



महाविद्यालय अनुसंधान एवं नवाचार प्रकोष्ठ

College Research & Innovation Cell

शिवाजी कॉलेज (दिल्ली विश्वविद्यालय)

Shivaji College (University of Delhi)

नई दिल्ली - ११० ०२७

New Delhi - 110 027



# ACTIVITIES

*Academic Session: 2022 - 2023*

# MEMBERS OF THE CELL



*Dr Kumari Priyanka  
Convener*



*Dr Lalita Rana*



*Dr Neetu Rani*



*Dr Kiran Bamel*



*Dr Prabuddh K Mishra*



*Dr Devender Singh  
Meena*



*Dr Priyanka Verma*



*Ms Preetika Dhawan*



*Dr S. S. Gaur*



*Dr Ravindra Singh*



*Dr Bhasha Sharma*

# VISION, MISSION AND OBJECTIVES

## VISION

*Research and development is the backbone of Education. Research provide opportunities for collaboration, sharing of knowledge, and innovative practices.*

## MISSION

- ◇ *The Cell aims to develop strategies to foster research collaborations within the faculty, across faculty and institutes/organizations and with agencies outside the college.*
- ◇ *The Cell conducts several programmes such as seminars, workshops and training sessions and motivates the faculty members to undertake research activities and supervise M. Phil and Ph.D. programmes.*
- ◇ *The Cell encourages faculty members of the college to publish their works in leading good quality journals and to present their research findings on the national and international platforms through seminars and conferences.*
- ◇ *The cell facilitates and supports the faculty and students to undertake research projects from various funding agencies.*

## OBJECTIVES

*The main objective of the Cell is to nurture research culture among the faculty members and students by encouraging them to pursue research-based activities in newly emerging and challenging areas.*

# INTRAMURAL RESEARCH SCHEME


## MINOR RESEARCH PROJECTS SANCTIONED IN 2020– 2021:

- ◇ *All seven sanctioned projects are complete. Files are submitted to Governing Body for approval for closure.*

## MINOR RESEARCH PROJECTS SANCTIONED IN 2021– 2022:

- ◇ *The tenure of all five minor research projects are complete.*
- ◇ *Students presentations are over and the Project Completion Reports are processed for external evaluation.*

# MRP / 2022 / 0001



## Disseminating Antimicrobial Resistance in Food Chain using Blended Learning Approach

Karishma Lekhwar\*, Aantra Rao\*, Gungun Saini\*, Vanshika Bansal\*, Sudhanshu Shukla\*, Sparsh Aggarwal\*, Renu Baweja\*, Abhijeet Mishra\*

B.Sc. (H) Biochemistry, Sem IV, Department of Biochemistry, Shivaji College, University of Delhi\*

B.Sc. (H) Biochemistry, Sem IV, Department of Biochemistry, Shivaji College, University of Delhi\*

Assistant Professor, Department of Biochemistry, Shivaji College, University of Delhi\*

### INTRODUCTION

Genetic Transfer between Bacteria

Lack of Awareness

According to WHO By 2050, up to 10 million deaths could occur annually due to AMR, if unchecked

AMR

**Global Threat**

OBJECTIVES

Poor Sanitation and Hygiene

Overuse/Misuse of antibiotics

As per WHO report, AMR could shave trillion off GDP annually and push 24 million more people into extreme poverty in the next decade

To discover potential pathogens on the surface of fresh produce that can gain entry into the food chain

Check the Level of awareness in the general about AMR and to educate them about this

### RESULTS

**Table I: CFU Value and identification of different types of colonies in each sample**

SAMPLE	CFU VALUE (cfu/ml)	DIFFERENT TYPE OF CLONES
Brinjal	5.7 X 10 <sup>8</sup>	2
Apple	1.19 X 10 <sup>9</sup>	2
Carrot	1.2 X 10 <sup>9</sup>	2
Pear	1.6 X 10 <sup>9</sup>	2
Cauliflower	5.8 X 10 <sup>9</sup>	2


**TABLE II: Characterization of Bacterial colonies by Biochemicals Test Kits**

SAMPLE	GRAM STAINING	KB001 KIT	KB002
BRINJAL ( <i>Solanum melongena</i> L.)	Gram Negative	<i>Enterobacter gergoviae</i> , <i>Enterobacter cloacae</i>	<i>Citrobacter freundii</i>
APPLE ( <i>Malus pumila</i> )	Gram Negative	<i>Enterobacter gergoviae</i>	<i>Citrobacter freundii</i>
CARROT ( <i>Daucus carota</i> )	Gram Negative	<i>Enterobacter gergoviae</i> , <i>Klebsiella pneumoniae</i>	<i>Citrobacter freundii</i>
PEAR ( <i>Pyrus communis</i> L.)	Gram Negative	<i>Enterobacter cloacae</i>	<i>Citrobacter freundii</i>
CAULIFLOWER ( <i>Brassica oleracea</i> )	Gram Positive	<i>Enterobacter cloacae</i>	<i>Citrobacter freundii</i>

#### General Public Awareness Data

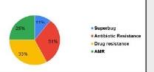
Who prescribed the antibiotic to you?

