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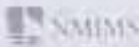
Dr. Nancy Pandita

Dr. Rajan Saxena

Dr. Jayant Gandhi

Dr. Aparna Khanna



 **Dr. Nancy Pandita**

 **Dr. Brijesh S.**





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Solubility Enhancement studies of Febuxostat

Krutika Lad, M.Pharm (Pharmaceutics), SPP School of Pharmacy and Technology Management, SVKM's NMIMS University



Introduction:
Febuxostat is an anti-hyperuricemic drug which is used in the treatment of Gout. Febuxostat is a non-selective inhibitor of Xanthine oxidase. Since it is a BCS class II drug it suffers from low solubility and high permeability. The drug is very expensive. Hence, the main objective of preparing solid dispersion is to enhance the solubility of Febuxostat.

Materials and Methods:
Materials:
Febuxostat API which was obtained as a gift sample, Polyvinylpyrrolidone (PVPK30), Methanol, Phosphate buffer pH 6.8.
Method:
Solvent evaporation Method:
Accurately weighed quantities of polymers and drug in the ratios (1:1, 1:2, 2:1, 3:1) were placed in a mortar pestle. Methanol was added to the mixture and it was triturated till the solvent was completely evaporated. Solid dispersions were dried at 60°C for 15 minutes followed by passing through 60 mesh sieve. Solid dispersions were stored at desiccators until use for further studies.

Assay of solid dispersions:
The content of Febuxostat in solid dispersions was determined using UV-VIS spectrophotometer. Solid dispersions equivalent to 10mg drug were dissolved in methanol. 1ml of the stock solution was diluted to 10ml with methanol which was further diluted to give a final concentration of 10µg/ml (10ppm) solution. Percent drug content was calculated from the absorbance obtained at 318nm.

Tablet preparation:
Tablets were prepared using direct compression and wet granulation.

Direct compression: All ingredients were weighed accurately and mixed using mortar pestle. The powder was passed through 40 mesh and mixed in a rotating tumbler for 15min. The powder blend was compressed into tablets using 9.5mm standard concave punch.

Wet granulation: Solid dispersion, microcrystalline cellulose, lactose and half the quantity of croscarmellose sodium were weighed accurately. The blend was passed through 60 sieve. Powder was wet granulated using water: isopropyl alcohol (1:1) through 20 mesh to give granules. These granules were passed through 60 mesh and remaining quantity of croscarmellose was added to it. Granules were lubricated with colloidal silicon dioxide and magnesium stearate. Powder blend was compressed into tablets using 9.5mm standard concave punch.

Results & Discussion:
The following ratios of solid dispersions were prepared using solvent evaporation method. Out of these ratios 1:1 (D-P) was selected since it gave 100% drug release at the end of 45min in Phosphate buffer pH6.8 and was further compressed into tablets.

Polymer	Ratio of solid dispersion prepared (drug: polymer)				
PVPK30	1:1	2:1	1:2	1:3	3:1

Conclusion: Solid dispersion techniques can be used to increase the solubility of poorly soluble drugs and also improves the bioavailability of these drugs. Solid dispersion is the most widely used techniques for enhancing solubility of poorly soluble drugs.

Evaluation:

(A) Solid dispersions:
Drug content:
Drug content of solid dispersions was determined spectrophotometrically. Solid dispersion equivalent to 10mg of febuxostat was weighed accurately and dissolved in methanol. Further the stock solution was dilute to give a final concentration of 10ppm. Percent drug content was calculated from the absorbance obtained at 318nm.

In-vitro drug release studies:
The dissolution studies of various ratios of solid dispersions were performed in 900ml, phosphate buffer pH 6.8 and USP apparatus II (paddle) method. In each dissolution vessel, quantities of samples equivalent of 40 mg febuxostat were added to dissolution medium. Bath temperature and paddle rotation speed were set at 37°C and 75 rpm, respectively. The amount of drug dissolved was assayed spectrophotometrically at 318 nm at regular intervals.

Fourier Transform Infrared Spectroscopy (FTIR):
Infrared spectra of solid dispersions were observed using FTIR spectrophotometer (Perkin Elmer, Spectramax). KBr pellets were scanned over a range of 4000-400 cm⁻¹. Pellets containing febuxostat, pure polymer, physical mixture and solid dispersions were scanned and data was interpreted.

Scanning Electron Microscopy (SEM):
A scanning electron microscope was used to observe the morphology of pure drug, pure polymer, physical mixture and solid dispersions at 10kV accelerating voltage. Samples were placed on carbon tape and coated with platinum before analysis. The stubs containing the samples were then observed under microscope for its morphological characteristics.

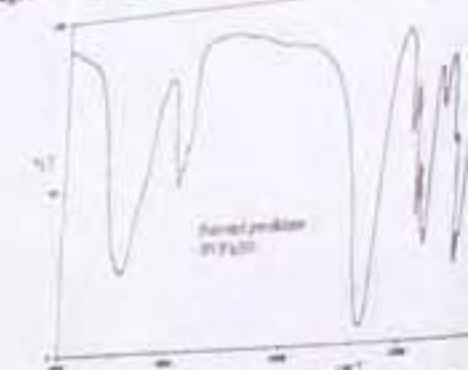
(B) Tablets:
Drug content:
Tablets were crushed in a mortar pestle and powder equivalent to 40mg of febuxostat was dissolved in methanol. The stock solution was diluted to 10ml with phosphate buffer to give 100ppm solution which was again diluted to give a final concentration of 10ppm. The drug content of tablets was determined spectrophotometrically at 318nm.

In-vitro drug release studies:
The dissolution studies of various ratios of solid dispersions were performed in 900ml, phosphate buffer pH 6.8 and USP apparatus II (paddle) method. In each dissolution vessel, quantities of samples equivalent of 40 mg febuxostat were added to dissolution medium. Bath temperature and paddle rotation speed were set at 37°C and 75 rpm, respectively. The amount of drug dissolved was assayed spectrophotometrically at 318 nm at regular intervals.

