EVENTS

Conducted guest lecture on Microbial Therapeutics – Speker: Dr. M.Shailaja Raj

Visited InKdustrial Knowledge Park at Thurakapally


ALYST

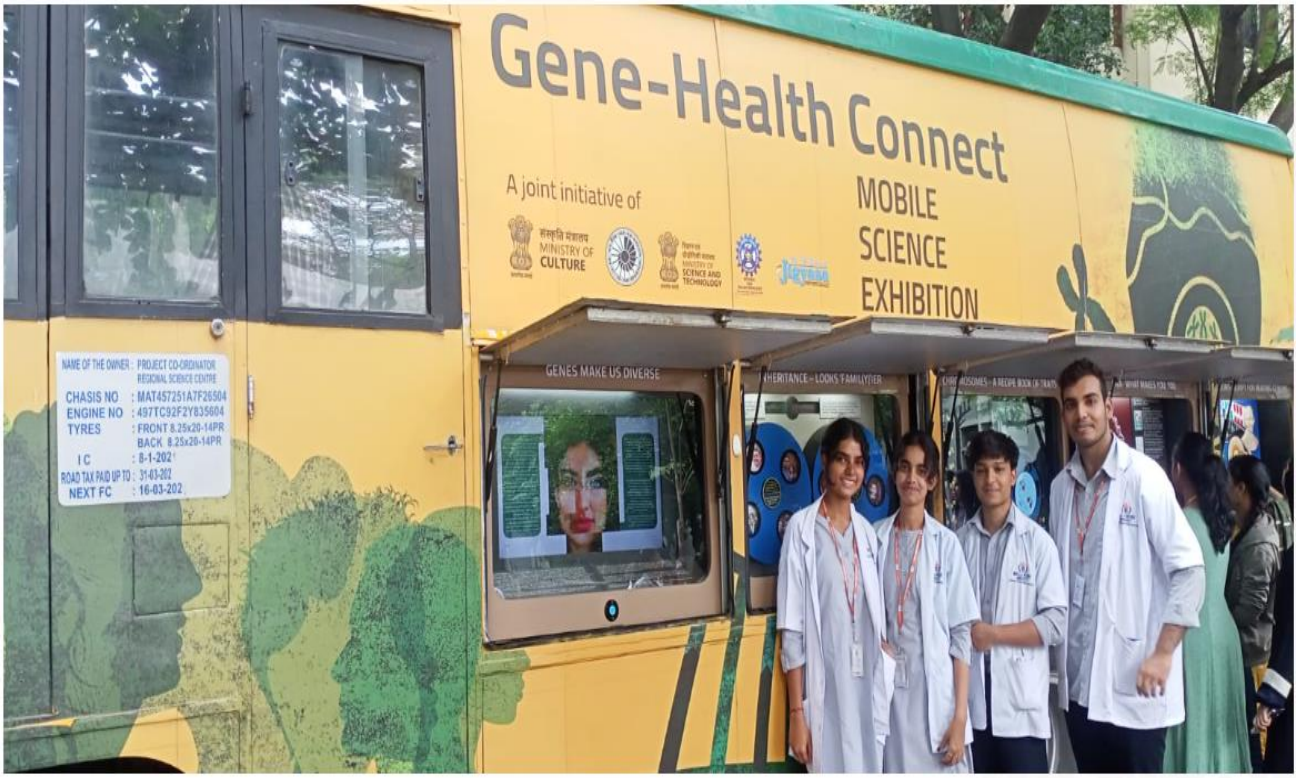

BRUKER
Ascend™ 400

Visited CCMB twice

- **For One Week One Lab – On 2nd August, 2023**
- **For CCMB Open Day**

CSIR-Centre for Cellular & Molecular Biology Hyderabad

1-5 August 2023


Gene-Health Connect
A joint initiative of
MINISTRY OF CULTURE
MINISTRY OF SCIENCE AND TECHNOLOGY
MOBILE SCIENCE EXHIBITION
NAME OF THE OWNER : PROJECT CO-ORDINATOR REGIONAL SCIENCE CENTRE
CHASIS NO : MAT457251A7F26504
ENGINE NO : 497TC92F2Y835604
TYRES : FRONT 8.25x20-14PR BACK 8.25x20-14PR
I C : B-1-202
ROAD TAX PAID UP TO : 31-03-202
NEXT FC : 16-03-202
GENES MAKE US DIVERSE

Conducted Health Survey - 'Exposure and field visit for problem identification' on 11.11.2023

