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JALANDHAR (PUNJAB) INDIA

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SCIENCE GRAVITY

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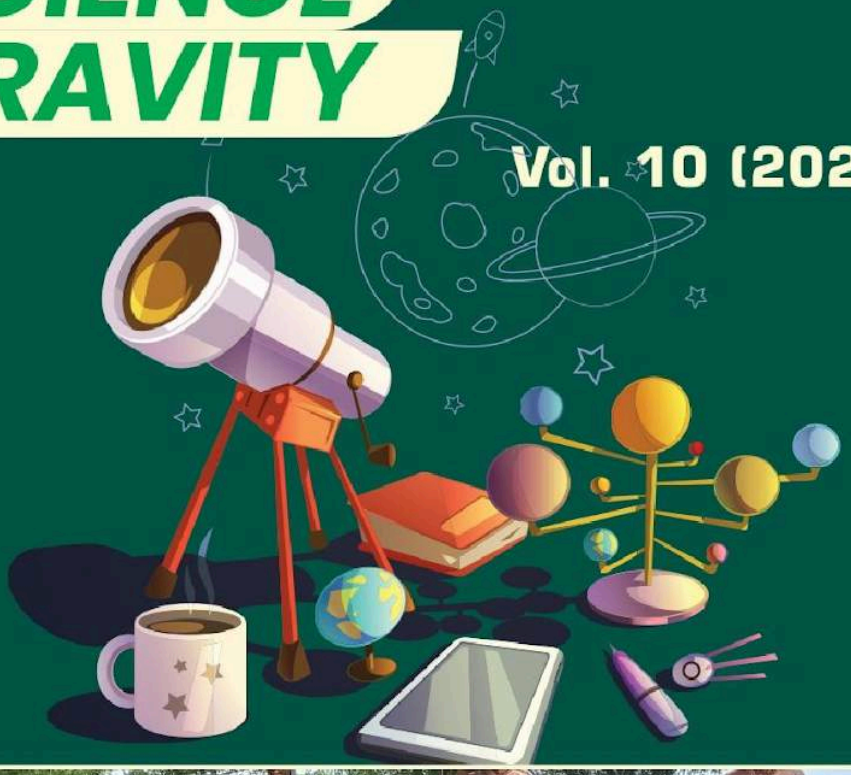

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डी ए वी गान

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हो चहुँदिश उद्घोष अभय ।।
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प्रबल प्रवाहमयी नित-नूतन
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Principal Message

HMV is a hub of continuous learning where everyone, be it faculty or parents, embraces the role of a student. Each day presents an opportunity for growth and learning, fostering a sense of community among us. Our commitment to maintaining high standards is unwavering, and we dedicate ourselves tirelessly to understand and improve the educational process while keeping a sharp focus on student performance.

At HMV, we view ourselves as a dynamic community of learners. Our mission is not only to impart knowledge but also to instill in our students the right ideals for life. We place a strong emphasis on fostering creativity, critical thinking, innovation, and diverse perspectives. Throughout the years, we have strived to implement various programs aimed at nurturing these talents in our students.

This edition of the publication serves as a platform to encourage and showcase creativity. It provides faculty members and students with an outlet to express their ideas and ideals, encompassing a wide range of artistic abilities, including magazine editing, writing, and designing.

It is imperative to acknowledge the tireless efforts of the editorial board, the active participation of students, and all those working behind the scenes. Their collective dedication played a crucial role in bringing forth the manifestation of creativity in this splendid form, reflecting the best in our young minds.

Wishing you all the best of times!

Prof. Dr. (Mrs.) Ajay Sareen

Principal

Editor's Message

In the ever-evolving landscape of scientific discovery, the pursuit of knowledge remains a ceaseless journey that stretches the boundaries of human understanding. As we navigate the intricate realms of physics, biology, and technology, The collective efforts of the scientific community continue to unravel the mysteries of the universe, opening up new horizons that challenge our perceptions and redefine the limits of what is possible.

One of the most captivating frontiers of contemporary science lies in the exploration of the cosmos. From the enigmatic depths of dark matter to the awe-inspiring phenomena of distant galaxies, researchers are delving into the cosmos with unprecedented precision and curiosity. The challenges ahead are as vast as the cosmos itself, and as we gaze into the future, collaboration and interdisciplinary efforts will be pivotal. Scientific discoveries do not exist in isolation; they are interconnected threads woven into the rich tapestry of human knowledge.

As we celebrate the remarkable achievements of modern science, let us also reflect on the responsibilities that come with this knowledge. The power to shape the future rests in our hands, and it is our duty to wield it with wisdom and foresight. The journey of scientific exploration is not only about unraveling the mysteries of the universe but also about using that knowledge to build a better, more sustainable world for generations to come.

In the pages of this magazine, we invite our readers to embark on a voyage of discovery, to explore the frontiers of science that captivate our collective imagination. Through the lens of innovation, curiosity, and collaboration, we strive to capture the essence of the scientific endeavor and inspire a new generation of thinkers and pioneers. We are thankful to the benign support of Principal Prof. Dr. (Mrs.) Ajay Sareen for giving us the platform to showcase the creative abilities of the students.

Dr. Jitender Kumar
Head, Biotechnology Deptt.

Co- Editor's Message

An analytical mind with a passion for learning leads an individual to achieve success and glory in life. In the era of privatization as well as globalization the hallmark of success is hard work. Hans Raj Mahila Maha Vidyalaya being an Institution of higher learning provides an environment to train our young Girls to build an effective carrier.

"Science Gravity'" is an annual publication of the science department of college. It is written and edited by the college students and teachers. 'Science Gravity' provides a platform to our young students to express their thoughts on various issues pertaining to academics, society, scientific literature etc and thus helps them to form the habit of reading and writing which ignites the young minds for the generation of constructive inputs/ideas to bring overall growth and development.

It is an open forum where students can express their views and opinions. It is an outlet for the creative talents of the Students. The student Editor, and Co-Editor helped by an Editorial Board, brings out the magazine at the far end of the academic year.

The magazine showcases the scientific literature related to latest research in the field of plants and animals and Human body, various diseases and their treatments, latest techniques of physics and chemistry, agricultural improvements and highlights of activities conducted by various science departments during the session.

I am thankful of the, From the DESK OF THE EDITOR, Principal Prof. Dr. (Mrs.) Ajay Sareen for giving us this opportunity and Mr. Gullagong for helping me in bringing out this valuable magazine within the time frame. I am also thankful to the Students of science department at large for their timely submission of the article within a short time.

Mrs. Purnima
Department of Bioinformatics

From The Desk Of Head, Faculty Of Sciences

In the grand tapestry of human progress, the Renaissance of Science is upon us—a time when the collective brilliance of researchers, innovators, and thinkers converges to illuminate the uncharted realms of knowledge. As we stand on the precipice of unprecedented technological advancements and groundbreaking discoveries, the pages of this magazine unfold to reveal the thrilling narratives of scientific exploration that define our era.

In an age where the insatiable thirst for knowledge propels humanity forward, we find ourselv standing on the cusp of scientific marvels that challenge the very fabric of our understanding. traverse the unexplored landscapes of discovery, the pages of this magazine unfurl to reveal a kaleidoscope of breakthroughs that redefine the boundaries of possibility.

We extend our gratitude towards Principal Prof. Dr. (Mrs.) Ajay Sareen for encouraging and supporting us in every of our endeavor. As we embark on this journey through the pages of our magazine, we invite you to witness the eclipse of boundaries that once confined human imagination. Each article encapsulates a chapter in the unfolding saga of modern scientific exploration, where the synergy of ideas and the convergence of disciplines spark revelations beyond the scope of conventional wisdom.

In celebrating these scientific marvels, let us not only revel in the brilliance of discovery but also contemplate the responsibilities that come with wielding the power of knowledge. Together, let us embrace the awe-inspiring journey of discovery, where the only limits that persist are the ones we have yet to eclipse.

Mrs. Deepshikha
Head, Faculty of Sciences & Chemistry Deptt.

1. Don't wait for the opportunity, create it!

Leaders don't wait for opportunities, they create them!
Waiting for the right time, waiting for that door to open, is just that, waiting is just wasting time. You don't want to be one to just wait your life away and then wonder what if …..
You can create your opportunities simply by putting yourself out there, making mistakes, but going for it, it's the actions and efforts that bring opportunities forward. Some things take more time than others but we must plant the seeds before the crops can grow. Staying actively engaged in creating. Continue to go for it, be unapologetic about what you want. Continue to believe and work, keep an open mind and magical things will happen! You see, obstacles are opportunities in right direction, they present the growth that you may need to experience, the contrast to help through what is right.
As a student, we are open for the opportunities but we are not able to find them or sometimes we don't feel a need to find them. We feel that the opportunity will automatically come in our way but it's not true always. In the today's world, full of competition, we need to upgrade us with new skills and there are various opportunities for us online as well as offline, but the thing is that we need to create them and work for it. Small opportunities will make a big one, the lesson is that does not miss any opportunity and don't wait for them. A very famous quote that should always be in our mind is that-
"Each new day is an opportunity to start a fresh, to see each new day as an opportunity to embrace life's events to fear what lies ahead. To start out a day on a positive note is to set the welcoming tone for the rest of the day."
Well, the best thing that you can do is to begin giving efforts towards the goal. To be precise it is the only way that will bring you success. . Well, there are lots of opportunities that we can grab. But, most of the time, we are in different towards it. So, to stay away from situations like that, what you have to do is to create your opportunities. And for that, you have to work pretty hard. You must know that creating your opportunities is not an easy thing. For that, you have to keep on trying. Sometimes, you may feel like giving up. But that is the most harmful thing that you will do. It will not only lower your confidence but, it will also make it hard for you to reach the desired destination. Therefore, stop waiting for opportunities and create your own. Our magazine makes a sincere effort to aware all the readers with modern and ongoing research, researchers and knowledge. I personally would like to extend my heartiest gratitude towards respected Principal Mam, teachers and all the team who gave their valuable time for magazine

Jasleen Kaur, Class-B.Sc. Biotechnology Sem- III, Roll no- 23202

2. Exploring the Nexus of AI and Mental Health: A Scholarly Examination of Technology's Role in Supporting College Students

The convergence of Artificial Intelligence (AI) and mental health indicates a new frontier in the well-being of college students. As the demands of academic life continue to evolve, the question arises: Can technology, specifically AI serve as a viable means for college students to cope with the myriad stressors that accompany higher education? This academic exploration attempts to dissect the potential contributions of AI to mental health support, while critically assessing the ethical considerations and limitations inherent in this evolving intersection.

1. **AI-Powered Mental Health Apps: Bridging Accessibility Gaps**
   The advent of AI has seen the emergence of mental health applications designed to offer support, resources, and coping mechanisms for college students. These apps, leveraging machine learning algorithms, aim to personalize interventions, providing tailored strategies for stress management, anxiety reduction, and emotional well-being. Students should critically evaluate the efficacy of these tools and consider their accessibility, ease of use, and evidence-based foundations.
2. **Chat bots and Emotional Support: A Technological Listening Ear**
   AI-driven chat bots are being deployed as conversational agents to provide emotional support and companionship. These chat bots utilize natural language processing to engage in meaningful conversations, offering a virtual space for students to express their thoughts and feelings. Analyzing the ethical considerations surrounding the use of AI in emotional support is paramount, as students grapple with the nuances of privacy, confidentiality, and the role of human connection.
3. **Predictive Analytics for Early Intervention: Mitigating Mental Health Risks**
   AI's predictive capabilities are increasingly harnessed to identify patterns indicative of mental health challenges. By analyzing data points such as academic performance, social interactions, and online behavior, AI algorithms can potentially flag early signs of distress. College students must explore the ethical dimensions of predictive analytics, contemplating issues of consent, data privacy, and the delicate balance between proactive intervention and individual autonomy.
4. **Virtual Reality Therapy: Immersive Solutions for Stress Reduction**
   Virtual reality (VR) technologies, underpinned by AI algorithms, offer immersive environments for therapeutic interventions. These interventions range from relaxation exercises to exposure therapies, providing students with an alternative avenue for stress reduction. Delving into the effectiveness of VR-based therapies and the ethical considerations associated with their deployment is essential for students navigating the evolving landscape of mental health support.
5. **AI and Human-Centric Mental Health: Striking a Balance**
   While AI holds promise in augmenting mental health support, students must grapple with the importance of preserving the human-centric elements of mental health care. Acknowledging the irreplaceable role of human empathy, understanding, and genuine connection is crucial. Striking a balance between technological interventions and human touch becomes a central consideration for college students evaluating the potential of AI in mental health.