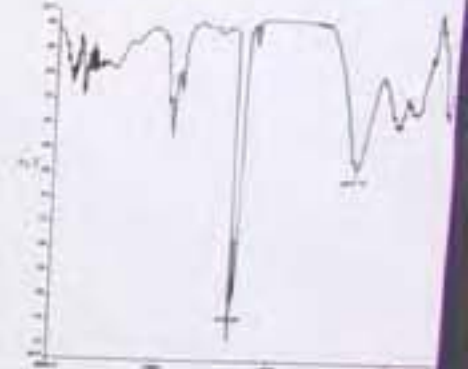
FTIR studies:



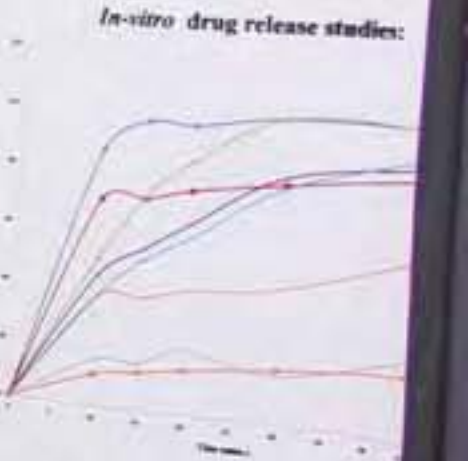
IR spectra of Febuxostat



IR spectra of Polyvinylpyrrolidone



IR spectra of Febuxostat + PVPK30 dispersion



In-vitro drug release studies:

Scanning electron microscopy (SEM)



A. Excipient: PVPK30 Pure



B. Febuxostat



C. Febuxostat + PVPK30 solid dispersion

IR spectra of Febuxostat and also improves the bioavailability of these drugs. Solid dispersion is the most widely used techniques for enhancing solubility of poorly soluble drugs.

JR ELECTRONICS
LABORATORY



A woman with long dark hair, wearing a dark purple short-sleeved button-down shirt and light-colored trousers, is pointing towards the display board with her right hand. She has a name tag on her chest.

A woman with long dark hair, wearing a white long-sleeved shirt and a dark blue blazer, is standing next to the first woman, looking at the display board.

A man with a balding head, wearing a light-colored striped long-sleeved shirt, is standing in the foreground, looking towards the women and the display board. He is holding a blue pen and a small piece of paper.

A man in a light blue shirt and dark trousers is standing in the background, looking towards the group.



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MICROEMULSION BASED INTRANASAL DRUG DELIVERY OF

Payal Desai, Sarika Wairkar, Ram Gaud
Mishra Prashant Patel, School of Pharmacy & Technology Management, SVKM's NSIMS,
Vile Parle (W), Mumbai-400116 Maharashtra, India

ABSTRACT

Migraine attack is multidimensional physiological condition associated with throbbing severe headache in one half of the head. Essential oils like Basil oil have been used for the treatment of migraine. The major active ingredient of basil oil is methyl chavicol that has soothing, antispasmodic and analgesic effect. Nasal cavity has been used for drug delivery as it is highly permeable to acidic or basic drugs and it bypasses hepatic degradation and hepatic metabolism. The objective of the study was to formulate and evaluate intranasal delivery of basil oil. A microemulsion system with methyl chavicol as oil phase, tween 80 as surfactant and polyethylene glycol 400 as co-surfactant was developed. The microemulsion system was prepared by inverse method and evaluated for pH, viscosity, stability, in vitro release. The formulation was evaluated for stability after centrifugation at 6000rpm for 15 min. The in vivo absorption percentage of microemulsion formulation was evaluated in rat. The in vivo absorption percentage of drug prepared was evaluated by UV spectrophotometry. The basis of the study is as follows:

INTRODUCTION

Migraine drug delivery is one of the fastest delivery approach across the drug targeting. Delivery of the drug components of the nose and the CNS, the intranasal route can deliver therapeutic agents to brain through BBB.

Microemulsion is a clear colloidal dispersion of particles less than 100nm containing surfactant, co-surfactant and water phase. Intranasal administration of microemulsion offers a practical, convenient, alternative route of administration for drug delivery to brain crossing BBB.

Migraine is a neurological disorder characterized by recurring pain on one side of the head. Essential oils like Basil oil have been used for the treatment of migraine. The major active ingredients of Basil oil is Methyl chavicol that has soothing, antispasmodic and analgesic effect.

EXPERIMENTAL WORK

Materials used

Basil oil was obtained from Kaveri exports, Tumbur, 25, Tumbur, 411001, Maharashtra, India and was obtained from 428794.

Development of formulation containing Basil oil

For the development of formulation, study with different surfactant and co-surfactant was made. The formulation was optimized for clarity, viscosity and pH. Near similar method was used for microemulsion.



NMIMS **P21** **Antioxidant and Anti-aging ability of Methanolic Extracts of *Ocimum tenuiflorum* Linn.**
 Vinita D. Appa, Nancy S. Pandita
 SVKM'S NMIMS, School of Science, Vile-Parsee (West), Mumbai-400 056

INTRODUCTION
 Skin is the largest organ of the body. It protects from outer environment. It is composed of 3 layers.

SKIN AGING

AIM
 To evaluate antioxidant and anti-aging ability of Methanolic Extracts of *Ocimum tenuiflorum* Linn.

OBJECTIVES

1. DPPH Free Radical Scavenging Assay
2. Superoxide Anion Scavenging Assay
3. ABTS Radical Scavenging Assay
4. FRAP Assay
5. Anti-Elastase Assay

MATERIALS & METHODS

ANTHOXIDANT ASSAYS

DPPH FREE RADICAL SCAVENGING ASSAY

Preparation of various concentration of std/test extract

DPPH Reagent (10 mg/ml) Working stock (0.36 mg/ml)

1 ml Test Solution + 200ul Reagent

Absorbance at 517 nm after 30min. incubation at RT

SUPEROXIDE ANION RADICAL SCAVENGING ASSAY

Superoxide anion generation in 3ml Tris HCl buffer + 0.75ml NBT + 0.75ml NADH + 0.5ml Diff conc. of std/Extract

Reaction initiation by 0.75 ul PMS

Incubation at RT for 5 min and Absorbance is measured at 560 nm

ABTS RADICAL SCAVENGING ASSAY

ABTS radical cation were produced by reacting ABTS and APS and incubating the mixture at room temperature in dark for 16 hours

10mM PBS pH 7.4 + Plant extract + ABTS radical solution was added to a final concentration of 0.216mM

The reaction mixture was mixed and immediately read at 734nm using microplate reader. A control reaction was carried out without the test sample

FRAP ASSAY

20 ul Test Solution + 700 ul sodium Phosphate buffer, pH 7.4 + 120 ul of sodium Ferric Tricloride incubation at 37°C for 10 min.

