IIUM Research, Invention & Innovation Exhibition 2011

"Enhancing Quality Research & Innovation for Societal Development"

Cultural Activity Centre (CAC), IIUM | 9-10th February 2011

International Islamic University Malaysia Research, Invention and Innovation Exhibition 2011

The 2011 International Islamic University Malaysia Research, Invention and Innovation Exhibition (IRIIE2011) organized by International Islamic University Malaysia (IIUM) held on 9-10th February 2011 at the Cultural Activity Centre (CAC) and KAED Gallery, International Islamic University Malaysia

Theme of Exhibition

Enhancing Quality Research and Innovation for Societal Development

Objectives

- To provide an opportunity for researchers to interact and exchange ideas amongst themselves.
- To provide an opportunity to exhibit research outputs of the University.
- To promote research culture within the Kulliyyahs/Centres/Institutes of the University.
- To act as a platform to select research products of the researchers for national and international exhibitions.
- To promote collaborative research between Kulliyyahs/Centres/Institutes and Industrial partners.

Categories

Research, Invention and Innovation in the following categories are displayed:

- Islamic Revealed Knowledge and Heritage *Studies on the revelation (wahy) and the Muslims' intellectual heritage pertaining to it. Sub-areas include: aqidah, tafsir, hadith, tajwid and qira'at, fiqh, usul al-fiqh, shari'ah studies, sirah, ethics, da'wah, Islamic thought, Islamic education, comparative religion and Islamic philosophy(new category)*
- Science, Engineering and Technology
- Health and Allied Sciences
- Social Sciences and Humanities

CONTENTS

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Radio Frequency Identification (RFID) is a rapidly developing wireless technology that utilizes electromagnetic waves for the automatic identification and tracking of objects. An RFID system composes of a transponder or tag, which is attached to an object and uses an antenna to communicate with a reader. This research work presents the design of micro wave Dual-band RFID tag antenna with a modified Minkowski fractal. A Dual-band antenna with a modified Minkowski fractal is selected, due to its many attractive characteristics. This fractal geometry has space-filling properties that can be utilized to miniaturize antennas. In addition, the self-similarity properties of fractals make them especially suitable to design dual-band antennas. These proposed antennas are designed using the electromagnetic simulation software CST for a passive RFID tag operating in the Microwave frequency band. A Dual-band antenna with a modified Minkowski fractal has been designed, fabricated, and measured. The proposed antenna is fed by microstrip line, and it consists of modified Minkowski radiating element on the top layer and partial ground on the bottom layer. Simulated and measured performance results are presented for a modified Minkowski small size (2.4x3.3cm) fractal antenna. The measured result for return loss of the proposed antenna shows that the antenna has two operating frequency bandwidth the lower frequency from 2.2-2.475GHz and the upper frequency from 5.775-5.85GHz. The measurement results showed good agreement with the simulation result.

PP-429 Microspher-iiUM, A Novel, Controlled-Released Drug/Gene Delivery System

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Multiple-emulsion, solvent-evaporation method is employed to synthesise MICROSPHER-iiUM. A biodegradable co-polymer, poly(L-lactic-co-glycolic acid) (PLGA), is used as the matrix to form the microspheres. Briefly, an appropriate amount of PLGA is dissolved in dichloromethane to form the primary emulsion. This phase is then homogenised with an aqueous phase, containing surfactant and a model drug (e.g. plasmid DNA or small molecules drug) for a certain duration and at an appropriate speed. The resultant water-in-oil-in-water (w/o/w) emulsion is then dispersed in a bigger volume of aqueous stabiliser. Then the mixture is transferred to a continuously stirred hardening tank containing the same stabiliser. Stirring is continued for a certain duration to allow complete evaporation of the solvent. The hardened MICROSPHER-iiUM isharvested by means of centrifugation and washing with distilled before it was freeze-dried. Characterisation of the MICROSPHER-iiUM is conducted to investigate its surface morphology, size distribution, encapsulation efficiency and in-vitro release profile. Different protocols are adopted depending on the types of the model drug to analyse the model drug. This MICROSPHER-iium has demonstrated robustness in encapsulating different types of agents with substantial encapsulation efficiency. The controlled-release profile is also achievable due to the inherent degradation rate of the co-polymers, PLGA, of which the rate and duration are dependent on its molecular weight. The colloidal size of this delivery system and the release of drug that can be controlled are envisaged to enhance the quality of therapy in chronic diseases as it can improve patient compliance towards drug regiment owing to reduction in frequency of dosing and reduction in side effects.