Theme: ''Prevalence of Communicable & Non-communicable Diseases in Rural areas'': A Research approach

IIC activities - Quarter - I

Venues: Jeedimetla, Gandimaisamma, Maisammaguda, Medchal and other selected rural areas of Telangana


MALLA REDDY
UNIVERSITY

Celebrated NATIONAL ENERGY CONSERVATION DAY (INDIA), ON 14.12.2023

Presentations of BMB Students on this event

Sl.No.	Name of the student	Year/Course	Topic

1	S. Yashaswi	II B.Sc (BMB)	Solar energy for future generation and its uses
2	Sneha Priya	III B.Sc (BMB)	Importance of Energy conservation- Bamboo as a source of energy
3	S. Shreyan V. Pooja Tanisi Reddy	II B.Sc (BMB)	Biofuels – Energy conservation


RGY
IC SOLAR POWER
are slightly newer
pared to thermal.
nlight and transform it
by utilizing a silicon
gy.

Celebrated NATIONAL YOUTH DAY on 12TH JANUARY, 2024

Presentations of BMB Students on this event

Sl.No.	Name of the student	Year/Course	Topic
1	S. Shreyan	II B.Sc (BMB)	Youth Empowerment
2	Tanisi Reddy	II B.Sc (BMB)	Youth Empowerment
3	Shruthi	II B.Sc (BMB)	Youth Empowerment
4	Prakash	II B.Sc (BMB)	Youth Empowerment
5	Parikshith Kumar	II B.Sc (BMB)	Youth Empowerment
6	S. Yashaswi	II B.Sc (BMB)	Youth Icons in India


MALLA REDDY UNIVERSITY

<u>Participated in One Day National conference on Viksit Bharat @2047 on January 25 ,2024 at Malla Reddy University</u>


MALLA REDDY
UNIVERSITY
ONE DAY NATIONAL CONFERENCE ON
VIKSIT BHARAT


TO OVERCOME
1. Set Healthy Boundaries
2. Encourage offline activities
3. Develop passion
4. Create screen free zones
5. Practice self care
MALLA REDDY
UNIVERSITY


MALLA REDDY
UNIVERSITY
MALLA REDDY
UNIVERSITY
MALLA REDDY
UNIVERSITY
MALLA REDDY

Technical Event (Medophilia 2K24)

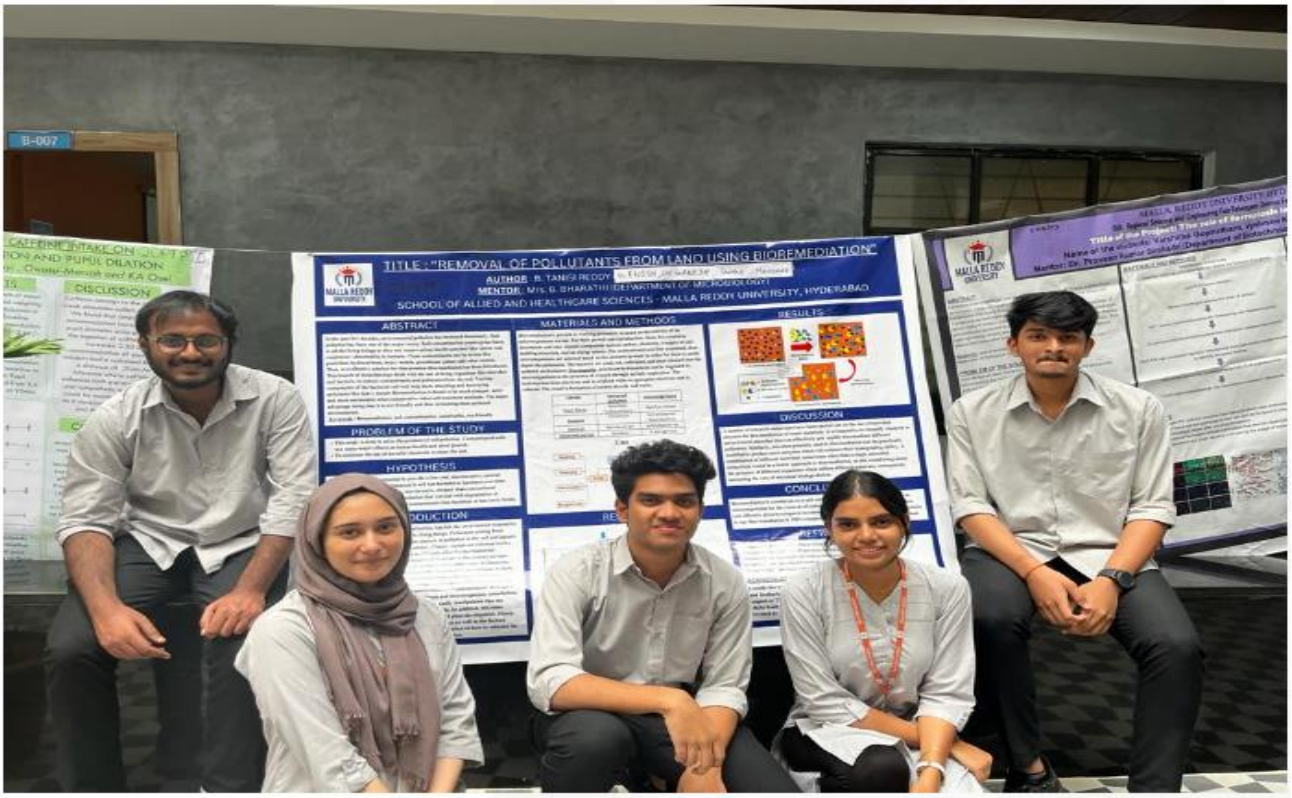
- **Conducted Blood donation awareness program**
- **Conducted Blood glucose estimation**
- **Conducted Hemoglobin estimation**
- **Conducted Blood grouping**

