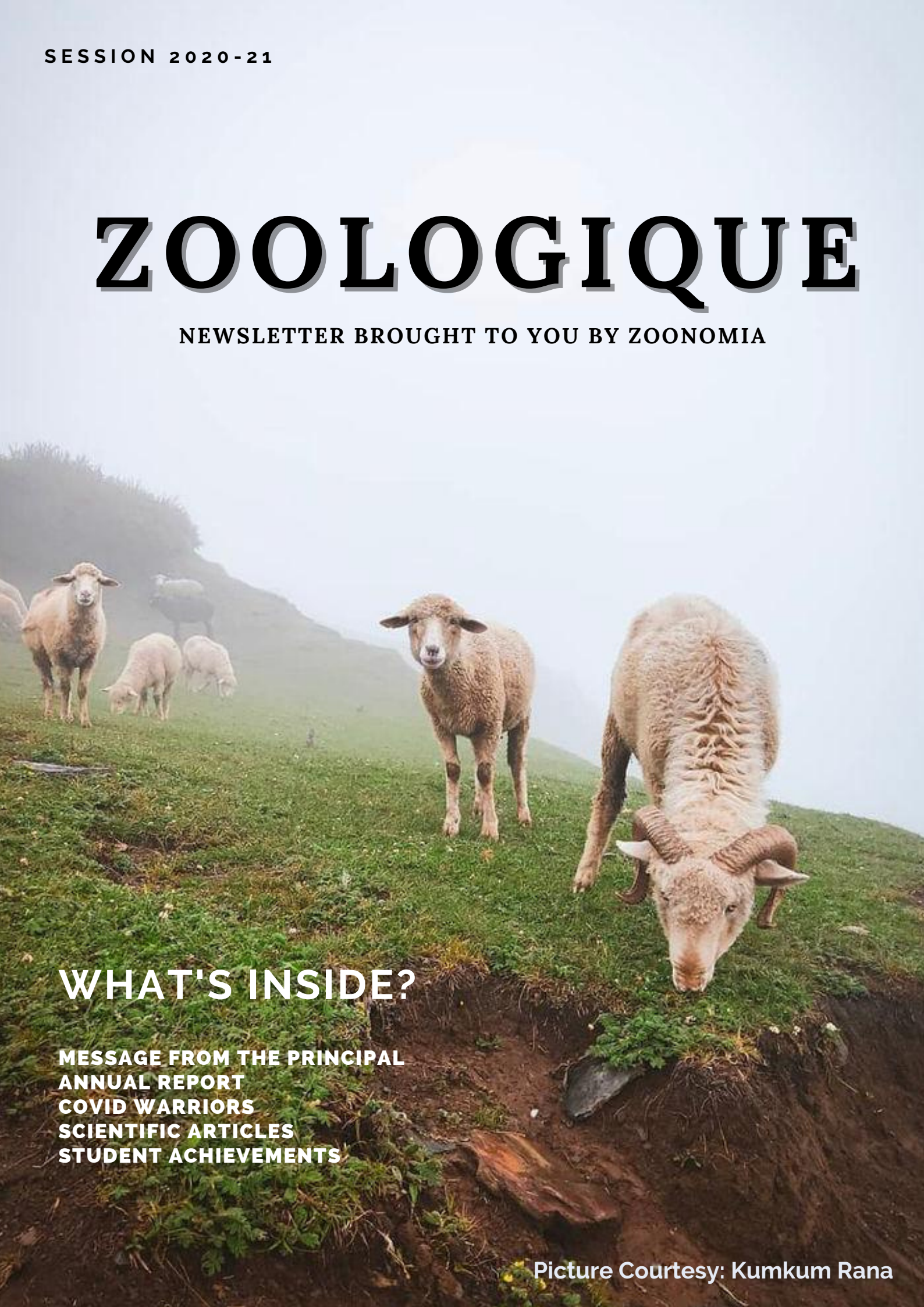
SESSION 2020-21

ZOOLOGIQUE

NEWSLETTER BROUGHT TO YOU BY ZOONOMIA



WHAT'S INSIDE?

Picture Courtesy: Kumkum Rana

NEWSLETTER

INTRODUCTION

Zoologique

It gives us immense pleasure to announce the first edition of Zoologique, the newsletter of Zoonomia, the Zoological Society of Kalindi College. This newsletter has been possible only due to the constant and persistent hardwork of the entire team. We take this opportunity to congratulate our team for performing this arduous task so efficiently. We also applaud the contributors for the interesting, stimulating and creative thoughts in the content contributed by them.

Zoologique is a French word that means zoological. One of the world's earliest and most gifted naturalists, Jean Baptiste Lamarck wrote a book called Philosophie Zoologique, which contributed greatly towards our current knowledge of evolution. That's where the inspiration for our newsletter's name comes from.

Zoologique '21 presents a report of all the activities, contributions and commitments of Zoonomia for the year 2020-21. Our society endeavours to create an interest among students for extracurricular and co-curricular activities. Zoonomia consistently works to ignite young minds by providing them opportunities to interact with eminent persons in the field of Biological Sciences. With this newsletter we aim to connect our readers with the stimulating world of Zoological Science.

We hope that Zoologique not only develops a taste for reading among students but also develop a sense of belonging to the Department.

FROM PRINCIPAL'S DESK

Zoology Department of Kalindi College is an active Department and is involved in many activities involving the students. The students are the most important resource of the nation and education makes them a valuable asset and responsible citizen. Zoological Society has been organising events taking care to broaden the horizons of its students, with exposure to different themes and ideas.

I also congratulate the students and their Convenor for selflessly and voluntarily working for the Covid-19 patients during the pandemic, reflecting their value system. They recognise that their responsibility lies not only in the field of Academics but also as contributing members of society at large.

I wish them and the Department all the best.

-Dr. Naina Hasija

NOTE FROM CONVENER

Zoonomia, the Zoological Society of the Department of Zoology, Kalindi College, University of Delhi is a vibrant and dynamic Society led by very active and enthusiastic students. The Faculty of the Department strives to nurture the undergraduate students in their chosen field and encourages them to explore their interests. We are all bound together with the passion for learning more about the intriguing world of Zoology and that is what drives our Society. The Society has endeavoured to give a flavour of Zoology in the past year to the students of the Department to enhance their interest in this exciting subject. The Members of the Society organised various events to highlight the different aspects which kept all the students engaged and involved. As we were acutely aware of the ongoing pandemic we did not let that dampen our spirts and kept up the pace by coming up with different activities.

Students of Zoonomia also contributed to the effort of helping the people suffering with Covid-19 under Mission Help, a voluntary service in association with the NGO Kranti. They were involved day and night to bring succour to the patients in the form of arranging beds, oxygen, plasma, medicines and ambulances and achieved the marvellous task of reaching out to the infected people and their families.

I am very honoured and proud to have been part of such an enterprising team and I wish the students great success in their future.

-Dr. Shanuja Beri

NOTE FROM TEACHER IN-CHARGE

Zoology Department of Kalindi College always lays stress on academic excellence. The department motivates students to aim high. Good education is never an accident but it is the result of hardwork, sincere efforts, skillful execution and high intentions.

