



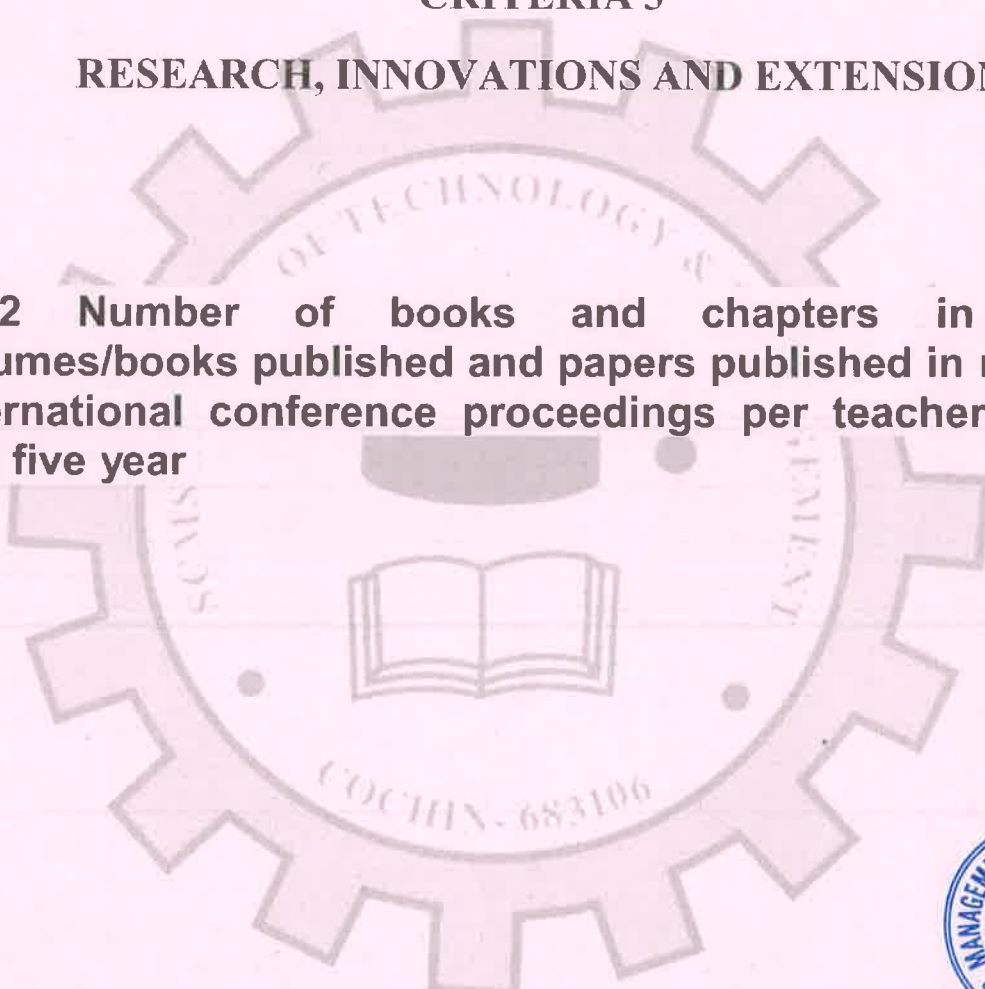
**SCMS SCHOOL OF TECHNOLOGY AND MANAGEMENT (SSTM)**

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### **CRITERIA 3**

#### **RESEARCH, INNOVATIONS AND EXTENSION**

**3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/international conference proceedings per teacher during last five year**



**Dr. G SASHI KUMAR**  
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**3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/international conference proceedings per teacher during last five year**

**2017-2018**

Sl. No.	Title of the book/chapters published	Name of the teacher
1.	Sociogenomic variations of four populations of south India with reference to butyrylcholinesterase activity	Dr. Swapna Merlin David
2.	Influence of heavy metal pollution on the antioxidant enzyme activity in Anabas testudineus collected from Periyar river at ernakulam district and the recovery responses in pollution free water	Asha Raj, M.L. Joseph
3.	Fun is the Future a collection of compelling gamification success stories	Manu Melwin Joy
4.	Mainstreaming Biodiversity for Sustainable Development	Mohankumar Chinnamma.
5.	Organizational behavior - A study on the impact of high commitment work systems organizational citizenship behavior	Manu Melwin Joy
6.	A study on the impact of high commitment work systems organizational citizenship behavior	Manu Melwin Joy
7.	Analysis of trends of banking in Nifty Bank index using ROC and ros	VS BINU
8.	A study on key financial performance	Dr Vinosi Peter

  
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**Swapna Merlin David- Sociogenomic variations of four populations of south India with reference to butyrylcholinesterase activity.( ISBN 81-86366-93-98)**

2<sup>nd</sup> Kerala Science Congress 2017

02-13

**SOCIOGENOMIC VARIATIONS OF FOUR POPULATIONS OF SOUTH INDIA WITH REFERENCE TO BUTYRYLCHOLINESTERASE ACTIVITY**

**Swapna Merlin David<sup>1,2</sup>, R. Lalitha<sup>1,3</sup>, R. Boopathy<sup>1</sup> and C. Mohankumar<sup>1</sup>**

<sup>1</sup>Department of Biotechnology, Bharathiar University, Coimbatore, Tamil Nadu;

<sup>2</sup>Molecular Biology Division, SCMS School of Technology and Management, Cochin, Kerala

<sup>3</sup>Neuro Stem Cell Biology Lab, Rajiv Gandhi Centre for Biotechnology, Trivandrum, Kerala

**Introduction**

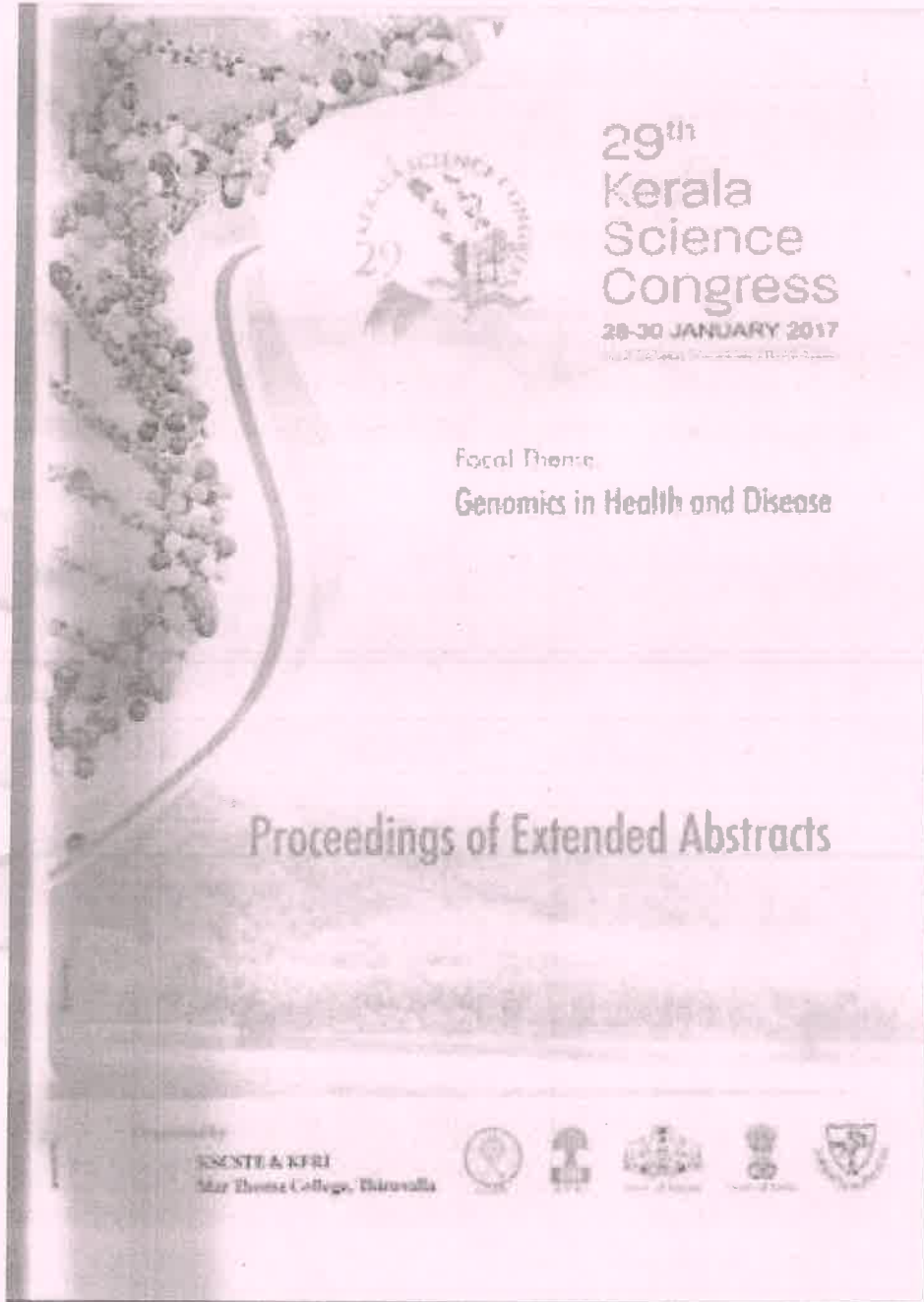
Butyrylcholinesterase (BChE; EC: 3.1.1.8) enzyme was known for a century but its clinical interest becomes evident only after the World War II. The enzyme is of pharmacological and toxicological importance, as it hydrolyses ester-containing drugs and scavenges cholinesterase inhibitors. Also, it is implicated in the metabolism of local anaesthetics such as cocaine, procaine and in the hydrolysis of short-acting muscle relaxant succinylcholine and rocuronium. The enzyme is also involved in several human pathophysiological conditions such as cancers, hepatic disorders, neuronal disorders etc. and hence used as a diagnostic marker protein. Individuals experiencing prolonged apnea after a normal dose of any of the ester containing drugs are suspected with genetic variants of BChE. In most of such cases, several BChE variants with structural BChE protein and lowered activity were evident in different populations. In an Indian origin ethnic community called Vysya, such a BChE variant with a point mutation (T920C) in exon2 of BChE gene, altering the amino acid leucine to proline at 307 position (L307P) of BChE enzyme was identified with neither protein nor enzyme activity in man. Genotyping analysis showed that T920C mutant allele of BChE gene has high frequency among the Vysya population of India. Based on this scenario, the aim of this study was to evaluate the distribution of BChE in different populations of South India. Depending on their social and professional background, we have selected three different populations named Coimbar (Tamil Nadu), Madhavar (Tamil Nadu) and Nair (Kerala) and compared with Vysya (Andhra) population.