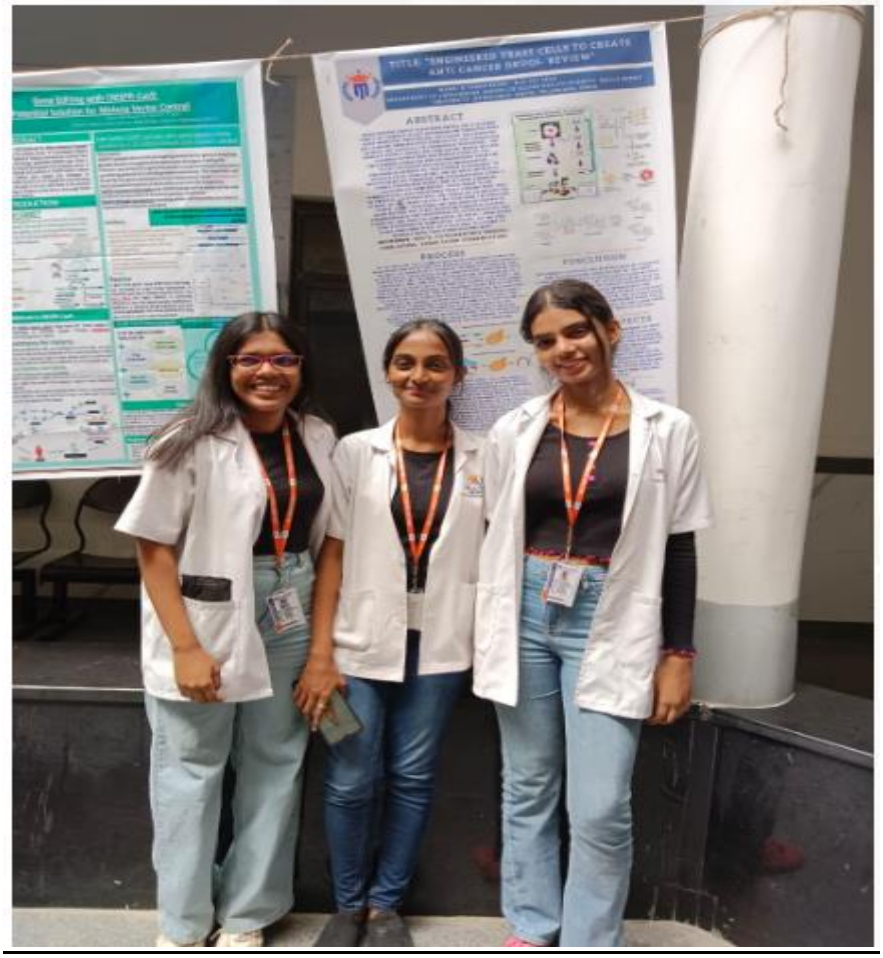

BIOCHEMISTRY
MALLA REDDY UNIVERSITY
SCHOOL OF ALLIED AND HEALTHCARE SCIENCES
AWARENESS ON BLOOD DONATION
BLOOD DONOR DAY
14th June
HEMOGLOBIN