Conclusion: In conclusion, the intersection of AI and mental health in the context of college students opens a realm of possibilities and challenges. As students traverse the landscape of technological solutions, a critical evaluation of AI-powered mental health support is imperative. Balancing the promise of innovation with ethical considerations and recognizing the complementary nature of human and technological support ensures a comprehensive approach to fostering mental well-being among college students in the technologically advanced era.

Tania Sethi
M Sc Bioinformatics (Sem-III), 25201

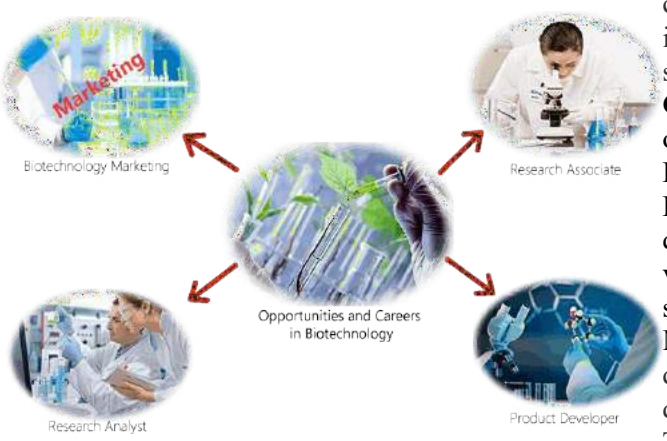
3. Career Prospects In Biotechnology

Biotechnology has emerged as one of the most favored career options by youngsters who want to explore the modern aspects of science. The demand for skilled biotechnologists is high in industrial sectors like food, textiles pharmaceuticals, agriculture, animal husbandry etc. Biotechnology is a combination science of biology and technology and is used to make products useful to mankind.

The scope of biotechnology is not just limited to biology, it has been expanded to diverse sciences like; immunology, virology, cell biology, plant physiology etc. Some of the careers available are:

Agriculture and food science technician-Food science technicians typically collect and prepare samples following established procedures; test food, food additives, and food containers to ensure they comply with established safety standards; analyze chemical properties of food to determine ingredients and formulas; and keep a safe, sterile laboratory environment

Biofuel technician-Biofuel technicians work with fermenters, distillation, grain preparation, algae culture, oil chemistry, and separations technology. They can work independently, or under supervision, and they can also supervise manufacturing assistants.



Genomics technician-Genomics technicians use a range of technologies related to determining and comparing DNA and RNA sequences. They isolate RNA and DNAfrom samples. They construct libraries, perform quality control, carry out titrations, and work with a variety of microarray, PCR, and DNA sequencingtechnologies.

Microbiology quality control technician -Microbiology quality control technicians are responsible for assuring quality of the product through all day-to-day operations. They assist the biomanufacturing plant by evaluating raw materials, other supplies and the finished, packaged product. They ensure compliance to common Good Manufacturing Practices.

Plant tissue culture technician-Plant tissue culture technicians perform micro propagation (growing plants in vitro) by taking clippings from plants and using them to inoculate agar media in sterile containers. This type of work is performed in a laminar flow hood to prevent contamination from bacteria or fungi.

Biochemist-A biochemist studies the chemical attributes of biological processes and living things that include various diseases, heredity, and cell growth or destruction. Such biochemists mostly spend time in the labs because of the complex research. They analyze, isolate, and synthesize fats, proteins, carbohydrates, DNA, and other molecules in order to know the effect of such things to our body. These are just a few career paths which can be followed by the people pursuing biotech, there are millions of other routes which can be taken by our young experimental minds.

Dr. Jitender Kumar, Head, Biotechnology Deptt.

4. Exploring The Cosmos

Space exploration, the quest to unravel the mysteries of the cosmos, has captivated human imagination for centuries. In the modern era, technological advancements have transformed this dream into a reality, as nations and private entities embark on ambitious missions to explore the vast expanse beyond our planet. This article delves into the significance of space exploration, recent break throughs, and the promising future that awaits us among the stars .India's journey in space exploration began with the launch of Aryabhata , its first satellite, in 1975. Since then, the Indian Space Research Organization (ISRO) has achieved numerous milestones, including the development of an indigenous launch vehicle, the Polar Satellite Launch Vehicle (PSLV), which gained global acclaim for its cost-effectiveness and reliability. India made a significant *impact on lunar exploration with its Chandrayaan missions. Chandrayaan-1, launched in 2008; Chandrayaan*-2, launched in 2019; Mars Orbiter Mission (Mangalyaan) into Martian orbit; etc. As ISRO continues to embark on bold missions and collaborate with the global space community, India's stellar ambitions in space exploration shine brightly, inspiring a new era of scientific discovery and contributing to the collective exploration of the cosmos.

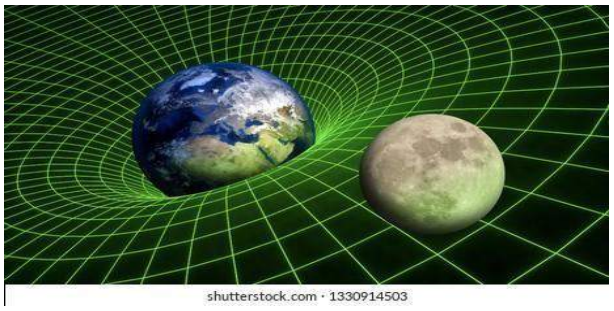
Ms.Lavanya
B.Sc Medical Sem I

5. Gravity- The Reality

Have you ever thought, if that one red apple had not fallen on his hand, neither the world would have ever known the great Sir Isaac Newton nor the greatest of all forces- The Gravitational Force.

Thinking about gravity, numerous questions do come in the minds of all, but the foremost one is, about what actually is gravity? A good article must always have a start which very well explains the meaning of the topic written about. Just as life is meaningless without goals, so is an article without explaining is topic's real meaning and importance. Both the science and non-science readers here, must be well aware of the fact that every object we see around, including our own selves have certain mass, never to forget our mother planet- Earth, which itself has huge mass. So the forces of attraction between any two bodies having certain masses is what we call- the Force of Gravity! When we say stay grounded, that is what we mean to say don't go against the gravity, because ultimately we have to come back down. "Stop making castles in air!, "a great idiom is true in saying, but not true in reality, because if it would have been true, there would have been a tough competition between all the species out there for who flies faster! "Gravity", the word itself has volumes and volumes to say and it's importance cannot be described in a few words. If we are able to walk, sit, stand comfortably is all due to this great force, because if it would not have been there, there would have been no difference between us and the pupetts. Water which pours down from the tap into the bucket would have poured upwards. It is the most dominant force. Without it, whatever is 'still' now on ground including us, would have been floating in space. Can you imagine if there was no gravity existing, planets including our earth would have never orbited around sun, imagine the darkness….

The atmosphere we have around would never have been there, tides would have never formed, because there would have been no moon- Imagine women celebrating KarwaChauth's! ,the stars we see twinkling at night would have never been there, the solar system we study and talk about never have existed, those life threatening asteroids would have crashed into planets, if this force of nature, the Gravity would not have been there. Chandrayaan III would have never been successful if the force of gravity was no there. Such human made satellites would have never been able to go moon and return back from there. Just imagine! Not only this, the decayed leaves of trees, fruits, would have never fallen off if there was no gravity. Imagine precipitation in the form of rain and snow not falling on ground but floating in air. Imagine pouring water from the tap into the glass on a scorchy summer afternoon, and the water instead of going till the base of the glass, goes upward, oh my my! Just imagine if gravity was not there, would we have ever existed? Earth would have never formed so would have the sun. The air we breathe in our lungs, is all due to it, without gravity the air would have drifted away into space. Heart is such an important and integral part, imagine if there was no gravity….No life for sure…. Could you ever imagine only living in such a planet where only hydrogen and helium are there ?Really ? The 'Big Bang' Theory, the reason for formation of stars, where all gases that support life are contained, and if there was no big bang theory there would not be stars, all elements created from it would not have been there, could you think of living with hydrogen and helium? All this possible due to what? Gravity, my friend. The reason why the big bang theory exists is due to gravity. Everything starts from gravity, and gravitates back to it. Ever thought why only life is possible on earth and not on any other planet, even after they are revolving around the sun? The sole reason is gravity, the impactful force of it. It plays such a pivotal role, no matter how much is told of its importance, seems to be less.



perfect balance of life we see around is due to gravity. The correct synchronization between objects like sun rising and setting, moon rising and setting is because of the gravity. What gives meaning to life is gravity and without it life is absolute meaningless. Just as behind a successful student, there is a good teacher, the reason why life is only successful on Earth and not on any other planet is "GRAVITY". What makes living and life possible on our planet

Earth is this force of nature. We must thank god for giving us this beautiful life and above all thank him for presenting this beautiful and dominating force of nature which has made our survival, including all the species survival possible on Earth. Gravity is the real hero, real master. Hope this article made the readers gravitate towards it. Isn't it justified?...

"GRAVITY IS REALITY"

Gulnaar Grewal
MSc Chemistry (1st Year), 25402

6. Safeguarding GMO Crops

The term GMO, stands for "genetically modified organisms ", it refers to the any living organism which is formed by various genetic combinations with a touch of modern techniques of biotechnology. All our crops and livestock have been manipulated genetically over 10,000 years by man. It was done so to extend the life span of crops in adverse agricultural conditions. According to FAO and the European Commission define a GMO, and its byproducts, as being plants and animals that are produced through techniques in which the genetic material has been altered in a way that does not occur naturally. The best example of it is "triticale' (a manmade crop used in bread and pasta).

In the upcoming 30 years, the major obstacle of the world would be: how do we feed everyone with nutritious food in a sustainable way? Currently the yields of most major crops are stagnating while the demand for food is growing. Conventional breeding alone cannot fulfill this purpose therefore biotechnology and GM CROPS are required to fill the gap.The safety of GM crops is under great threat. The biggest example of it is the anti- GMO action held in Philippines. In august 2013, anti -GMO activists destroyed the Philippine department of agriculture's trials of golden rice. Golden rice was envisioned as a non- commercial venture to deliver a cheap and effective dietary source of Vitamin A for the areas where it is not a major source. This mainly happened due to lack of awareness among people regarding GMOs and biotechnological techniques.

It has been 30 years since the first genetically modified crops were generated, since then around 433million acres of land (in 2013) has been used for GMOs cultivation. In India, around 80% GMO cultivation is done under private sector. But the side of coin shows that majority of people are against this also, it is so because they GMOs poses adverse health and environmental effects on people. Lot of European commissions and national research committees have concluded that GMOs is equally safe and beneficial as conventional breeding techniques. At the end, GMOS are "agricultural toolboxes" that contributes in shaping our agricultural sector.

Mankiran Kaur
Bsc biotechnology sem 3 , 23221

7.Bioethanol: Fueling The Sustainable Future

In a world grappling with the pressing issues of climate change, pollution, and depleting fossil fuel reserves, the quest for sustainable and renewable energy sources has reached a critical juncture. Bioethanol, a clean-burning fuel derived from biological sources, has emerged as a frontrunner in the race to secure our planet's future. This article takes an in-depth look at the production process, benefits, challenges, and the promising future of bioethanol as a sustainable energy solution.

Bioethanol is crafted through the remarkable process of fermentation. It begins with the cultivation of high-starch or high-sugar crops like corn and sugarcane, or even lignocellulosic materials such as switchgrass. These feedstocksundergo a transformation where they are broken down into sugars. These sugars then undergo a magical transformation, fermenting under the watchful eye of microorganisms, typically yeast. The end result is ethanol, which is distilled to enhance its purity and eliminate impurities.The first and foremost advantage of bioethanol lies in its potential to mitigate greenhouse gas emissions. It is celebrated as a carbon-neutral fuel due to the offsetting effect where the carbon dioxide released during combustion is balanced by the CO2 absorbed during the growth of the feedstock. This unique characteristic makes bioethanol an environmentally friendly alternative to traditional

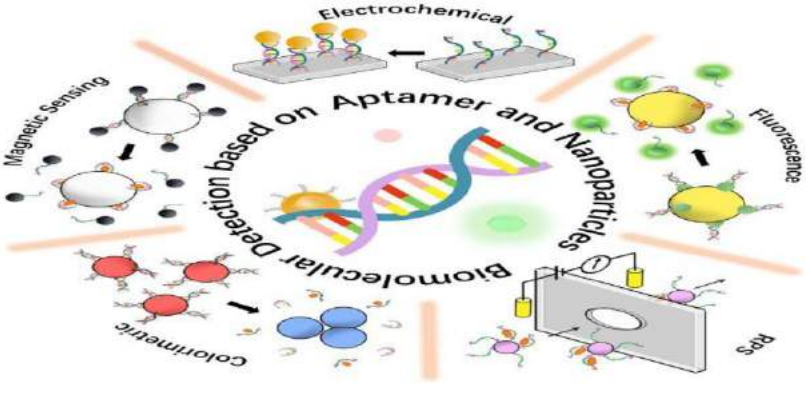
fossil fuels.
Additionally, it offers energy security by diversifying the fuel mix and reducing our reliance on finite fossil resources. The bioethanol industry contributes to rural economies by creating jobs in agriculture, processing, and distribution, thus fostering economic growth. Bioethanol is not just eco-friendly; it is also engine-friendly. It can be seamlessly blended with gasoline to reduce greenhouse gas emissions and enhance engine performance. Common blends include E10 (10% ethanol) and E85 (85% ethanol).

