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TEKNOLOGI  
MARA

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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DEWAN AGUNG TUANKU CANSELOR (DATC)  
UNIVERSITI TEKNOLOGI MARA  
MALAYSIA

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

RESEARCH BOOK

# iiindex 2014

AN INTERNATIONAL EXPOSITION ON RESEARCH AND INNOVATION

## invention innovation & design exposition 2014

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**RESEARCH INNOVATION BUSINESS UNIT**  
UiTM-MTDC Technopreneur Centre, Universiti Teknologi MARA  
40450 Shah Alam, Selangor Darul Ehsan, MALAYSIA  
Tel : +603-5544 2747/2748/2750  
Fax : +603-5544 2790

Web : [www.iiindex.com.my](http://www.iiindex.com.my)  
Email : [iiindexuitm@gmail.com](mailto:iiindexuitm@gmail.com)



## 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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## MUSHROOM ENDOPHYTIC FUNGI AS A SOURCE OF BIOACTIVE METABOLITES

Fatmawati Lambuk, Jean Frederic Faizal Weber, Sadia Sultan, Nurhuda Manshoor  
Atta-Ur-Rahman Institute for Natural Product Discovery, UiTM Puncak Alam, Selangor.  
*Email: fatma\_potter@yahoo.co.uk*

Fungi are known as a great source of new bioactive metabolites. They can be epiphyte, living at the surface of plant tissue or endophyte, living in between the plant tissue. Mushroom is the fruiting body of a fungus. It is composed of a network of mycelium. This non-flowering plant consists of three parts; a cap, gills and stem. Mushrooms are easily obtained in tropical regions. It grows on its own source of food which is usually dead plants. Here, the interest is the relationship between endophytic fungi and mushroom. Many studies conducted previously show the relationship of the endophytic fungi with plants. Logically, due to the temperature and humidity of tropical climate, the fleshy mushrooms would be easily attacked by bacteria and rapidly decay. Amazingly, this does not happen and leave a question of what type of compounds present in them that ensure their living. Primary metabolites are very important in organisms that play a role in growing and reproduction. Secondary metabolites are the metabolites produced by organism which are not involved in the development and reproduction but play their role in ecological functions. Production of secondary metabolites may manipulate the interaction between host and producer. Hence, the secondary metabolites of these mushroom endophytic fungi will be further investigated for their properties and functions in treating infectious diseases. Mushrooms were collected from Sungai Chilling, Kuala Kubu Bharu, Selangor. Under sterile condition, tissues of mushroom from the base of cap were taken and cultured on potato dextrose agar (PDA) and incubated in dark place at 28°C. Any hyphae of fungus growing out from the tissue were sub cultured to obtain pure culture - sample isolation. The growth rates of each fungus were determined by culturing the fungi on PDA and the diameter of the hyphae grown were taken daily for 40 days. Graphs of the growth rates were plotted to determine the growth pattern and grouped together to enable them to be grown in the same microtiter plate. The fungus were cultured in small scale (microtiter plate) in 12 different media (addition of epigenetics and minerals) and extracted by solid phase extraction. The epigenetic or minerals were added to the media to increase the amount of compounds produced. The solid phase extraction was used, not the conservative methods. The purpose of applying this phase of extraction is to obtain the extract in minimum usage of solvents and time consuming. Then, the crude extract would be proceeded for screening purpose by high performance liquid chromatography using diode array detection (DAD). Interesting peaks in certain media were observed and proceeded with large scale (containing selected epigenetic or elicitor) to obtain large amount of crude extracts. These crude extracts will undergo biological assay tests to see the activity of the extracts towards potentially pathogenic bacteria. Fractionation of the crude extracts which are biologically active was done to get pure compound and each of the compounds were again undergone biological assay tests. These pure compounds which are biologically active would be taken for structure elucidation through nuclear magnetic resonance (NMR), infrared (IR) and mass spectrophotometer (MS). Only a few researches have been done on mushroom endophytic fungi and not many related articles are being published. Fungi are currently known as a great source of novel bioactive compounds from various species of plants. Hopefully, the mushroom endophytic fungi may also give an outstanding result in searching new bioactive compounds and give their contribution in pharmaceutical industry, not only in treating infectious diseases (bacterial involvement) but also as a cure for cancers and other diseases.