Best wishes

Dr. Kanchan Batra

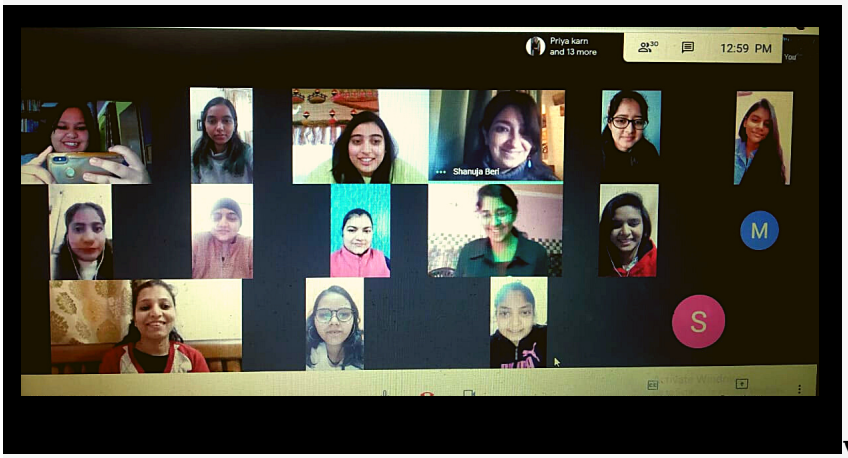
ANNUAL REPORT

Zoologique

INAUGURATION CEREMONY

Zoonomia, Zoological Society, Department of Zoology, Kalindi College, Delhi University, on 10th of October 2020, organized an inauguration ceremony Pranaah, with the theme Enchanting Animal World. The ceremony was embellished with the presence of Dr. Surya Prakash Sharma as a guest lecturer, who delivered a lecture on the topic 'JNU as a classic example of Ridge Ecosystem'. The event continued with the introduction of the Council Members of the Society to Principal ma'am, and a small Quiz round among the students of the department. The event ended with the vote of thanks by the Convener of the Society, Dr.Shanuja Beri.

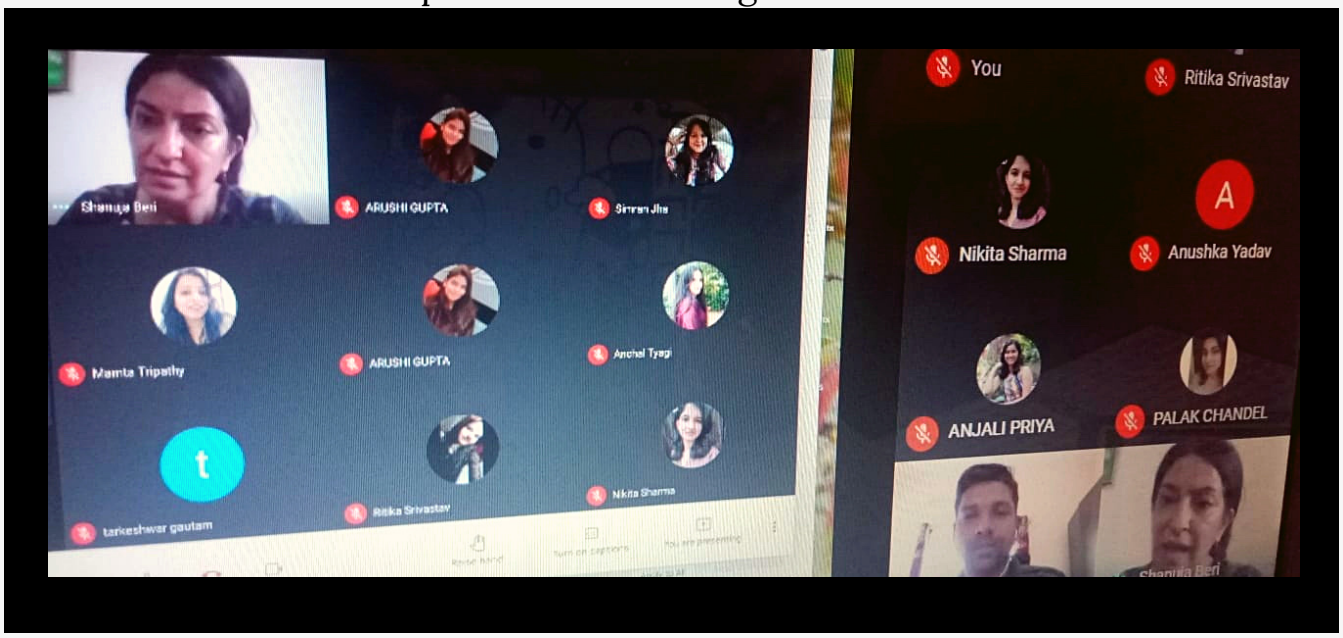
DEPARTMENT FRESHERS



Zoonomia, Zoological Society, Department of Science, Kalindi College, Delhi University, on 16th January 2021, organized a Departmental freshers party on a virtual platform Google meet. The theme of the party was Bollywood. In the event various virtual games like Quiz and Talent hunt were held for the freshers.

CONVERGENCE, DEPARTMENTAL FEST

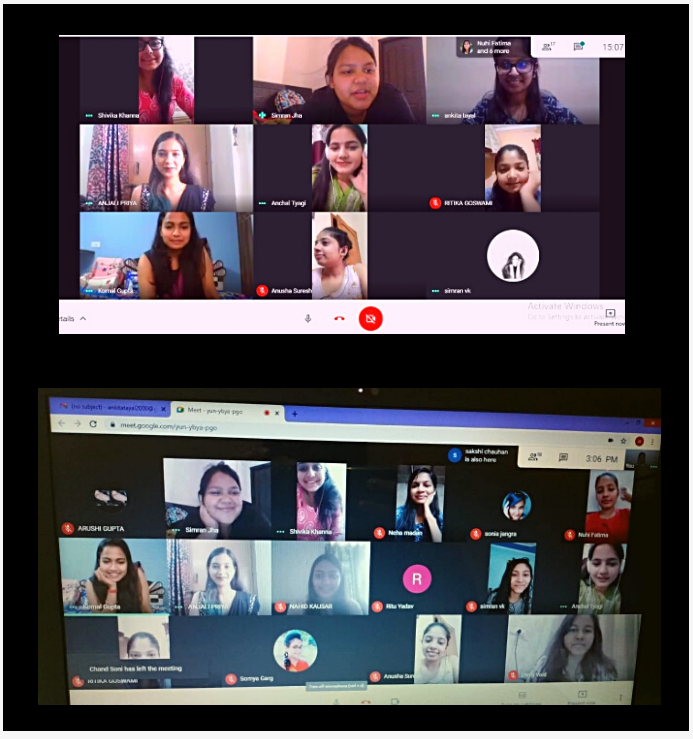
Zoonomia, Zoological Society, Department of Zoology, Kalindi College, Delhi University on 26th and 27th February 2021, organized a departmental fest- Convergence, an intercollege event via a virtual platform. The event was furnished with the presence of Dr. Yashobant, Indian Institute of Public Health, Gandhinagar and a talk by Mr. Ansil BR, NCBS Bangaluru. The theme of the the event was 'Zoonotic Diseases'. Various competitions were organized for the students.