134



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Asha Raj, M.L. Joseph- Influence of heavy metal pollution on the antioxidant enzyme activity in *Anabas testudineus* collected from Periyar river at ernakulam district and the recovery responses in pollution free (ISBN 81-86366-93-98)



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09-32

**INFLUENCE OF HEAVY METAL POLLUTION ON THE ANTIOXIDANT ENZYME ACTIVITY IN ANABAS TESTUDINEUS COLLECTED FROM PERIYAR RIVER AT ERNAKULAM DISTRICT AND THE RECOVERY RESPONSES IN POLLUTION FREE WATER.**

Asha Raj KR and Joseph M.L.

Department of Zoology, St. Albert's College, Ernakulam, Kochi, Kerala, India.

**Extended abstract**

Periyar is the carrier of becoming city of Kochi, one of the most urbanized and industrialised region of Kerala, it receives both urban and industrial waste in an alarming rate. Heavy metal (lead, nickel, zinc, arsenic and cadmium) pollution status in water, sediment, and the corresponding bioaccumulation in biomass of *Anabas testudineus* from two different stations of Periyar river at Ernakulam district (Station I- Floor Industrial area, Station II- Irumbanam, Ernakulam) during three seasons (Premonsoon, Monsoon and Postmonsoon) of two year period (2012- 2014) was analysed. The antioxidant enzyme activity (Vit. Catalase (CAT), Superoxide dismutase (SOD) and Glutathione peroxidase (GPx)) in liver, gills and muscle was also estimated. The recovery responses were studied in fishes kept in aquaria maintained at controlled laboratory conditions for 30 days.

A stagnant water body free from urban and industrial influence at Cherthala, Alappuzha district was selected as reference station. The samples for the heavy metal analysis were processed according to the method suggested by APHA (1995) and analysed using the Inductively Coupled Plasma Atomic Emission Spectroscopy in Sophisticated Test and Instrumentation Centre, Cochin University of Science and Technology, Kochi, Kerala. The antioxidant enzyme activity like CAT, SOD and GPx in the organs were analysed by the method suggested by Saha (1972); Das *et al* (2000); Rotruck (1973) respectively.

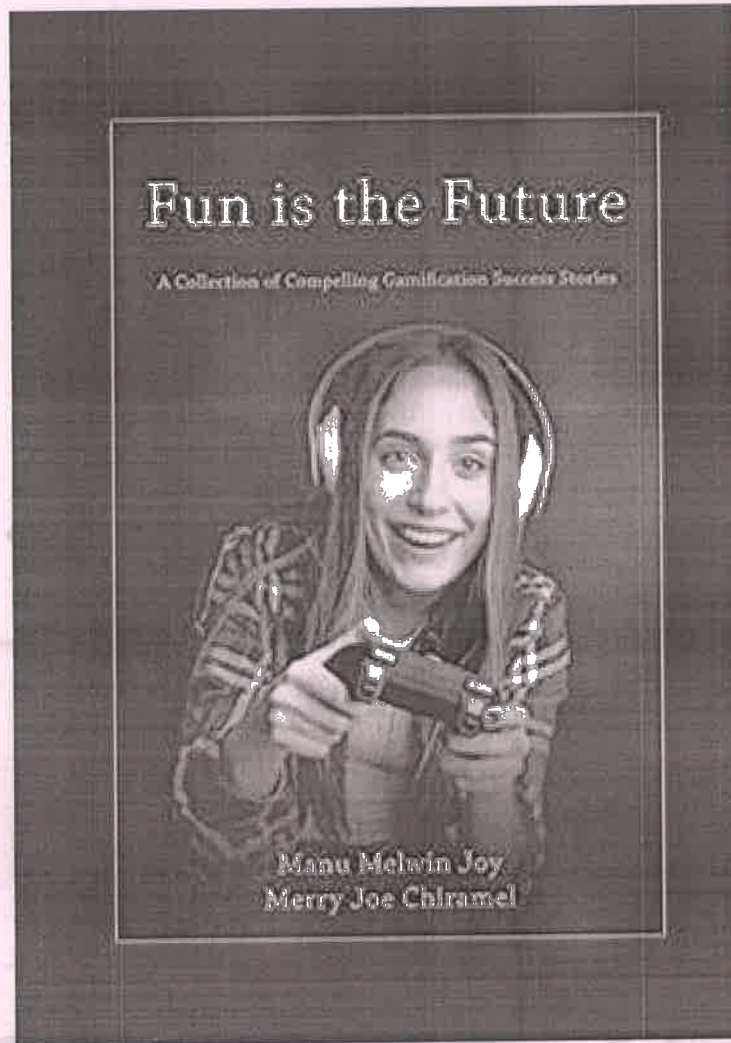
3083



A handwritten signature in blue ink, appearing to read 'Sashi Kumar'.

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Manu Melwin Joy- Fun is the Future a collection of compelling gamification success stories ( ISBN 978-1-61813-874-3)



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**Mohankumar Chinnamma, Anisha Shashidharan and Salini Bhasker-  
Molecular Detection of Vechur cow, the conserved breed of Bos  
indicus from Kerala (ISBN No:978-81-934231-1-0)**



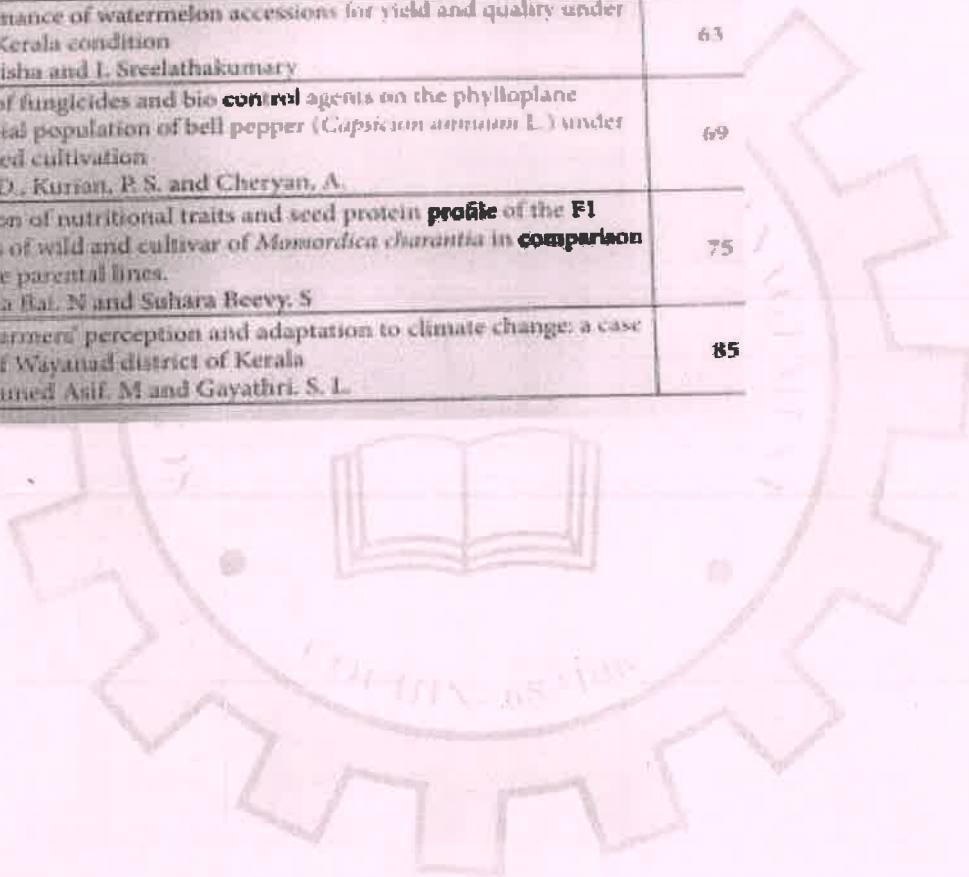
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## MOLECULAR DETECTION OF VECHUR COW, THE CONSERVED BREED OF *BOS INDICUS* FROM KERALA

S. Anisha<sup>1</sup>, Sallini Bhasker<sup>2</sup> and C. Mohankumar<sup>2</sup>

<sup>1</sup> Department of Plant Science, St. Albert's College, Ernakulam, PIN 682018

<sup>2</sup> Molecular Biology Division, SCMS Institute of Bioscience & Biotechnology Research & Development, Cochin, PIN 682033

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Cattle are an important part of the socio-agricultural system in India. At present India possesses the largest cattle population in the world with 61 registered and genous breeds. Vechur cow is the only one from Kerala (NBAGR Accession No. INDIA\_CATTLE\_0960\_VECHUR\_03030). Identification of breeds is based on conventional methods since molecular markers are not popular in India. The correct identification of the animal is of prime importance for conservation. Among the numerous proteins found in milk, Lactoferrin (Lf) is a unique whey protein owing to its multidimensional therapeutic and nutritional properties. In the case of Vechur cow, the Lactoferrin gene (BLFV) has already been amplified, cloned, sequenced and registered in NCBI. Based on the SNPs and amino acid variations in BLFV, an attempt was made towards doing a restriction enzyme analysis for determining the recognition sites in BLFV with respect to the Lf of other cross breeds (*Bos taurus* x *Bos indicus*, BLFBt). It was observed that the SNP at position 526, involving a change from T to C modifies the recognition site for PvuII present in the BLFBt sample. The Lf gene was amplified from the respective clones (BLFV-IP926526 & BLFBt- F1589071) and purified. The gene was digested with PvuII restriction enzyme and the gel profiles compared. Comparison of the restriction profiles confirmed that the enzyme has only two cutting sites in BLFV but three in BLFBt. The consistent result from different samples highlights the specificity of the enzyme for detecting Vechur cows exclusively. Hence, this can be used as a molecular marker for identification of the breed.