50 ul of LAMP (0.05M) is added and run for 15 seconds. The reaction was carried out at 37°C

The Absorbance measurements were taken at 410 nm excitation and 520 nm emission filter

ANTI-ELASTASE

Control: 50ul plant extract + 100ul Elastase + 50ul plant extract + 50ul buffer

RESULTS

Conc.	EC ₅₀ Value	CME
1000	2.8 µg/ml	12.14 µg/ml
500	10.5 µg/ml	104.2 µg/ml
250	15.3 µg/ml	10.96 µg/ml
100	1.10 µg/ml	1.10 µg/ml

CONCLUSION



Evaluation of cytotoxicity assessments were carried out by determining the LD₅₀ values.

Silver nanoparticles

- obtained through chemical reduction of silver nitrate using sodium borohydride as reducing agent



Gold nanoparticles

- obtained through a chemical reduction of gold (III) chloride using rhodium citrate as reducing agent



Embryos were exposed to different concentrations of silver and gold nanoparticles at 4 hours post-fertilization (HPF).





Eugenol from Tulsi



Curcumin from Turmeric



Polyphenols from Blueberry



Vitamin E from Spinach

ANTIOXIDANT PHYTOCHEMICALS



Polyphenols from Blueberry

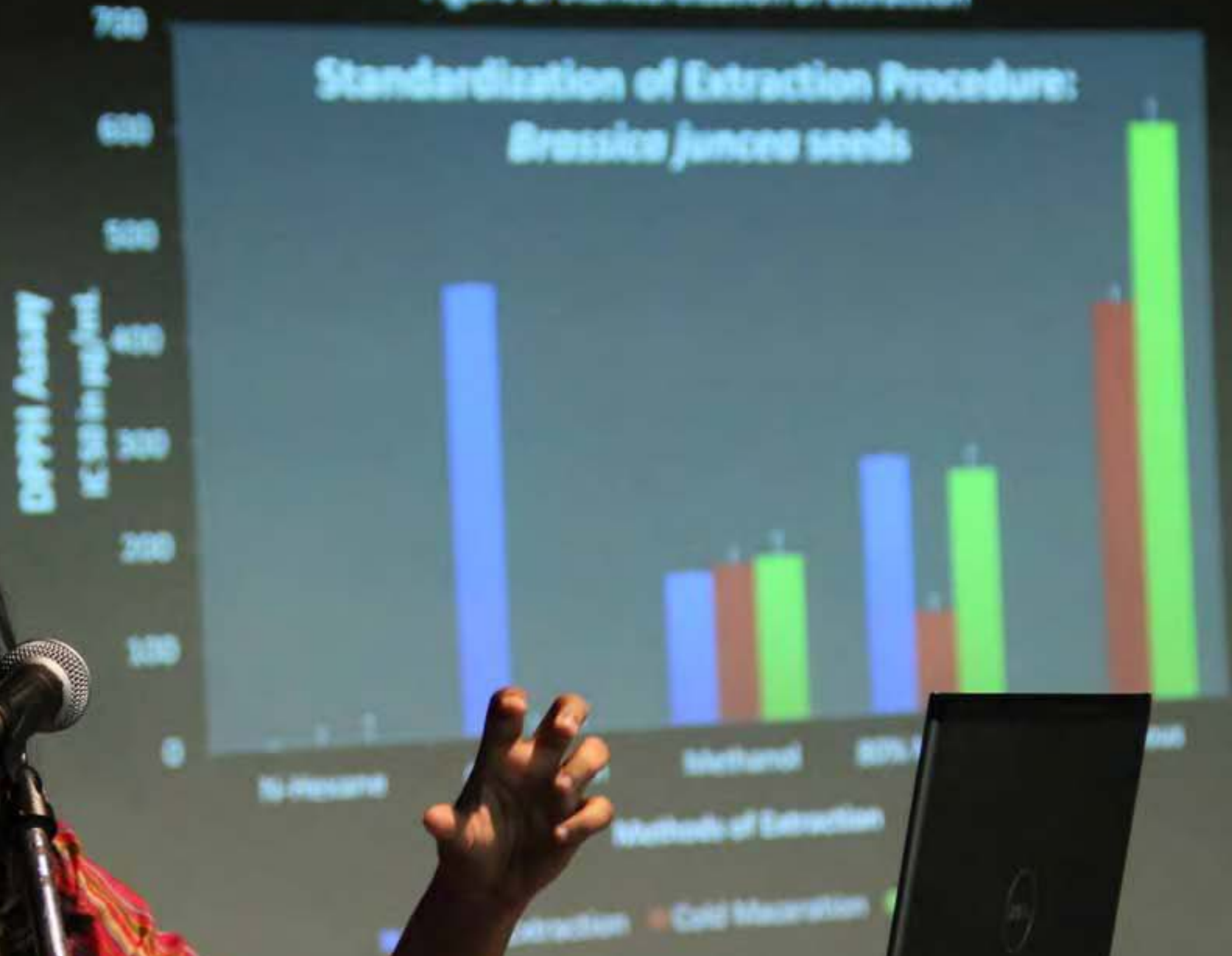



Lycopene from Tomatoes



Zeaxanthin from Corn

Figure 2: Standardization of extraction



A woman with dark hair, wearing a green and red saree with gold borders, is seated at a table. She is looking towards the right of the frame. A nameplate in front of her identifies her as Prof. Leena Kulkarni. There is a water bottle to her left.

Prof. Leena Kulkarni

A man with glasses, wearing a dark blue suit jacket over a light-colored shirt, is seated at a table. He is holding a microphone and appears to be speaking. A nameplate in front of him identifies him as Prof. Sunil Shirvaiker. There is a water bottle to his left.

Prof. Sunil Shirvaiker



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Prof. Leena





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Industry Outlook Survey Contd...

- The survey consists of a panel of about 2000 private and public limited companies engaged in manufacturing activities.
- The response pattern ranges between 60-75 %.





information system
World's Children, Child
and Health Surveys by
Data on IADR for nine sta
Yearly data on IADR fo
states for India is col

Research Background

- Stock markets are the primary indicators of a country's economy. It gives us a picture of the growth and development of a country.
- The CNX NIFTY index has 50 stocks from 22 sectors of the Indian economy. It represents about 70.28% of free float market capitalization of stocks under BSE.