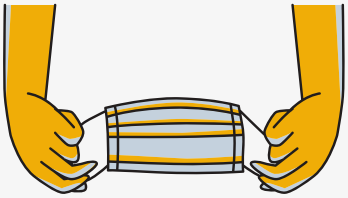
INTERNATIONAL WOMEN'S DAY AND OATH TAKING CEREMONY

Zoonomia, Zoological Society, Department of Zoology, Kalindi College, on the 8th of March 2021, organized an Oath taking Ceremony for the council members of the Society, which took place in the college premises and was live streamed via Google meet to our remote audience as well. The event was embellished with the presence of Dr. Meenakshi Munshi who talked about WOMEN IN SCIENCE, on the occasion of Women's Day. The event ended with a vote of thanks by the Convener of the Society, Dr. Shanuja Beri. Seminar on Women and Health Zoonomia, Zoological Society, Department of Zoology, Kalindi college on the 7th of April 2021, in collaboration with the Biochemical Society of Kalindi college, organized a seminar on the topic WOMEN AND HEALTH. The speaker at the event was Dr. Radhika Srivastava The event continued with an oath-taking ceremony of council members of Biochemical Society.

VIRTUAL FAREWELL MEET

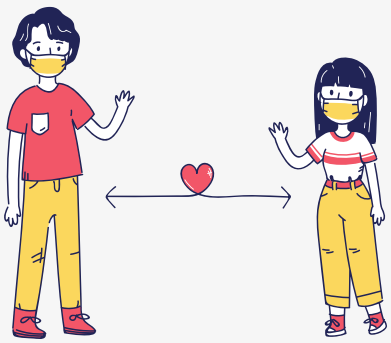


Zoonomia, Zoological Society, Department of Zoology, Kalindi college, on the 21st of April 2021, organized a virtual farewell party for batch 2021. Various fun events were organized for the seniors starting with a short video of memorable moments, and a dance performance by juniors. Teacher's pep talk was organized, various titles were given to the seniors, and a small song was also presented by juniors. In the end, an informal talk was organized for seniors where they shared their precious three years of college experiences with juniors. The event ended with a good bye message given by the juniors.



COVID WORRIORS

All of us have been deeply affected by Covid-19. Some chose online jobs, some chose to call and support all those who were suffering. Many of us had no choice but to go and face the pandemic. We as a team chose to do our part in every way possible. All of us gave our best to reach out and help the patients and their families. It all started when our respected teacher Dr. Shanuja Beri contacted our President Simran to collaborate and collect volunteers to help in overcoming this situation. A special thanks to KRANTII (Knowledge Resources Analytics Network Technology Innovation and Integration) that set up as an online think-tank primarily to “discuss ideas of nation building”. KRANTII connected Kalindi College to resources and patients. After contacting to KRANTII we were able to gather around 50 students. All the students gave their names very valiantly. With NSS team of our college we were able to make a team of hundreds of students along with our teacher Dr. Shanuja Beri and team KRANTII. We made Google forms to expand participation of students and we are very happy to state that many colleges like Maharaja Surajmal, School of Chemical Technology, Shri Aurobindo College etc. came forward and joined us. We designed specific strategies in order to do our work more efficiently. We made different groups for different resources like oxygen, doctors, medicines and beds. There was also an SOS team in which team members worked day and night in order to provide 100% results to the emergency cases. We made excel sheets to keep our data. We had a whole different team to work on systems to update and keep a track on each and every case. We had shifts in order to be consistent, regular and punctual in our work.



ThePrint

The group also has experienced domain experts such as doctors and engineers, who are both former defence personnel and civilians.

KRANTII currently has 10 separate task forces, in which 300 volunteers from Delhi's colleges such as Kalindi and Lady Shri Ram and from the Rashtriya Raksha University (RRU) in Gujarat coordinate to maintain real-time data and provide smooth assistance.

Most Popular

Russia unveils new security strategy that aims to balance ties with India, China

4 July, 2021

India's theaterisation being driven by a 1930s mindset, treat IAF as artillery

3 July, 2021

We were excellently guided by Dr. Shanuja Beri and Wing Commander Satyam Kushwaha (Retd). As an online think-tank, KRANTII has been active since 2016 and has been having discussions and doing research on policies related to national interest and nation building. KRANTII's discussions range from education, social safety and security to strategic dimensions and healthcare to sustainable development goals," the former Wing Commander said. "It is primarily an apolitical, self-driven, self-enabled, not-for-profit independent group that focuses on collaborative efforts to strengthen national interest and nation building." There were times when we lost patients, but we always hoped for betterment of situations. With all the work we also had great experiences which were seeing our patients happily going home and thanking us. Their kind and generous words always kept us motivated throughout our journey.

The Print, India's digital platform for latest news and reports, insightful analyses, opinion on politics, policy, governance, economy, education, defense and culture printed our work on their site too. We all were proud.

With around 2100 cases in hands our team was able to solve 1500 of them. We circulated forms for patient's family members so that they could easily reach out to us. All our team members were always boosted by Wg Cdr Satyam who gave constant motivation along with guidance. We are thankful to Dr. Shanuja Beri who made us believe that we as an individual are capable of everything. All of us are thankful to our college which gave us this opportunity. A big hug to all our volunteers.

SIMRAN JHA

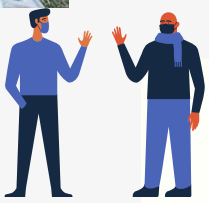
It all started on 16th April 2021, 8:30 PM, my convenor Dr. Shanuja Beri dropped a text in our class group saying that, "We need student volunteers who can aid in connecting patients to Covid resources".
The first thing that came to my mind was - "Is there anything better than this? It's the need of the hour, and here I am with the opportunity to provide emergency Covid resources from my home!"
I felt overwhelmed when I imagined myself involved. I reached out for more volunteer help and found that over fifty Kalindi College students were willing to join us. Our team was clueless at first. We made a plan of action - assignments were assigned, contacts were made, leads were confirmed in real time, and we created a rich database of resources. It all comes rushing back to me, as I scroll past numerous contacts saved as 'Oxy Cylinder'. The number of requests grew daily, and as a result, the death toll went up. We began staying up late and working on a variety of emergency cases, where some were helped in time and others were not. I, along with my team members, experienced quite an emotional roller coaster. However, we all offered our tired shoulders to each other, virtually, whenever anyone needed help.

When I got carried away, my team members periodically checked on me & reminded me to take breaks (which we forgot to do quite often). I was supported by people like Ruchi, Arushi, Kim, Deepshikha and Gayathri, to name a few. They were always there for me, no matter how anxious or clueless I felt. Similarly, Dr. Shanuja Beri was there to infuse us with optimism and to inspire us to keep going. I am proud to call her my mentor.

Despite the unfortunate circumstances that brought me to this incredible, crazy, baffling, eye-opening experience. On the other hand, I can say that this experience has given me lessons for a lifetime.

RITIKA SRIVASTAV

"I remember with a sudden surge in Covid cases, the situation was getting worse. It would have been impossible for me to just sit, surrender and do nothing about it. So, I decided to help in best way possible to contribute my part for the cause. Honestly there were times, I felt annoyed when nobody answered those phone calls made by me. But a Thank You message was always a treat."



SNEHA SHARMA

"Part of being a person is helping others."

Through my esteemed College and NGO KRANTII, I got this chance. With the help of my team, I was able to help many families. Their thank you texts and appreciating words were no less than a gem for me. I thank my parents and friends who always support me. Working with each other helped us to build a better relationship amongst us."

ARUSHI GUPTA

The month of April was nothing less than a nightmare for Indians, especially Delhites. The convener of our department, Dr. Shanuja Beri brought us an opportunity where we could help the patients by working with a group named KRANTII. Simran Jha (President of Zoonomia) guided us all through this journey.