**Keywords:** Indigenous breeds, Conservation, Vechur cows

### INTRODUCTION

Cattle, colloquially termed as cows form an important part of the socio-agriculture system in India. Cows occupy 37% of the entire livestock population of the country. At present India possesses the largest cattle population in the world and is the largest producer of milk (146.31 million metric tonnes) (USDA). The cattle wealth of India is composed of valuable indigenous breeds (both desert and non-desert), several indicus x taurus crossbreeds and few taurus breeds well adapted to the Indian climatic conditions. Considerable variation is observed in the climatic conditions in different regions of India. This has led to the development of various breeds in domestic animals including cattle. As per the National

Maximizing Biodiversity for Sustainable Development



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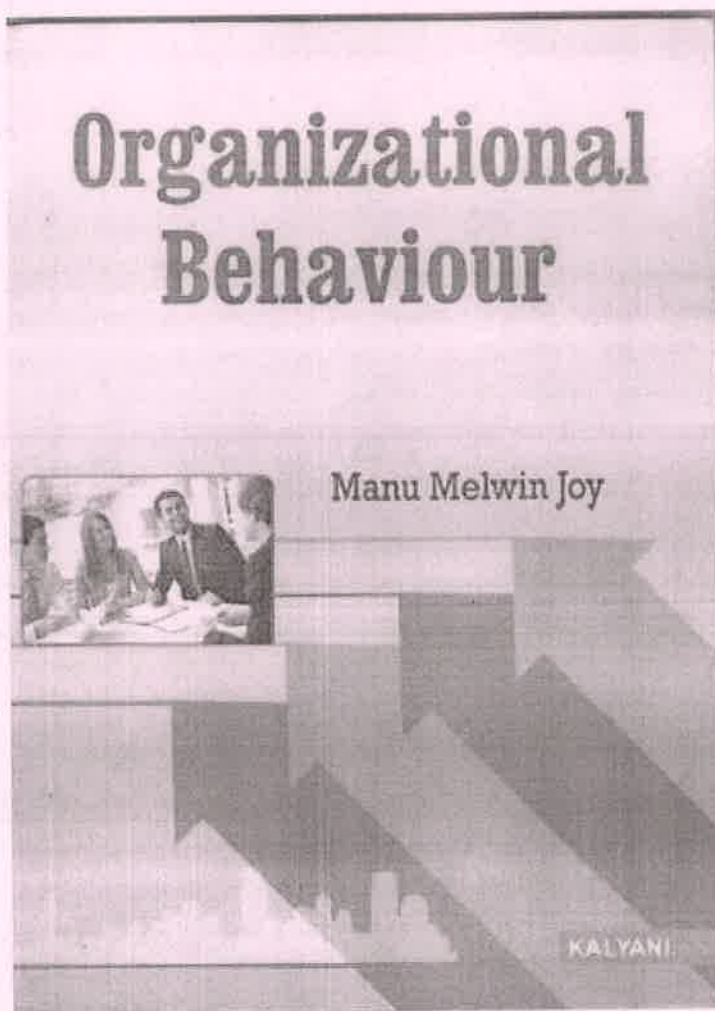


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## Manu Melwin Joy

Book/ Chapter/ Conference : Organizational behavior - A study on the impact of high commitment work systems organizational citizenship behavior  
ISBN No. : ISBN978-93-272-7053-2  
Publishers : Kalyani publishers

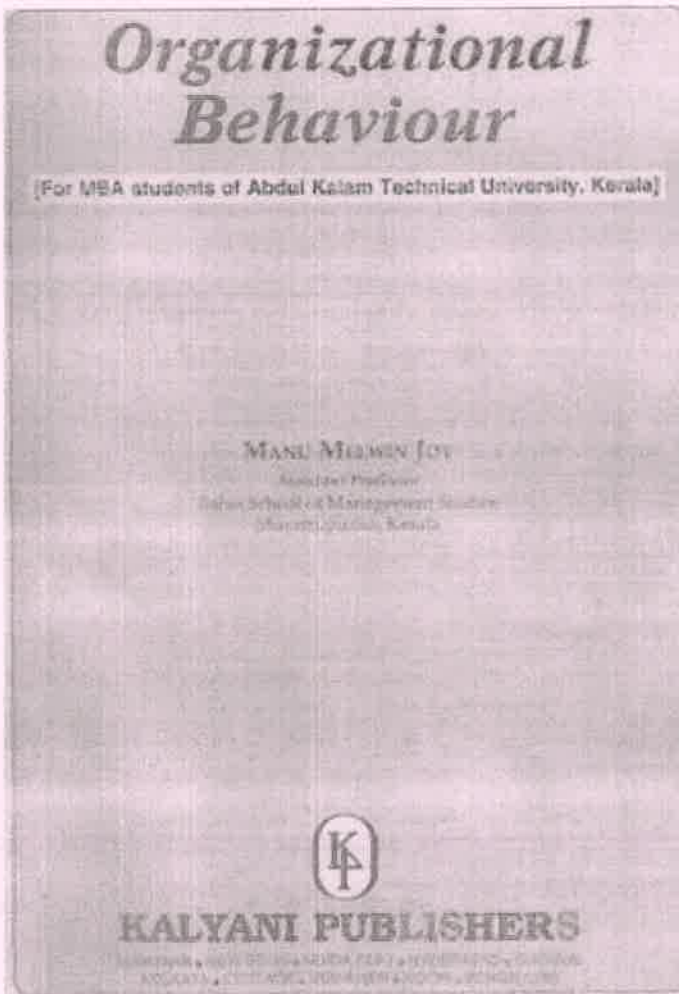


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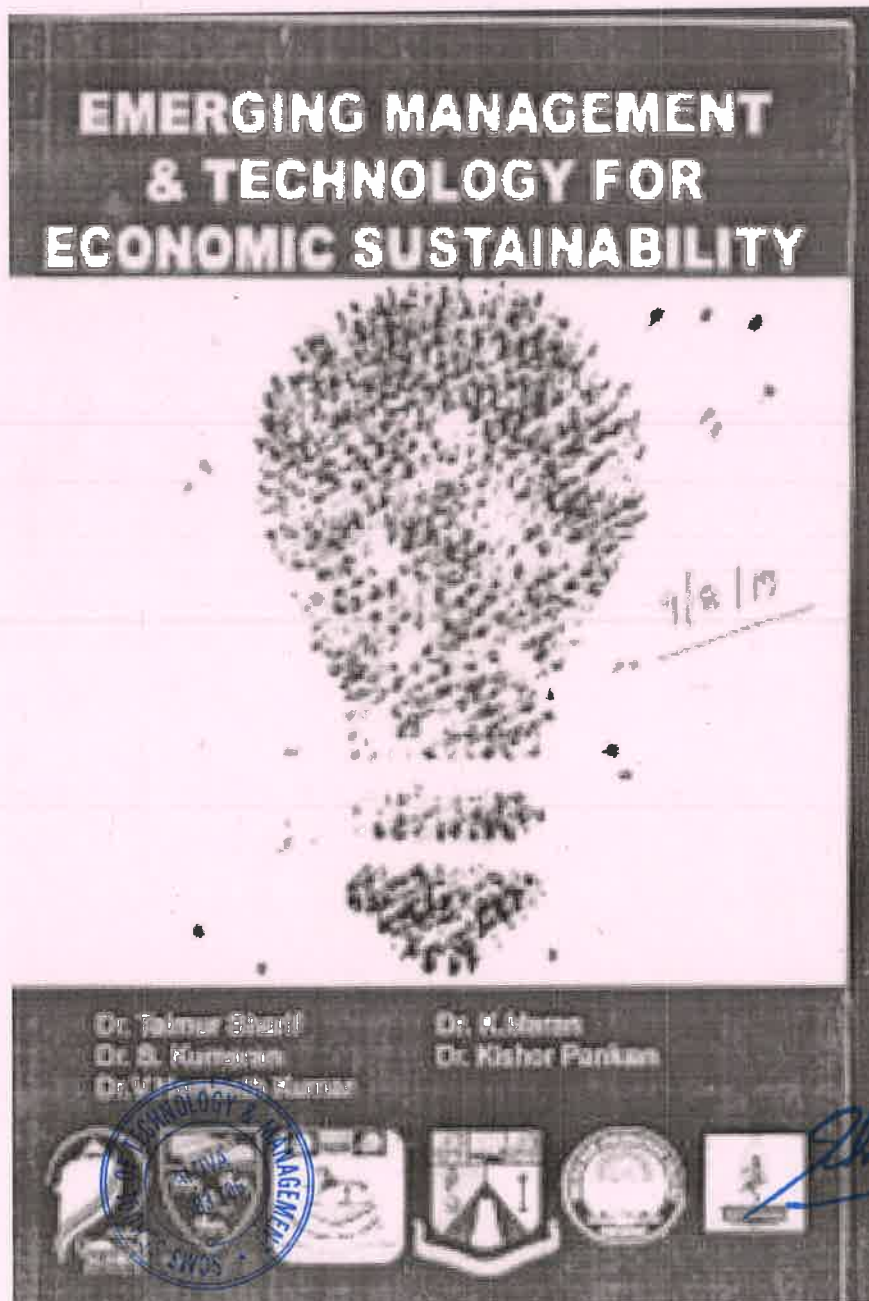


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## Manu Melwin Joy

Book/Chapter/Conference Title : Emerging management and technology for economic sustainability  
Title : A study on the impact of high commitment work systems organizational citizenship behavior  
ISBN No. : 978-93-5228-83  
Publishers : Anuragam Foundation, Chennai



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Book/Chapter/Conference : National conference on trends in engineering applications and management  
Title : Analysis of trends of banking in Nifty Bank index using ROC and ros  
Publishers/ Organized by : Organised by Velalar college of engineering and technology Erode



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## Dr. Vinosi Peter

Book/ Chapter/ Conference : National conference on trends in engineering applications and management  
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 Publishers/ Organized by : Organised by Velalar college of engineering and technology Erode




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**3.3.2 Number of books and chapters in edited volumes/books published and papers published in national/international conference proceedings per teacher during last five year**