Doctor (Pharmacist), Family, Friend



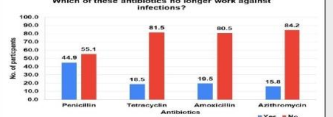
Public awareness about different terms

Antibiotic Resistance, Antibiotic, Drug resistance, AMR




Which of these antibiotics no longer work against infections?

Penicillin, Tetracycline, Amoxicillin, Amphotericin




#### Fruits/Vegetables Vendor Awareness Data


Location of vendors



How many vendors are aware of AMR?




How many vendors are aware of AMR?




### METHODOLOGY


**SAMPLE COLLECTION (Fruits & Vegetables)**



**PROCESSING OF SAMPLES**




**ISOLATION OF BACTERIA PRESENT ON THE SURFACE OF FRESH PRODUCE**




**CHARACTERIZATION OF BACTERIAL SPECIES USING BIOCHEMICAL KIT ASSAYS (KB001 & KB002)**

(The colour change depicts the positive behaviour of Pathogen for the test)

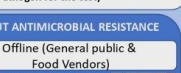


**AWARENESS AND KNOWLEDGE ABOUT ANTIMICROBIAL RESISTANCE**

Online (School Students)



Offline (General public & Food Vendors)



### REFERENCES

- Leff JW, Fierer N. Bacterial communities associated with the surfaces of fresh fruits and vegetables. *PLoS One*. 2013;8(3):e59310
- Teneza, G.N.; Reyes, P.; Molina, D.; Ortega, C. Pathogenic Microorganisms Linked to Fresh Fruits and Juices Purchased at Low-Cost Markets in Ecuador, Potential Carriers of Antibiotic Resistance. *Antibiotics* 2023 12, 236.

### ACKNOWLEDGEMENT

We would like to thank funding from Intramural Minor Research project (MRP/2022/0001), Shivaji college, University of Delhi and all the participants of the awareness campaign

### CONCLUSION

- We have identified the potential pathogens on the surface of Food produce that can enter the Food chain and responsible for generating AMR.
- It is very important to make people aware (52.4% unaware) about the havoc AMR can make in upcoming years and educate them about it.

Status: Tenure Complete



# MRP / 2022 / 0002

**Role of Medicinal Plants for Sustainability of Environment**

Project investigators  
Dr Prabhavathi, Department of Botany, Shivaji College, DU  
Dr Vandana Katoch, Department of Chemistry, Shivaji College, DU

Students  
B.Sc.(Hons) Botany- Sumit K. Pathak (III year), Sarthak (II year) & Palak Gupta (II year)  
B.Sc.(Hons) Chemistry- Saniya Baberwal (II year) &  
Anurag Maurya (II year)

## Introduction

The environmental condition have an impact on the secondary metabolite content of medicinal plants. The secondary metabolites are alkaloids, reducing sugars, flavanoids, phlobatannins and they are produced with plants in certain quantities under specific conditions with biotic and abiotic factors. The environmental factors have a role in the pH, amount of salinity, electrical conductivity, heavy metals which greatly affect the concentration of secondary metabolites in medicinal plants of herbal garden and plants of shivaji college garden. The medicinal plants are useful for healing and curing of human diseases because of the presence of photochemical constituents. Photochemicals are naturally occurring in medicinal plant leaves, roots that have a defense mechanism against air and soil pollution. Secondary metabolites exhibits various pharmacological activities like anti-inflammation, anti-cancer, anti-malarial, inhibition of cholesterol synthesis, anti-viral and anti-bacterial activities and anesthetic agent. Our main work was to analyse the presence or absence of different phytochemicals present in medicinal plants of herbal garden and plants from shivaji college garden.



## Results and discussion

The photochemical & biochemical experiments performed during the current project study confirms that the extracts of plant have chlorophyll, proline, alkaloid, reducing sugar, terpenoids, flavanoids, carbohydrates. The secondary metabolites concentration is reduced due to high concentration of CO<sub>2</sub> (400ppm-1200ppm) and other components (volatile organic components, formaldehyde). The pH of soil sample of medicinal plants was more alkaline than the soil sample of shivaji college garden, this is due to high concentration of calcium and magnesium ions in the soil sample of herbal garden. The salinity of herbal garden soil is 5.056 ppm and shivaji college garden soil is 2ppm while road side soil is 500 ppm. The salinity is high due to high pollution. The electrical conductance was double the salinity which is due to calcium, magnesium and sodium ions. No heavy metal like mercury, lead, copper & nickel were detected in the soil sample. The chlorophyll estimation of medicinal plants and Shivaji College garden plants was done and chlorophyll content of neem was high, as compared to other plants. In line with the above findings it is suggested that further research on medicinal plants should be directed towards quantification of other components of secondary metabolites with effect of environmental conditions.

## Acknowledgement

We would like thank Prof. Shiv K. Sahdev, Principal, Shivaji College, University of Delhi, for funding the CRC project. We thank lab staff of Botany and Chemistry Department and gardeners in helping to carry out this projects work.

*Status: Tenure Complete*



## EFFECTIVENESS OF NUDGES IN WASTE MANAGEMENT



### AIM OF OUR STUDY

To examine the waste disposal behavior of students without nudges and assess the effectiveness of nudges on waste segregation.