In the initial days, we used to be active all day, verify sources and offer help to the patients. In the days that followed, we divided shifts and worked in our slots and started getting hold of things. We kept records, our efficiency improved and we were able to help more and more families. While searching for medicines, plasma donors, and Oxygen supplies, we also came across some swindlers. Our seniors reported them to the concerned authorities. Even though we could not always fulfill our patients' needs, we tried our best. This volunteering journey was a real rollercoaster for me. While connecting with the families, it became more of a personal thing for me. It was really difficult for all of us to face deaths but what kept us going were the blessings and love we got from the families. While volunteering for Covid relief, I also got better at managing things, communicating with patients and leading team. I can't thank my seniors enough for helping me throughout and encouraging me. Our president, Simran Jha was always there for us when we had our emotional breakdowns. She was a real support system and motivated us from time to time. With their guidance and support, we were able to help as many people as possible and I will look forward to do the same in future too.

Reduce The Carbon Footprint Caused By Cement

Industry causing the worst climate impact is all but ignored, even though its products support our existence. Concrete is the second most used substance on earth after water, for this reason, it has a significant environmental impact. Concrete is an intrinsically low-impact material with much lower emissions of carbon dioxide and energy per ton like iron and steel. Because of the enormous volume we use, overall 8 percent of man-made carbon dioxide emission is caused.

We are going to need concrete for industrialization, cement is a glue that holds concrete together, the most used cement is Portland cement, currently producing nearly 3.6 billion metric tons of materials each year, which is formed by burning limestone with other ingredients like clay at a very high temperature of about 1450 °C thus increasing carbon footprint.
https://www.pexels.com/photo/selective-focus-photography-cement-2219024/

How to lower cement carbon footprint?
Right policy and technology can make cement manufacturing net climate benefit. We have to replace cement with other materials with a lighter carbon footprint, clays produce reactive material when they are calcined, heated to around 800°C which is lower than 1450°C, meaning lower carbon emission.Lc3 formed using local material clay having 40 percent lower carbon emission than Portland cement.

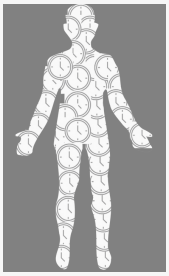
Carbicretes technology makes it possible to produce concrete without using any cement. The patented process which can be implemented in any concrete plant involves replacing cement in the concrete mix with steel slag and then injecting wet concrete with co2 to cure it, giving it strength.
Process avoid greenhouse gas emission associated with cement production, about 2 kg of carbon dioxide per standard- size concrete block, because more carbon dioxide is consumed than emitted during this method, the product formed is carbon negative.

Other ways to reduce carbon emission from cement are the use of a dry kiln, which uses input material with lower moisture content, so less energy is needed to evaporate water. Use of materials like aggregates, pozzolans, water are relatively plentiful and can often be drawn from a local source.

The study says that the extent of thermal fuel supply in decarbonization, carbon dioxide capture rate between 53 percent and 80 percent will make cement neutral and higher CCS (carbon capture and storage) rate and achieving net carbon-negative cement.

by Mallika Kapoor, 2nd Year

My Body Clock



Do you also wake up around five minutes before your alarm clock? Do you feel sleepy only at a fixed time window and if that time is passed, it is difficult for you to fall asleep? Do you start feeling hungry right about your usual meal times? Do you feel sleepy after your afternoon meals? And do you ever wonder why your doctor prescribed you a medicine to be taken at a particular time of the day?

One common factor in all these questions is “Time”. And answer to all these questions is hidden in the fact that life on earth has evolved under a rhythmic environment. Daily light and dark cycle have led to development of a timing system in our body, so that we can plan our activities to the best suited time of the day. These rhythmic patterns that repeat after approximately same time period are called biological rhythms (or circadian rhythms: circa = approximately, dian = a day). The daily rhythmicity in our sleep-wake pattern, body temperature, hormone secretion, etc. are all examples of biological rhythms. Hence, our body exhibits a set pattern and ability to digest food, to metabolize medicines, to concentrate on the studies better, and to run faster and all these patterns are tied to a fixed TIME window.

To monitor the biological rhythms, our body has a biological clock (or circadian clock). Do you know that each and every cell of our body has its own clock and all these clocks are regulated by a master clock sitting in your brain, more precisely in your hypothalamus and is called as the SCN (suprachiasmatic nucleus). The SCN can use environmental information from sunlight (obviously!) to synchronize our cellular clocks with Earth's rotation.

ARE WE CONFUSING OUR CLOCKS?

Earlier, sun was the only source of light on Earth. But since the invention of light bulbs, our planet is always illuminated. However, scientific studies suggest that artificial light interferes with our circadian rhythms.

WHAT TO DO?

- Dring day, exposure to sunlight is important
- During evening hours, use dimmer/warmer light. Avoid blue light at night (it hampers your melatonin (the night hormone) levels)
- Limit the use of phone during night hours (even if you have a blue light filter in your phone)

The 2017 Nobel Prize in the field of Medicine and Physiology was given to three scientists Jeffrey C. Hall, Michael Rosbash, and Michael W. Young who worked out the molecular components and working of circadian clock machinery

by Akansha Sharma, PhD

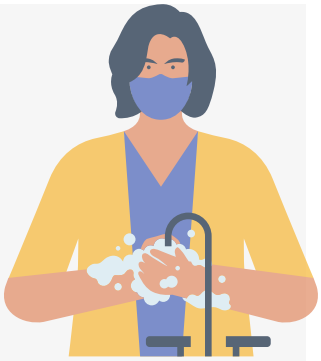
Delta Variant : The Variant of Concern

WHAT IS DELTA PLUS VARIANT?

When the delta variant develops additional mutations of possible importance, it is called delta plus. As of now, the K417N mutation, which was previously seen in the Beta variant, is what people usually mean when they say delta plus.This new variant of coronavirus, also known as AY.1, spreads almost 60 per cent faster than its predecessor, the Delta variant. It also binds more easily to the lung cells and shows higher resistance to some of the drugs being used against Covid-19.

The so-called Delta Plus Variant of COVID-19 is dangerous but appears unlikely to be a game- changer by June 24, only about 40
cases of Delta Plus infections were reported by Indian health officials, based on genetic sequencing of the virus from positive patients.

The Delta Plus variant of coronavirus has been wreaking havoc across the world, with increased transmissibility and resistance to some drugs and therapies. India has already declared it as the variant of concern, with the strain found in 49 samples from 12 states. Maharashtra has reported the highest number of cases of the Delta Plus variant.Vaccination and safety measures such as wearing of face masks are essential when it comes to fighting the Delta Plus coronavirus variant, World Health Organization



SYMPTOMS

India's top virologists have said that the Delta Plus variant carries symptoms of the Delta as well as its partner the beta variant. Some of these symptoms include cough, diarrhoea, fever, headache, skin rash, discolouration of fingers and toes, chest pain, and shortness of breath.
Other symptoms listed by the experts and attributed to the Delta Plus variant are: stomache ache, nausea and appetite loss.

