can quantitatively detect target molecules in a solution, a necessity for diagnosis and detection, but only responds to one chemical: glucose. A novel approach by coupling it with a class of molecular sensors called functional DNA sensors will enable detection of the targets. Objectives: This study will utilise the action of invertase enzyme to transform DNA into glucose in developing a cost-effective, portable, and rapid HBV DNA quantification device for public or on-site use. The results of this study could revolutionise and facilitate medical diagnosis and management of infectious diseases particularly hepatitis B with highly cost-effective and simpler solution. Methodology: The quantification is based on target-dependent binding of cDNA-invertase conjugate with the analyte DNA, thereby transforming the concentration of DNA in sample into glucose through invertase-catalysed hydrolysis of sucrose for the readout in a glucose meter. Outcomes: This study would provide novel alternative method for HBV DNA quantification on-site without the high costs and long waiting period of sending samples to professional laboratories. Moreover, portable and cost-effective methods that are directly usable by the public can facilitate early detections to reduce the hazard of the diseases and are also affordable for low income countries and regions.

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## THREE DIMENSIONAL BIODEGRADABLE HYDROGEL FOR THE TREATMENT OF GUM DISEASES

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Gum problems negatively affect the quality of life of the young and adult population. To ease these conditions, we formulated a three dimensional biodegradable hydrogel (CentaGel) for the treatment of gum problems and rejuvenating of teeth supporting structures. CentaGel is a unique innovative product with dual action, systematically made to reduce inflammation, boost the immune system and rejuvenate the collagen builds up in the gum. CentaGel contains natural bioactive components of *Centella asiatica* which is a widely used medicinal plant of South East Asian origin, helps to facilitate the natural healing and recovery of inflamed tissues. CentaGel has won awards at the UiTM IID conference and Nagai-Shukri prize of the Asian Federation for Pharmaceutical Sciences, Tokyo, Japan. CentaGel state-of-the-art prototype is ready for demonstration in an operational environment. This pre-commercialisation activity includes prototype field testing. Product patent approval process is in the final stages at the Intellectual Property Corporation, Malaysia.