While bioethanol brings a host of benefits, it is not without its share of challenges and concerns. One of the primary concerns is the use of food crops for bioethanol production, which has raised worries about competition for land and potential impacts on food prices. The answer lies in embracing non-food crops like switchgrass or adopting sustainable land-use practices. Another challenge is the substantial energy requirement for bioethanol production, particularly when it comes from lignocellulosic materials. This calls for innovations and research to develop more energy-efficient processes and technologies. Water usage is another concern, especially in regions with water scarcity. Sustainable water management practices become imperative to address this issue. Bioethanol holds a bright future in the global transition to more sustainable energy sources. Researchers and innovators are continuously striving to improve feedstock selection, refine production processes, and develop advanced bioethanol technologies. Notably, the emergence of cellulosic ethanol, which utilizes non-food plant materials, is a significant step towards reducing competition with food crops and enhancing sustainability.
The future of bioethanol also lies in the growth of second-generation bioethanol and advanced biofuels, such as those derived from algae. These advancements could further enhance the environmental benefits of this renewable energy source. Moreover, carbon capture technologies promise to mitigate the carbon footprint of bioethanol production. Investments and supportive policies will be pivotal in realizing the full potential of bioethanol. In conclusion, bioethanol represents a cleaner and renewable alternative to traditional fossil fuels. It has the potential to reduce greenhouse gas emissions, enhance energy security, and stimulate economic growth. While challenges and concerns exist, ongoing advancements in technology and sustainable practices are paving the way for a future where bioethanol plays a pivotal role in the global effort to combat climate change and transition to more sustainable energy sources. As we navigate our path towards a sustainable future, bioethanol emerges as a beacon of hope, illuminating the way forward.

Sehajdeep Saini
B.Sc. Biotechnology Sem-5, 23108

8.Aptamers As Biosensor And Targeted Therapy

Aptamers are single-stranded nucleic acid sequences that fold into highly specific structures and can bind to target molecules, much like antibodies, with high selectivity and affinity. Since aptamers were discovered, they have attracted considerable attention and have been widely used in many fields owing to their unique advantages. We present an overview of the advancements made in aptamers used for biosensors and targeted therapy.



Owing to its high binding affinity and selectivity to its target, it is also termed as chemical antibody with dissociation constants. Aptamers are developed against any desired molecule using SELEX (Systematic Evolution of Ligands By Exponential Enrichment).
Generally, the process of SELEX includes three steps, which are repeated to generate aptamers that fit their targets. (i)In the first step (library generation), a random library is artificially designed and synthesized by a combinatorial chemical synthesis technique. These oligonucleotides consist of 20–40 bases in the middle, flanked by up- and

downstream primer binding sites at each end, which enabled the library to contain 10^{12}–10^{15} ssDNA or RNA sequences.

(ii) In the second step (selection), the target molecule is first incubated with the library for several minutes in binding buffer. In theory, the aptamers will specifically bind to their targets, and other non-specific sequences will stay in the binding buffer. The aptamer-target complexes were collected and washed several times with washing buffer. Then, the aptamers were separated from the aptamer-target complex by treating with elution buffer. In this step, counter-selection is usually implemented to eliminate those that do not bind to the target of interest. During counter-selection, the target is replaced by analogs for one selection round, and the nucleic-acid sequences that bound to the analogs were excluded from the library prior to the next round of selection with the target. In addition, the selection parameters will become increasingly stringent with the increase in the number of selection rounds. These measures greatly increase the pressure in the screening process, making the specific aptamers against the target continuously enriched. (iii) In the third step (amplification), the sequences eluted from the target are amplified by employing PCR for DNA and reverse transcriptase (RT)-PCR for RNA to produce a sub-library for the next round of selection. These three steps consist of one cycle of SELEX. When the affinities of the sequences bound to the target are saturated, the sequences from the last round are sent to the clone and sequence, followed by the identification of aptamer sequences that bind the target with high sensitivity and specificity.

A typical biosensor consists of two basic components: a recognition element (antibody, biological tissue, antigen, nucleic acid, enzyme, etc.) and a signal transducer (fluorescent, electrochemical, colorimetric, chemiluminescent, etc.). Biosensors that are based on aptamers as biorecognition elements are named aptasensors.

Aptamers find applications as aptasensors, aptazymes, food testing, colorometric, nanosensor, paperchip, diagnostic purposes, can be conjugated with drugs then act as targeted drugs as in lung cancer etc. Aptamers also have role in neurological and brain disorders.

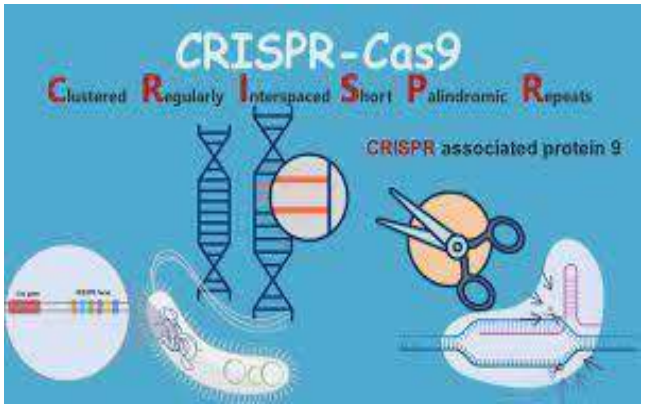
9.Crispr-Cas9: A Revolutionary Gene Editing Tool Transforming Science And Medicine

In the realm of genetic research and biotechnology, few innovations have generated as much excitement and potential as the CRISPR-Cas9 system. This revolutionary gene-editing tool has opened up a world of possibilities in the fields of science, medicine, and beyond. In this article, we delve into the workings, applications, challenges, and ethical considerations surrounding CRISPR-Cas9, a technology that is reshaping our understanding of genetics and the potential to edit our very DNA.

CRISPR, short for Clustered Regularly Interspaced Short Palindromic Repeats, is a naturally occurring bacterial defense mechanism against viral infections. Cas9, on the other hand, is a protein that acts like a pair of "molecular scissors." Scientists have harnessed this system to create a powerful gene-editing tool. The Cas9 protein, guided by a synthetic RNA molecule, can be programmed to target and cut specific DNA sequences with remarkable precision.

The medical community has embraced CRISPR-Cas9 with enthusiasm. Researchers are exploring its potential to treat genetic diseases such as cystic fibrosis, sickle cell anaemia, and Huntington's disease. By editing the disease-causing mutations at their root, CRISPR-Cas9 offers hope for curing previously untreatable conditions. Clinical trials using CRISPR to treat diseases are ongoing, marking a pivotal moment in the field of gene therapy.

Beyond medicine, CRISPR-Cas9 has vast implications for agriculture. Scientists are using the technology to engineer crops with enhanced traits, such as drought resistance, improved nutritional content, and resistance to pests and diseases. These genetically modified crops have the potential to increase food security and reduce the need for chemical pesticides.



While the possibilities with CRISPR-Cas9 are groundbreaking, they also raise profound ethical questions. The ability to edit the human genome sparks concerns about "designer babies" and unintended consequences. The international scientific community is actively debating the ethical boundaries and regulations surrounding CRISPR applications in humans, emphasizing the need for careful consideration.

In agriculture, the widespread adoption of CRISPR-edited crops may have unforeseen consequences on ecosystems and biodiversity. Researchers are examining the environmental impact of genetically modified organisms to ensure responsible use of this technology. CRISPR-Cas9,

though powerful, is not without its limitations. Off-target effects, where unintended DNA sequences are edited, remain a concern. Researchers are working to enhance the system's accuracy and reduce the risk of such errors. Additionally, delivery methods for CRISPR components into target cells, tissues, or organisms can be challenging and require refinement. The development of CRISPR technology has led to patent disputes and intellectual property battles. This legal landscape is complex, with multiple parties vying for recognition and control over various aspects of the technology. These disputes underscore the significance of CRISPR-Cas9 in science and industry.

CRISPR-Cas9 is more than just a scientific breakthrough; it is a gateway to an era of unprecedented genetic manipulation. It offers the potential to revolutionize medicine, agriculture, and other fields. Yet, the power it holds also brings forth ethical, environmental, and practical challenges that require careful consideration. As science continues to unravel the mysteries of the genome, CRISPR-Cas9 stands at the forefront of this revolution, redefining the boundaries of what is possible and raising essential questions about the ethical use of this remarkable technology. The future of CRISPR-Cas9 is uncertain, but its potential to reshape our world is undeniable.

Sehajdeep Saini
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10. Low-In-The-Dark Petunias

Biotechnology is often advertised as the solution to world hunger or a way to cure disease. But new glow-in-the-dark house plants suggest it can have more whimsical uses too. The rapidly improving ability to edit the genetic code is opening doors to all kinds of groundbreaking new possibilities. From tackling malnutrition with vitamin fortified rice to re-engineering the body's immune cells to fight cancer, the technology is being put to use tackling some of the world's most pressing problems. Bioluminescence isn't a particularly rare trick in nature: certain bacteria, fish, amphibians, insects, and even worms can glow. But getting plants to do it is harder than it might seem. Inserting genes from fireflies or bacteria into plants however that wasn't enough! 1 Header The key, it turns out, is adding genetic components that integrate well with the host.BUT HOW..? By borrowing a metabolic pathway found in mushrooms that produces luciferin—the molecule responsible for bioluminescence. The pathway relies on a molecule known as caffeic acid, which is already found in significant quantities in plants where it is used to build cell walls. And the company is planning to sell these by the next year!

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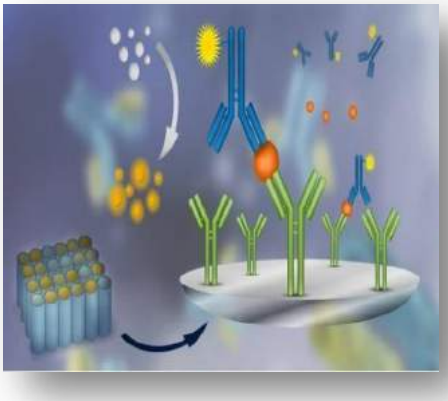
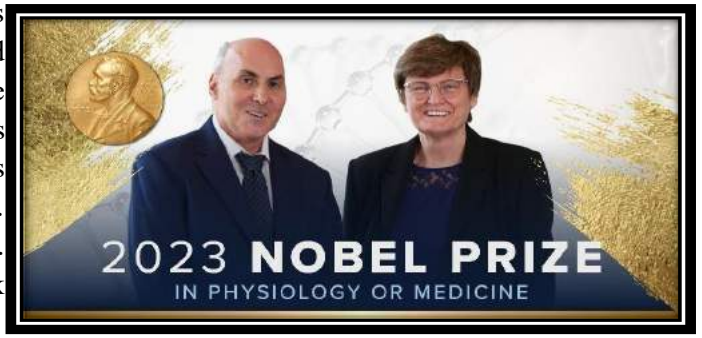
PGD in Bioinformatics, 56252

11. Elisa: Enzyme-Linked Immunosorbent Assay

The term 'ELISA' stands for Enzyme-linked Immunosorbent Assay. ELISA is a test that checks the presence of antibodies in the blood. The human body generates antibodies when any infection affects your body. The antibodies are made to protect your body from infections or antigens. If there is a presence of an antibody in your body, it means that you are affected by any infection.The human body is complex, and for that, the doctors also undergo tricky methods to fight the contaminations.With the ELISA abbreviation test, the doctors monitor the number of antibodies in your blood sample. No antibody in your blood means your body is not affected by any virus or bacteria. This is just a process of detecting the presence of antibodies produced by your immune system.