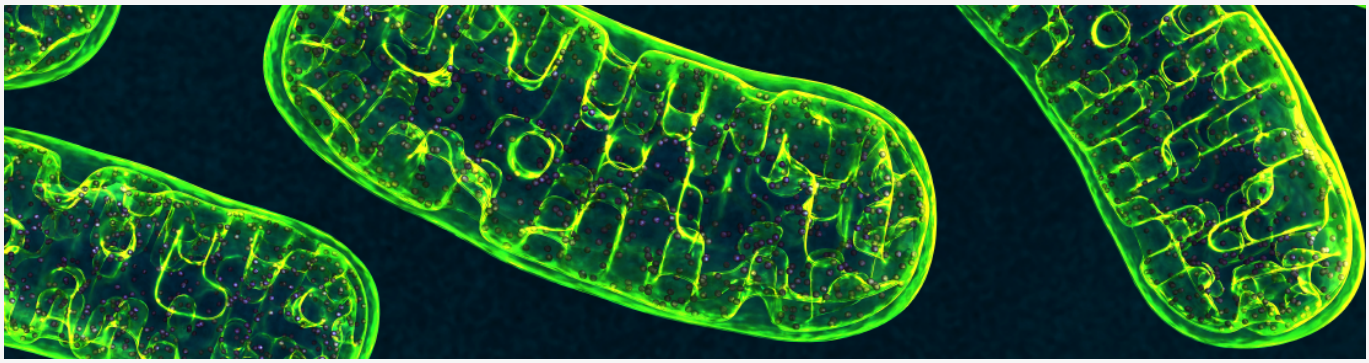
PREVENTION

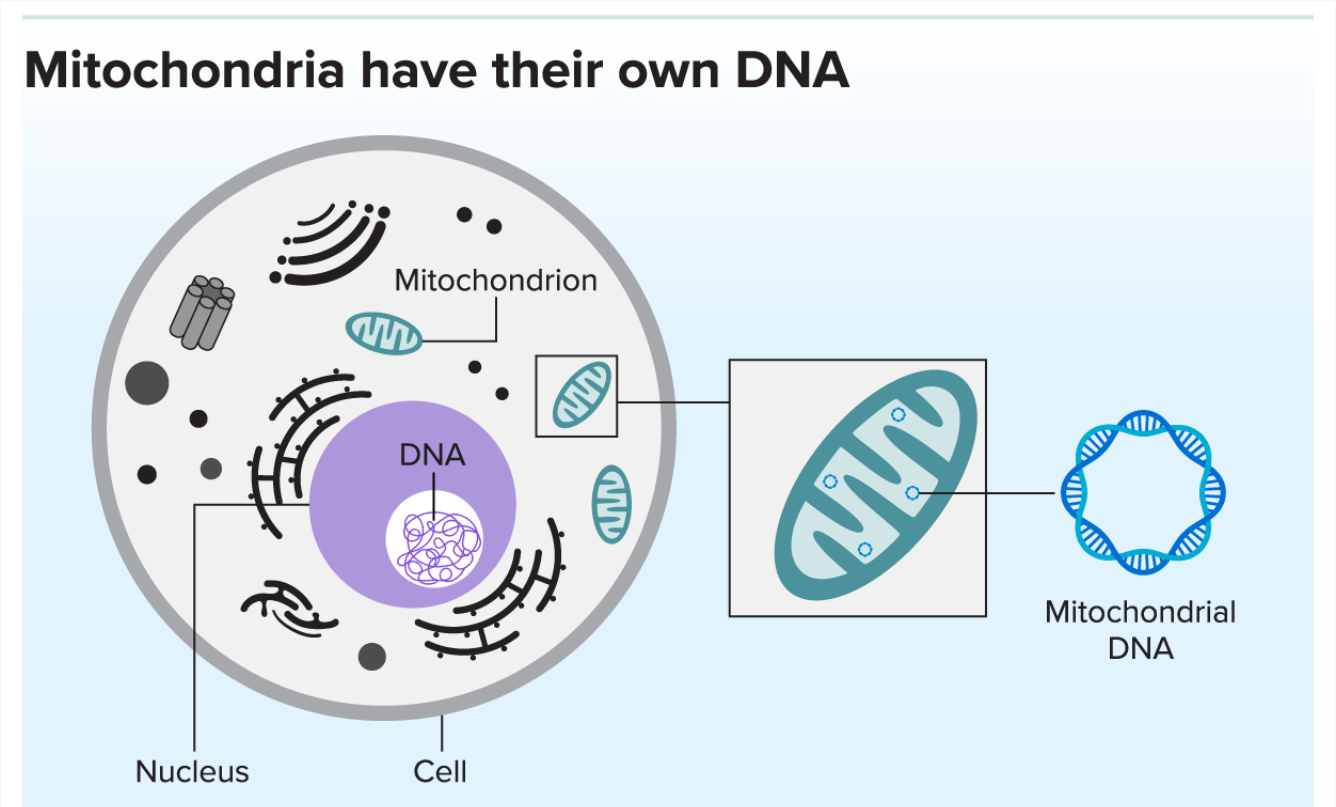
Preventive measures include physical or social distancing, quarantining, ventilation of indoor spaces, covering coughs and sneezes, hand washing, and keeping unwashed hands away from the face. The use of face masks or coverings has been recommended in public settings to minimise the risk of transmissions.

by Diksha, 1st Year

Could Mitochondria be the Key to a Healthy Brain?

Long before the earliest animals swam through the water-covered surface of Earth's ancient past, one of the most important encounters in the history of life took place. A primitive bacterium was engulfed by our oldest ancestor — a solo, free-floating cell. The two fused to form a mutually beneficial relationship that has lasted more than a billion years, with the latter providing a safe, comfortable home and the former becoming a powerhouse, fueling the processes necessary to maintain life. That's the best hypothesis to date for how the cellular components, or organelles, known as mitochondria came to be. Today, trillions of these bacterial descendants live within our bodies, churning out ATP, the molecular energy source that sustains our cells. Despite being inextricably integrated into the machinery of the human body, mitochondria also carry remnants of their bacterial past, such as their own set of DNA. These features make mitochondria both a critical element of our cells and a potential source of
problems. Age, stress and other factors may disrupt mitochondria's many functions. On top of that, mitochondrial injury can release molecules that, due to their similarities to those made by bacteria, can be mistaken by our immune system as foreign invaders, triggering a harmful inflammatory response against our own cells. There is one organ that appears to be particularly vulnerable to mitochondrial damage: our power-hungry brains. "The more energetically demanding a cell is, the more mitochondria they have, and the more critical that mitochondria health is — so there's more potential for things to go wrong," says Andrew Moehlman. According to some estimates, each neuron can have up to 2 million mitochondria.





PROBLEMS AT THE POWERHOUSE

In the 1960s, researchers discovered that mitochondria possess a unique set of genetic material. Investigations revealed that mitochondrial DNA, like that of bacteria, forms a circular strand and encodes just 37 genes — a mere fraction of the tens of thousands found in the human genome. Researchers have since linked dozens of disorders to alterations in mitochondrial DNA and nuclear DNA related to mitochondrial function — and interestingly, the majority of these are either neurological in nature or have some effect on the brain. Wallace is particularly interested in how mitochondria might contribute to autism spectrum disorder. Studies by several research teams have revealed that mitochondrial diseases, a mix of symptoms caused by defects in the organelle, are much more prevalent in people with autism (5 percent) than in the general population (about 0.01 percent). In some people with autism, scientists have identified genetic differences either in mitochondrial DNA, or in some of the thousand or so genes in the human genome known to influence mitochondrial function. Genetic alterations aren't the only way mitochondria could contribute to autism. Certain environmental factors, such as toxic pollutants, have been associated with a higher risk of developing the condition. Richard Frye, a pediatric neurologist and autism researcher at the Phoenix Children's Hospital in Arizona, he found that the amount of air pollution that children with autism were exposed to before birth altered the rates at which their mitochondria produced ATP.