**2018-2019**

<b>Sl. No.</b>	<b>Title of the book/chapters published</b>	<b>Name of the teacher</b>
1.	Expression of TGF beta 1 gene in Human Embryonic Kidney (HEK) 293 cell lines by the effect of HALE	Divyaa Sreekumar
2.	Quality of Management Education and its Impact on Skill development: A study of Alumni of Management Institutes in Kerala State	George Mathew
3.	SUSTANANCE OF LARGE OUT REACH	R Rupa
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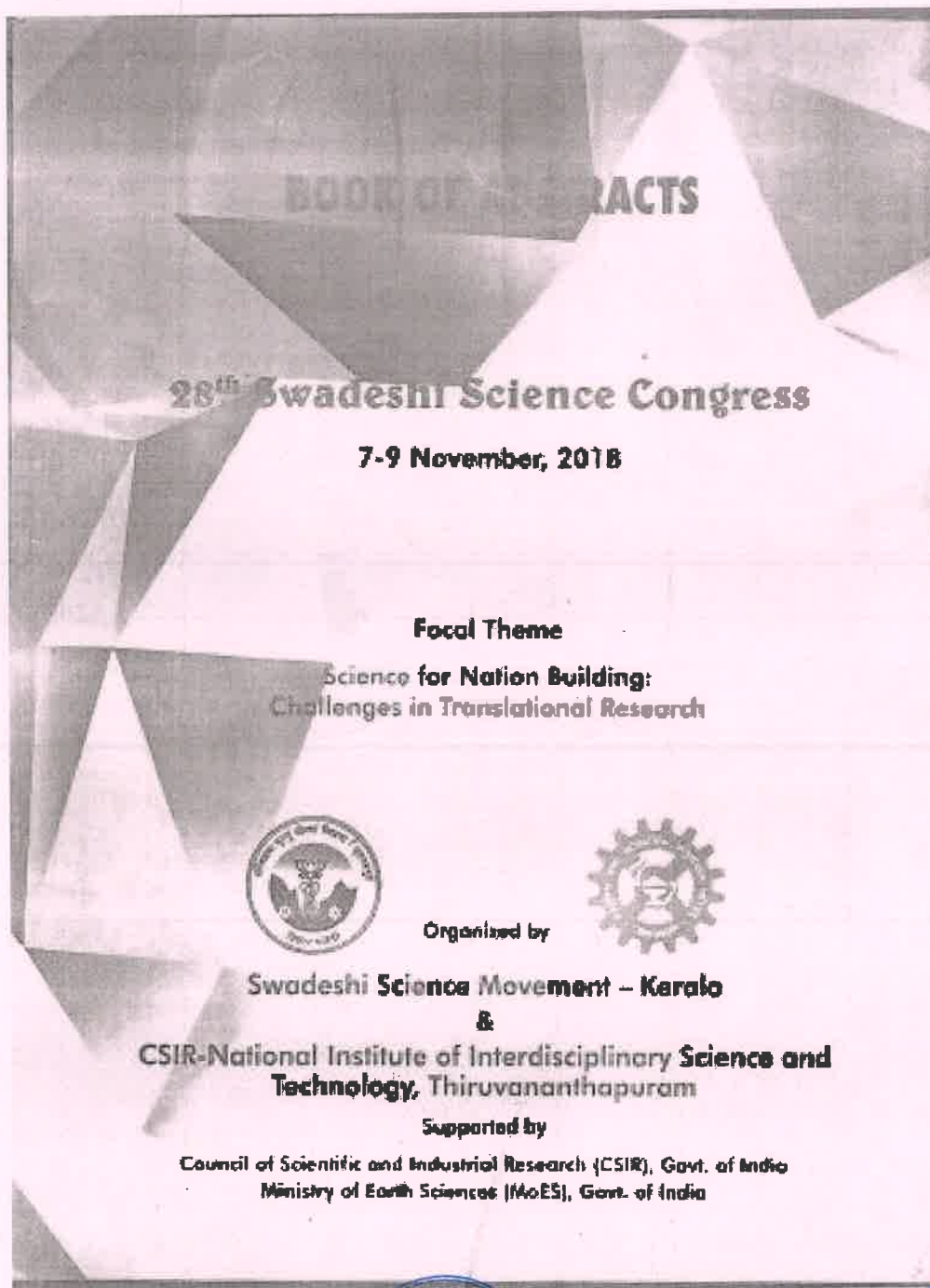




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**Divyaa Sreekumar:** Expression of TGF beta 1 gene in Human Embryonic Kidney(HEK) 293 cell lines by the effect of HALE, 28th Swadeshi Science Congress



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**28<sup>th</sup> Swadeshi Science Congress**

**7 -9 November, 2018**

**at**

**CSIR-NIIST, Thiruvananthapuram**

**Focal Theme**

**Science for Nation Building: Challenges in  
Translational Research**

**Sub Theme**

**Solid and Liquid Waste Management**

**BOOK OF ABSTRACTS**

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**November, 2018**



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an untreated control. The bands indicated that MEAA treated cells at 50 µg/ml and 100 µg/ml concentrations exhibited DNA fragmentation, which points towards the apoptotic-inducing property of MEAA. GCMS analysis of MEAA suggested that the extract was primarily characterized by the presence of phytol, Phthalic acid di (2-propylpentyl) ester and Phthalic acid octyl 2-propylpentyl ester, which are compounds having anticancer potential. The study thus identifies *A. aurum* as a plant having the potential to be developed as an anti-cancer pharmaceutical.

HS -12

**Expression of *TGF-β1* gene in human embryonic kidney 293 cell lines by the effect of *Hemigraphis alternata* leaf extract**

**Divyaa Sroekumar, Salini Bhasker, Mohankumar C.  
and Renuka Devi P.**

SCMS Institute of Bioscience and Biotechnology Research & Development,  
South Kakumassery, Cochin - 682 013

Biotechnology Division, Anna University Regional Center,  
Coimbatore - 641 004

[mohankumar@scmsgroup.org](mailto:mohankumar@scmsgroup.org)

Despite the chemical and biochemical analysis of the therapeutic properties of herbs, the molecular evidence for detecting the mode of action of natural drugs has been a novel trend of research today. *Hemigraphis alternata*, a tropical herb of Acanthaceae family has gained sufficient therapeutic attention in folkloric medicines as a potent phyto-medicine for wound healing. Wound healing is a complex and protracted process of tissue repair and remodeling. Each phase of repair requires presence of certain growth factors, cytokines and immune cells to accelerate healing process. Transforming Growth Factor Beta 1 (*TGF-β1*) is one such growth factor which plays an effective role in wound healing. In the present study, an attempt was made to reveal the molecular mechanism of the wound healing effect of *H. alternata* leaf extract (HALLE) fractions separated by silica-based column chromatography. Nine fractions were collected and each fraction was treated on in vitro scratch wound model cell line cultures of Human Embryonic Kidney (HEK) 293 cells for determining wound closure rate at an interval of 24 hours. It was obvious from the data that the Fractions 8 and 9 showed higher wound closure. The



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George Mathew: Quality of Management Education and its Impact on Skill development: A study of Alumni of Management Institutes in Kerala State

# Quality of Management Education and its Impact on Skill Development: A Study of Alumni of Management Institutes in Kerala State

GEORGE K.MATHEW



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## ABOUT THE AUTHOR



Dr. George K Mathew is presently working as Associate Professor (Marketing) with SCMS School of Technology and Management, Kochi. Dr. Mathew holds a Ph.D. in Management from the Bharathiar University as well as a Post Graduate Diploma in Rural Management (PGDRM) from the Institute of Rural Management Anand (IRMA). At SCMS he teaches various subjects viz. Product and Brand Management, Consumer Behavior, Services Marketing and Business Ethics & Corporate Governance.

Prior to academics, Dr. Mathew worked with FMCG and Pharmaceutical industry in the functional area of Sales and Marketing for more than 25 years. During this stint with the National Dairy Development Board (NDDB) he undertook a host of assignments, in various capacities as a marketing consultant, manager, trainer and coach for the FMCG (dairy and edible oil) brands viz. Dhara, Sudha, Saras, Verka, Nandini, Suhana, Kiran and Sulabh. Subsequently he also worked for the prestigious brands 'AMUL' (Dairy) and 'SUGUNA' (Poultry) in the respective Companies. Prior to joining SCMS group, Dr. Mathew also had a stint as the Managing Director of the Kerala State Drugs and Pharmaceuticals Ltd., a Public Sector Undertaking in Kerala and significantly contributed to its turnaround efforts.

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Book/Chapter/Conference  
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 : SUSTANANCE OF LARGE OUT REACH  
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MFI's - A Comparison of India & Bangladesh  
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 National Conference on Recent Advancements in Business Practices, organized by  
 Nehru Institute of Management Studies & Nirmala College for Women,  
 Coimbatore on 01st February 2018

  
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## R. Rupa

Book/ : National Conference Disruptions in Banking  
Chapter/  
Conference  
Title : Digital Payment in India  
Publishers/ : Organised by Dr NGP. Arts and Science College  
Organized by : Coimbatore



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on

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28<sup>th</sup> February 2018

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**Praveen K.**

Book/Chapter/Conference  
Title : International Conference on Aging Well (2018)  
Are our elder digitally literate? A study to understand the internet usage of elders  
Publishers/Organized by : Scms Group of Institution and India Medical Association and Helpage India



Sl No. (11)

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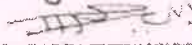
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Title: Are our elders digitally literate? A study to understand the internet usage by elders.

Place : COCHIN  
Date : 13.01.2018

  
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SCMS Group Director  
& Conference Convener

  
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# SCMS SCHOOL OF TECHNOLOGY AND MANAGEMENT

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**Divyaa Sreekumar: Inducing Effect of Marker Genes PAI 1 and TGF  $\beta$ 1 in Wound Closure in Cell line cultures using Hemigraphis alternata leaf extract (HALE)**

## CERTIFICATE

*Department of Biotechnology Engineering, Sahasraya College of Engineering & Technology, Kodakara, Kerala together with All India Council for Technical Education confers*

**Ms. DIVYAA SREEKUMAR, SCMS COCHIN**

*with the First / Second prize in the Postgraduate / Undergraduate category for the presentation of the Paper / Poster entitled*

**INDUCING EFFECT OF MARKER GENES PAI 1 / TGF  $\beta$ 1 IN WOUND CLOSURE IN CELL LINE CULTURES USING HALE**

*during National Conference on MOLECULAR TOOLS & DISEASE DIAGNOSIS, Organised by Department of Biotechnology Engineering, Sahasraya College of Engineering & Technology, Kodakara, Kerala; held over October 3-3, 2019 at college campus.*

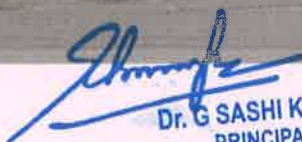
  
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**2019-2020**

<b>Sl. No.</b>	<b>Title of the book/chapters published</b>	<b>Name of the teacher</b>
1.	Inducing Effect of Marker Genes PAI 1 and TGF $\beta$ 1 in Wound Closure in Cell line cultures using Hemigraphis alternata leaf extract (HALE)	Divyaa Sreekumar
2.	education 4.0 in India and challenges in teaching learning process	DR. Deepa Pillai, Dr.Rajeswari R
3.	Cultivate the seven habits for the best performance in the learning organisations	Dr. Rajeswari R
4.	Collaborative Destination Marketing Through Trade Shows - A Study OF Kerala Travel Mart	Dr. Shobha Menon