### WHAT ARE NUDGES?

Nudges are used to influence human behavior, not to force it. In our study, stickers and googly eyes have been used as nudges to increase students' waste disposal.



### KEY FINDINGS

**88%** of the respondents believe that the presence of different colored bins will affect their waste disposal practices.

**97%** of the respondents believe waste segregation would make recycling waste easier.

TO KNOW MORE ABOUT OUR PROJECT, COME MEET US AT SRIJAN'23.

#### Principal Investigators:

Mr. Sumeet Singh Raheja  
Assistant Professor, Department of Economics  
Ms. Shruti Goyal  
Assistant Professor, Department of Economics

#### Study By:


Aparna Rana  
Shaily Sengar  
Kinshuk Taneja  
Parth Jain  
Akanksha Srivastava

*Status: Tenure Complete*




# MRP / 2022 / 0004

Status: Tenure Complete



## INTERPLAY OF GENETIC AND LIFESTYLE RISK FACTORS IN CARDIOVASCULAR DISEASES

Dr. Sunita Singh  
Principal Investigator - MRP/2022/004  
Department of Biochemistry, Shree College, University of Delhi, Raja Garden, New Delhi - 110027



### Project Students

Ayush Sachan, Shivangi Aggarwal, Vandana, Bhumiika Chaudhary, Harshika Kohli, Hemant Gaudam, Ranjit Kumar Shah, Disha Chandeliya, Sony Sharma

### OBJECTIVE

- To identify the genes contributing towards the four cardiovascular diseases like Cardiomyopathy/ Coronary artery disease, Hypertension, Myocardial infarction and stroke.
- To explore the biochemical pathways of the identified genes.
- Survey for the healthy lifestyle behavior check (which will include different parameters like no smoking, control of weight, balanced diet, and regular exercise) and cardiovascular comorbidities as predictors for severe COVID infection.

### METHODOLOGY

- RNA sequences of Diseased Patients and Healthy Volunteers were taken from NCBI SRA
- The sequences were uploaded on Galaxy Server in FASTQ format.
- Sequence Quality was checked using FastQC Tool and low-quality bases were trimmed out using Trimmomatic Tool
- The sequence was aligned to the human genome using TopHat or HISAT2 tools, followed by Cuffdiff tool for assembling transcripts, estimating their abundance and testing differential expression
- The Cufflinks were merged using Cuffmerge tool and then were differentiated for diseased and control samples using Cuffdiff
- The Cuffdiff data was sorted on Excel and Edit Plus to obtain Upregulated and downregulated genes.
- The gene names were retrieved from Ensembl/Biomart and Biochemical Pathways from David GO. Heatmaps for differential expression of genes was created using Graphpad prism

### RESULTS

#### In silico Approach

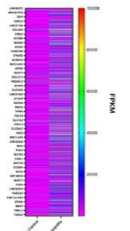
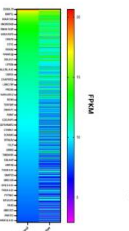
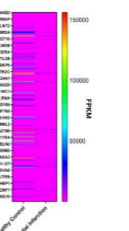




Figure 1: Heatmap displaying the FPKM values of highly differentially expressed genes in Cardiomyopathy

Figure 2: Heatmap displaying the FPKM values of highly differentially expressed genes in Hypertension

Figure 3: Heatmap displaying the FPKM values of highly differentially expressed genes in Myocardial infarction

Gene	Function	Gene	Function	Gene	Function
CDP390	cardiolipin protein 390(CDP390)	EGLN3	egl-3 family hypoxia inducible factor 3(EGLN3)	SCARB1	scavenger receptor class B member 1(SCARB1)
L2IC	lysine zipper and CTNBP1 domain containing 2(L2IC)	PTGS2	prostaglandin G synthase(PTGS2)	CACM2	cell adhesion molecule 2(CACM2)
MBAT17	nicotinamide nucleotide adenosine diphosphate transferase 17(MBAT17)	THEM3P	thioesterase superfamily member 7, pseudo gene(THEM3P)	FAM103B	family with sequence similarity 103 member B(FAM103B)
PTGIP2P1	prostaglandin synthase 2 pseudogene 1(PTGIP2P1)	SELENP3	selenoprotein 3(POLENP3)	DAG1	diacylglycerol 1(DAG1)
TNMD24P1	transmembrane protein 24, pseudogene 1(TNMD24P1)	LINC01513	long intergenic non-protein coding RNA 1513(LINC01513)	IOOH	iodoform containing HDCH4

Genes Involved in Cardiomyopathy      Genes Involved in Hypertension      Genes Involved in Myocardial infarction

#### Non-invasive Approach


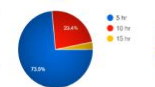





Figure 4: Pie chart for Lifestyle

Figure 5: Pie chart for Average hours per day spent in front of mobile/laptop screen

Figure 6: Pie chart for SpO2 level

BMI (kg/m <sup>2</sup> )	Diagnosis
Below 18.5	Underweight
18.5 to 24.9	Healthy weight
25.0 to 29.9	Overweight




Figure 7 & 8: BMI of Male and Female Subjects distributed into respective categories.