GPS Map Camera

MEDOPHILIA 2K22 - Poster Presentations

Participated in Poster Presentation At Mallareddy University


TITLE : "REMOVAL OF POLLUTANTS FROM LAND USING BIOREMEDIATION"
AUTHOR : B. TANISI REDDY
MENTOR: Mrs. G. BHARATHI, DEPARTMENT OF MICROBIOLOGY
SCHOOL OF ALLIED AND HEALTHCARE SCIENCES - MALLA REDDY UNIVERSITY, HYDERABAD
ABSTRACT
MATERIALS AND METHODS
RESULTS
DISCUSSION
PROBLEM OF THE STUDY
HYPOTHESIS


ABSTRACT

TITLE : "CURRENT APPROACHES TO REPLACE STREETLIGHTS WITH BIOLUMINESCENT TREES TO SAVE ELECTRICITY."

AUTHORS: 1. SHREYAN SHESHADRI SANGA (DEPARTMENT OF LIFE SCIENCE) 2. POOJA.V (DEPARTMENT OF LIFE SCIENCE)
MENTORS: 1. MRS. B. BHARATHI (DEPARTMENT OF MICROBIOLOGY) 2. DR. MUNI KUMAR (DEPARTMENT OF BIOCHEMISTRY)
SCHOOL OF ALLIED AND HEALTHCARE SCIENCES, MALLA REDDY UNIVERSITY, HYDERABAD

BIOLUMINISCENCE

ABSTRACT

Bioluminescent plants are the future. This was possible by chemical engineers at MIT (Massachusetts Institutes of Technology) under Michael Strano's mentorship by undergrads. Bioluminescence is a fascinating natural phenomenon that some living organisms like fireflies (Lampyridae) and marine organisms emit light as a form of energy by the secretion of certain enzymes and substrates. The bioluminescent property in the firefly is based on the secretion of a specific enzyme named as Luciferase which can trigger the oxidation by the presence of Mg^{+2}, ATP and CO2 and produces a small organic substrate molecule called Luciferin which in turn undergoes oxidation and releases a by-product which emits as a light. The luciferin-luciferase system is activated when luciferin is converted to oxyluciferin by luciferase. The oxyluciferin then reacts with oxygen to produce light.

Key words: Bioluminescence, Luciferin, Luciferase, Oxyluciferin

PROBLEM OF STUDY

The first, without any doubt, is the high consumption of electricity. Each year, in the world, around trillion kWh are expended on street lighting thus making it expensive. A high consumption means a high amount of generated energy, which in turn translates into a high level of noxious emissions. Therefore, bioluminescent trees can be a solution for the rising issue of electricity consumption for the upcoming generations.

HYPOTHESIS

Imagine a world where trees softly illuminate the night, casting a gentle glow on their surroundings. The landscape would be enchanting, with a natural radiance replacing the darkness. It could create a surreal and magical atmosphere, transforming forests into otherworldly realms. Additionally, the need for artificial streetlights might diminish, fostering a more sustainable and visually captivating environment.

Night time Bioluminescent Trees

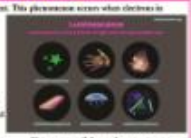
OBJECTIVES OF THE STUDY

To replace the street lights in the city with bioluminescent trees that are genetically engineered to produce light, thus reducing the electricity consumption and also the release of carbon emissions in the environment.

INTRODUCTION

Luminescence is an emission of light that does not produce heat. This phenomenon occurs when electrons in atoms or molecules absorb energy and then release it in the form of light. The two primary types of luminescence are fluorescence and phosphorescence. Additionally, there are other specialized forms of luminescence. In all these phenomena, light emission does not result from the material being above room temperature, and so luminescence is often called cold light. Bioluminescence is a fascinating natural phenomenon in which living organisms produce and emit light through a chemical reaction. This captivating display of light is widespread in the natural world and is often associated with various marine organisms, fungi, and some insects. Although the chemical process to create bioluminescent light varies by species, all bioluminescence is dependent on the presence of two chemicals: luciferin and luciferase.

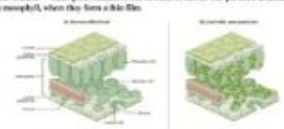
The study of bioluminescence not only provides insights into the biology of the organisms that exhibit this phenomenon but also has practical applications in fields such as medical research, environmental monitoring, and biotechnology.