ELISA test can easily detect the antigens as it is preferably sensitive. While having the Enzyme-linked Immunosorbent Assay test, you can undergo multiple tests at a time as it can monitor plenty of specimens together. The procedure of ELISA is not complicated as it involves neither a radiation counter nor radioisotopes. There is no chance of a faulty result after the ELISA test. If you are suspect of Being infected, undergo this quick process of the ELISA test. The **ELISA** test involves taking a sample of your blood. First, a healthcare provider will cleanse your arm with an antiseptic. Then, a tourniquet, or band, will be applied around your arm to create pressure and cause your veins to swell with blood. Next, a needle will be placed in one of your veins to draw a small sample of blood. When enough blood has been collected, the needle will be removed and a small bandage will be placed on your arm where the needle was. You'll be asked to maintain pressure at the site where the needle was inserted for a few minutes to reduce blood flow. The blood sample will be sent to a laboratory for analysis. In the lab,a technician will add the sample to a petri dish containing the specific antigen related to the condition for which you are being tested. If your blood contains antibodies to the antigen, the two will bind together. The technician will check this by adding an enzyme to the petri dish and observing how your blood and the antigen react.

Ms. Aarushi
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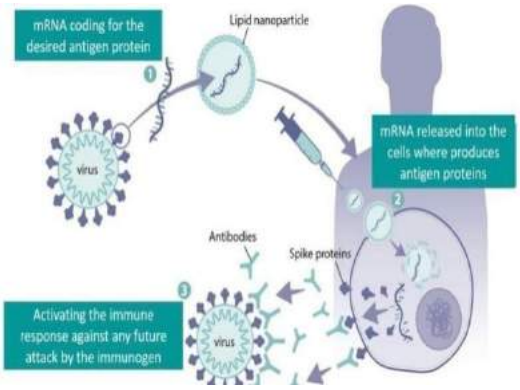
12.Messenger Rna Vaccines

Vaccines help in preventing infection in our body by introducing a harmless species of a particular bacteria or virus, triggering a immune response. In current times, scientists have developed a new type pf vaccine that uses messenger RNA rather than bacteria or viruses. mRNA is a type of RNA that is useful in protein production. mRNA from vaccines does not enter nucleus and does not alter DNA.



A **mRNA vaccine** uses a copy of mRNA, it delivers molecules of mRNA to immune cells.Thesecellsuse mRNA as a reference to build foreign protein. These protein molecules generate an adaptive immune response in our body that enables the body to identify and destroy the corresponding pathogen or cancer cells.

The mRNA vaccine introduces a viral protein which recognizes the protein that is foreign and produces specialized proteins called antibodies. Antibodies help protect the body against infection by recognizing individual viruses or other pathogens, attaching to them and marking the pathogens for destruction. After the production of antibodies, they remain in our body so that if the pathogen enters again it can be destroyed immediately. If a person receives an mRNA vaccine, it recognizes it, attaches it, and marks it for destruction. In present times, vaccines for COVID-19, are the only authorized or approved mRNA vaccines.

Tanu
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13.Breakthrough In Virology Research

In our cells, genetic information encoded in DNA is transferred to messenger RNA(mRNA), which is used as a template for protein production. During the 1980s, efficient methods for producing mRNA without cell culture were introduced, called *in vitro*.*In vitro* transcribed mRNA was considered unstable and challenging to deliver,

requiring the development of Sophisticated carrier lipid systems to encapsulate RNA. Moreover, *in vitro*-produced mRNA gave rise to inflammatory reactions.

These obstacles did not discourage the Hungarian biochemist Katalin Karikó, who was devoted to developing methods to use mRNA for therapy. During the early 1990s, when she was an Assistant professor at the University of Pennsylvania, she remained true to her vision of

Realizing mRNA as a therapeutic despite encountering difficulties in convincing research funder soft he significance of her project. Anew colleague of Karikó at her university was the immunologist Drew Weissman. He was interested in dendritic cells, which have important functions in immune surveillance and the activation of vaccine-induced immune responses.Karikó and Weissman noticed that dendritic cells recognize *in vitro* transcribed mRNA as a foreign substance, which leads to their activation and the release of inflammatory signaling molecules. They wondered why the in vitro transcribed mRNA was recognized as foreign while mRNA from mammalian cells did not give rise to the same reaction. Karikó and Weissman

Realized that some critical properties must distinguish the different types of mRNA.RNA contains four bases, abbreviated A,U,G,and C,corresponding to A,T,G,and C in DNA, the letters of the genetic code. Karikó and

Weissman knew that bases in RNA from mammalian cells are frequently chemically modified, while *in vitro* transcribed mRNA is not. This was a Paradigm change in our understanding of how cells recognize and respond to different forms of mRNA. Karikó and Weissman immediately understood that their discovery had profound. Significance for using mRNA as therapy. These seminar l results were published in 2005, fifteen years before the COVID-19 pandemic. In December 2020, Pfizer–Bio Techand

Moderna obtained authorization for their mRNA-based COVID-19 vaccines. Through their fundamental discoveries of the importance of base modifications in mRNA, this year's Nobel laureates critically contributed to this transformative development during one of the biggest health crises of our time. Persistence Pays Off: Recognizing Katalin Karikó and Drew Weissman, the 2023 Nobel Prize Winners in Physiology or Medicine.

Jasleen Kaur
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14. Unlocking Potential: The Fascinating World Of Artificial Seeds

In the quest for innovative agricultural solutions, scientists and researchers are turning to an extraordinary breakthrough – artificial seeds. These tiny marvels have the potential to transform the way we cultivate crops and ensure global food security. In this article, we delve into the intriguing world of artificial seeds and explore their incredible implications.

In a world grappling with issues like climate change, depleting arable land, and increasing food demand, artificial seeds have emerged as a beacon of hope. These remarkable creations combine cutting-edge biotechnology and agriculture to address some of the most pressing challenges in farming. Artificial seeds, also known as synthetic seeds or encapsulated somatic embryos, are man-made structures that mimic real seeds. They consist of plant embryos encapsulated in protective coatings made of biodegradable polymers, providing a safe environment for their development. These artificial seeds carry the genetic information of the parent plant and can give rise to full-fledged plants under suitable conditions.

Artificial seeds were first conceived as a solution to propagate plants that are traditionally challenging to grow from conventional seeds or cuttings. The concept gained momentum in the 1970s when scientists developed a technique to encapsulate somatic embryos. This breakthrough opened the door to mass-producing valuable plants like orchids, conifers, and certain fruits.

Crop Conservation: Artificial seeds are revolutionizing the preservation of rare and endangered plant species. By encapsulating embryos, scientists can conserve the genetic diversity of plants, ensuring their survival.Enhanced Crop Yields: Traditional methods of breeding and cultivation can take years. Artificial seeds expedite the breeding process, leading to faster crop development and increased yields.Disease Resistance: Scientists can create artificial seeds from disease-resistant plant varieties, offering a powerful tool to combat agricultural diseases without chemical interventions.

Crop Uniformity: Artificial seeds guarantee uniformity in crops, enabling farmers to produce consistent, high-quality yields.Ecosystem Restoration: Artificial seeds play a crucial role in reforestation efforts, enabling the rapid

growth of trees in degraded landscapes.

Despite their promise, artificial seeds face several challenges. Critics raise concerns about genetic uniformity, the need for extensive laboratory facilities, and potential ecological consequences. Striking the right balance between innovation and environmental responsibility is a significant challenge.

The journey of artificial seeds is far from over. Ongoing research is focused on improving the encapsulation techniques, enhancing genetic stability, and expanding the range of plant species that can be artificially seeded. With sustainable agriculture and conservation at the forefront, artificial seeds have the potential to reshape our agricultural landscape.

Artificial seeds represent an exciting chapter in the world of agriculture and biotechnology. They hold the promise of more robust crop yields, the preservation of biodiversity, and the restoration of ecosystems. As we embrace the power of innovation and scientific progress, the future of artificial seeds shines brightly on the horizon, offering a sustainable path to address the food and environmental challenges of tomorrow.

Ishita Sabharwal
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15. Artificial Womb And Ecto-Life

Have you ever thought what would happen if you could grow a baby in a pot? Well, it is no longer a fantasy, researchers in Philadelphia have created a unique artificial womb-like device called "Biobag" that simulates the mother's womb like the

world has ever seen. The prototype of an organic bag was successfully designed to facilitate ectopic pregnancy. Researchers at Children's Hospital test and monitored the effects of artificial womb technology on sheep fetuses whose development is comparable to that of human babies. The sheep exhibited normal growth, normal respiration, wool growth, and neurological function as well as normal organ maturation.

Current developments

- Experiments on animal embryos: Ecto-life has made remarkable advances in animal research. Scientists have successfully transferred animal embryos into an artificial uterus. These experiments provide valuable

insight into the possibilities and challenges of extending this technology to human reproduction.

- Solutions for premature birth:One of the most promising applications of artificial womb technology is its ability to solve thesevere problem of premature birth. Babies born prematurely often face serious health problems, but ecto-life of way to continue pregnancy outside the mother's body ,improving the chances of survival and long-term health.

Ethical considerations: The development of ecto-via raises countless ethical questions. These include concerns about the definition of motherhood, the rights and responsibilities of genetic parents, and the potential for commodifying human embryos. .Ethical frameworks must be established to ensure the responsible and ethical use of artificial womb technology.

Future possibilities:Ecto-life opens many possibilities:

- Extending pregnancy: Artificial wombs could extend pregnancy beyond the traditional nine months, potentially improving fetal development and addressing health problems related to premature birth.
- Reproductive Equity: Ecto life can provide equitable reproductive options, allowing people who are unable to become pregnant, same-sex couples, and others to experience biological parenthood.

Conclusion: Ecto-life, or artificial womb technology, is a concept poised to revolutionize human reproduction. Pregnancyandfetaldevelopment.Asscientistscontinuetoadvanceinthisfield,societymust engage in thoughtful discussions to ensure that ecto-via benefits humanity while respecting ethical boundaries.

Amritpal Kaur
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16.Neurobiology

Neurobiology is concerned with uncovering the biological mechanisms by which the nervous system mediates behavior. Much of Neurobiology has focused on the cells of the nervous system. The structure and physiology of nerve cells and supporting glial cells have been elucidated in considerable detail as well as the functional contacts made between neurons. How individual nerve and receptor cells generate, carry and transmit electrical and chemical signals is now well understood and many substances that are used by neurons to communicate information have been identifying.

The neurobiology of consciousness is now alegitimate topic for scientific enquiry. Scientists curious about the nature of human consciousness. Anesthesia is a unique tool for the modern scientific study because it offers direct experimental control over the variable of most interest. It allows brain functioning to be examined in the same person when they are either in a conscious or an unconscious state. Most recently, Molecular Biology approaches are revealing the molecules involved in carrying out neural activities and we are rapidly gaining glimpses of these molecules function. As we move into the developing world, increasing attention is being given to integrative or system neurobiology- the study of aggregate and ofneurons and functional circuits. The track in Neuroscience is intended to provide students with the tool to study nervous system biologically from molecules to behavior.

Palak Sharma
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17. Biofueltechnology:Keycomponent of g20summit

Biofuels are the fuels derived from a living matter. Like most of the other renewable energy sources,biomass can be converted directly into liquid fuels called “biofuels”. The two most common types of biofuels are ETHANOL and BIODIESEL; both are first generation of biofuel technology.

ETHANOL is a renewable fuel which is made from various plant materials. It is an alcohol used as a blending agent with gasoline. It cut down the emissionofcarbonmonoxideandothersmogcausingemissions.Sincemaximum of ethanol is made from plant which affects the agricultural sector, therefore scientists are developing technologies that uses cellulose and hemi-cellulose(the non-edible fibrous material).

BIODIESEL is liquid fuel derived from renewable sources. It is produced from mixture of alcohol and vegetable oil, animal fat. It is nontoxicandbiodegradable.Itisaveryeffectivealternativeforpetroleum-based diesel fuel.

GLOBALBIOFUELALLIANCE-G20SUMMIT

Biofuel technology was a major part of G20Summit heldon10 September 2023 at new Delhi, India. The Global Biofuel Alliance ‘s aim was to accelerate the worldwide adoption of biofuels by promoting technological advancements. It encourages people to use sustainable biofuels and establishing standardized processes which enable people to have easy access of these biofuels.

MankiranKaur
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18. Car T – Cell Therapy

Over many decades, cancer treatment has been a major concern for scientists. Traditional cancer treatments included nonspecific drugs and monoclonal antibodies to target tumor cells, surgery, chemotherapy and radiation therapy. These continue to be critical mainstays of treatment, but recently new treatments came into force. Among those the most efficient is CAR T-CELL THERAPY.

CAR T-cell is another form of immunotherapy which uses T cells to act against the pathogens. As the name implies, T cells help to adapt the immune response and directly kill the infected cells. The backbone of this therapy is, collecting T cells from the patient and re- engineering them in laboratory to produce proteins known as **chimeric antigen receptors (CARS). The** major function of CARS is to recognize and bind to antigens on the surface of cell. These receptors are not naturally forming receptors.