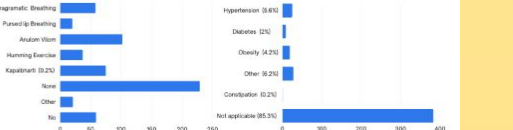


Figure 9: Breathing exercises performed by subjects

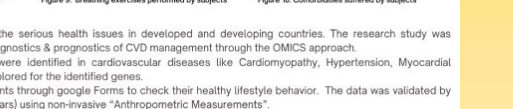



Figure 10: Comorbidities suffered by subjects

### Health Camp for Anthropometric Measurements



### CONCLUSION

- Cardiovascular diseases (CVDs) are ranked as one of the serious health issues in developed and developing countries. The research study was undertaken to make contributory efforts towards early diagnostics & prognostics of CVD management through the OMICS approach.
- The highly overexpressed & under-expressed genes were identified in cardiovascular diseases like Cardiomyopathy, Hypertension, Myocardial infarction and stroke. The biochemical pathways were explored for the identified genes.
- The survey studies were undertaken by the project students through google Forms to check their healthy lifestyle behavior. The data was validated by organizing the health camp for college students (17-25 years) using non-invasive "Anthropometric Measurements".





# MRP / 2022 / 0005

*Status: Tenure Complete*

## Minor Research Project

Shivaji College, University of Delhi

### Impact of Online Education on Schooling Choices: A Study of Slums in Delhi

**Invigilator 1**  
Anshu Chopra  
Associate Professor  
Department of Economics  
Shivaji College, University of Delhi

**Invigilator 2**  
Nikita Gupta  
Assistant Professor  
Department of Economics  
Shivaji College, University of Delhi

**Students Team**  
Abhishek Raj  
Devanshi Thakur  
Divyanshi Pathak  
Khushi Bhatia  
Saloni Agarwal



### Introduction

During the nationwide lockdown in India, education of children was hugely affected due to shutting down of schools and abrupt transition to the digital classes. This was aggravated by unavailability of skills and equipment to operate the classes online. While the impact on children belonging to middle- and high-income families is more in terms of the quality of education, the impact on low-income families is largely quantitative in nature i.e., it has led to the shift in their schooling choices altogether.

### Objectives

The main objective of this project is to study the schooling choices of the children in these clusters and assess the enrolment and dropout numbers during the pandemic. The aim is to draw a comparison between these choices amongst pre-, during, and post-pandemic periods. We also wish to check if the dropout was temporary and whether the children resumed the classes after re-opening of the schools.

### Methodology

To check the differential impact of Covid-19 and the lockdown imposed on the students with different family backgrounds, we have conducted a primary survey in JJ clusters in Delhi.

To collect information about the education and employment choices, we have conducted a study on children and their families at the individual level using a time use survey in 4 Slum areas of Delhi (zone wise).

We also aim to corroborate the findings of the primary data collection using the secondary data for India.

### Results and Findings

**87.2%** students continued their schooling by using online devices (such as smartphones, laptops, computers) along with **30.8%** with books distributions and **43.1%** with the help of Assignments



Response	Percentage
Education devices	87.2%
Books	30.8%
Assignments	43.1%

**90.7%** students are enrolled in schools during covid-19 where as **9.3%** are drop outs (including temporary drop out because of covid-19 and permanent drop out depending on several reasons).



Response	Percentage
Yes	90.7%
No	9.3%

**2.70%** of the children reported that no intervention was made by the government or the NGOs during the lockdown while 25.9% and 10.4% responded positively to intervention/aids by the government and NGOs respectively.


**56.2%** Not Applicable because of no intervention made by the Government where as 36.6%, 5.2% and 3.9% goes to Books, Internet and Devices respectively.

### Conclusion

A regression analysis on the primary data will be conducted based on different possible econometric models to explain the change in schooling choices using variables such as barriers to education, parent's perception, ease of studying etc that will help in understanding the impact of such factors on the dropout rates. A similar regression for secondary data is to be carried out to observe patterns and similarity in results obtained using primary data.

# MINOR RESEARCH PROJECTS SANCTIONED IN 2022 – 2023

Seven projects have been sanctioned. Their details are as follows:


 महाविद्यालय अनुसंधान एवं नवाचार प्रकोष्ठ  
 College Research & Innovation Cell  
 शिवाजी कॉलेज (दिल्ली विश्वविद्यालय)  
 Shivaji College (University of Delhi)  
 नई दिल्ली - ११० ०२७  
 New Delhi - 110 027