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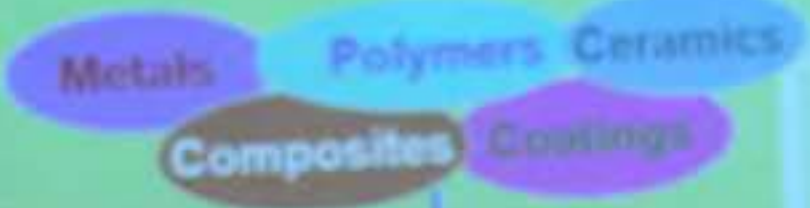


Dr. Dhananjaya Saranath

Dr. Aparna Khanna

A Scenario of Aging & Disease

Replacement parts needed for transplantation or tissue reconstruction





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Dr. Prathu Nair
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CLINICAL SPECTRUM

Transit to limbal stem cells → Absence/Malfunction of limbal stem cells



Manifests

Poor Vision
Photophobia, Tearing, Blepharospasm
Recurrent Pain
Chronic Inflammation & Redness
Scarring
Epithelial Defects





Region	Prevalence Rate (%)
World	10.0
North America	12.0
Europe	11.0
Asia	8.0
Africa	6.0
South America	9.0

Prevalence rates (MAAR)



SMIMS
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Dr. Sujata Bapat
For the Occasion of
National Education Day
2023

Decolorization and Biodegradation study of textile dye Reactive Orange-13 by isolated bacterial strain *Shewanella halotis* DW01.

Radhika Birmole and Aruna K.

Department of Microbiology, Wilson College, Mumbai-400007, India.

Abstract

The aim of the present study was to study the decolorization of the RO-13 dye by an isolated bacterial strain *Shewanella halotis* DW01. Reactive Orange 13 (RO-13) dye belongs to the group of azo dyes. The 100% dye decolorization was observed in 14 days. The culture was obtained with an inoculum size of 10⁸ CFU/ml. The decolorization was observed with a wide range of NaCl concentrations (0.5% to 2.5%) and showed optimum at 1.5% NaCl concentration. The decolorization was observed with a wide range of pH (5 to 10) and showed optimum at pH 7. The decolorization was observed with a wide range of temperature (25 to 45°C) and showed optimum at 30°C. The decolorization was observed with a wide range of dye concentration (10 to 100 mg/l) and showed optimum at 10 mg/l. The decolorization was observed with a wide range of incubation time (1 to 14 days) and showed optimum at 14 days. The decolorization was observed with a wide range of media (MHA, TSA, TSB, etc.) and showed optimum at MHA medium. The decolorization was observed with a wide range of media (MHA, TSA, TSB, etc.) and showed optimum at MHA medium. The decolorization was observed with a wide range of media (MHA, TSA, TSB, etc.) and showed optimum at MHA medium.

Introduction

Dyes are most visible pollutants. They are used in various industries. Their synthesis and complex synthesis involves various toxic materials. Chemical methods applied for effluent treatment are inefficient, expensive, generate secondary waste products. Microorganisms are known to utilize such complex compounds and convert them into simple forms. Thus, development of practical, sustainable strategies for treating the wastewater using natural organisms is of great significance. In this study biodegradation of synthetic azo dye, Reactive Orange 13 by an isolated bacterial strain DW01 is reported.

Aims and Objectives

- Monitoring dye decolorization using UV-Visible spectrophotometer.
- Optimization of nutritional and physicochemical parameters for dye degradation.
- Confirmation of dye degradation using LCMS, HPTLC & FTIR.
- Determination of dye degradation efficiency using parameters such as COD.
- Toxicity assay to confirm the environmental safety nature of the degradation product.

Materials and Methods

- Decolorization analysis by UV-Visible spectrophotometer.
- Degradation confirmation by HPTLC, HPLC & FTIR analysis.
- Optimum degradation parameters (growth media, O.T, pH, temperature, addition and substitution assay, effect of electron acceptors).
- Dye spectrum determination, degradation of highest dye concentration.
- Toxicity assay to confirm the environmental safety nature of the degradation product.

Results

Optimization of Medium

Shewanella halotis DW01 decolorized RO-13 upto 94% in MHA medium and significant decolorization of the dye RO-13 was found in the pH range of 5-10.

Optimization of pH

The optimum pH for the decolorization of the dye RO-13 by *Shewanella halotis* DW01 was found to be 7.5.

Optimization of Temperature

The optimum temperature range for the decolorization of the dye RO-13 by *Shewanella halotis* DW01 was found to be 25-45°C.

Optimization of O.D

The optimum inoculum size for the decolorization of the dye RO-13 by *Shewanella halotis* DW01 was found to be 10⁸ CFU/ml.

Varying Concentration of NaCl

The decolorization of the dye RO-13 by *Shewanella halotis* DW01 was observed with a wide range of NaCl concentrations (0.5% to 2.5%) and showed optimum at 1.5% NaCl concentration.

Addition and Substitution Assay

Under strict conditions, more than 90% decolorization was observed for 14 days. Under shake conditions, more than 50% decolorization was observed for 14 days. 10 days were decolorization significantly 50% and almost entire dye was decolorized within 14 days.

Dye Spectrum

The UV-Visible spectrum confirmed dye degradation by *Shewanella halotis* DW01. The peak of RO-13 was completely disappeared in the degradation product.

Determination of highest dye concentration degraded

The concentration of RO-13 ranging from 10-100 mg/l was completely decolorized by *Shewanella halotis* DW01 in a minimal medium.

Effect of Pre-grown cell mass on dye degradation

The decolorization of RO-13 dye was significantly increased with the pre-grown cell mass. The dye RO-13 was decolorized in 20 days by using pre-grown cell mass of *Shewanella halotis* DW01 in a minimal medium.

U.V-Visible Spectroscopy Analysis

The UV-Visible spectrum confirmed dye degradation by *Shewanella halotis* DW01. The peak of RO-13 was completely disappeared in the degradation product.

Toxicity Assay

Toxicity studies suggested the non-toxic nature of degradation product. The dye concentration of RO-13 (100 ppm) concentration of inoculum resulted their degradation of RO-13 dye.

COD and HPTLC Analysis

HPLC analysis of the degradation product showed the presence of RO-13. The HPLC analysis of the degradation product showed the presence of RO-13. The HPLC analysis of the degradation product showed the presence of RO-13.