After the T cells are copied and produced in millions in laboratory, they are then introduced back to the patient. Now according to the general mechanism of these cells, they will continue to multiply in patient's body and due to the presence of the receptors, they would recognize and kill any cancer cells that harbor the target antigen on its surface. Like every other treatment, this treatment also has side effects that include death of many antibody producing B cells and the major one is cytokine release syndrome (CRS). However, it turned out to be very productive in current times.

Khushboo
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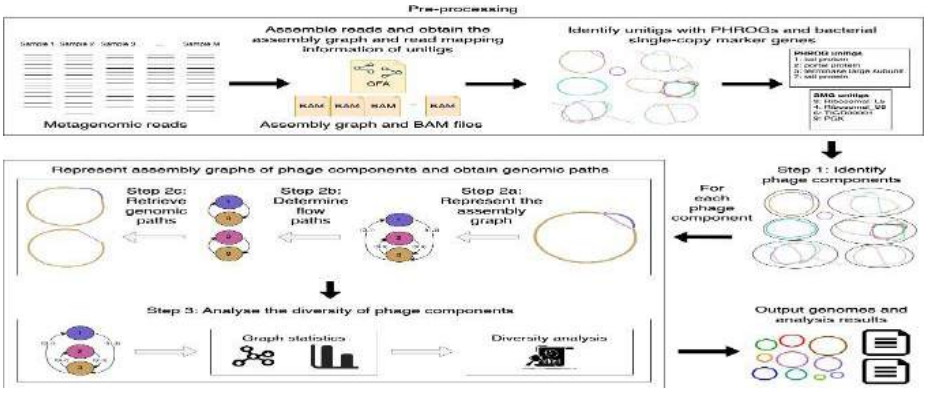
19. "Innovative application facilitates the identification of bacteriophages to manage bacteria"

Bacteriophages were discovered independently by Frederick W. Twort in Great Britain (1915) and Félix D'Hérelle in France (1917). D'Hérelle coined the term bacteriophage, meaning "bacteria eater," to describe the agent's bactericidal ability. They are the most abundant and diverse biological entities on Earth, and they play a key role in shaping microbial communities in various environments. Phages are also potential sources of novel biotechnology applications, such as phage therapy, phage display, and phage engineering.

However, finding and characterizing phage genomes from environmental samples is not an easy task. Phage genomes are often fragmented and incomplete due to the challenges of viral assembly and identification. Existing tools may miss or misclassify phage sequences, leading to a loss of valuable information.To address this problem, a team of researchers from Flinders University, College of Science and Engineering have launched a software program for scientists across the globe to discover 'bacteriophages' or phages using more precise genome sequencing called Phables, which stands for PHAgeBubbLES. Phables is designed to resolve phage genomes from fragmented viral metagenome assemblies, using graph algorithms and flow decomposition techniques.

Phables works by identifying phage-like components in the assembly graph, which are regions that contain bubbles, representing alternative phage sequences. It then models each component as a flow network, where the nodes are the contigs and the edges are the overlaps. It uses a linear programming solver to find the optimal flow paths that correspond to the most likely phage genomes.The researchers tested Phables on viral metagenomics samples obtained from different environments, such as soil, water, and human gut.



They compared Phables with existing viral identification tools, such as VirSorter, VirFinder, and MetaPhinder and they found that Phables recovered on average over 49% more high-quality phage genomes than the other tools. Moreover, Phables was able to resolve variant phage genomes with over 99% average nucleotide identity, a distinction that the other tools were unable to make.

The researchers also applied Phables to a large-scale viral metagenomics dataset from the Global Ocean Virome project, which contains over 125,000 viral contigs. They discovered over 8,000 novel phage genomes, representing a 65% increase in phage diversity. They also identified several phages that infect marine cyanobacteria, which are important primary producers in the ocean.

Phables is a novel and powerful tool for phage genome discovery and resolution. It can help researchers to uncover the hidden diversity and complexity of phages in various environments, and to advance our understanding of phage biology and ecology. It is available on Github and Pypi, and can be installed using Conda or pip.

Pallavi Jain
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20. Acid Rain

An increase in population increases the use of vehicles, leading to a major problem, i.e., pollution. Pollution is increasing daily, and a vital side effect of pollution isACID RAIN.

Acid rain is the precipitation, like rain and snow, that is more acidic than normal rain. It occurs when sulfur dioxide and nitrogen oxides are emitted from human activities like the burning of fossil fuels, industrial activities, and vehicles. The acid components reacted with water vapors in the atmosphere and fell on Earth in the form of rain, snow, or other form of precipitation. They harm the ecosystem, soil, water bodies, and even buildings and infrastructure.

Acid rain is a type of rain that is formed when acidic pollutants mix with the atmosphere's natural moisture.Did you know that acid rain is a dangerous type of rain that is formed when acidic pollutants mix with the natural moisture in the atmosphere? It's a result of human activities such as burning fossil fuels, industrial processes, and transportation emissions. We should take this issue seriously and work towards reducing our carbon footprint to prevent further harm to our environment.

The effect of acid rain encompasses a range of environmental, ecological, and human-related impacts such as soil degradation, water acidification, forest damage, nutrient imbalances in crops and plants, deterioration of buildings, statues, bridges, and other structures, respiratory issues in human, a decline of certain plants and animals. In India, many industrial centers, urban areas, and western ghats are affected by acid rain.

The impacts of acid rain on science have been significant. Scientific studies on the effects of acid rain on forests, plants, and aquatic life have provided vital data for ecological research and have played a pivotal role in shaping environmental policies and regulations. Researchers have used scientific methods to study the effects of acid rain, including monitoring pH levels in soil and water bodies, analyzing plant and animal populations, and studying the chemistry of the atmosphere. These studies have helped scientists to better understand the impacts of human activities on the environment and to identify ways to reduce pollution and mitigate the effects of acid rain. Overall, the scientific community has played an important role in raising awareness about the impacts of acid rain and in developing solutions to address this environmental problem.

In conclusion, acid rain is a serious environmental issue caused by human activities such as the burning of fossil fuels, industrial processes, and transportation emissions. It harms the ecosystem, soil, water bodies, and even buildings and infrastructure. The impacts of acid rain are far-reaching and can have significant consequences for both the environment and human health. It is important to take this issue seriously and work towards reducing our carbon footprint to prevent further harm to our planet. Through scientific research and awareness, we can develop solutions to mitigate the effects of acid rain and create a healthier and sustainable planet for ourselves and future generations.

"Acid rain is a stark reminder that our actions have consequences and that we must take responsibility for the impact we have on the environment." - Al Gore.

Simardeep Kaur
B.Sc. Non-Medical Sem-5, 21111

21. Praker Solar Probe

The praker solar probe is a **NASA** space probe launched in 2018 with the mission of making observations of outer corona of the sun. It will approach to within 9.86 solar radii from the centre of the sun, and by 2025 will travel, at closest approach as far as 690,000 km/h speed of light.

Historythe project was announced in the fiscal 2009 budget year. The cost of the project in US$ 1.5 billion. Johns Hopkins University applied physics laboratory designed and built the spacecraft, which was launched on 12 august 2018.

The praker solar probe concept originates in 1958 by the fields and particles group, but this concept was always postponed due to cost. In the early 2010s, plans for the solar probe mission were incorporated into lower cost solar probe plus .and at the last in may 2017, the spacecraft was renamed the Praker solar probe in honor of astrophysicist *Eugene Newman Praker*.

The praker solar probe is the first spacecraft to fly into the low solar corona .it will assess the structure and dynamics of the sun's coronal plasma and magnetic field, the energy flows that heats the solar corona and impels the solar wind, and the mechanisms that accelerate energetic particles.

'Humanity has touched the sun' in a pioneering achievement for space exploration.

A NASA probe has entered the sun's atmosphere and "touched" the blazing corona, in a first for solar science. It is great achievement for science history because probe is first spacecraft which enters in the sun's atmosphere, and

continuously collect the data about sun's atmosphere and send it's to the scientists.For the first time in history, a spacecraft has touched the sun. NASA's praker solar probe has flow through the sun's upper atmosphere and sampled particles and magnetic field there.

The new milestone marks one major steps for praker solar probe and one giant leap for solar science. Just us landing on the moon allowed scientist to understand how it was formed, touching the very stuff the sun is made of will help scientists uncover critical information about our closest star and its influence on the solar system. Not only does this milestone provide us with deeper insights into our own star also teaches us more about star in the rest of the universe, As it circles to the solar surface, praker is making new discoveries that other spacecraft were too far away too see, including from within the solar wind, the flow of particles from the sun that can influence us at earth. In 2019 praker discovered that magnetic zig-zag structures, in the solar wind. Continuously we get other information just like on April 28,2021 during its eighth flyby of the sun, Praker solar probe encountered the specific magnetic and particle conditions at 18.8 solar radii above the solar surface that told scientist it had crossed the Alfven critical surface for first time and finally entered the solar atmosphere. Looking at the investigation we can estimate that by 2025 we get complete information about the sun's atmosphere, and it will be greatest achievement for scientists.

Aruna
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22. Waste management

Waste management is essential in today's society. Due to an increase in population, the generation of waste is getting doubled day by day. Moreover, the increase in waste is affecting the lives of many peopleFor instance; people living in slums are very close to the waste disposal area. Therefore there are prone to various diseases. Hence, putting their lives in danger. In order to maintain a healthy life, proper hygiene and sanitation are necessary. Consequently, it is only possible with proper waste management.

The Meaning of Waste Management Waste management is the managing of waste by disposal and recycling of it. Moreover, waste management needs proper techniques keeping in mind the environmental situations. For instance, there are various methods and techniques by which the waste is disposed of. Some of them are Landfills, Recycling, Composting, etc. Furthermore, these methods are much useful in disposing of the waste without causing any harm to the environment.Methods for Waste ManagementRecycling– Above all the most important method is the recycling of waste. This method does not need any resources. Therefore this is much useful in the management of waste. Recycling is the reusing of things that are scrapped of. Moreover, recycling is further converting waste into useful resources. **Landfills**– Landfills is the most common method for waste management. The garbage gets buried in large pits in the ground and then covered by the layer of mud. As a result, the garbage gets decomposed inside the pits over the years. In conclusion, in this method elimination of the odor and area taken by the waste takes place. **Composting**– Composting is the converting of organic waste into fertilizers. This method increases the fertility of the soil. As a result, it is helpful in more growth in plants. Furthermore it the useful conversion of waste management that is benefiting the environment.

Advantages of Waste Management: There are various advantages of waste management. Some of them are below:

Decrease bad odor– Waste produces a lot of bad odor which is harmful to the environment. Moreover, Bad odor is responsible for various diseases in children. As a result, it hampers their growth. So waste management eliminates all these problems in an efficient way.

Reduces pollution– Waste is the major cause of environmental degradation. For instance, the waste from industries and households pollute our rivers. Therefore, waste management is essential. So that the environment may not get polluted.

Reduces the production of waste -Recycling of the products helps in reducing waste. Furthermore, it generates new products which are again useful. Moreover, recycling reduces the use of new products. So the companies will decrease their production rate.

It generates employment– The waste management system needs workers. These workers can do various jobs from collecting to the disposing of waste. Therefore it creates opportunities for the people that do not have any job. Furthermore, this will help them in contributing to society.

Produces Energy– Many waste products can be further used to produce energy. For instance, some products can generate heat by burning. Furthermore, some organic products are useful in fertilizers. Therefore, it can increase the fertility of the soil. Waste can be solid, liquid, or gases and each type has different methods of disposal and management. Waste management deals with all types of waste, including industrial, biological, household, municipal, organic, biomedical, radioactive wastes. In some cases, waste can pose a threat to human health. Health issues are associated with the entire process of waste management. Health issues can also arise indirectly or directly: directly through the handling of solid waste, and indirectly through the consumption of water, soil, and food. Waste is produced by human activity, for example, the extraction and processing of raw materials. Waste management is intended to reduce the adverse effects of waste on human health, the environment, planetary resources, and aesthetics.

The aim of waste management is to reduce the dangerous effects of such waste on the environment and human health. A big part of waste management deals with municipal solid waste, which is created by industrial, commercial, and household activity.As global solid waste generation rates increase faster than urbanization, coupled with inadequate SWM systems, local governments and urban residents often resort to unsustainable SWM practices. These practices include mixing household and commercial garbage with hazardous waste during storage and handling, storing garbage in old or poorly managed facilities, deficient transportation practices, open-air incinerators, informal/uncontrolled dumping, and non-engineered landfills. The implications of such practices include air and water pollution, land degradation, climate change, and methane and hazardous leachate emissions. In addition, these impacts impose significant environmental and public health costs on residents with marginalized social groups affected mostly.