**Intramural Research Scheme**  
**Minor Research Projects**  
**Sanction Year: 2022-2023**

S. No	File No.	Principal Investigators	Title of the Project	Student Details	Sanction Order Details & Date of Start (DOS)
1	MRP/2022 - 2023/0001	1. Dr. Neena Khanna (Dept. of Chemistry) 2. Dr. Parveen Gahlyan (Dept. of Chemistry)	Synthesis of rhodamine based chemosensors and their application in detection of toxic metal ions	1. Garv Gupta (Roll No.: 21/10027) B. Sc. (H) Chemistry 2. Sakshi Bhardwaj (Roll No.: 21/10066) B. Sc. (H) Chemistry 3. Yogita (Roll No. 21/10053) B. Sc. (H) Chemistry 4. Garv Gaur (Roll No. 21/10048) B. Sc. (H) Chemistry 5. Gunit Manaktala (Roll No. 21/10071) B. Sc. (H) Chemistry	SH/Adm./ 2175/23 Dated 31/01/2023  DOS: 02.02.2023
2	MRP/2022 - 2023/0002	1. Dr. Neetu Rani (Dept. of Mathematics)	Mathematical Modelling for Volume Estimation of Guava (Psidium Guajava L.)	1. Raghav Anand Nath (Roll No. 21/17007) B. Sc. (H) Mathematics 2. Vaibhav Bhatt (Roll No. 21/17143) B. Sc. (H) Mathematics 3. Sneha Gupta (Roll No. 21/17096) B. Sc. (H) Mathematics 4. Shashvat Kumar Mishra (Roll No. 22/17067) B. Sc. (H) Mathematics 5. Dolly Chawla (Roll No. 22/09026) B. Sc. (H) Botany 6. Saloni (Roll No. 22/09018) B. Sc. (H) Botany	SH/Adm./ 2295/23 Dated 03/03/2023  DOS: 05.03.2023

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 03/03/2023  
 Shri K. Sarda

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 नया गार्डन, नई दिल्ली-110027  
 Page Garden, New Delhi-110027

3	MRP/2022 - 2023/0003	1. Dr. Kiran Bamel (Dept. of Botany) 2. Dr. Seema Talwar (Dept. of Botany)	Impact of Elevated Temperature on the Seed Germination of Medicinal plants ( <i>Catharanthus roseus</i> and <i>Trigonella foenum-graecum</i> )	1. Ankit (Roll No. 22/09005) B. Sc. (H) Botany 2. Tribeni (Roll No. 22/09022) B. Sc. (H) Botany 3. Palak (Roll No. 22/23052) B. Sc. (Prog.) Life Sciences 4. Shorya (Roll No. 22/23071) B. Sc. (Prog.) Life Sciences 5. Gautam (Roll No. 22/23065) B. Sc. (Prog.) Life Sciences	SH/Adm./ 2296/23 Dated 03/03/2023  DOS: 05.03.2023
4	MRP/2022 - 2023/0004	1. Dr. Preeti Tiwari (Dept. of Geography) 2. Ms Ekta Raman (Dept. of Geography)	Impact Assessment of Swachh Bharat Mission in Raghur Nagar	1. Sonia Borana (Roll No. 22/31050) B. A. (H) Geography 2. Vanshika Punia (Roll No. 22/31055) B. A. (H) Geography 3. Aman Singh (Roll No. 22/49151) B. A. (Program) 4. Maseera Siddiqui (Roll No. 22/31029) BA(H) Geography 5. Aditya Sharma (Roll No. 22/49112) B. A. (Program)	SH/Adm./ 2297/23 Dated 03/03/2023  DOS: 05.03.2023
5	MRP/2022 - 2023/0005	1. Dr. Jayita Thakur (Dept. of Biochemistry) 2. Dr. Usha Yadav (Dept. of Biochemistry)	Comparative analysis of the effects of dietary supplements on <i>Drosophila melanogaster</i>	1. Sayena Simron (Roll No. 21/06055) B. Sc. (H) Biochemistry 2. Sanjana Gupta (Roll No. 21/06007) B. Sc. (H) Biochemistry 3. Sony Sharma (Roll No. 21/06050) B. Sc. (H) Biochemistry 4. Sahil Anand (Roll No. 21/06031) B. Sc. (H) Biochemistry 5. Shivangi Aggarwal (Roll No. 21/06030) B. Sc. (H) Biochemistry 6. Vandana (Roll No. 21/06047) B. Sc. (H) Biochemistry 7. Debdatta Chatterjee (Roll No. 22/06009) B. Sc. (H) Biochemistry 8. Pooja (Roll No. 22/06024)	SH/Adm./ 2298/23 Dated 03/03/2023  DOS: 05.03.2023

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 03/03/2023  
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 नया गार्डन, नई दिल्ली-110027  
 Page Garden, New Delhi-110027

				B.Sc. (H) Biochemistry 9. Kanishk Rai (Roll No. 22/06017) B.Sc. (H) Biochemistry 10. Tushar Gupta (Roll No. 22/06032) B.Sc. (H) Biochemistry	
6	MRP/2022 - 2023/0006	1. Ms Nimita Kant (Dept. of Zoology) 2. Dr Jitendra Kr. Chaudhary (Dept. of Zoology)	Developing insights into stem cell therapeutic potential for hematological disorders based on analysis of National Institute of Health (NIH)'s clinical trials repertoire	1. Priya Roy (Roll No. 21/22020) B.Sc. Zoology(H) 2. Akanksha (Roll No. 21/22021) B.Sc. Zoology(H) 3. Supriya Bhardwaj (Roll No. 21/22054) B.Sc. Zoology(H) 4. Lakshay Bhardwaj (Roll No. 21/22064) B.Sc. Zoology(H) 5. Priya Talwar (Roll No. 21/22069) B.Sc. Zoology(H)	SH/Admn/ 2299/23 Dated 03/03/2023  DOS 05.03.2023
7	MRP/2022 - 2023/0007	1. Dr Lalita Rana (Dept. of Geography) 2. Ms Rashmi Singh (Dept. of Geography)	Urban Sprawl Modelling & Commuting Pattern- Delhi Gurgaon Corridor: A Sustainable Growth	1. Inika Garg (Roll No. 22/31020) B.A. (H) Geography 2. Jhilmil Verma (Roll No. 22/31021) B.A. (H) Geography 3. Toyaj Gini Goswami (Roll No. 22/31054) B.A. (H) Geography 4. Nivedita Sharma (Roll No. 22/31033) B.A. (H) Geography 5. Dildar Ali (Roll No. 22/31017) B.A. (H) Geography 6. Shashank Singh (Roll No. 22/31047) B.A. (H) Geography 7. Akilesh Kumar (Roll No. 22/31009) B.A. (H) Geography 8. Syed Sadiq Husain (Roll No. 22/31053) B.A. (H) Geography	SH/Admn/ 2300/23 Dated 03/03/2023  DOS: 05.03.2023