Future

Shewanella halotis DW01 can be used for the treatment of textile effluent wastewater. The decolorization of RO-13 concentration, absence of high degraded product of dye. The decolorization can also be used in the treatment of dye wastewater. The decolorization of RO-13 can be used in the treatment of dye wastewater.

Enzyme Analysis

A direct mechanism behind biodegradation of dye in microbial system is known by the biotransformation of dye.

FTIR Analysis

A significant difference was observed between the FTIR spectra of RO-13 and its metabolite clearly indicating biodegradation of *Shewanella halotis* DW01. Peak of nitrite and nitrate (N-O bond) stretching at 1395.22, 1111.04 & 1048.21 was observed in control dye spectrum. These absorption were completely absent in the metabolite spectrum indicating break of N-O bond in biodegradation of the RO-13 dye. The breakdown of C-H bond group and C-H bond group was also observed.

LCMS Analysis

The control dye RO-13 showed single major peak at the retention time of 4.902 min. The metabolite obtained after degradation of RO-13 by *Shewanella halotis* DW01 showed single major peak at the retention time of 2.777 min. The chromatogram of RO-13 dye and the metabolite obtained after degradation showed different retention times indicating degradation of RO-13 dye by *Shewanella halotis* DW01.



Think
AN IDEA ABOUT THE

Antibiotics

ABSTRACT

Worldwide, about 1.8 million people are diagnosed with urinary tract infections (UTIs) each year. UTI is also the most common community-acquired infection. *Lactam antibiotics* are widely used for treatment of UTI. Advent of β -lactamases producing organisms pose a great threat to the use of β -lactam antibiotics. *ESBL* (Extended spectrum β -lactamase) and *MBL* (Metallo- β -lactamase) are more capable of hydrolyzing broad spectrum β -lactam antibiotics. The prevalence of *ESBL* & *MBL* producers has progressively increased throughout the globe. Emergence of drug-resistant strains could become a serious global public health problem due to medical tourism and international travel.

CONCERN

Worldwide, about 1.8 million people are diagnosed with urinary tract infections (UTIs) each year. UTI is also the most common community-acquired infection. *Lactam antibiotics* are widely used for treatment of UTI. Advent of β -lactamases producing organisms pose a great threat to the use of β -lactam antibiotics. *ESBL* (Extended spectrum β -lactamase) and *MBL* (Metallo- β -lactamase) are more capable of hydrolyzing broad spectrum β -lactam antibiotics. The prevalence of *ESBL* & *MBL* producers has progressively increased throughout the globe. Emergence of drug-resistant strains could become a serious global public health problem due to medical tourism and international travel.

MATERIALS AND METHODS

Collection of samples: 100 gram negative organisms were collected from various pathological laboratories and tertiary care hospitals.

Primary Screening of *ESBL* and *MBL* producers by Antibiotic sensitivity assay (AST): AST was performed using the disk diffusion method as described by the CLSI.

Secondary Screening of *ESBL* and *MBL* Producers phenotypic tests: Secondary Phenotypic screening of *ESBL* and *MBL* producers was done using Phenotypic Confirmatory Test (PCIT) Double Disc Synergy Test (DDST), Modified Hodge Test (MHT) and E-Test.

Molecular analysis of *ESBL* and *MBL* genes: PCR was carried out for *ESBL* genes (*TEM*, *SHV* and *CTXB*) and *MBL* genes (*IMP*, *IMP2*, *IMP3*, *IMP4*, *IMP5*, *IMP6*, *IMP7*, *IMP8*, *IMP9*, *IMP10*, *IMP11*, *IMP12*, *IMP13*, *IMP14*, *IMP15*, *IMP16*, *IMP17*, *IMP18*, *IMP19*, *IMP20*, *IMP21*, *IMP22*, *IMP23*, *IMP24*, *IMP25*, *IMP26*, *IMP27*, *IMP28*, *IMP29*, *IMP30*, *IMP31*, *IMP32*, *IMP33*, *IMP34*, *IMP35*, *IMP36*, *IMP37*, *IMP38*, *IMP39*, *IMP40*, *IMP41*, *IMP42*, *IMP43*, *IMP44*, *IMP45*, *IMP46*, *IMP47*, *IMP48*, *IMP49*, *IMP50*, *IMP51*, *IMP52*, *IMP53*, *IMP54*, *IMP55*, *IMP56*, *IMP57*, *IMP58*, *IMP59*, *IMP60*, *IMP61*, *IMP62*, *IMP63*, *IMP64*, *IMP65*, *IMP66*, *IMP67*, *IMP68*, *IMP69*, *IMP70*, *IMP71*, *IMP72*, *IMP73*, *IMP74*, *IMP75*, *IMP76*, *IMP77*, *IMP78*, *IMP79*, *IMP80*, *IMP81*, *IMP82*, *IMP83*, *IMP84*, *IMP85*, *IMP86*, *IMP87*, *IMP88*, *IMP89*, *IMP90*, *IMP91*, *IMP92*, *IMP93*, *IMP94*, *IMP95*, *IMP96*, *IMP97*, *IMP98*, *IMP99*, *IMP100*).

RESULTS

100 gram negative organisms were collected from various pathological laboratories and tertiary care hospitals. AST was performed using the disk diffusion method as described by the CLSI. Secondary Phenotypic screening of *ESBL* and *MBL* producers was done using Phenotypic Confirmatory Test (PCIT) Double Disc Synergy Test (DDST), Modified Hodge Test (MHT) and E-Test. Molecular analysis of *ESBL* and *MBL* genes was carried out for *ESBL* genes (*TEM*, *SHV* and *CTXB*) and *MBL* genes (*IMP*, *IMP2*, *IMP3*, *IMP4*, *IMP5*, *IMP6*, *IMP7*, *IMP8*, *IMP9*, *IMP10*, *IMP11*, *IMP12*, *IMP13*, *IMP14*, *IMP15*, *IMP16*, *IMP17*, *IMP18*, *IMP19*, *IMP20*, *IMP21*, *IMP22*, *IMP23*, *IMP24*, *IMP25*, *IMP26*, *IMP27*, *IMP28*, *IMP29*, *IMP30*, *IMP31*, *IMP32*, *IMP33*, *IMP34*, *IMP35*, *IMP36*, *IMP37*, *IMP38*, *IMP39*, *IMP40*, *IMP41*, *IMP42*, *IMP43*, *IMP44*, *IMP45*, *IMP46*, *IMP47*, *IMP48*, *IMP49*, *IMP50*, *IMP51*, *IMP52*, *IMP53*, *IMP54*, *IMP55*, *IMP56*, *IMP57*, *IMP58*, *IMP59*, *IMP60*, *IMP61*, *IMP62*, *IMP63*, *IMP64*, *IMP65*, *IMP66*, *IMP67*, *IMP68*, *IMP69*, *IMP70*, *IMP71*, *IMP72*, *IMP73*, *IMP74*, *IMP75*, *IMP76*, *IMP77*, *IMP78*, *IMP79*, *IMP80*, *IMP81*, *IMP82*, *IMP83*, *IMP84*, *IMP85*, *IMP86*, *IMP87*, *IMP88*, *IMP89*, *IMP90*, *IMP91*, *IMP92*, *IMP93*, *IMP94*, *IMP95*, *IMP96*, *IMP97*, *IMP98*, *IMP99*, *IMP100*).