Diya
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23. The Art And Science Of Wine Production: Unveiling The Magic Of Fermentation

Wine, often referred to as the elixir of life, has a rich history that dates back thousands of years. Central to the alchemy of winemaking is the fascinating process of fermentation. This natural transformation of grape juice into wine involves the intricate dance of microorganisms and chemical reactions, turning simple fruit into a complex and nuanced beverage.

The journey of wine production begins with the grape harvest. Grapes are carefully picked at the peak of ripeness, a crucial factor influencing the final flavor and aroma of the wine. Different grape varieties contribute unique characteristics, emphasizing the significance of grape selection in the winemaking process.

Once harvested, the grapes undergo crushing and pressing to release their juice. Traditionally, this step involved stomping on grapes with bare feet, but modern winemaking employs mechanical presses. The resulting liquid, known as "must," contains water, sugars, acids, and various compounds that will shape the final product.

Fermentation, the heart of winemaking, begins as naturally occurring yeasts or cultured strains are introduced to the must. Yeasts consume the sugars in the grape juice, converting them into alcohol and carbon dioxide. This transformative process not only produces alcohol but also unlocks a spectrum of flavors and aromas.

Two primary types of fermentation are involved in wine production: alcoholic fermentation and malolactic fermentation. Alcoholic fermentation, driven by yeast, transforms sugars into alcohol. Malolactic fermentation, involving bacteria, converts harsh malic acid into softer lactic acid, contributing to the wine's smoothness.

Yeast strains play a pivotal role in determining the wine's character. Different strains produce distinct flavors, aromas, and alcohol levels. Winemakers carefully select yeast strains based on the desired outcome, whether it's a crisp Sauvignon Blanc or a robust Cabernet Sauvignon.
Controlling fermentation temperature is crucial for achieving specific wine characteristics. Cooler temperatures slow down the process, preserving delicate aromas, while warmer temperatures can enhance the extraction of color and body. Modern winemaking facilities use temperature-controlled tanks to manage this critical aspect.
Following fermentation, the young wine undergoes maturation and aging. This stage allows the wine to develop complexity, depth, and balance. Winemakers may choose to age the wine in stainless steel tanks, oak barrels, or a combination of both, each imparting unique qualities to the final product.
Blending is an art that adds another layer of complexity to winemaking. Winemakers carefully mix wines from different batches or grape varieties to achieve a harmonious and well-balanced final product. This creative process showcases the expertise and intuition of the winemaker.
In the realm of winemaking, fermentation is the magical process that transforms humble grape juice into the exquisite nectar that graces our tables. From the careful selection of grapes to the artful blending of wines, every step contributes to the unique character of the final product. The science and tradition behind wine production are a testament to the harmonious marriage of nature and human craftsmanship, resulting in a beverage that has enchanted civilizations for centuries.

Komal
B.Sc. Biotechnology Sem-5 , 23117

24. Mice With Two Male Parents

Scientists have created mice with two biologically male parents for the first time: a significant milestone in reproductive biology. (MARCH 2023)

The team, led by Katsuhiko Hayashi, a professor of genome biology at Osaka University in Japan, generated eggs from the skin cells of male mice that, when implanted in female mice, went on to produce healthy pups, according to research published March 15 in the peer-reviewed journal Nature.

The proof-of-concept research, the culmination of years of pain-staking lab work, could expand the possibilities for future fertility treatments, treat or prevent genetic disorders, help same-sex couples have biological children, and perhaps help prevent the extinction of endangered animals.

Skin cells reprogrammed from mice tails:The researchers took skin cells from the tails of fully grown male lab mice, which, as in male humans, contain one X and one Y chromosome, and turned them into induced pluripotent stem cells, or iPSCs — a type of cell that scientists have reprogrammed into an embryonic state.

This process of genetic engineering, which introduces specific genes to create cells that mimic embryonic stem cells, was pioneered by Nobel Prize-winning scientist Shinya Yamanaka.(Induced pluripotent stem cells, which can be developed into any kind of human cell, are widely used in biological research to model and investigate human diseases and develop drugs.)

When the iPSCs are cultured in the lab, a few spontaneously lose the Y chromosome, which isn’t essential for the growth of this particular type of cell, generating “XO” cells, Hayashi explained.

The researchers cultured the XO cells and found that some cells developed two X chromosomes as a result of cell division errors — making them chromosomally female. Treating the XO cells with a compound called Reversine

(potent inhibitor of the mitotic kinase Mps1[4] and it is widely used to study the process of chromosome segregation.) increased the number of XX cells, the researchers found.From there, the team converted the XX cells into primordial germ cells, the precursors of eggs and sperm, that were subsequently programmed with the signals to turn them into egg cells. Once fertilized with sperm and implanted into a mouse uterus, the eggs generated live offspring.

“This study is particularly neat because it takes advantage of errors that are known to occur during culture of XY cells, which lead to loss of the Y chromosome and subsequent gain of a second X chromosome, resulting in XX cells that are capable of generating live offspring,” said Rod Mitchell, a professor of developmental endocrinology at the MRC Centre for Reproductive Health at the University of Edinburgh in Scotland, in a statement. (He wasn’t involved in the research)

“However, its potential application for humans (e.g. for same-sex couples) remains to be seen. In the mouse study, very few of the embryos generated using mouse cells resulted in live offspring and the final steps required to convert germ cells into eggs have not been reliably reproduced using human cells,” added Mitchell.Only 7 out of 630 implanted mouse embryos gave rise to mouse pups. Hayashi said this low success rate — around 1% — wasn’t down to the process of sex chromosome conversion but the reality that cells cultured in a lab are typically inferior to those in a living animal.

Hayashi’s research has raised the possibility that someday same-sex couples may be able to have a baby who shares both parents’ genes.“It will be difficult to produce babies from male-male (human) couples because of both technical and ethical reasons,” Hayashi said. “But it is theoretically possible to produce babies from male-male couples, as shown in this study.”

He said that it would be more challenging to accomplish the reverse — that is, making sperm from female cells because they contain no Y chromosome, which is essential for making sperm. Duplicating an X chromosome, which male cells already have, is easier than conjuring up a Y chromosome in female cells, Hayashi explained.

The technique holds promise for conserving endangered species, although it’s not known whether the process in mice that resulted in the spontaneous loss of a Y chromosome and the duplication of the X chromosome would occur in other mammal species, said Mike McGrew, Personal Chair of Avian Reproductive Technologies at The Roslin Institute at the University of Edinburgh.

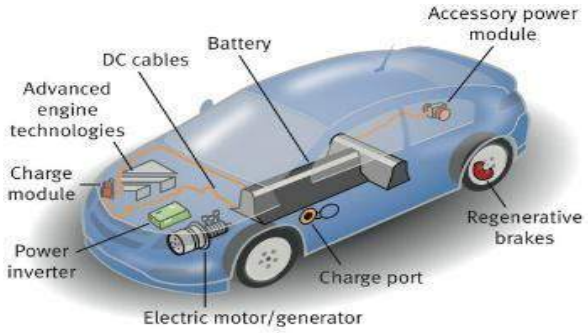
“This is a very exciting finding for species conservation,” he said via email. “You could imagine that the many ‘biobanks’ that are being established to capture genetic diversity stored for endangered species of animals. By chance, only or predominantly male cells may be conserved for some species.”

The techniques developed by Hayashi could help the northern white rhino breeding program, said Thomas Hildebrandt, professor and chair of wildlife reproduction medicine at FreieUniversität Berlin and head of reproduction management at the Leibniz Institute for Zoo and Wildlife Research.Only two animals of the species remain in the world, and both are female, Hildebrandt is attempting to artificially breed the animals with sperm and tissue samples taken from now deceased male counterparts.

Bhawna Sant
B.Sc. Medical Sem-1, 20014

25. Electric Vehicle

India is the eighth most polluted country according to 2022 World Air Quality Report; which has decreased the life expectancy by 5.3 years. Electric cars are becoming very popular these days as they are eco-friendly. Vehicles powered by fuel cells are Electric Cars. An Electric Car is also known as EV and do not require IC engines to operate. It is powered by an electric motor instead of a gas-powered engine. The Electric Motor gets energy from a Controller which regulates the amount of power. Based on the drivers use of an accelerator pedal the Electric Car uses energy stored in its rechargeable batteries which are recharged by common household electricity. **How Electric car works?** Electric vehicles are like an automatic car. They have a forward and reverse mode. When you place the vehicle in gear and press on the accelerator pedal these things happen; power is converted from the DC battery to AC from the electric motor, the accelerator pedal sends a signal to the controller which adjusts the vehicle speed by changing the frequency of the AC power from the inverter to the motor. The motor connects and turns the wheels through a cog. When the brakes are pressed or the car is decelerating, the motor becomes an alternator and produces power which is sent back to the battery. If you want to understand how electric vehicle works, you need to be familiar with the physical elements of electric motor and it starts with understanding the principles of its two major parts i.e., the Stator and the Rotor. An electric car motor works using a physical process. This consists of using a current to create a magnetic field at the fixed part of the machine known as the Stator whose displacement sets a rotating part, Rotor. When talking about converting thermal energy into mechanical energy, it means combustion not electric. In other words, an engine is a type of motor, but a motor is not necessarily an engine with electric vehicles because the mechanical energy is created from electricity; the word motor is used to describe the device that makes the electric vehicle move. It's still relatively simple to wrap your head around its main parts i.e., instead of a gas tank they have batteries, instead of an engine they have an electric motor and they've got no tail pipe. The **parts of EV's include** Traction Battery Pack, Power Inverter, Electric Traction Motor, Power Electronics Controller, Battery, Charge Port, DC/DC Converter, Charger and Transmission. The function of the battery in an electric car is as an electrical energy storage system in the form of direct current electricity. If it gets a signal from the controller, the battery will transmit DC electrical energy to the inverter and then used to drive the motor type of battery used a rechargeable battery arranged in such a way that it is called Traction Battery Pack. The inverter functions to change the direct current into an alternating current and then this alternating current are used by an electric motor. In addition, the inverter on an electric car also has a function to change the AC current when regenerative breaking to DC current and then used to recharge the battery. A controller unit is an inverter and converter combination that recharges the battery pack of an electric vehicle during regenerative breaking which develops kinetic energy. The flow of energy from the battery is controlled using a controller unit in tandem with a converter and inverter combinations. The DC motor controller system is still used today on some electric vehicles to keep the cost down. However, many of today's electric vehicles are using AC motor controller systems because of their improved motor efficiency and lighter weight. In an electric drive vehicle, the auxiliary battery provides electricity to power vehicle accessories. The Charge Port allows the vehicle to connect to an external power supply in order to charge the traction battery pack. Charger is a battery charging device charger is getting electricity from outside sources such as the utility grid or solar power plants. Thermal system cooling is a system that maintains a proper operating temperature range of the engine, electric motor, power electronics and other components. The transmission electric transfers mechanical power from the electric traction motor to drive the wheels. There are **four types of electric cars** are available. They are Batteries electric vehicle, Hybrid, electric vehicle, Plug in hybrid electric vehicle and Fuel cell electric



vehicle. Some of the examples are Volkswagen e-Golf, Tesla model 3, BMW 3, Honda Civic Hybrid, Toyota Prius Hybrid, SE, hybrid Audi A3 E-Tron, Toyota Murai etc.

The main advantage of an electric car is that they're easier on the environment as there is no emission of harmful exhaustible gases. It contributes to cleaner air and a healthier planet. Electricity is significantly less expensive than gasoline or diesel. Installing solar panels on your home can save you even more money. Also, they don't have as many components that need to be replaced compared to gas powered vehicles. They are much quieter than conventional gas engines, reducing noise pollution and making the ride even more comfortable. Electric motors respond much faster than mechanical engines, providing greater torque and agility. **The main drawback** of an electric car is to find a charging station. Even though you can charge an electric vehicle at home. Finding a charging station can be a challenge if you're driving through the countryside or on a long road trip. There is no doubt that Electric cars are more efficient, sustainable and more eco-friendly.