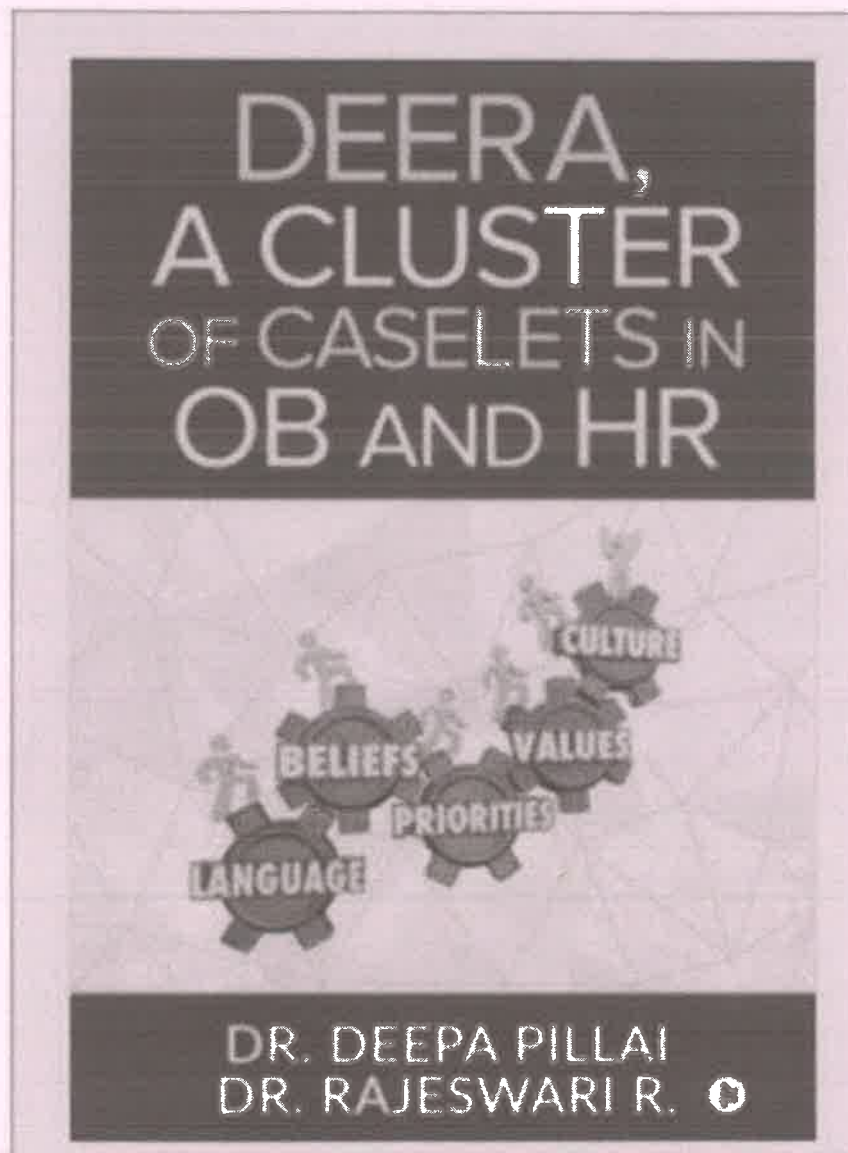
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**Dr Deepa and Dr Rajeshwari: DEERA ; A cluster of case lets in OB and HR**



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**Title:** Cultivate the seven habits for the best performance in the learning organizations



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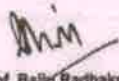
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**COLLABORATIVE DESTINATION MARKETING  
THROUGH TRADE SHOWS - A STUDY  
OF KERALA TRAVEL MART**

**Dr. Shobha Menon  
Dr. Manoj Edward**



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**COLLABORATIVE DESTINATION MARKETING  
THROUGH TRADE SHOWS - A STUDY OF KERALA  
TRAVEL MART**

**Dr. Shobha Menon  
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2020-2021

Sl. No.	Title of the book/chapters published	Name of the teacher
1.	"Buisness Managemnet Practices- Emerging Trends (Co-authored a chapter in the book)	Dr Dulari S. S.
2.	'The Role of PAI 1 gene in wound closure of scratch wound models under the treatment of <i>Hemigraphis alternata</i> leaf extract (HALE)'. E Judiciary system-Accessing Justice in a virtual world	DIVYAA SREEKUMAR A Arsha, Aishwarya Murali

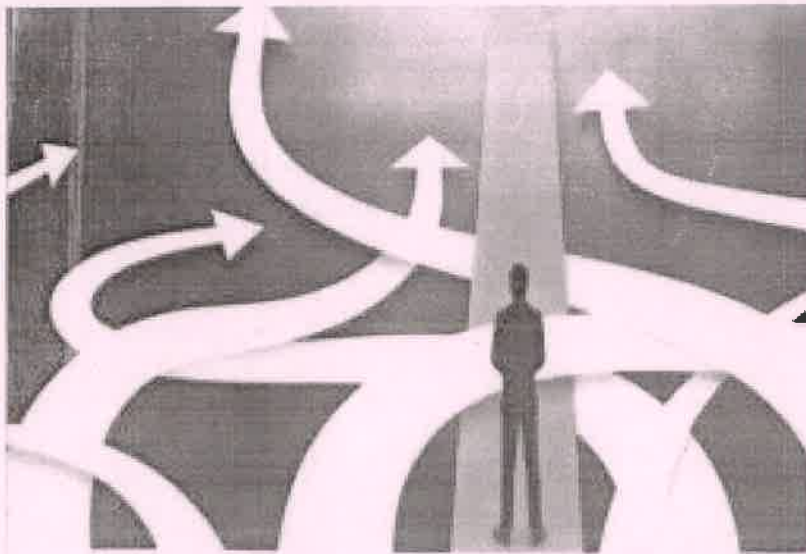
  
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1. Dr. Dulari SS: Book Chapter titled – Online Education opportunities and challenges –For an edited book entitled “Management Education Post Covid Dr. Dulari S : - Buisness Managemnet Practices- Emerging Trends 19” bearing – ISBN "978-93-90153-00-8", Bestow Edutrex International, Mumbai



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full view of the products and information through online channels. Ultimately it is about embracing change to grow, adapt and win in the retail business.

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2. 'The Role of PAI 1 gene in wound closure of scratch wound models under the treatment of *Hemigraphis alternata* leaf extract (HALE)' – Dr DIVYAA SREEKUMAR



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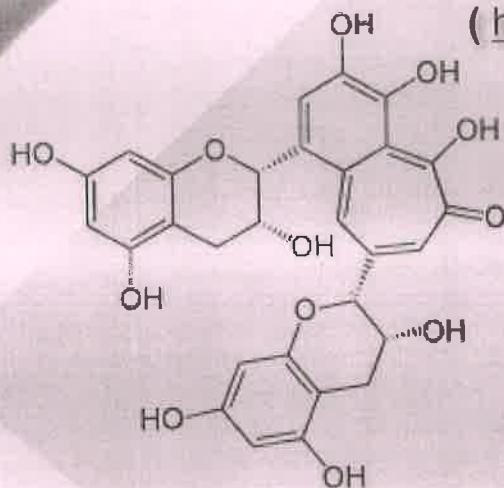
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### Oral Presentations

#### Session I

28-09-2020 (First Day)

Time: 12.30 pm to 1.30 pm

**Chair:** Dr. V. George, Director, Amity Institute of Phytochemistry and Phytomedicine,  
Thiruvananthapuram

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**Session II**

**28-09-2020 (First day)**

**Time: 2.00 pm to 4.30 pm**

**Chair:** Prof. (Dr.) A. Gangaprasad, Dean, Faculty of Science, Uty of Kerala, Thiruvananthapuram and  
Dr. Raghu K. G., Senior Principal Scientist & Head, Agro Processing and Technology Division, CSIR-NIIST, Thiruvananthapuram

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**29-09-2020 (Second Day)**  
**Time: 12.00 pm to 1.30 pm**

**Chair:** Dr. G. Jayakumar, Former Principal, MG College, Thiruvananthapuram

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**Chair:** Dr. A. Jayakumaran Nair, Head, Dept.of Biotechnology, Hon. Director, IUCGGT, University of Kerala

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*Dr. G. Jayakumar*  
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**The Role of PAI 1 gene in wound closure of scratch wound models under the  
treatment of *Hemigraphis alternata* leaf extract (HALE)**

Divyaa Sreekumar<sup>1</sup>, Salini Bhasker<sup>2</sup>, P. Renuka Devi<sup>3</sup>, C. Mohankumar<sup>2</sup>

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**Abstract**

*Hemigraphis alternata* the potent exotic herb is used widely in folklore medicines as an effective wound healing drug. The result of the present study demonstrates the molecular mechanism of the wound healing effect of scratch wound model cell line cultures (myoblast L6 cells) by treatment of HALE. Histological changes on the cells were observed for 3 days after the treatment with HALE at an interval of 24 hrs. The parameters like antiinflammatory activity by membrane stabilization of RBCs, protein and proteinase denaturation, and antioxidant property by NOX assay and DPPH assay were determined. Cell viability in the presences of HALE was examined by MTT assay. The qPCR data further support the histological and phytochemical observations. It's obvious from the data that HALE showed a higher efficiency in inducing the expression of PAI 1 gene which in turn indicates its wound healing efficacy. At molecular level, effect of the marker gene PAI 1 gene in wound healing was revealed by quantifying the gene copy number in HALE treated scratch wound cells by qPCR. A higher level of PAI 1 gene copy was observed in HALE treated cells than the control i.e. without HALE. The gene quantification data further supports the wound closure observed in scratch wound models treated with HALE. To the best of our knowledge, this is the first report showing the wound healing effect of HALE with molecular evidenc



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## A COMPARATIVE STUDY ON CONSUMER PROTECTION ACT OF 2019 AND 1986

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Assistant Professor, SCMS School of Technology and Management, Muttom, Aluva, Kerala

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**Abstract:** Consumer refers to any person who purchases some goods for a consideration that has been either paid or promised to pay or partly paid and partly promised.

The consumer protection Act 2019 provides for the protection of interest of consumers and to establish authority for timely and effective administration and settlement of consumer disputes. The Act has been enacted by the parliament in the 70<sup>th</sup> year of republic of India and received the assent of the President on 9<sup>th</sup> August 2019 thereby repealing the Consumer Protection Act 1986. In the modern era of marketing where consumer sovereignty exists this Act plays a significant role. The various lacunae created by the provisions of Consumer Protection Act 1986 stipulated the need for redesigning and forming a new Act with more strict and stringent rules which finally led to the Consumer Protection Act 2019. In this paper we will be making a comparative study on the provisions of Consumer Protection Act 2019 and Consumer Protection Act 1986. The paper will also highlight the role played by different consumer protection councils in dealing with the issues of consumer.

**Keywords:** Consumer, Protection, Councils.

**Introduction:** "A customer is the most important visitor on our premises. He is not dependent on us. We are dependent on him. He is not an interruption in our work. He is the purpose of it. He is not an outsider in our business. He is part of it. We are not doing him a favour by serving him. He is doing us a favour by giving us an opportunity to do so" - Mahatma Gandhi.

The existence of a business is solely dependent on the consumers. They are the in the forefront in all aspects business. Consumer Sovereignty is the lime light in this era of globalization. The key motivation for the production units to run smoothly are the demand for the consumers. The consumer is an individual who pay for buying goods and availing services. They play an important role in the chain of distribution.

Consumer refers to any person who purchases some goods for a consideration that has been either paid or promised to pay or partly paid and partly promised.

To protect the interests of consumers in 1986 the landmark legislation of Consumer Protection Act was enforced from 1986. It provides all round protection to consumers and safeguards against various types of exploitation. The act ensures simple speedy and inexpensive machinery for redressal of consumer grievances at district, state and national level. The agencies had jurisdiction to adjudicate the complaints received from consumers against any defect in the goods purchased or deficiencies in the services availed or any other trade practices. The Act is applicable to all goods, services and unfair trade practices unless exempted by the Central Government under all sectors-Private, Public or Co-Operative.