CONCLUSIONS

The study concludes that the prevalence of *ESBL* and *MBL* producers is increasing globally. The emergence of drug-resistant strains could become a serious global public health problem due to medical tourism and international travel. The study will provide a fundamental base to the problems associated with *ESBL* and *MBL* producing organisms.

KEYWORDS

Antibiotic sensitivity assay (AST), Double Disc Synergy Test (DDST), Modified Hodge Test (MHT), E-Test, Molecular analysis of *ESBL* and *MBL* genes, PCR, *ESBL* genes (*TEM*, *SHV* and *CTXB*), *MBL* genes (*IMP*, *IMP2*, *IMP3*, *IMP4*, *IMP5*, *IMP6*, *IMP7*, *IMP8*, *IMP9*, *IMP10*, *IMP11*, *IMP12*, *IMP13*, *IMP14*, *IMP15*, *IMP16*, *IMP17*, *IMP18*, *IMP19*, *IMP20*, *IMP21*, *IMP22*, *IMP23*, *IMP24*, *IMP25*, *IMP26*, *IMP27*, *IMP28*, *IMP29*, *IMP30*, *IMP31*, *IMP32*, *IMP33*, *IMP34*, *IMP35*, *IMP36*, *IMP37*, *IMP38*, *IMP39*, *IMP40*, *IMP41*, *IMP42*, *IMP43*, *IMP44*, *IMP45*, *IMP46*, *IMP47*, *IMP48*, *IMP49*, *IMP50*, *IMP51*, *IMP52*, *IMP53*, *IMP54*, *IMP55*, *IMP56*, *IMP57*, *IMP58*, *IMP59*, *IMP60*, *IMP61*, *IMP62*, *IMP63*, *IMP64*, *IMP65*, *IMP66*, *IMP67*, *IMP68*, *IMP69*, *IMP70*, *IMP71*, *IMP72*, *IMP73*, *IMP74*, *IMP75*, *IMP76*, *IMP77*, *IMP78*, *IMP79*, *IMP80*, *IMP81*, *IMP82*, *IMP83*, *IMP84*, *IMP85*, *IMP86*, *IMP87*, *IMP88*, *IMP89*, *IMP90*, *IMP91*, *IMP92*, *IMP93*, *IMP94*, *IMP95*, *IMP96*, *IMP97*, *IMP98*, *IMP99*, *IMP100*).



Evaluation of vapors of essential oils from *Trachyspermum ammi* in increasing the shelf life of fresh produce

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INTRODUCTION

- Several essential oils are used in fresh produce. Green chilies, Green peas, Carrot, etc. are susceptible to large attack thereby leading to their spoilage and reduced shelf life.
- Various essential oils used to prevent food spoilage.
- Currently, there is a need for food preservation or extend of the shelf life.
- Plant extracts have been studied for their antimicrobial properties.
- Essential oil from *Trachyspermum ammi* (Ajwain) is known to have a potent antifungal effect, due to the presence of the phenolic compound Thymol.



Fig. 1) Ajwain seeds.
• The current study investigates the antifungal activity of vapors of Ajwain essential oil and its effect on growth of *Aspergillus* species. The volatile agent is used as preservative.

- The study also focuses on food preservation for natural and synthetic food preservatives.

MATERIALS & METHODS

Oil Extract
The hydro-distilled extract of the essential oil of Ajwain was obtained from Bombay Chemicals.

Test Organisms
The bactericidal *Aspergillus niger* and a strain of yeast obtained from spore suspension, were cultured on Sabouraud's agar.

Minimum Inhibitory Concentration (MIC)
The MIC was determined using vapor phase study is modified method of the Agar Cup Method.

The test organisms were exposed to the vapors of 1:10 diluted essential oil.

Preservation study
The vegetables were packed in sterile polythene bags, covered with a film sprayed with a 1:10 diluted essential oil, hermetically sealing the chamber with oil vapors.

Controls were also maintained for the food samples (i.e. absence of vapors of essential oil).

Time Kill Study & Analysis by Fluorescence Microscopy
The cell suspension of yeast having density of 2.2×10^8 per ml was exposed to the vapors of 1:10 diluted oil spread on the film.

The cell suspension from the plate was removed at regular time intervals and enumerated through viable count.

Simultaneously, the cells were also observed using live cell and observed under fluorescence microscope.

RESULTS

Vapor Phase Study
• Encubating the plates for 48 hours at room temperature, the following results were obtained:

Serial No.	Organism	Dilution of oil used	Zone of inhibition (in mm)
1.	Fungus	1:10	23
2.	Yeast	1:10	14

• A 1:10 concentration of the oil was found to be effective.

Preservation Study
• The vegetables that were exposed to vapors of essential oil, remained fresh for a period of 7 days.

• The controls showed growth of fungus within 48 hours of storage.



Fig. 2) Test and Control in presence and absence of essential oil, respectively.

Time Kill Study
• The results indicated 9 decimal reduction in the number of viable cells.

• The fluorescence microscopy showed a higher amount of fluorescence of cells indicating the cell membrane rupture.



1) Fungus
2) Yeast
Fig. 3) Fluorescence microscopy image of fungus and yeast exposed to essential oil vapors.