SAHIBPREET KAUR
M.SC PHYSICS (1ST YEAR), 25251

26. Research Reveals Rare Metal Could Offer Revolutionary Switch For Future Quantum Devices:-

According to a November 2023 , researchers found a rare phenomenon in purple bronze could lead to a “perfect switch” in quantum devices. This switch would allow the devices to flip between being a insulator and a super conductor. The Remarkable Journey of discovery :-The journey to this discovery began 13 years ago when two PhD. Students Xiao fengXuand Nick Wakcham, measured the magneto resistance of purple bronze. Thematerial’s shows a complex behaviour, that is, shifting from metallicto insulating states with temperature changes. Present researchers:-Lead author Nigel Hussey, Professor of Physicsatthe University of Bristo, found these two opposing electronicstatesexistwithin purple bronze, a unique one -dimensional metal composed of individual conducting chains of atoms. Emergent symmetry :-Tiny changes in the material, prompted by as mallstimulus like heat or light, may trigger an instant transition from an insulating state with zero conductivity to a superconductor with unlimited conductivity, and vice versa. This polarised versatility, known as'emergent symmetry' , has the potential to offer an ideal On/Off switch in future quantum technology developments. We are expecting its future application which makes the devices more developed which makes our lives easier. Looking ahead, it might be possible to exploit this ‘edginess’ to create switches in quantum circuits where by tiny stimuli induce profound, orders-of-magnitude changes in the switch resistance.”

MANJOT
MSc (PHYSICS) I st YEAR , 25254

27. Practical Application:-Nanoparticles Give Laser Wakefield Accelerator A Boost To 10 Gev

A highly stable laser wake field accelerator has been created by Bjorn Manuel Hegelich at the University of Texas at Austin and an internationalteam. Their device uses nanoparticles to put electrons directlyintoitsplasma wave, accelerating the electrons to energies as highas10GeV.

HISTORY:- First proposed in 1979, laser wakefield accelerationoffersaway to create compact particle accelerators that can reachenergiesthatare normally the preserve of kilometer-sized facilities. Huge gradient:-This plasma wave has an oscillating electric fieldthatresembles the electromagnetic waves that drive particles throughconventional accelerators. The result is an acceleration gradient that can be three orders of magnitude greater than those found

unconventionalaccelerators.Over the past few decades, physicists have achievedseveralimportant milestones in perfecting the design and operation of the laser wake field accelerator. However, it remains a significant challengetoproduce stable electron beams. In their study, Hegelich's team tackled this challenge with a modified accelerator setup that features aremovablemetal plate at the bottom of a helium gas cell. The accelerationprocessbegins by firing a pulse from an auxiliary laser at the plate. This release saluminium nano particles, which mix uniformly with the gas.Thegasisthen ionized with a powerful pulse from the Texas Petawatt Laser, which creates the plasma and also releases electrons fromthe nanoparticles.The team hopes that future generations of laser wakefield acceleratorswillbenefit from their research. The development of practical, room-sizedaccelerators could be useful across a broad range of fields includingmaterials science, medical imaging and cancer therapy.

KIRAN CHAUHAN
MSC PHYSICS SEM 1, 25256

28. Molecular Markers for Transgenic Plants: Unlocking the Potential Of Genetic Modifications.

Molecular markers play a pivotal role in the development and characterization of transgenic plants. These markers are specific DNA sequences used to identify and track genes of interest in the process of genetic engineering. In the realm of transgenic plants, molecular markers serve several crucial purposes.

One primary use of molecular markers is to confirm the successful integration of foreign genes into the plant genome. Polymerase chain reaction (PCR) and other DNA amplification techniques are commonly employed to detect the presence of transgenes. This verification step ensures the accuracy of the genetic modification and aids in the selection of transformed plants. Additionally, molecular markers contribute to the selection of desirable traits in transgenic plants. Through marker-assisted selection (MAS), researchers can identify and choose plants with the desired transgenic traits more efficiently. This accelerates the breeding process by allowing scientists to focus on plants with the desired characteristics, such as resistance to pests or tolerance to environmental stress.

In the context of biosafety and regulatory compliance, molecular markers assist in distinguishing transgenic plants from their non-transgenic counterparts. These markers help monitor gene flow and assess potential environmental impacts, ensuring that transgenic plants are effectively contained and managed. As technology advances, new types of molecular markers, such as single nucleotide polymorphisms (SNPs) and high-throughput sequencing methods, continue to enhance the precision and efficiency of transgenic plant research. The integration of molecular markers into the development and analysis of transgenic plants not only streamlines the genetic engineering process but also contributes to the responsible and sustainable deployment of genetically modified crops.

Aditi Sharma
MSc. Botany (Sem3) , 25104

Activities of the Session 2023-2024

Guest Lecture on “Cancer: A multifaceted disease with novel insights” and Poster Making competition.

Biotechnology Sem-6 Student of HMV got 2nd Position in University

B.Sc. Biotechnology Sem 3 Students of HMV got University Positions

B.Sc. Biotechnology Sem-I Students of HMV got top 3 University positions

Students winners during workshop on “Safety Measures in Chemistry Lab” organized by Chemistry Department

Tech startup- connects and grows series at GNDU, Amritsar.

HMV Students participated in International youth day celebrated at Pushpa Gujral Science City, Kapurthala.

National Science Day Celebrated at HMV in collaboration with Punjab State Council of Science and Technology & NCTSC, DST, Govt. of India

World Ozone Day Celebrated on 18 September 2023 by Botany Department

Respected Principal Madam, the resource person (Prof. Manpreet Kaur, Head Department of Human Genetics, GNDU, Amritsar), the organizing committee and the winners of the poster competition as a part of the guest lecture on Cancer: A multifaceted disease with novel insights

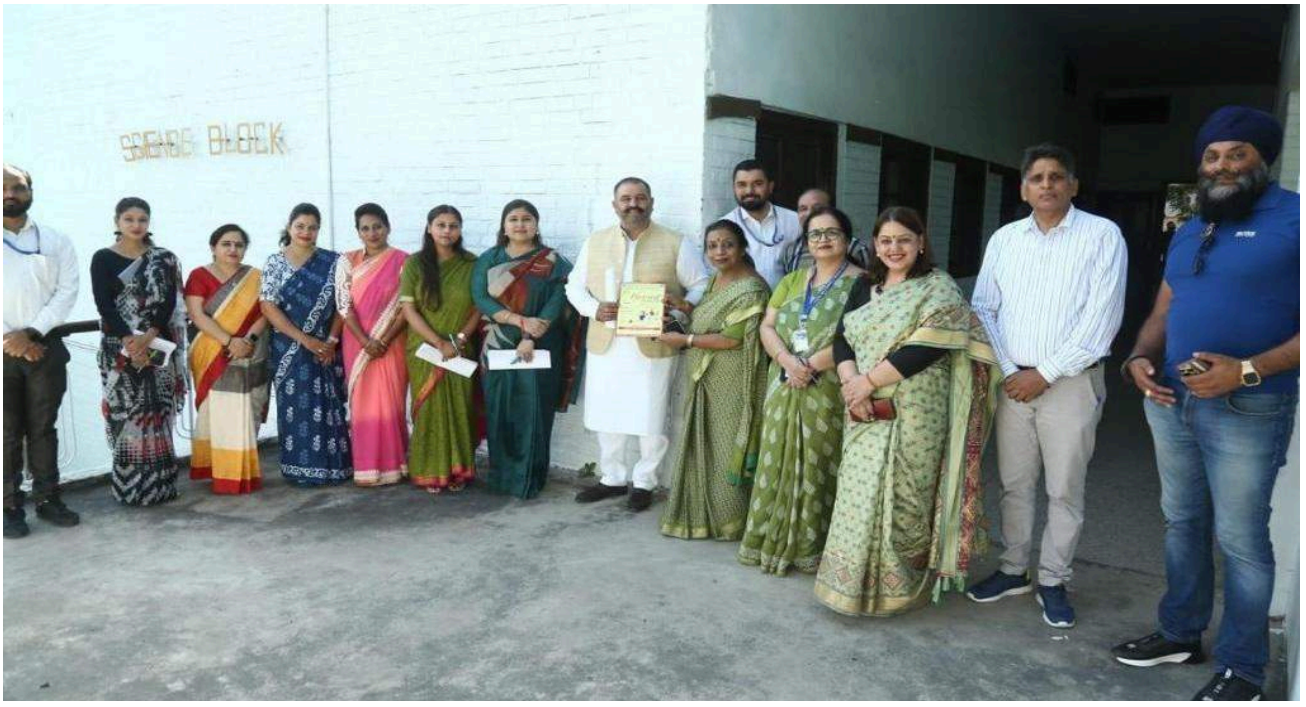
HMV Environment Club Celebrates Organic Holi

A group photo of respected Principal Madam, the resource person and the organizing committee of the MultiOmics Data Integration and Visualization using Cytoscape workshop conducted by Dr. Gitanjali Yadav from NIPGR, New Delhi

Students of Bioinformatics Department visited the Indo-Israel center of Excellence for vegetable, Kartarpur

Nature study camp organized by PG department of Botany

Akshay Urjadivas celebrated by Zoology Department



Yuvan -2023 an exhibition for school students

World's AIDS day Celebration by Zoology Department

World Ozone Day Celebrated at HMV

Jalandhar-
Harpreet Singh Lehal

DD Pant Botanical Society of PG Department of Hans Raj Mahila Maha Vidyalaya celebrated World Ozone Day under DBT Star Scheme. The Resource Person of the day was Prof. Dr. Anish Dua, Professor at Zoology Department, GNDU, Amritsar. Principal Prof. Dr. (Mrs.) Ajay Sareen welcomed him with a planter. She said that Dr. Dua is a role model, a great researcher and a teacher. Dr. Dua said that Science and Arts goes hand in hand. Science unfolds hour things open. He talked about unorganized development taking place during last few years and the relation of natural calamities which we are facing every year now. He urged the students to the committed and take social responsibility to save our mother earth. He urged everyone to abide law and participate in sustainable development. Stage was conducted by Dr. Anjana Bhatia. On this occasion, interclass competition on Ecorangavalli and fuel less cooking and 22 teams for Rangoli Competition participated. In Rangoli Manpreet and Siya got 1st Prize, Gurleen, Geetanjali, Riti and Rajni got 2nd prize. Khushboo, Suhani, Aarushi, Kiran and Palak got 3rd prize. Consolation prize was won by Akansha, Kiran, Riya, Jasleen, Gurleen and Pavani. In fuel less cooking 1st prize was won by Najam, Hitasha, Bhumi, Bipasha and Neha. 2nd prize was given to Ishita, Tanya and Vridhi. 3rd prize was given to Devangi, Yashika and Ravneet. Consolation prize was won by Chhavi, Saloni, Kiran, Komal, Bhavna and Daljeet. Principal Prof. Dr. (Mrs.) Ajay Sareen congratulated the department for wonderful event. The judges were Dr. Seema Marwaha, Mrs. Deepshikha, Dr. Jatinder, Mrs. Saloni and Mrs. Purnima. On this occasion, Dr. Anjana Bhatia, Dr. Shaveta Chauhan, Mrs. Ramandeep, Ms. Harpreet and Dr. Shuchi Sharma were also present.

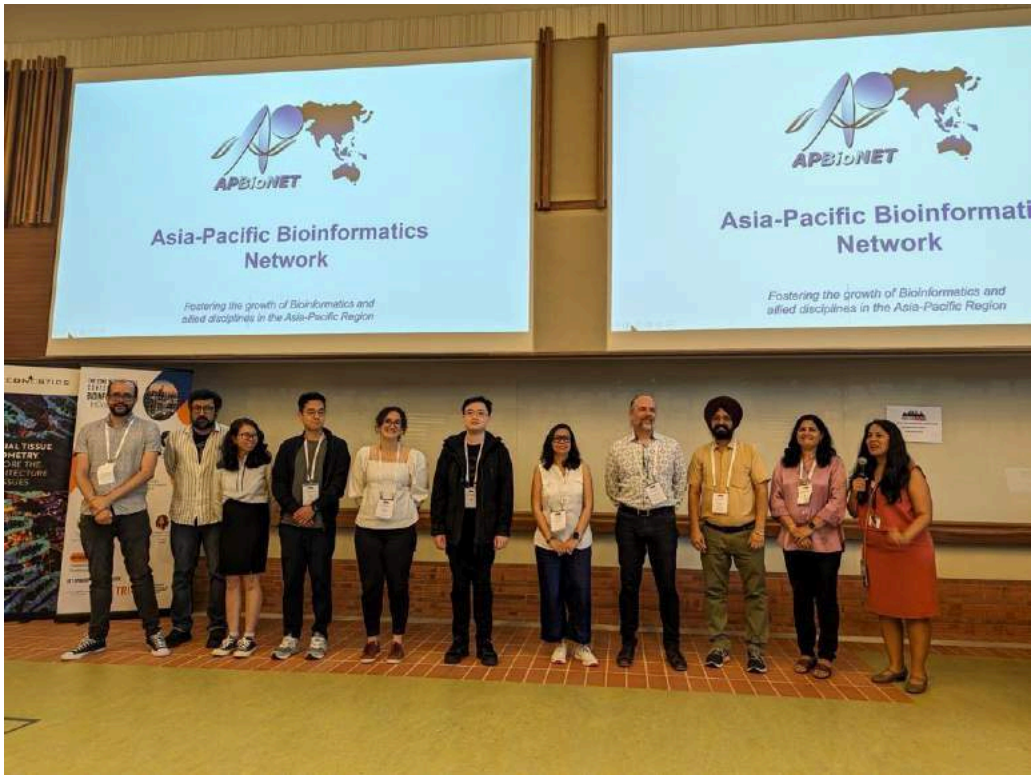
ਐਚ.ਐਮ.ਵੀ. ਦੀ ਡੀਡੀ ਪੰਤ ਬੋਟਾਨਿਕਲ ਸੁਸਾਇਟੀ ਨੇ ਆਯੋਜਿਤ ਕੀਤਾ ਨੇਚਰ ਕੈਂਪ