Kumari Pooja  
03/03/2023

Shiv Kumar Solanki

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अध्यापिका, प्रोफेसर / Officiating Principle  
विश्वविद्यालय / Shri Lal College  
विश्वविद्यालय / University of Delhi,  
एन.ए. रोड, नई दिल्ली-110027  
New Garden, New Delhi-110027

No. of student beneficiary : 44  
No. of teacher beneficiary : 13  
Total beneficiary : 57

Kumari Pooja  
03/03/2023

Shiv Kumar Solanki

अध्यापिका, प्रोफेसर / Officiating Principle  
विश्वविद्यालय / Shri Lal College  
विश्वविद्यालय / University of Delhi,  
एन.ए. रोड, नई दिल्ली-110027  
New Garden, New Delhi-110027

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# EVENTS



# महाविद्यालय अनुसंधान एवं नवाचार प्रकोष्ठ COLLEGE RESEARCH & INNOVATION CELL



शिवाजी कॉलेज (दिल्ली विश्वविद्यालय)  
SHIVAJI COLLEGE (University of Delhi)

Organizes  
one-day workshop entitled  
**STRENGTHENING RESEARCH SKILLS**

## Resource Persons



**DR ANIL KUMAR GOYAL**  
Associate Professor  
Maharaja Agrasen Institute of Management Studies  
Sector – 22 Rohini, Delhi – 110 086



**DR KHUSHBU KUSHWAHA**  
Associate Managing Editor  
Wiley  
Noida, Uttar Pradesh, India



November 10, 2022

Time: 10:00 AM onwards



College Auditorium

For any query contact [crc@shivaji.du.ac.in](mailto:crc@shivaji.du.ac.in)

**Dr Kumari Priyanka**  
Convener

Organizing Committee  
Dr Lalita Rana, Dr Neetu Rani, Dr Kiran Bamel, Dr Prabhudd Kumar Mishra, Dr S. S. Gaur, Dr Bhasha Sharma,  
Ms Preetika Dhawan, Dr Priyanka Verma, Dr Devender Singh Meena, Dr Ravindra Singh

**Prof. (Dr) Shiv Kumar Sadhev**  
Patron | Principal

## The Program Schedule

<u>TIME</u>	<u>EVENT</u>
10:00 - 10:30	<b>Inauguration</b> <ul style="list-style-type: none"><li>• Ceremonial Lighting of Lamp</li><li>• Introductory Speech by Principal, Shivaji College</li><li>• Distribution of Project completion certificate of projects sanctioned in academic session 2020-2021 under intramural research scheme</li></ul>
10:30 - 11:45	<b>Session 1: Overview of research and its methodologies</b> Speaker: Dr Anil Kumar Goyal
11:45 - 13:00	<b>Session 2: Approaches to solve research problem and data analysis</b> Speaker: Dr Anil Kumar Goyal
14:00 - 15:15	<b>Session 3: General practices of publishing research findings</b> Speaker: Dr Khusbu Kushwaha
15:15 - 15:30	<b>Session 4: Sharing experience of working in a project under intramural research scheme</b> Speaker: Some students who worked in projects sanctioned in academic session 2020-2021, which are complete
15:30	Valedictory session including distribution of certificates to participants

For any query contact [erc@shivaji.du.ac.in](mailto:erc@shivaji.du.ac.in)

Dr Kumari Priyanka  
Convener









# ANNUAL FESTIVAL OF THE CELL

## “SRIJAN-2023”



# महाविद्यालय अनुसंधान एवं नवाचार प्रकोष्ठ COLLEGE RESEARCH & INNOVATION CELL

शिवाजी कॉलेज (दिल्ली विश्वविद्यालय)  
SHIVAJI COLLEGE (University of Delhi)



Cordially invites all students and teachers to its annual festival

## SRIJAN- 2023

*Chief Guest*

*Program Schedule*



**Prof. B. K. Dass**  
Former Professor  
Department of Mathematics  
University of Delhi  
Delhi - 110 007

**Inauguration: 10:00 AM to 10:30 AM**  
**Presentation of Research Findings, Minor Research Projects**  
MRP/2022/0001 - 10:30 - 11:00 AM  
MRP/2022/0002 - 11:00 - 11:30 AM  
MRP/2022/0003 - 11:30 - 12:00 NOON  
MRP/2022/0004 - 12:00 - 12:30 PM  
MRP/2022/0005 - 12:30 - 01:00 PM  
**Valedictory Function: 01:00 PM**