Consumer Protection Act 2019 replaced the Consumer Protection Act 1986 and aims at protecting at strengthening the rights of consumers by establishing authority imposing strict liabilities and penalties on product manufacturers, electronic service providers, misleading advertisers, and by providing additional settlement of consumer disputes through mediation





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2	De-motivating factors towards entrepreneurship career among management student	Tess Jacob
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## 2. Tess Jacob: Demotivating factors towards entrepreneurship career among management student : ISSN:2336-2693 | E-ISSN:2336-4890

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### Demotivating factors towards entrepreneurship career among management student

Tess Jacob

Assistant Professor IICOM Department SCMS School of Technology and Management Muttom, Kalamassery

#### ABSTRACT

Entrepreneurs are the key pillars for the development of a country like India hence it is in the developing stage. The person who is doing the process of entrepreneurship activity is called an entrepreneur. Students are taught to be executives, corporate leaders, directors and administrators through management education, which is a discipline of higher education. The goal of this research paper is to find out the demotivating factors among management students to pursue a career in entrepreneurship. With the use of SPSS software, the data was analyzed using descriptive analysis, one way ANOVA, cross tabulation and t-test. The study discovered that out of all the demotivating elements unavailability of capital is ranked one with 3.1683 mean and 1.36398 standard deviation.

**Keywords:** Economic development, Entrepreneur, Career, Demotivation and Capital

#### 1 Introduction

Management education's primary goal is to mold future company leaders. Students learn how to build the necessary leadership skills through this program. Manage a group of People who work in management education must be able to adapt to new situations. In terms of legislation, regulations, and trends India has a large number of reputable management institutes that participate in the program for the progress of the country. Management institutes are marketing themselves on the basis of number of placements during the course duration. So while pursuing education, students look forward to highly paid jobs. They do not think about the entrepreneurial opportunities available in the market and are not willing to accept entrepreneurship as a career option. Certain demotivating factors are there behind the reason for not choosing an entrepreneurship career. The purpose of this study is to rank the various demotivating factors among management students and how it related with different demographic features.

#### 2 Statement of the problem

In current situation, youngsters will start job hunting immediately after the completion of job. They will consider business as the last option in the career list. Management institutes and parents are not supporting the students to gain the entrepreneurship career; they will push the students to get highly paid jobs. Apart from that our education system focuses more on exams and results, instead of innovation and creative ideas. Hence, the problem is stated as demotivating factors towards entrepreneurship career among management students with reference to Kottayam district.

#### 3 Objectives

- To study various demotivating factors towards entrepreneurship career among management students.
- To analyse the relationship between demotivating factors and various demographic features of management students.

#### 4 Research Methodology

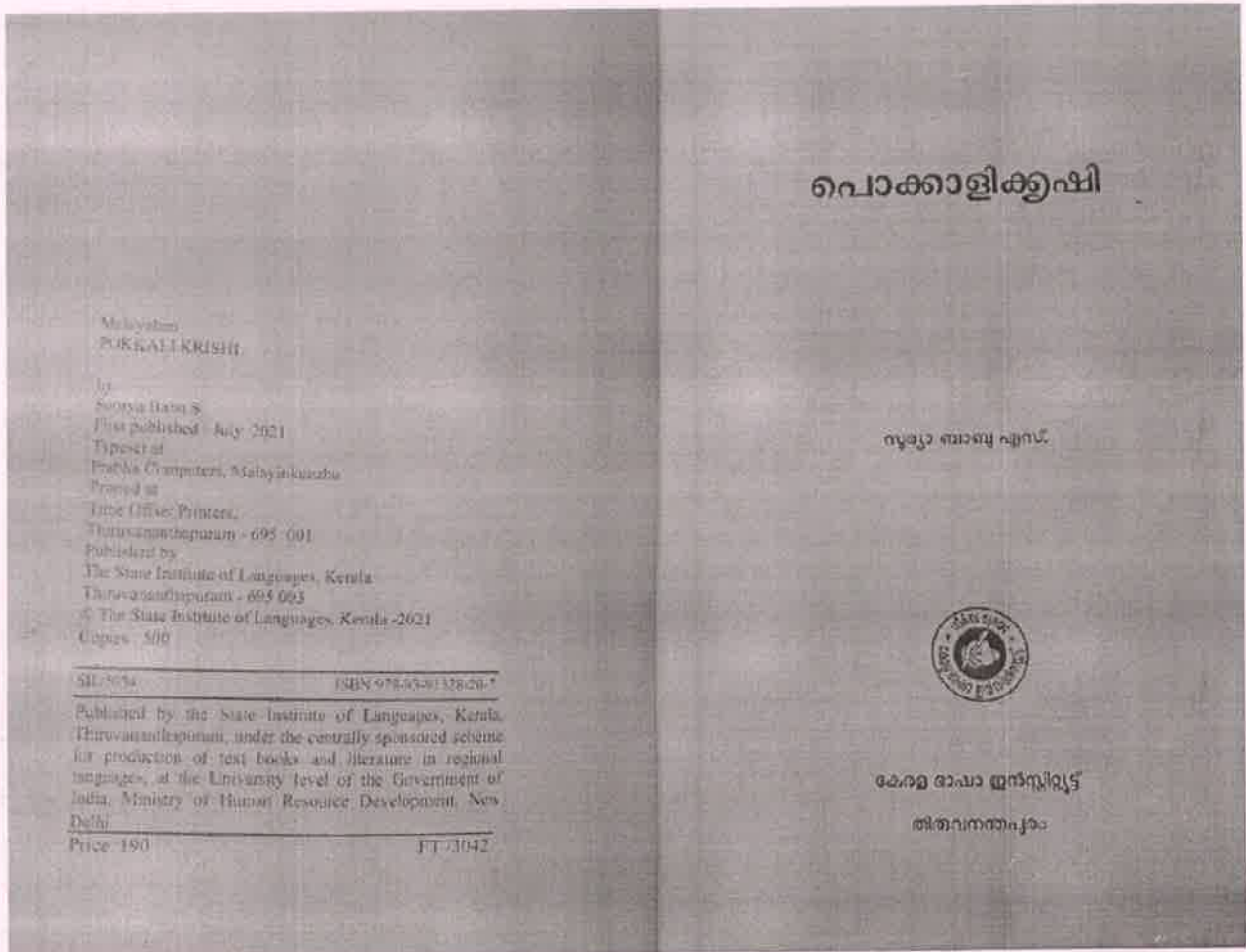
The researcher has adopted a descriptive study for this paper. Cochran sample size formula is used to select 200 samples out of the population since it is a finite population. The population for this study is all the final year management students in Kottayam district. A structured questionnaire is distributed among the management



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3. Dr. Surya Babu S. - Pokkali Krishi - ISBN 978-93-91328-20-7



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4. Divya UK - Bioentrepreneurship in Biosciences - Recent Approaches ISBN : 978-93-93942-38-8

Bioentrepreneurship in Biosciences - Recent Approaches

**Sustainable Development Goals-2030 Agenda**

**Dr Divya UK**

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Management House, South Kalamassery  
Ernakulam, Kerala- 682033  
Email: [divyauk22@gmail.com](mailto:divyauk22@gmail.com)

**Introduction**

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3. Ensure healthy lives and promote well-being for all at all ages
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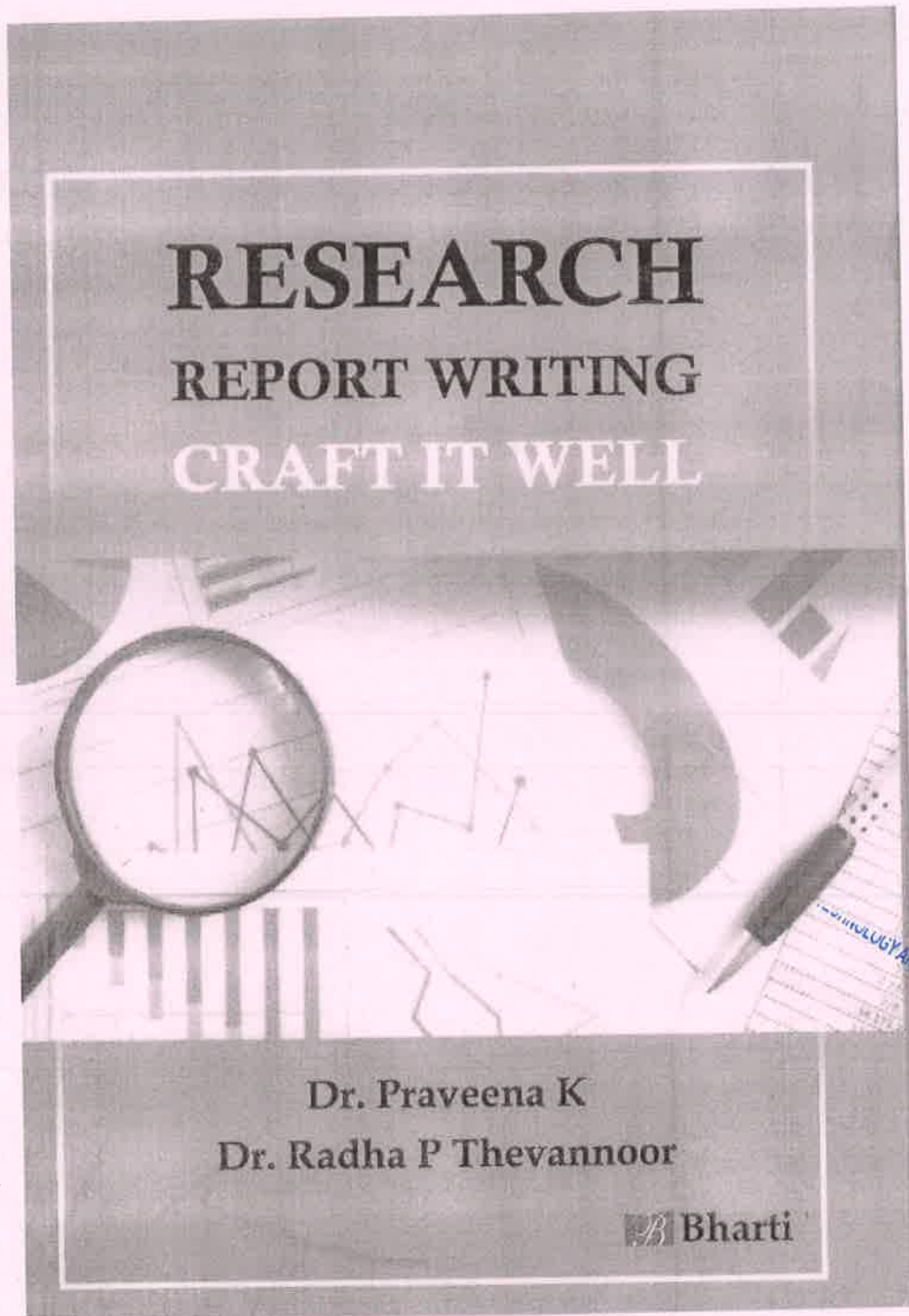
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6. Govind S Menon: India Quiz

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## 7. Govind S Menon :Development of a photovoltaic thermal collector

Proceedings of the International Conference on  
Sustainable Technology and Innovation for Industry 4.0 (ICSTI 2022)  
April 21-22, 2022, CUSAT, Kochi, Kerala, India.