ਜਲੰਧਰ-ਪਵਨ ਗੌਤਮ

ਹੰਸਰਾਜ ਮਹਿਲਾ ਮਹਾਵਿਦਿਆਲਾ, ਜਲੰਧਰ ਦੇ ਪੀਜੀ ਵਿਭਾਗ ਬਾੱਟਨੀ ਦੀ ਡੀਡੀ ਪੰਤ ਬੋਟਾਨਿਕਲ ਸੁਸਾਇਟੀ ਵੱਲੋਂ ਪ੍ਰਿੰਸੀਪਲ ਪ੍ਰੋ. ਡਾ. (ਸ਼੍ਰੀਮਤੀ) ਅਜੇ ਸਰੀਨ ਦੀ ਦੇਖਰੇਖ ਹੇਠ ਨੇਚਰ ਸਟੱਡੀ ਕੈਂਪ ਦਾ ਆਯੋਜਨ ਕੀਤਾ ਗਿਆ। ਇਹ ਕੈਂਪ ਸਟੇਟ ਨੋਡਲ ਏਜੰਸੀ ਦੇ ਤੌਰ ਤੇ ਪੰਜਾਬ ਸਟੇਟ ਕੌਂਸਿਲ ਫਾਰ ਸਾਇੰਸ ਐਂਡ ਟੈਕਨਾਲੌਜੀ

ਅਤੇ ਐਨਵਾਇਰਮੈਂਟ ਐਂਡ ਕਲਾਈਮੇਟ ਚੇਂਜ ਮੰਤਰਾਲੇ ਦੇ ਸਹਿਯੋਗ ਨਾਲ ਆਯੋਜਿਤ ਕੀਤਾ ਗਿਆ। ਇਸ ਨੇਚਰ ਕੈਂਪ ਦੇ ਦੌਰਾਨ ਐਮਐਸਸੀ ਬਾੱਟਨੀ ਅਤੇ ਬੀਐਸਸੀ ਦੀਆਂ ਵਿਦਿਆਰਥਣਾਂ ਨੇ ਜਿਲਾ ਹੋਸ਼ਿਆਰਪੁਰ ਦੇ ਮੇਹਨਗਰੇਵਾਲ, ਤਖਨੀ, ਰਹਮਾਪੁਰ ਵਾਈਲਡ ਲਾਈਫ ਸੈਂਚੁਰੀ, ਵਾਇਲਡ ਲਾਈਫ ਡਿਵੀਜਨ ਹੁਸ਼ਿਆਰਪੁਰ, ਪੰਜਾਬ ਦੇ ਫਾਰੈਸਟ ਅਤੇ ਵਾਈਲਡ ਲਾਈਫ ਪ੍ਰਿਜਰਵੇਸ਼ਨ ਵਿਭਾਗ, ਕੁਕਾਨੇਟ ਫਾਰੈਸਟ ਰਿਜਰਵ, ਦੇਹਰੀਆਂ ਅਤੇ ਥਾਨਾ ਡੈਮ ਹੁਸ਼ਿਆਰਪੁਰ ਦਾ ਦੌਰਾ ਕੀਤਾ। ਕੈਂਪ ਦੌਰਾਨ ਵਿਦਿਆਰਥਣਾਂ ਨੇ ਮੇਹਨਗ੍ਰੇਵਾਲ ਦੇ ਫਾਰੈਸਟ ਗੈਸਟ ਹਾਊਸ ਤੱਕ ਸ਼੍ਰੀ ਪਰਮਿੰਦਰ ਸਿੰਘ ਨਾਲ ਟ੍ਰੈਕ ਕੀਤਾ ਅਤੇ ਪੌਦਿਆਂ ਦੀਆਂ ਵਿਭਿੰਨ ਪ੍ਰਜਾਤੀਆਂ ਜਿਵੇਂ ਭਾਰਤੀ ਸੈਂਡਲਵੁਡ ਪਲਾਂਟ, ਪੀਨਸ, ਸ਼ੀਸ਼ਮ, ਬੁਗਨਵੇਲੀਆ ਅਤੇ ਕਰੀ ਰੁੱਖ ਦੀਆਂ ਵਿਭਿੰਨ ਪ੍ਰਜਾਤੀਆਂ ਦਾ ਅਧਿਐਨ ਕੀਤਾ। ਤਖਨੀ-ਰਹਿਮਾਪੁਰ ਵਾਈਲਡ ਲਾਈਫ ਸੈਂਚੁਰੀ ਦੇ ਦੌਰਾਨ ਦੌਰਾਨ ਡਾ. ਅਮਨਦੀਪ ਸਿੰਘ ਨੇ ਵਿਦਿਆਰਥਣਾਂ ਨੂੰ ਕੁਦਰਤ ਵਿੱਚ ਛਿਪੇ ਖਜ਼ਾਨੇ ਦਾ ਅਧਿਐਨ ਕਰਨ ਲਈ ਵੀ ਪ੍ਰੇਰਿਤ ਕੀਤਾ। ਵਿਦਿਆਰਥਣਾਂ ਨੇ ਕੁਕਾਨੇਟ ਫਾਰੇਸਟ ਰਿਜ਼ਰਵ ਦਾ ਵੀ ਦੌਰਾ ਕੀਤਾ। ਇਨ੍ਹਾਂ ਜੰਗਲਾਂ ਵਿੱਚ ਰੁੱਖਾਂ ਦੀਆਂ ਵਿਭਿੰਨ ਕਿਸਮਾਂ ਪਾਈਆਂ ਜਾਂਦੀਆਂ ਹਨ। ਵਿਦਿਆਰਥਣਾਂ ਨੇ ਕੁਦਰਤ ਦੀ ਸ਼ਾਂਤੀ ਅਤੇ ਬਹਿੰਦੇ ਪਾਣੀ ਦੀ ਮਧੁਰ ਆਵਾਜ਼ ਦਾ ਵੀ ਅਨੁਭਵ ਕੀਤਾ ਜਿਸਦਾ ਇਸਤੇਮਾਲ ਕਈ ਸਰੀਰਕ ਅਤੇ ਮਾਨਸਿਕ ਸਮੱਸਿਆਵਾਂ ਨੂੰ ਦੂਰ ਕਰਨ ਲਈ ਕੀਤਾ ਜਾਂਦਾ ਹੈ। ਵਿਦਿਆਰਥਣਾਂ ਨੇ ਬਲਾਕ ਆਫਿਸਰ ਸ਼੍ਰੀ ਜਸਵੀਰ ਸਿੰਘ ਦੀ ਅਗਵਾਈ ਹੇਠ ਦੇਹਰੀਆਂ ਅਤੇ ਥਾਨਾ ਡੈਮ ਹੁਸ਼ਿਆਰਪੁਰ ਦਾ ਵੀ ਦੌਰਾ ਕੀਤਾ। ਫਾਰੈਸਟ ਗਾਰਡ ਸ਼੍ਰੀ ਜਸਬੀਰ ਅਤੇ ਬਲਾਕ ਇੰਚਾਰਜ ਸੁਸ਼੍ਰੀ ਹਸ਼ਿਕਾ ਨੇ ਵਣ ਚੇਤਨਾ ਪਾਰਕ ਵਿੱਚ ਵਿਦਿਆਰਥਣਾਂ ਨੂੰ ਫਲੋਰਲ ਡਾਇਵਰਸਿਟੀ ਬਾਰੇ ਦੱਸਿਆ। ਨਾਰਾ ਡੈਮ ਜਾਂਦੇ ਹੋਏ ਵਿਦਿਆਰਥਣਾਂ ਨੇ ਨਾਰਾ ਜੰਗਲ ਦੀ ਫਲੋਰਲ ਡਾਇਵਰਸਿਟੀ ਦਾ ਵੀ ਅਨੁਭਵ ਕੀਤਾ। ਉਨ੍ਹਾਂ ਅੰਗਰੇਜਾਂ ਵੱਲੋਂ ਬਣਾਏ ਗਏ ਨਾਰਾ ਗੈਸਟ ਹਾਊਸ ਵਿੱਚ ਖਾਣ-ਪੀਣ ਦਾ ਆਨੰਦ ਲਿਆ। ਤੀਜੇ ਦਿਨ ਵਿਦਿਆਰਥਣਾਂ ਨੇ ਹਰੀਕੇ ਸੈਂਚੁਰੀ ਅਤੇ ਕਰਮੋਵਾਲ ਦਾ ਦੌਰਾ ਕੀਤਾ। ਹਰੀਕੇ ਪ੍ਰੋਜੈਕਟ ਇੰਚਾਰਜ ਸੁਸ਼੍ਰੀ ਗੀਤਾਂਜਲੀ ਨੇ ਵਿਦਿਆਰਥਣਾਂ ਨੂੰ ਪਾਣੀ ਦੇ ਵਿਭਿੰਨ ਮਾਨਕਾ ਬਾਰੇ ਜਾਣਕਾਰੀ ਦਿੱਤੀ। ਉਨ੍ਹਾਂ ਪਾਣੀ ਵਿੱਚ ਪਾਈ ਜਾਣ ਵਾਲੀ ਡਾਲਫਿਨ ਅਤੇ ਘੜਿਆਲ ਬਾਰੇ ਵੀ ਦੱਸਿਆ। ਪ੍ਰਿੰਸੀਪਲ ਪ੍ਰੋ. ਡਾ. (ਸ਼੍ਰੀਮਤੀ) ਅਜੇ ਸਰੀਨ ਨੇ ਵਿਭਾਗ ਦੇ ਯਤਨਾਂ ਦੀ ਸ਼ਲਾਘਾ ਕੀਤੀ ਅਤੇ ਕਿਹਾ ਕਿ ਇਸ ਤਰ੍ਹਾਂ ਦੇ ਵਿਜ਼ਿਟ ਨਾਲ ਵਿਦਿਆਰਥਣਾਂ ਵਿੱਚ ਬਾਇਓਡਾਇਵਰਸਿਟੀ ਅਤੇ ਵਾਤਾਵਰਣ ਸੁਰੱਖਿਆ ਪ੍ਰਤੀ ਜਾਗਰੂਕਤਾ ਆਏਗੀ। ਡਾ. ਅੰਜਨਾ ਭਾਟੀਆ ਨੇ ਕਿਹਾ ਕਿ ਕਲਾਸ ਦੀ ਚਾਰਦੀਵਾਰੀ ਵਿੱਚ ਵਾਤਾਵਰਣ ਨੂੰ ਨਹੀਂ ਪੜ੍ਹਿਆ ਜਾ ਸਕਦਾ। ਇਸਦੇ ਲਈ ਕੁਦਰਤ ਦੇ ਕਰੀਬ ਆਉਣਾ ਜਰੂਰੀ ਹੈ। ਕੈਂਪ ਦੌਰਾਨ ਡਾ. ਅੰਜਨਾ ਭਾਟੀਆ, ਡਾ. ਸ਼ਵੇਤਾ ਚੌਹਾਨ, ਡਾ. ਨੀਤਿਕਾ, ਸ਼੍ਰੀਮਤੀ ਰਮਨਦੀਪ, ਡਾ. ਸ਼ੁਚੀ ਅਤੇ ਸੁਸ਼੍ਰੀ ਹਰਪ੍ਰੀਤ ਮੌਜੂਦ ਸਨ।

Dr Harpreet Singh, Head Department of Bioinformatics, Hans Raj Mahila Maha Vidyalaya, Jalandhar delivered Invited talk during the HCT International Conference on Advancements in Health Sciences at the Higher Colleges of Technology (Mens Campus), Dubai, UAE from 8th to 9th March, 2023.



Dr. Harpreet Singh, presented his research during the 23rd International Conference on Bioinformatics 2023 (InCoB2023) held at the Translational Research Institute (TRI), Brisbane, Australia from 12th to 15th November, 2023. He also represented Asia Pacific Bioinformatics Network (APBioNET) during this event as the Vice President of APBioNET and the Member of the steering committee.

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