WHEN FRIEND BECOMES FOE

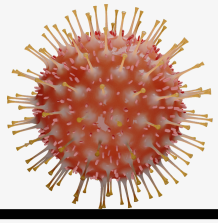
When mitochondria become damaged or dysfunctional, one consequence is simply less ATP, and therefore less energy for the normal operations of the brain. But another way mitochondria could contribute to brain disorders stems from their ancestral past.

As descendants of bacteria, mitochondria have DNA and other components that can be released when cells are injured or stressed and mistaken by our immune system as a foreign threat.

A few years later, A. Phillip West, who was then a postdoc at Yale University, and his colleagues showed that DNA can leak out of mitochondria and activate the immune system even in the absence of such severe injuries — for example, when the organelles became deficient in a key protein.

Ritika Goswami, 2nd year

Fungus sharing the platform with COVID-19

While India was still fighting with second wave of COVID-19, there was another challenge for country's medical professionals to grapple with, that is, the rising cases of "Mucormycosis" or "Black Fungus".

India has recorded 40,854 cases of Mucormycosis, or Black Fungus. (as per the latest government data : 28 June, 2021) Many states also declared black fungus as an Epidemic as cases of the fatal rare infection shoot up in patients recovering from Covid-19. More than 50% of the total cases were from Maharashtra and Gujarat alone. Along with rising cases of black fungus infections among recovering Indian COVID patients, several cases of more severe white fungus and yellow fungus infections started being reported. Cause or mode of transmission of the disease was through the fungal spores found in soil and organic matter, usually inhaled by humans from the air. The mould enters the body and then manifests around the nose and eye sockets, causing the nose to blacken, and if not stopped will move fatally into the brain. Healthy individuals will usually fight off the fungus but it can spread fast in those with compromised immunity.Black fungus or Mucormycosis has a 50% mortality rate. It affects patients initially in the nose but the fungus can then spread into the brain, and can often only be treated by major surgery removing the eye or part of skull and jaw. White fungus is more dangerous than black fungus because it affects the lungs badly and can also cause damage to other body parts. White fungus can become lethal and may impact brain, respiratory system, digestive tract. Yellow fungus can be rather fatal and deadly as it begins internally — unlike the others where symptoms are visible. This yellow fungus trait often leads to a delay in its diagnosis. This characteristic of yellow fungus makes it very difficult to manage and more dangerous as early diagnosis is a necessity in such cases. It caused deaths due to organ failure and necrosis in many cases. The above three fungal infections were treated by giving Amphotericin injections to the patients.

- Arushi Gupta, 1st year

All you need is a good sleep

Humans spend almost one quarter to one third of their life span while sleeping. Earlier, it was believed that our daily schedule is divided into an active state (while we are awake) and a passive state (when we are asleep). However, decades of research has shown that during sleep, our body and brain is engaged in a number of activities necessary for life and hence sleep is no more considered a dormant or a passive state. Sleep is rather a complex and dynamic process that affects how a human body functions. Sleep affects almost every system and every function in the body including right from the brain, heart, and lungs to metabolism, immune function, mood, and resistance to disease (Worley, 2018). In fact, some of our old literature identifies sleep as the best healer as it removes toxins in our body that build up while we are awake. Research shows that a chronic lack of sleep, or getting poor quality sleep, increases the risk of disorders including high blood pressure, cardiovascular disease, diabetes, depression, and obesity (Worley, 2018). Why do we sleep? There are essentially two main processes that regulate sleep: circadian rhythms and physiological drive. Firstly, circadian (circa = approximately, dian = a day) rhythms that are controlled by a biological clock present in hypothalamic region of the brain regulate sleep timings. The clock responds to light and dark stimulus and regulates the secretion of night hormone melatonin. The biological clock hence is important for timing our daily activity-rest patterns and regulation the timing of our sleep (Kumar and Sharma, 2018). It is the function of biological clock that a person start to feel sleepy right about his/ her usual sleep time daily. Secondly, our body craves for to sleep, much like it hungers for food. When the body is tired (or exhausted) the physiological drive can put a person to sleep. Even in middle of another work (like sitting in a classroom or a meeting, sitting on the rear seat of a bike). When you're exhausted, your body is even able to engage in episodes of micro-sleep (sleep episode that lasts only for one or two seconds) resulting in a sudden jerk as you try to stay awake. Further, napping later in the day for more than 30 minutes can throw off the night's sleep by decreasing your body's physiological drive to sleep.

WHAT COMPRISES OF A SLEEP EPISODE?

Several structures within the brain, majorly the hypothalamus and brain stem are involved with sleep. The hypothalamus has neurons that are considered as centres for sleep and arousal (Szymusiak and McGinty, 2008). Further, the suprachiasmatic nucleus (SCN) of hypothalamus controls the behavioural and sleep wake rhythms (Kumar and Sharma, 2018). Along with this, the brain stem communicates with the hypothalamus to control the transitions between wake and sleep. It also sends signals to relax muscles that essential for body posture and limb movements, so that the body movement is restricted while we are dreams. A sleep episode comprises of two types of sleep: The Rapid eye movement (REM) sleep and the non-REM sleep. Non-REM is further divided into three stages. We cycle through all stages of non-REM and REM sleep several times during a typical night. Stage 1 of non-REM is a period of relatively light sleep, stage 2 comprises of transition from light into the deeper sleep, stage 3 is the period of deep sleep that you need to feel refreshed in the morning and REM sleep occurs about 90 minutes after falling asleep. During REM stage, the eyes move rapidly from side to side behind closed eyelids. Most of the dreaming occurs during REM sleep. Further during REM, the arms and leg muscles become temporarily paralyzed, which prevents us from acting out in our dreams.

BENEFITS OF SLEEP (EVIDENCES FROM RESEARCH)

Sleep exerts a strong influence on the immune system, heart performance and many other aspects of physiology. It has been reported that the undifferentiated naïve T cells number and production of pro-inflammatory cytokines show peaks during early night sleep whereas circulating numbers of immune cells with immediate effects such as cytotoxic natural killer cells, as well as anti-inflammatory cytokine activity peak during daytime wakefulness (Besedovsky et al., 2012). Further, sleep also reinforces the immunological memory against harmful pathogens. In yet another study by Dr. Kuetting and colleagues, it has been shown that short-term sleep deprivation in the context of 24-hour shifts can lead to a significant increase in cardiac contractility, blood pressure and heart rate (Kuettinget al., 2018). It has also been reported that REM sleep deprivation is a potent oxidative stressor that may result in increased lipid peroxidation and reduction in total glutathione levels in brain (Mathangi et al., 2012). Hence establishing that sleep deprivation may result in improper functioning of the general body functions.

How much sleep is important?