### DEVELOPMENT AND EXPERIMENTATION OF A HYBRID PHOTOVOLTAIC THERMAL (COGENERATION) SYSTEM

Govind S. Menon<sup>1</sup>, Jacob Elias<sup>2</sup>, S. Murali<sup>3</sup>

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<sup>3</sup> ICRAR-Central Institute of Fisheries Technology, Kochi - 682 629, Kerala  
India

#### ABSTRACT

PVT system is a hybrid co-generation technology device along with a photovoltaic panel and thermal collector that produces electric and thermal energy simultaneously. The PV module is cooled using the waste heat generated inside the module and ultimately the overall performance of the device increases. Flat plate collectors are easy to fabricate and need less maintenance. Flat plate collectors additionally collect heat from each type of radiation - beam or diffuse. In a PVT device, the heat generated using the photovoltaic is conducted in an absorption absorber plate and eliminated by convection using the gliding of water via cooling pipes, and extracting the waste heat from the panel. In this study a Serpentine tube Flat Plate Collector based Photovoltaic Thermal Hybrid system is fabricated and experimented. The electrical efficiency of the PVT system with cooling was found to be 14.95 %. The obtained thermal efficiency was 61%.

#### INTRODUCTION

The photovoltaic-thermal hybrid solar collector (or PVT) is a system that combines a photovoltaic (PV) module for solar energy conversion and a high-efficiency thermal conversion module that uses a thermal fluid (Ramesh et al., 2014). Majority of the solar energy is absorbed or reflected in the solar cell. As a result, the operating temperature of the solar cell rises dramatically after lengthy operations. Unglazed collectors have a higher electrical efficiency and reduced convective heat. Flat plate solar collectors are a promising alternative for future, since they are cheap and simple to fabricate. The current studies discuss the technology behind these collectors and traces their development including design and operating aspects such as absorber plate designs, use of novel materials for absorber plate, use of nano fluids for enhancing the heat transfer etc. in accordance to Dobryal et al. (2020). Flat plate collectors are simple to make and require little maintenance (Pashikian et al., 2020). Flat plate collectors gather heat from both beam and diffuse radiation. PVT is a form of co-generation system technology that absorbs waste heat from a solar panel to provide both power and heat from a single system (Dobryal et al., 2011). The current study explains the methodology of Flat plate photovoltaic thermal collector fabrication and experimentation. PVT panel temperature is reduced by the cooling mediums, including air, water, and nanofluid and the absorbed heat can be utilized for domestic and industrial applications (Hassant et al., 2014; Wang et al., 2019; Dami et al., 2019). A PVT system can harness maximum energy per unit area than a parallelly fixed PV panel and solar



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AND SOCIETY  
THE SHIFTING PARADIGM  
(VOL – II)**

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**CORPORATE SOCIAL RESPONSIBILITY AND COVID-19**

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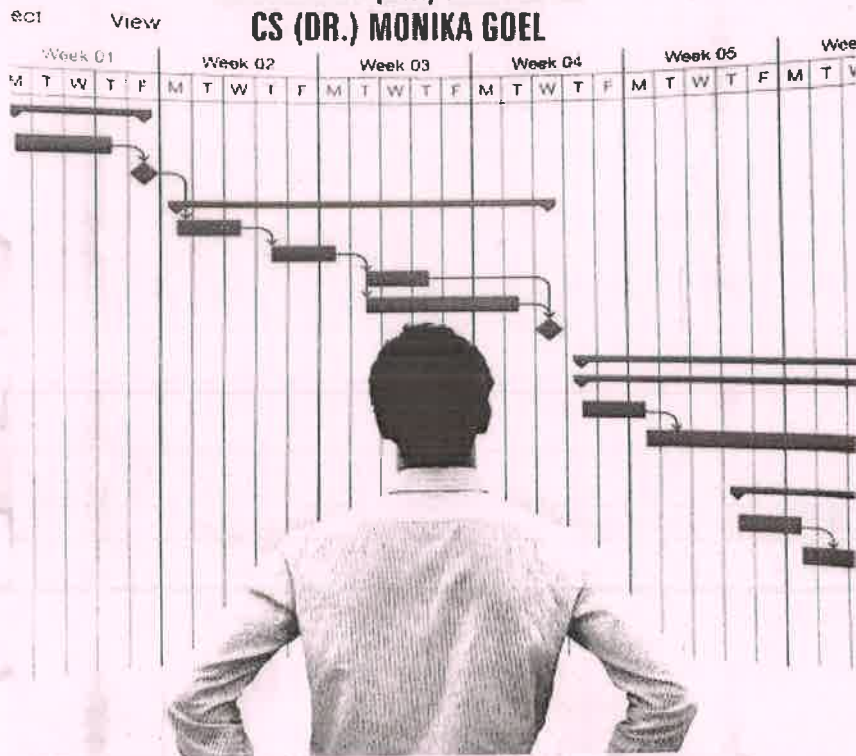
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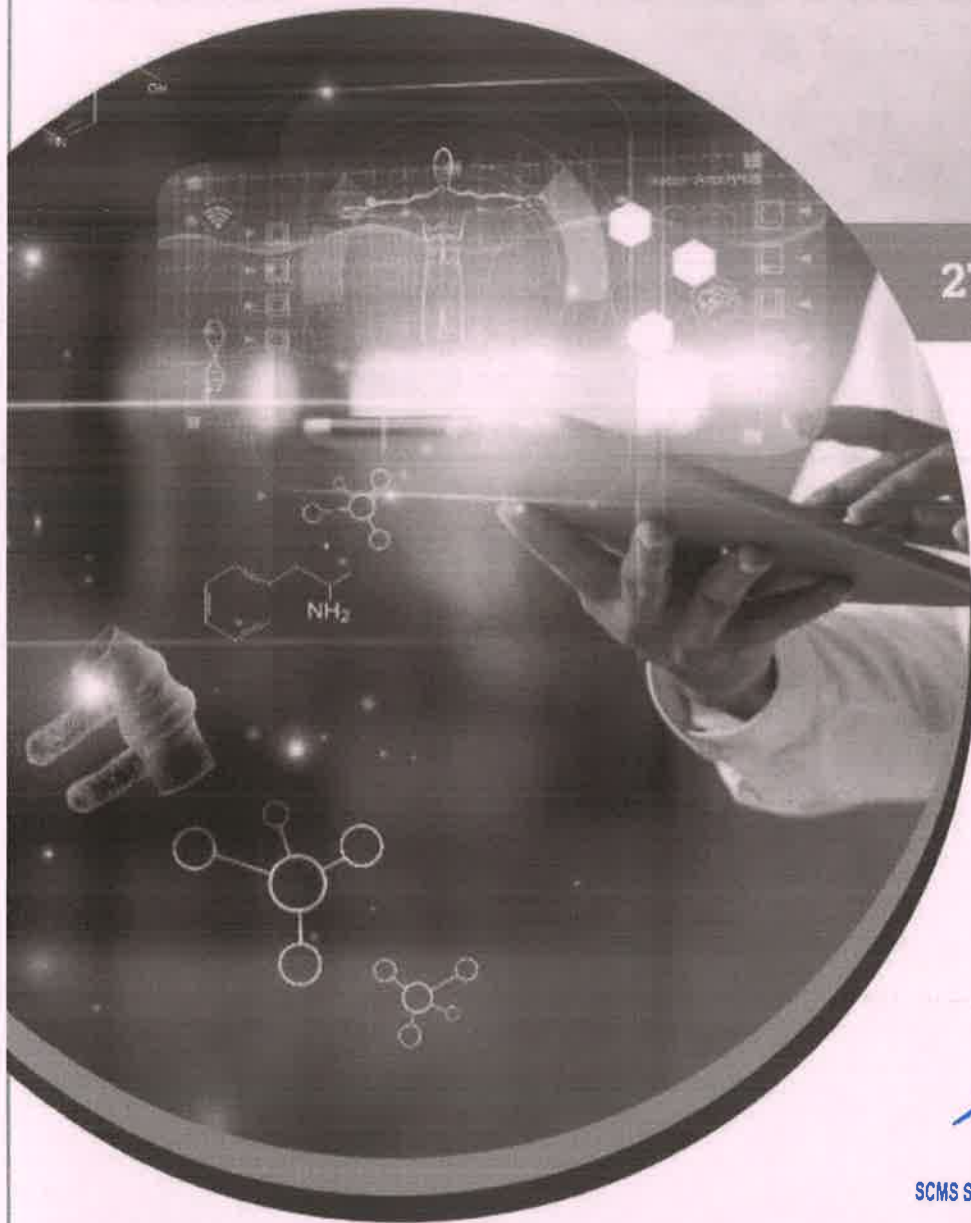
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**REVA-UMS-031: Molecular Docking Analysis of Apigenin against Bacterial FtsZ gene.**

Gayana Shaji, Deepthi D C, Harish M and Nair S

<sup>1</sup>SCMS Institute of Biosciences and Biotechnology Research & Development, South Kalamassery, Cochin-682033, Kerala, India.

\*Corresponding Author: [gayanashajigayana@gmail.com](mailto:gayanashajigayana@gmail.com)

**ABSTRACT:** The emergence of multiple drug resistant microorganisms is a serious and worldwide problem that has prompted research into the identification of new biocides with broad activity. Phytochemicals from medicinal plants are known to have an extended history for effective treatment against various pathogens and infections. The genus *Ocimum* consists of aromatic herbs and shrubs which have medico-botanical importance. Apigenin is a major bioactive compounds found in *Ocimum* species. Filamenting temperature-sensitive mutant Z (FtsZ) gene encoded FtsZ protein that assembles at bacterial cell division site and forms Z-ring structure. FtsZ is a tubulin homolog protein with low sequence similarity; hence it is possible to inhibit bacterial FtsZ protein without affecting the eukaryote cell division. In the present study, apigenin was virtually screened for their antibacterial activity against selected gram positive and gram negative bacteria's cell division protein, FtsZ. In silico molecular docking were carried out using Patch dock to investigate the effect of apigenin as a new lead inhibitor against bacterial cell division protein FtsZ. Docking studies and secondary structure prediction of the FtsZ gene of bacteria revealed that apigenin has higher binding affinity with the FtsZ gene and also bound near to the active site of the gene. Thus, the current study presents an experimental validation of antimicrobial activity and potential of apigenin as a lead anti-microbial molecule.

**REVA-UMS-032: In Silico prediction of new drug candidate from Piper nigrum against bacterial MurA gene.**

Aswathy PV, Kurian Anoja, Deepthi D C, Harish M and Nair S

<sup>1</sup>SCMS Institute of Biosciences and Biotechnology Research & Development, South Kalamassery, Cochin-682033, Kerala, India.