April 03, 2023

Time: 10:00 AM onwards



College Auditorium

For any queries contact [crc@shivaji.du.ac.in](mailto:crc@shivaji.du.ac.in)

Dr Kumari Priyanka  
Convener

Organizing Committee

Dr Lalita Rana, Dr Neetu Rani, Dr Kiran Bamel, Dr Prabuddh Kumar Mishra, Dr S. S. Gaur, Dr Bhasha Sharma,  
Ms Preetika Dhawan, Dr Priyanka Verma, Dr Devender Singh Meena, Dr Ravindra Singh

Prof. Shiv Kumar Sahdev  
Patron | Principal



# महाविद्यालय अनुसंधान एवं नवाचार प्रकोष्ठ

## COLLEGE RESEARCH & INNOVATION CELL



### अंतः भित्ति अनुसंधान योजना / Intramural Research Scheme



### Research Findings of Minor Research Projects, Sanction Year: 2021 - 2022

#### MRP/2022/0001

##### Disseminating Antimicrobial Resistance in Food Chain using Blended Learning Approach

**Project Investigators:** Karolina Lalwani, Anshu Raaj, Gurpreet Singh, Vandana Bhatnagar, Sushanta Ghosh, Sanku Aggarwal, Parvinder Singh, Shobhit Mishra, Divyanshu Singh, Department of Chemistry, Shri Raj College, Delhi.

**Students:** R.S. (Food) Bhatnagar, Sneha K. Puri (01 year), Nehal (01 year) & Pankaj Gupta (01 year), R.S. (Food) Chemistry, Sneha Bhatnagar (01 year) & Ananya Maurya (01 year)

**Introduction:** Genetic Transfer between Bacteria, AMR, Floor Sanitation and Hygiene, Lack of Awareness, Overuse/Misuse of antibiotics, Global Threat.

**Objectives:** To discover potential pathogens on the surface of fresh produce that can gain entry into the food chain. Check the Level of awareness in the general about AMR and to educate them about this.

**Methodology:** SAMPLE COLLECTION (Fruits & Vegetables), PROCESSING OF SAMPLES, ISOLATION OF BACTERIA PRESENT ON THE SURFACE OF FRESH PRODUCE, CHARACTERIZATION OF BACTERIAL SPECIES USING BIOCHEMICAL, RTI ASSAYS (PCR, RAPD), AWARENESS AND KNOWLEDGE ABOUT ANTIMICROBIAL RESISTANCE (Online School Students), Office (General public & Food Vendors).

**Results:** Table I: CFU Value and Identification of different types of colonies in each sample. Table II: Characterization of Bacterial colonies by Biochemical Test Kits. Table III: General Public Awareness Data. Table IV: Fruits/Vegetables Vendor Awareness Data.

**Conclusion:** We have identified the potential pathogens on the surface of food produce that can enter the food chain and responsible for spreading AMR. It is very important to train people across (SCs) awareness about the basic AMR can make in upcoming years and educate them about it.

#### MRP/2022/0002

##### Role of Medicinal Plants for Sustainability of Environment

**Project Investigators:** Dr. Pratiksha, Department of Botany, Shri Raj College, Delhi. Dr. Yashraj Kankar, Department of Chemistry, Shri Raj College, Delhi.

**Students:** R.S. (Food) Bhatnagar, Sneha K. Puri (01 year), Nehal (01 year) & Pankaj Gupta (01 year), R.S. (Food) Chemistry, Sneha Bhatnagar (01 year) & Ananya Maurya (01 year)

**Introduction:** The environmental conditions have an impact on the secondary metabolite content of medicinal plants. The secondary metabolites are alkaloids, reducing sugars, flavonoids, phenolamides and they are produced with plants in certain quantities under specific conditions with biotic and abiotic factors. The environmental factors have a role in the pH, amount of salinity, electrical conductivity, heavy metals which greatly affect the concentration of secondary metabolites in medicinal plants of herbal garden and plants of Shri Raj college garden. The medicinal plants are used for healing and curing of various diseases because of the presence of phytochemical constituents. Phytochemicals are naturally occurring in medicinal plant leaves, roots that have a defense mechanism against air and soil pollution. Secondary metabolites exhibit various pharmacological activities like anti-inflammation, anti-cancer, anti-mutagenic, inhibition of cholesterol synthesis, anti-viral and anti-bacterial activities and antibiotic agents. Our main work was to analyze the presence or absence of different phytochemicals present in medicinal plants of herbal garden and plants from Shri Raj college garden.