Having stated that sleep in important, the next obvious question is how much sleep is actually required. The sleep requirement may vary with age, however, there is no magic number of sleep hours that works for everybody in one age group. For example, infants may sleep as much as 16 to 18 hours per day. This is essential for their initial growth and development. School-age children and teens on average need about 9 hours of sleep per night. Most adults need 7-9 hours of sleep a night. After attaining an age of 60, night time sleep tends to be shorter, lighter, and interrupted by multiple awakening episodes. In general, people tend to have lesser sleep than required due to longer work hours, ability to schedule work at any time of the day, extended availability of light and the round-the-clock entertainment and other activities. Many people tend to sleep longer durations during weekends in order to catch up on their missed sleep during the entire week.

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All About The Covid -19 Vaccines: A Beginners' Guide

-Dr. Shanuja Beri

The Covid -19 disease pandemic that has gripped the world is caused by the coronavirus, SARS-CoV-2 belonging to the Coronaviridae family of positive stranded RNA virus. It has infected a total of 188,310,529 people and claimed 4,065,281 lives worldwide as of 14 July 2021. After the first genome sequence was published January 2020 a race ensued to produce vaccines against the deadly virus.

The genome encodes proteins, both structural and non-structural, such as the envelope protein E, the spike protein S and the nucleocapsid N protein. As it is the spike protein S which docks on the human ACE2 receptor to gain entry, the foremost strategy examined was to develop antibodies against the spike protein, which would block the uptake of the virus into the human cells. Subsequently many other platforms are being developed an d according to WHO there are 63 candidate vaccines in human clinical trials and more than 172 candidates in preclinical development worldwide. Among the 60 clinically evaluated vaccines 13 leading candidates are carrying out or entering Phase 3 clinical trials. A robust vaccine needs to not only protect from the disease but also resist infection and create a memory which will reduce the requirement t of a large number of booster doses. Moreover due to the need of the unprecedented pandemic it should be capable of being produced in billions of doses to reach the majority in as a short time span as possible.

The various platforms which can be used are attenuated pathogen vaccines, inactivated pathogen vaccines, subunit vaccines, protein subunit vaccines, virus-like particle vaccines, viral-vectored vaccines and nucleid acid vaccines.

Emergency use authorizations (EUAs) were issued in an unprecedented short span of time so as to enable countries to start vaccinating their population. At present 13 vaccines are in Phase 3 of clinical trials.

1. Nucleic acid vaccines
1. mRNA vaccines: an mRNA molecule coding for the synthesis of the stabilized pre-fusion form of the SARS-CoV-2 Spike (S) protein uses the host cell transcription and translation machinery to produce the viral antigen which initiates an adaptive immune response directed against the S protein of the virus. The two mRNA based vaccines are mRNA-1273 by Moderna/US NIAID and mRNA-BNT162b2/Comirnaty by Pfizer/BioNTech/Fosun Pharma.
2. DNA vaccines: DNA vaccines are genetic sequences that encode for a viral antigen and can induce humoral and cellular adaptive immune responses. INO-4800 of Inovio/International Vaccine Institute is developing this DNA based two dose vaccine e which will be administered by a small electric pulse.

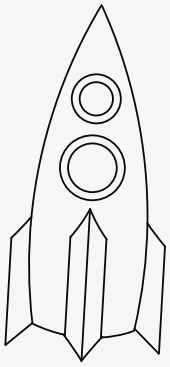
2. Replication-defective viral vector vaccines: Viral vector vaccines deliver the pathogen's genetic information to immune cells where they express and present antigenic proteins to lymphocytes. They are modified to reduce their replication potential but maintain their capacity to infect human cells.Adenovirus, measles, and vesicular stomatitis virus (VSV) vectors are commonly used for such designs which have been shown to provoke robust immune responses with a single administration.Ad5-nCoV of CanSino Biological/Beijing Institute of Biotechnology/Academy of Military Medical Sciences, AZD1222 of AstraZeneca/Oxford University, Gam-COVID-Vac/Sputnik V of Gamaleya Research Institute/Health Ministry of the Russian Federation/Acellena Contract Drug Research and Development and JNJ-78436735/Ad26.COV2.S of Janssen (Johnson and Johnson) and Beth Israel Deaconess Medical Center are the viral vector vaccines undergoing phase 3 of clinical trials at present.

3. Inactivated pathogen vaccines use a dead form of the pathogen, thus ensuring a better safety profile than live attenuated vaccines. They require the addition of adjuvants and booster doses for better efficacy. CoronaVac of Sinovac Research and Development Co. is an alum-adjuvant based vaccine and is closely related to the 2019-nCoV-BetaCoV Wuhan/WIV04/2019 strain. Others are Unknown name form Wuhan Institute of Biological Products/China National Biotech Group-Sinopharm, BBIBP-CorV of the Beijing Institute of Biotechnology/ China National Biotech Group-Sinopharm and Covaxin/BBV152 from Bharat Biotech/ Indian Council of Medical Research/ National Institute of Virology.

4. Protein subunit vaccines are produced through recombinant synthesis of protein antigens or protein isolation and purification methods and also use adjuvants to enhance their immunogenicity. They too need booster doses for efficacy. NVX-CoV2373 of Novavax, ZF2001 from Anhui Zhifei Longcom Biopharmaceutical/Chinese Academy of Medical Sciences and Unknown name from Sanofi Pasteur/GlaxoSmithKline are some protein subunit vaccines.
5. Virus like particle vaccinemimic the virus structure, and elicit strong immune responses. CoVLP from Medicago is a Quebec-based company uses the virus-transfected plant Nicotiana benthamianato express a subunit of the S protein.

As a massive vaccination drive is required to induce immunity to the world at large, all these different platforms and kinds of vaccines will aid in achieving that target at a pace much faster than using just one platform. They may also provide different levels of immunity to different types of populations and help counter the rapidly mutating SARS-CoV-2 coronavirus.