\*Corresponding Author: [aswathypv535@gmail.com](mailto:aswathypv535@gmail.com)

**ABSTRACT:** The use of medicinal plants to cure various diseases dates back to ancient civilizations. *Piper nigrum* or Black pepper is the most well known species with its various useful pharmacological properties. Black pepper is one of the most valued and widely used spices in the world and dominates multi-billion dollar global spices trade. It is also considered as a valuable source of various bioactive constituents. Piperine or piperic acid was isolated from fruits of *Piper nigrum* and had been reported as pharmacologically valuable bioactive constituents. In this study, Piperine was evaluated for its antibacterial activity against selected gram positive and gram negative bacteria's MurA protein. UDP-N-acetylglucosamine enolpyruvyl transferase (MurA), which catalyzes the first committed step of bacterial peptidoglycan biosynthesis, is a prime candidate for therapeutic intervention. Molecular docking was carried out to study the molecular interactions and binding affinities against the protein MurA, which is an essential enzyme for the synthesis of





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trending in healthcare research. Phytochemicals proves to have great potential in this regard as they are pleiotropic in their function and target complex multiple signalling events of cancer. Hence, they are most suitable candidate for anticancer drug development. Also, they act differently on cancer cells without altering normal cells. Curcumin is known to have anti-cancer activity due to its phenolic constituents. It suppresses proliferation and metastasis of human tumors through regulation of various transcription factors, growth factors, inflammatory cytokines, protein kinases and other enzymes. Pharmacokinetic data has shown that curcumin undergoes rapid metabolism leading to glucuronidation and sulfation in the liver and excretion in the feces accounting for its poor systemic bioavailability. Hence the present study was conducted to detect possible natural analogues of curcumin (Capsaicin, Chlorogenic acid, Ferulic acid, Zingerone, Gingerol) which are effective against breast cancer receptors and prove the ethno-medicinal value of these analogues using bioinformatic tools and software's like PDB, Patch Dock, PubChem, Chimera and My Presto. Out of the various curcumin analogues studied, Ferulic acid showed best binding affinity with all the breast cancer cell specific receptors (FGF, MMP9, RNRM1, TGF-beta, DHFR, VEGF and aromatase) which was confirmed through the docking studies. The current work was a preliminary step towards screening suitable drug candidate against breast cancer, confirmed through in silico methods. This information can be used further to carry out In vivo studies considering Ferulic acid which is an analogue of curcumin as a suitable drug candidate against breast cancer.

**REVA-UMS-030: Anti-inflammatory action of quercetin against Cyclooxygenases-1 enzyme, an In-silico approach.**

Meghana PM, Harish M and Nair S

<sup>1</sup>SCMS Institute of Bioscience and Biotechnology Research & Development (SIBB R&D)S.Kalamaserry, Cochin-33, Kerala,India.

\*Corresponding Author : [meghnamaallu@gmail.com](mailto:meghnamaallu@gmail.com)

**ABSTRACT:** Quercetin is a flavonoid that belongs to the flavonol class of compounds, has many pharmacological activities, and in order for any clinical application, it is important to evaluate the safety of the compound. Cyclooxygenases are key enzymes in lipid signaling. They catalyse the first step in the production of prostaglandins, important mediators of inflammation, pain, cardiovascular disease, and cancer, and they are the molecular targets for non-steroidal anti-inflammatory drugs, which are the oldest and most chemically diverse set of drugs known to date. The objective of this study was to evaluate the potential of quercetin as anti-inflammatory agent against COX genes. The In-silico analysis showed that, quercetin binds at THR212 of Cyclooxygenases-1 enzyme and produces more binding affinity, -5.91 Kcal/mol than that of diclofenac, -3.2 Kcal/mol, an established anti-inflammatory drug. Moreover, the lethal dose level of quercetin is three times higher than that of diclofenac, which is a good edge for the standardization of dosage of quercetin as a potential drug candidate for the treatment of inflammations, especially when most of the emerging viral diseases like COVID19 have inflammatory consequences.



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in the release of arsenic to the environment. Geological sources of arsenic release includes weathering of arsenic-containing rocks and volcanic activities. Conventionally arsenic is remediated from the environment by membrane filtration, ion-exchange, oxidation, adsorption, coagulation and flocculation techniques. However, remediating arsenic using these techniques involve high costs and release of hazardous sludges. Thus, involvement of biological methods in removal of arsenic from polluted environment has drawn attention of scientists. Application of heavy metals resistant microbes in remediation of arsenic can be considered as stable as well as economical alternative to the conventional techniques. This review article focuses on the hazardous impact of arsenic on environment and methods of bioremediation of arsenic.

**REVA-UMS-028: Nanoparticle sensors: A potential solution towards understanding the agriculture-based pollution.**

Prabhakar Mishra<sup>1\*</sup>, Sruthi Ann Alex<sup>2</sup>, Karthiga Durairaj<sup>3</sup>, Bijaylaxmi Sahoo<sup>1</sup>, Sarah Mohamed<sup>1</sup>, Kiran N S<sup>1</sup>

<sup>1</sup>Department of Biotechnology, School of Applied Sciences, REVA University, Bengaluru, Karnataka.

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\*Corresponding Author: [prabhakar.mishra@reva.edu.in](mailto:prabhakar.mishra@reva.edu.in)

**ABSTRACT:** Humans are dependent on agriculture for food both directly and indirectly. With increase in global population, the demand for food has increased, while the availability of land and resources have decreased. To ensure maximum yield with the available resources, several pesticides, fertilizers, and chemicals are applied to the crops, which in turn results in pollution and eco-toxicity. Proper monitoring of these residual chemicals in food requires engagement of new modern technology in agricultural sciences. Nanotechnology has beneficially impacted agriculture in several aspects through revolutionized tools for better yield management, smart delivery system for pesticides, detection of excessive chemicals and for disease monitoring/treatment. This review article discusses about various agricultural pollutants, their ecotoxicity aspect and applicative potential of nanometric sensors like silver and gold nanoparticles towards detecting them.

**REVA-UMS-029: Identifying the potential role of curcumin analogues as anti-breast cancer agents an In silico approach.**

Praseetha N G, Divya U K and Nair S

<sup>1</sup>SCMS Institute of Bioscience and Biotechnology Research and Development

\*Corresponding Author: [titikshabypraseethapillai@gmail.com](mailto:titikshabypraseethapillai@gmail.com)

**ABSTRACT:** Cancer is a major public health problem that has a significant global impact on both developed and developing countries. Breast cancer ranks top among newly reported cancer cases and constitute a major portion of cancer in women. Development of target therapy which is effectively with minimal side effects is



  
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# The Potential of Kaempferol Derivatives As Anti SARS-CoV-2 Drugs By *In Silico* Docking Study

**Sastha Kumar N., Harish M., Sethulekshmy Nair**

1 PG student Department of Molecular biology and Genetic Engineering, SCMS Institute of Bioscience and Biotechnology Research and Development, Mahatma Gandhi University, Kerala

2. Senior Scientist SCMS Institute of Bioscience and Biotechnology Research and Development, Mahatma Gandhi University-Kerala

3. Deputy Director, SCMS Institute of Bioscience and Biotechnology Research and Development, Mahatma Gandhi University-Kerala

## Abstract:

The emergence of the coronavirus that causes severe acute respiratory syndrome type 2 (SARS-CoV-2) poses huge social, economic, and political issues throughout the world. Since late 2019, SARS-CoV-2 has killed approximately 3.5 million people. Mutations in the spike (S) glycoprotein are particularly concerning since it contains the domain that recognises the angiotensin-converting enzyme 2 (ACE2) receptor and serves as a target for neutralizing antibodies. Mutations in the S protein may cause changes in the surface spike structures, altering the conformational B-cell epitopes and potentially reducing vaccination effectiveness.

Here, we summarize how the spike protein of the variants of SARS-CoV 2, interact with various kaempferol derivatives namely "Astragalín" "Jugalin" "Kaempferitrín" and "Kaempferol 7 alpha rhamnoside" to identify novel inhibitors of spike protein. The 3' kaempferol compounds, Astragalín and Jugalin, displayed exact binding in the alpha strain, comparable to Remdesivir, the control antiviral molecule in this study. While the 7' derivatives kaempferol 7 alpha rhamnoside shows binding to the RBD regions of delta and Beta strain, The 3'7' Kaempferol derivative Kaempferitrín exhibits binding to RBD regions of all known strains except alpha and beta strains and also exhibit similar characteristics to that of the control drug remdesivir.

As a result, the selected kaempferol compounds bind to distinct binding sites of SARS-Cov-2 variants and exhibit propensity to prevent spike glycoprotein from binding to the ACE2 human cell receptor, potentially inhibiting infectivity. Many of the Kaempferol derivatives have binding affinity to many regions of the virus, including the RBD domain, according to our molecular docking data.

According to our in-silico research, these compounds have a lot of potential as anti-Covid-19 drugs. With further modification and validation, including preclinical and clinical research, these compounds can be developed into potential inhibitors and antiviral medications for human use.

  
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# Differential Binding of SARS-COV-2 Variants to Anti-viral molecules: An *In Silico* Study

**Sethulekshmy Nair, Harish M and Deepthi DC**  
SCMS Institute of Bioscience and Biotechnology R&D, Kochi

## Abstract:

The present public health crisis posed by the ongoing Covid-19 pandemic, calls for precisely effective antiviral strategies, in addition to the vaccines. Several known antiviral drugs are being repurposed to combat SARS COV2. These antiviral agents mostly belong to classes such as 3CL protease inhibitors, RNA synthesis inhibitors or ACE 2 inhibitors. However, as the pandemic is further unfolding new variants, the quest for specific antiviral agents is gaining momentum. In this study, from a plethora of drug molecules with established antiviral properties, especially against corona virus and in some cases SARS-COV-2 itself, we have selected two antiviral agents namely Arbidol, Bisoxatin, along with and two phytochemicals Quercetin and Guijaverin, which in our extensive binding studies showed remarkable binding affinity with spike protein of SARS-COV-2. Further, we studied the structure guided drug binding analysis of these four molecules with the spike protein structure of SARS-COV-2 variants Beta, Gamma, delta omicron and the Wuhan reference strain, by molecular docking analysis using Autodock Vina. It was observed that Arbidol has highest binding affinity to the spike protein of the reference strain but the binding affinity is comparable with other variants as well. Bisoxatin has highest binding affinity to delta and gamma variants, closely followed by Omicron variant. Quercetin which is an anti-inflammatory agent as well, exhibited higher binding affinity to beta variant, followed by omicron. Guijaverin, a derivative of Quercetin exhibited its highest binding affinity to omicron variant. From this *in silico* repertoire, the possibility of differential binding and inhibition of different variants by the same anti-viral agent is evident, which may lead to the discovery of variant specific anti-viral agents. Further *in-vitro* studies in cell culture system are called for, to pinpoint the specific antiviral molecule(s).



  
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