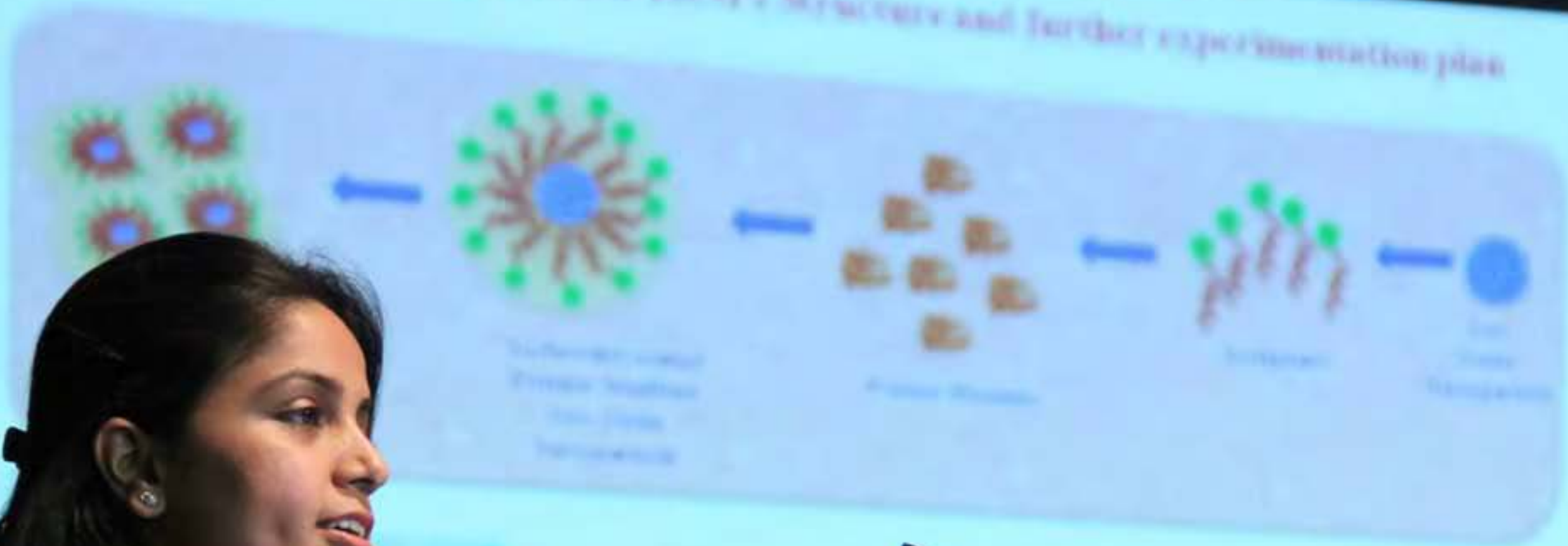
CONCLUSION

- Fungal attack on fresh produce is a problem due to humidity.
- Various methods of food preservation are used for preservation.
- Aqueous solution of essential oils of Ajwain vapors of essential oils can prevent the growth of fungus.
- Fluorescence microscopy showed the cell membrane rupture of the cell membrane and antifungal activity of essential oils.
- The study establishes the potential of fresh produce up to a period of 7 days.
- Hence, a novel method of food preservation using GRAS spice like Ajwain is established, which can replace conventional methods of using synthetic compounds used for preservation.

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A Schematic Explanation for ICNP's Structure and Further experimentation plan