Forms of luminescence

MATERIALS AND METHODS

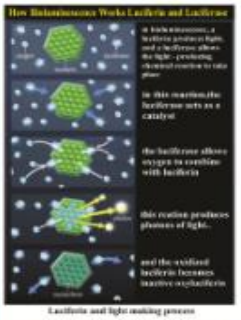
Massachusetts Institute of Technology, under the mentorship of Strano, has taken the first steps towards turning plants into functional lighting by embedding the firefly enzyme in the leaves of a watercress plant. The nanoparticles are so little boxes that hold, respectively, luciferase, luciferin, and another enzyme that lengthens the duration of the light emission. Once the reaction ingredients are packaged into nanoparticles, scientists transfer the particles into the leaves. They do this by giving the plants a bath — more specifically, a fully submerged, highly pressurized bath, during which they blast nanoparticle solution through the tiny pores in the leaves. The particles, which are several hundred nanometers in diameter, can be infused into the plants through the stomata — small pores located on the surface of leaves. The particles accumulate in a spongy layer called the mesophyll, where they form a thin film.



Nanoparticles accumulated in the mesophyll layer of the leaf

- Reaction 1:
Luciferase + D-luciferin + ATP + Mg^{+2} Luciferase-D-luciferyl-adenylate + Pyrophosphate + Mg^{+2}
- Reaction 2:
Luciferase-D-luciferyl-adenylate +Oxygen Luciferase-oxyluciferin + CO2 + AMP + Light

The important next step will be to optimize the light intensity and duration. They came up with the idea of using a light organism. His team found that adding the naturally-occurring chemical dehydroluciferin inhibits the reaction, stopping the plant from emitting light, while a small dose of chitosan restarts the reaction.



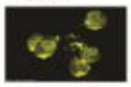
Luciferin and light making process

1. Watercress plant in daylight

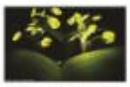
2. Injecting specialized nanoparticles

3. Tests being carried out on the plant

4. The initials "MIT" lit up on the leaves of the plant



5. The watercress plant in the dark



6. A watercress plant glow for nearly four hours

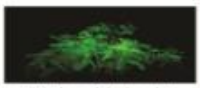
RESULTS

In December 2017, the Strano Research Group at MIT published a paper in the journal Nano Letters about how it modified four plant species — spinach, arugula, kale, and watercress — to emit light. The prototype glowed for 45 mins initially and later after few advancements, for 3.5 hours with a yellowish-green light about one thousandth the amount needed for reading, though one of the project's trademark photos shows a three-week old watercress plant faintly illuminating the pages of Paradise Lost.

MIT researchers develop glow-in-the-dark plants.

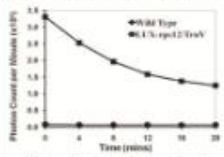
MIT - plants that glow replacing electrical lighting

Plants that glow in the dark



Bioluminescent indoor houseplants

First, the number of photons released by each type of plant was measured. Both types of plants with the lux operon produced more photons than the regular plant. Next, they checked if the plants gave off visible light. When in the dark, the plants with the lux operon did, in fact, glow.



This graph shows the light energy given off by the modified plants compared to the regular plants.

Glowing tree night landscape

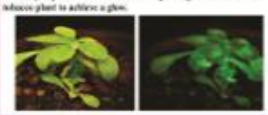
Glow in the dark trees could replace street lights

DISCUSSION

In 1980s, a team at the University of California, San Diego modified a tobacco plant to give off light. The team modified the firefly gene for the luciferase enzyme and spliced it into genetic material called plasmids, which were transferred into tobacco plant cells. Once the plants began to grow, they were irrigated with water containing another firefly compound: luciferin, the chemical fuel for light production. Both luciferase and luciferin were needed to illuminate the plant.

Genetic Engineering

Working with mushrooms, other researchers were able to identify the structure of the protein that allows certain fungi to glow. This "new" luciferin is produced by Caffeic acid, which occurs naturally in plants. Researchers have injected genes from a bioluminescent mushroom into a tobacco plant to achieve a glow.



Luminescent tobacco plant

LIMITATIONS

The research, materials, production, and maintenance cost would be significant. The light given off by bioluminescent trees is weaker and less consistent. In addition, the lack of control could disturb sleep patterns or cause long-term health problems.