**Results and discussion:** The phytochemical & biochemical experiments performed during the current project study confirm that the extracts of plant like chlorophyll, protein, alkaloid, reducing sugar, tannin, flavonoids, carbohydrates. The secondary metabolites concentration is reduced due to high concentration of CO<sub>2</sub>, SO<sub>2</sub>, H<sub>2</sub>O<sub>2</sub> and other components volatile organic compounds, formaldehyde. The pH of soil sample of medicinal plants was more alkaline than the soil sample of Shri Raj college garden. This is due to high concentration of calcium and magnesium ions in the soil sample of herbal garden. The salinity of herbal garden soil is 5100 ppm and Shri Raj college garden soil is 10000 ppm while road side soil is 500 ppm. The salinity is high due to high pollution. The electrical conductivity was double the salinity which is due to calcium, magnesium and sodium ions. No heavy metal like mercury, lead, copper & nickel were detected in the soil sample. The chlorophyll estimation of medicinal plants and Shri Raj College garden plants was done and chlorophyll content of leaves was high in compared to other plants. In line with the above findings it is suggested that further research on medicinal plants should be directed towards quantification of other components of secondary metabolites with effect of environmental conditions.

**Acknowledgment:** We would like thank Prof. Shri R. K. Sahdev, Principal, Shri Raj College, University of Delhi, for funding the CRC project. We thank lab staff of Botany and Chemistry Department and gardeners in helping to carry out this project work.

#### MRP/2022/0003

##### EFFECTIVENESS OF NUGDES IN WASTE MANAGEMENT

**AIM OF OUR STUDY:** To examine the waste disposal behavior of students without nudges and assess the effectiveness of nudges on waste segregation.

**WHAT ARE NUGDES?** Nudges are used to influence human behavior, not to force it. In our study, stickers and googly eyes have been used as nudges to increase students' waste disposal.

**KEY FINDINGS:** 88% of the respondents believe that the presence of different colored bins will affect their waste disposal practices. 97% of the respondents believe waste segregation would make recycling waste easier.

**Study By:** Aparna Rana, Shaily Sengar, Kinshuk Taneja, Parth Jain, Akanksha Srivastava

#### MRP/2022/0004

##### INTERPLAY OF GENETIC AND LIFESTYLE RISK FACTORS IN CARDIOVASCULAR DISEASES

**Project Students:** Anshu Raaj, Shobhit Ghosh, Karolina Lalwani, Divyanshu Singh, Sneha K. Puri, Nehal, Pankaj Gupta, Chandanika, Divyanshu.

**OBJECTIVE:** To identify the genes conferring disease to the four cardiovascular diseases like Coronary artery disease, Hypertension, Myocardial infarction and stroke. To explore the biochemical pathways of the identified genes. Screen for the healthy lifestyle behavior check lists will include different parameters like no smoking, control of weight, balance diet, regular exercise and avoid alcohol consumption as predictors for these CVDs related.

**RESULTS:** In silico Approach, Non-invasive Approach.

**Health Care for Anthropometric Measurements:** Cardiovascular diseases (CVDs) are ranked as one of the serious health issues in developed and developing countries. The research study was undertaken to make contribution efforts towards early diagnosis & prognosis of CVD management through the CRISPR approach. The highly overexpressed & under-expressed genes were identified in cardiovascular diseases like Coronary artery, Hypertension, Myocardial infarction and stroke. The biochemical pathways were explored for the identified genes. The same studies were validated by the project students through google forms to check their healthy lifestyle behavior. The data was validated by organizing the health camps for college students (17-22 years) using non-invasive 'Anthropometric Measurements'.

#### MRP/2022/0005

##### Minor Research Project

##### Impact of Online Education on Schooling Choices: A Study of Slums in Delhi

**Investigator 1:** Anshu Chopra, Associate Professor, Department of Economics, Shri Raj College, University of Delhi.

**Investigator 2:** Nikita Gupta, Associate Professor, Department of Economics, Shri Raj College, University of Delhi.

**Students Team:** Abhinav Raj, Divyanshu Taneja, Divyanshu Pathak, Khushi Bhatia, Saksham Aggarwal.

**Introduction:** The impact of online education on schooling choices in slums in Delhi. The research study was undertaken to explore the impact of online education on schooling choices in slums in Delhi. The study was conducted in slums in Delhi. The research study was undertaken to explore the impact of online education on schooling choices in slums in Delhi.

**Objectives:** To explore the impact of online education on schooling choices in slums in Delhi. The research study was undertaken to explore the impact of online education on schooling choices in slums in Delhi.

**Methodology:** The research study was undertaken to explore the impact of online education on schooling choices in slums in Delhi. The research study was undertaken to explore the impact of online education on schooling choices in slums in Delhi.

**Results and Findings:** The research study was undertaken to explore the impact of online education on schooling choices in slums in Delhi. The research study was undertaken to explore the impact of online education on schooling choices in slums in Delhi.

**Conclusion:** The research study was undertaken to explore the impact of online education on schooling choices in slums in Delhi. The research study was undertaken to explore the impact of online education on schooling choices in slums in Delhi.

Dr Kumari Priyanka  
Convener

"Above results are subject to evaluation by external experts"

Beneficiaries of the scheme:	Students	Teachers	Total
2020-2021:	38	14	52
2021-2022:	28	09	37
2022-2023:	44	13	57

Prof. Shiv Kumar Sahdev  
Patron | Principal







THANK YOU...!

Contact us at: [crc@shivaji.du.ac.in](mailto:crc@shivaji.du.ac.in)