INTRODUCTION

Aravind Thiruvud

Technology

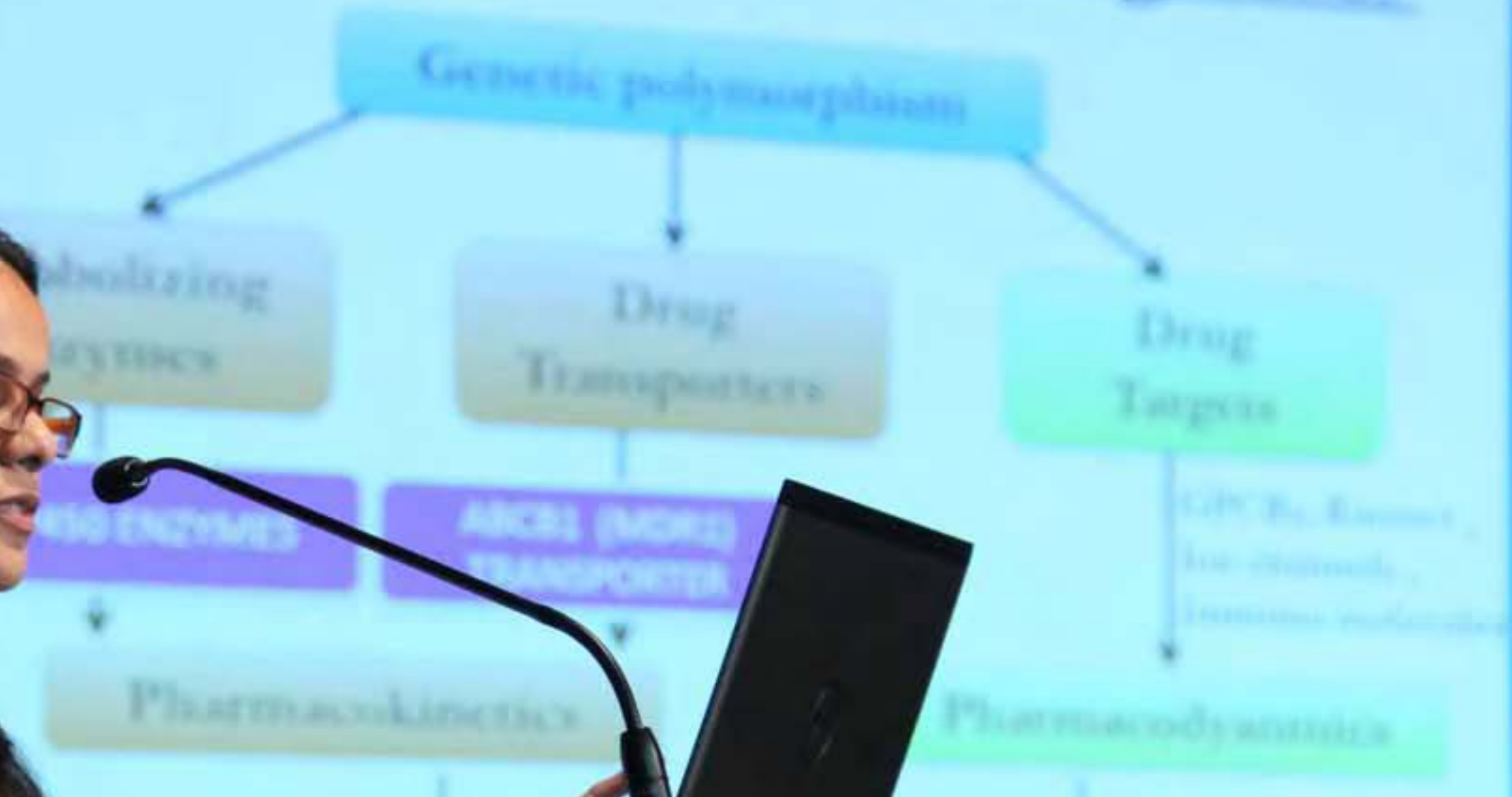


Dr. Abida Juwle

Dr. Purvi Bhatt



Gene Polymorphism & Pharmacogenetics²



The Long and Winding Road to an AIDS Vaccine

- > First AIDS case reported : 1981 Gorlich, 1981
- > HIV identified as cause of AIDS : 1983 Barre-Sinoussi, 1983
- > Advances in knowledge in virology, pathogenesis and immunology in the last three decades
- > Many experimental vaccines have been developed and some candidate vaccines are being tested in clinical trials
- > Yet a safe, effective vaccine to prevent AIDS remains elusive



Seminiferous tubule culture

A type of testicular explant culture including fragments of seminiferous tubules and excluding interstitial tissue

Advantages of using seminiferous tubule culture

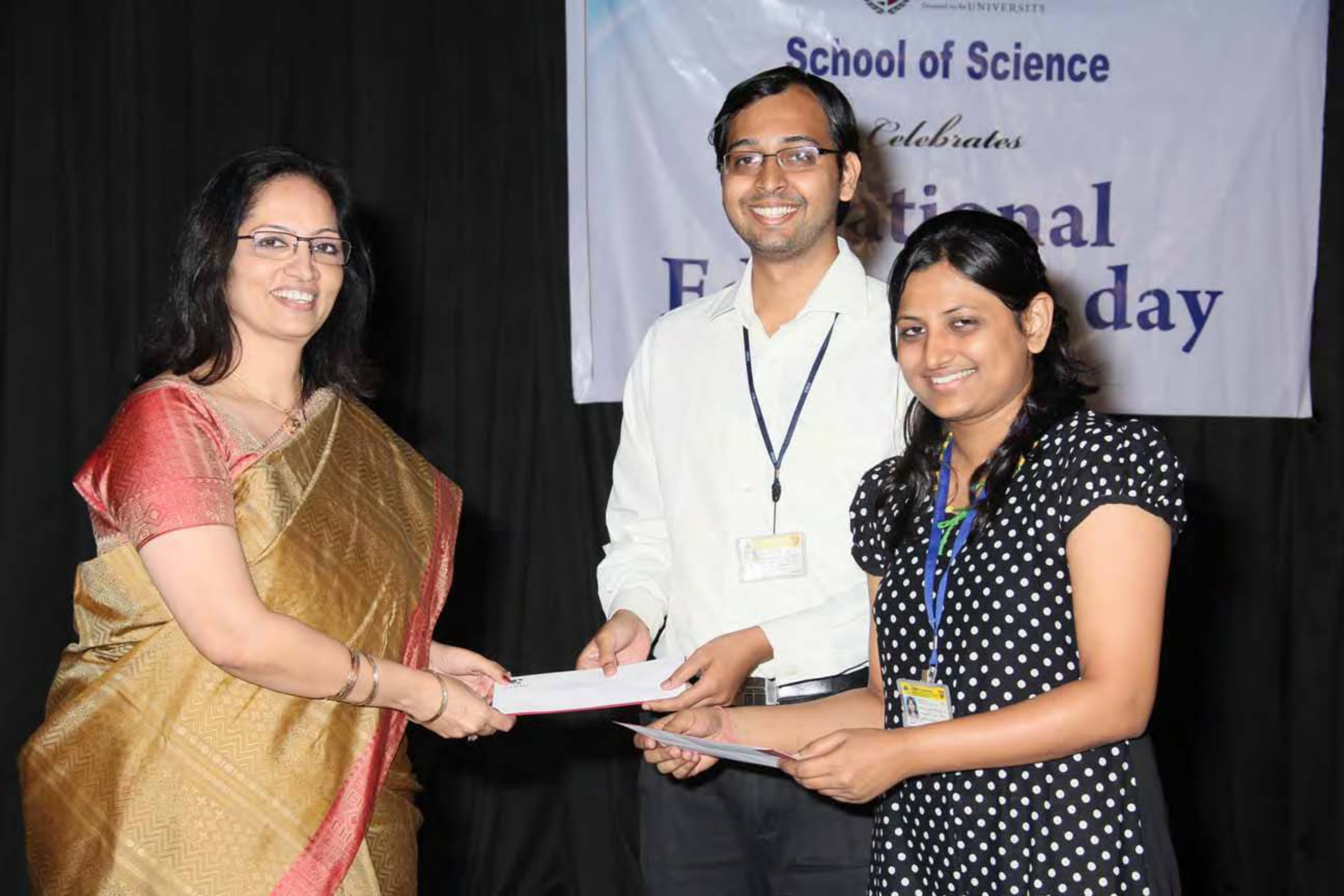
- Tubular paracrine environment is mostly preserved
- The effect of hormones can be studied alone (without influence of changes in other hormone levels through the hypothalamo-pituitary-gonadal axis)
- Hence, a good representative of *in vivo* system

This system has been used earlier for toxicity studies and to study the effects of some growth factors and hormones on gene expression

(Li et al., 1990; Chapin et al., 2001; Bois et al., 2012)



- This can be an alternative approach to create formal programs that effectively disrupt patterns that underlie chronic illness. Using ongoing research will support further development of evidence-based solutions.
- The ability to communicate is an essential skill for individuals to be a part of the community. The purpose of this program is to provide a platform for individuals to share their experiences and learn from one another.
- This study highlights the importance of community support and the role of social networks in the recovery process. The program aims to provide a safe space for individuals to connect with others who have similar experiences.



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