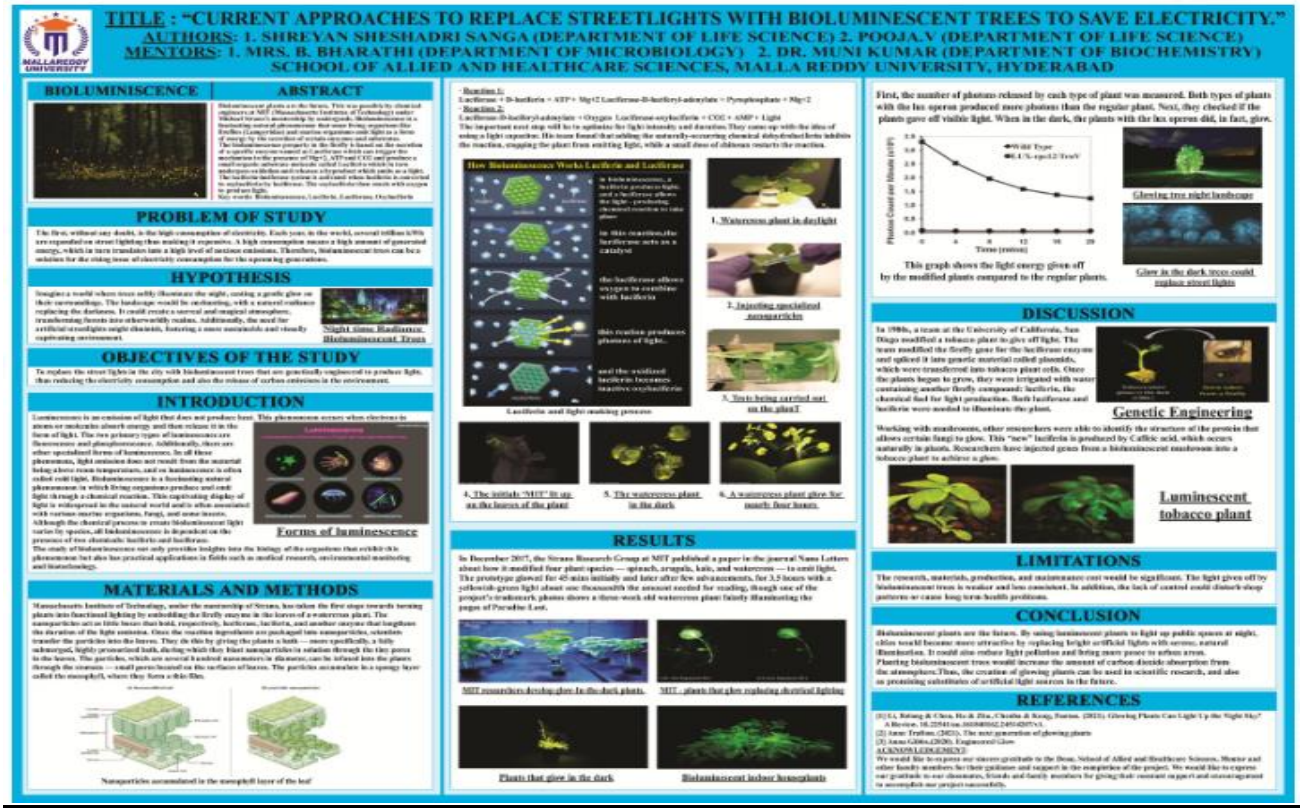
CONCLUSION

Bioluminescent plants are the future. By using luminescent plants to light up public spaces at night, cities would become more attractive by replacing bright artificial lights with serene, natural illumination. It could also reduce light pollution and bring more peace to urban areas. Planting bioluminescent trees would increase the amount of carbon dioxide absorption from the atmosphere. Thus, the creation of glowing plants can be used in scientific research, and also as promising substitutes of artificial light sources in the future.

REFERENCES

(1) Li, Belong & Chen, Ho & Zhu, Chenhu & Assaj, Fatima. (2021). Glowing Plants Can Light Up the Night Sky? A Review. 10.22541/au.161868042.24514207/v1.
(2) Anne Trafton. (2021). The next generation of glowing plants
(3) Anne Gibbs (2020). Engineered Glow

ACKNOWLEDGEMENT:
We would like to express our sincere gratitude to the Dean, School of Allied and Healthcare Sciences, Mentor and other faculty members for their guidance and support in the completion of the project. We would like to express our gratitude to our classmates, friends and family members for giving their constant support and encouragement to accomplish our project successfully.



Participated in One day International Philosophical Conference at Malla Redddy University

Selected for T-HUB


MALLA REDDY
UNIVERSITY
t-hub
MALLA REDDY
UNIVERSITY
abation Center
at T-Hub


t-hub