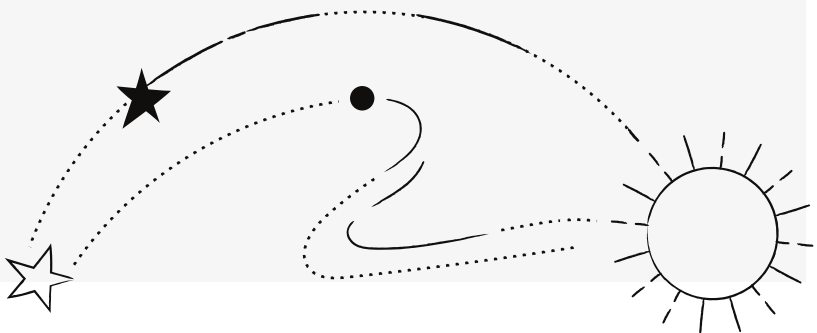
Space Exploration



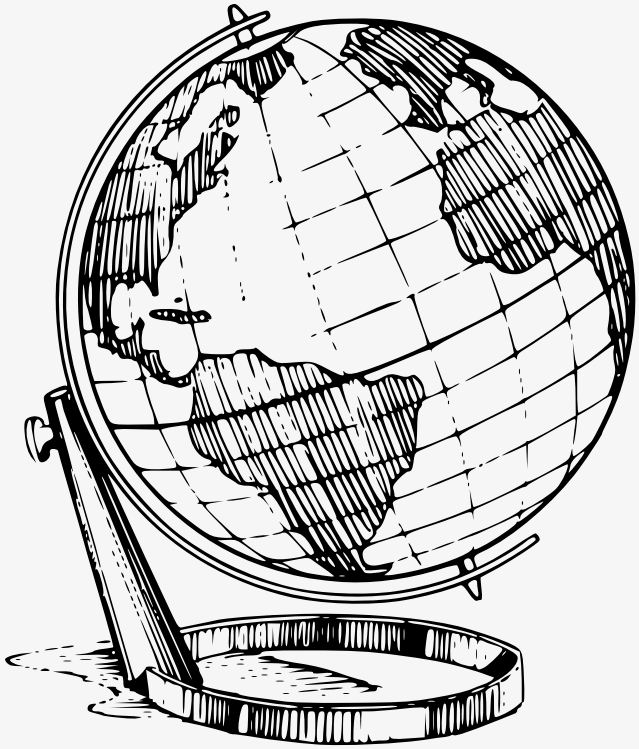
Space exploration is the use of astronomy and space technology to explore outer space. While the exploration of space is carried out mainly by astronomers with telescopes, its physical exploration though is conducted both by unmanned robotic space probes and human spaceflight. Space has always been in the spotlight for everyone including photographers, poets, writers, geologists, religions, worship, etc. Universe is huge. Exploring it is adventurous, exciting, breathtaking. It makes us wonder what else could be out there. More than fifty years of human activity in space has produced societal benefits that improve the quality of life on Earth. The first satellites, designed to study the space environment and test initial capabilities in Earth orbit, contributed critical knowledge and capabilities for developing satellite telecommunications, global positioning, and advances in weather forecasting. Space exploration initiated the economic development of space that today, year after year, delivers high returns for invested funds in space. The challenges of space exploration have sparked new scientific and technological knowledge of inherent value to humankind, leading to better understanding of our Universe and the solar system in which we live. Knowledge, coupled with ingenuity, provides people around the globe with solutions as well as useful products and services. Knowledge acquired from space exploration has also introduced new perspectives on our individual and collective place in the Universe.

Space exploration provides many benefits to us. Space exploration stimulates the creation of both tangible and intangible benefits for humanity. Tangible impacts include all the innovation-related applications and benefits resulting from investments in these projects, such as new devices and services that spin off into the marketplace. In addition, space exploration leads to advances in science and technology, and furthers workforce development and industrial capabilities, thus leading to an overall stimulation of private companies and industries, all of which contributes significantly to the economic progress of space-faring nations. Space exploration is also known to attract young people into careers in science and technology to the general benefit of society and the economy. There are several movies, aesthetics, decors, and paintings, many unimaginable and splendid write-ups inspired by space. All of these things add up in spreading kindness, love, positivity and ideas to audience.

When I hear the word space, few words immediately come to my mind – INNOVATION, CULTURE and INSPIRATION. Our planets, moons and stars are a source of inspiration to us. Universe selflessly shares its aura and energy with us. It's an unlimited source of knowledge whether it's scientific or fictional. Us humans are very curious. We always tend to see what all beauty and surprises are hidden from us and are yet to explore. Space exploration helps to improve national technical competence. Innovations are transferred to new applications. Through exploration and expanding our capacity and productivity of working in space are enhanced. With all this comes market benefits and services which are created which further helps in economic development of the nation. The environmental changes and status are also monitored with the help of the same. Moreover the importance of human kind is established in the universe and also gets enhanced.



Space exploration has produced an impressive record of benefits for humanity. Space exploration has driven scientific and technological innovation that benefits people around the globe every day. Sending humans and machines into space presents challenges that are overcome only by the utmost ingenuity; this leads to new knowledge and technical innovations that are used on Earth in ways that can be dramatic and unpredictable. Space exploration serves a cultural and inspirational purpose by fulfilling a deep need to understand the world, address questions about the origins of life and the nature of the Universe, and to expand the notion of what it means to be human. Because space exploration stimulates significant global investment and international partnerships, and because of its extremely challenging nature, demands the development of cutting edge technical capabilities, it provides unique opportunities to address some of the global challenges facing society today. When nations work together on challenging space missions, this promotes international cooperation beyond the realm of space. It aligns interests and forges relationships that further bring peace and stability on Earth.



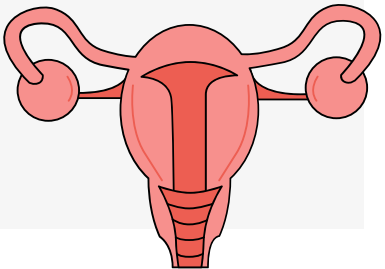
by Sneha Sharma, 1st Year

ALL ABOUT PCOS

PCOS or polycystic ovarian syndrome is a health condition that has become extremely common in women these days. It is basically a lifestyle disorder that affects the level of hormones. Women who have PCOS generally have an abnormally high level of male hormones in their system. This imbalance interferes with the regularity of their menstrual cycles and brings about a variety of other problems along with it. It causes hirsutism, which means excessive hair growth on face and body. It can also cause male pattern baldness due to the excessive testosterone, insulin resistance and ultimately diabetes, excessive weight gain, acne etc.

PCOS doesn't really have a cure, which means that once someone gets diagnosed with PCOS, it's a lifelong condition for them. But a number of drugs can be administered to manage the symptoms of PCOS by correcting the hormonal imbalance. The two main medications used to combat the symptoms of PCOS are Birth control pills (which have a combination of estrogen and progesterone) to regulate the menstrual cycles and Metformin (which is a diabetes drug) to deal with the insulin resistance. Since PCOS is so common in women of child-bearing age these days, a surprisingly high percentage of women with PCOS don't even know that they have it. A study showed that upto seventy percent of women having PCOS are completely unaware of their condition.

PCOS is a syndrome, which means that it's a group of diseases that present themselves together rather than being a single disease. The three primary features of PCOS are presence of bulky ovaries and cysts in ovaries, abnormally high level of male hormones, and irregular menstrual cycles. To diagnose PCOS, a transabdominal ultrasound of the lower abdominal area along with hormonal blood work is usually enough.



“Polycystic” means multiple cysts. PCOS causes the formation of fluid filled cystic sacs on the ovaries. These cysts are actually follicles containing one immature egg in each cyst. These eggs never mature completely to ovulate; they don’t degenerate like they should and remain trapped in their sacs to form multiple cysts with each subsequent menstrual cycle. This causes the ovaries to retain fluid, have a higher stromal echogenicity and become bulky in size. In some uncommon cases, the cysts might rupture and pose serious danger to one’s health.

Since the eggs don’t mature enough to ovulate, it can lead a woman to miss periods or have delayed periods. Some women might also have something known as Anovulatory cycles, in which the menstruation occurs without the ovulation ever occurring. Such a period is termed as a breakthrough bleeding, because it occurs just as a result of the blood and mucus lining becoming too heavy to hold on to the uterus anymore, and its not a normal menstrual bleed. In such cases, the condition might remain undiagnosed for years since the woman gets periods and doesn’t realize that she isn’t ovulating. Because it affects ovulation, PCOS is one of the biggest causes of infertility.

Even though PCOS has come into the limelight in the last few years, its not a new condition. Symptoms of PCOS had been first described by Italian physician Antonio Vallisneri in 1721.

There hasn’t been enough research yet to figure out what exactly causes PCOS. Some scientists believe that females can develop a genetic predisposition towards PCOS while they’re still in the womb. Others believe that the higher testosterone levels cause the disruption in ovarian function and lead to PCOS, and some believe that it is caused by unhealthy lifestyle choices. Neither one of these can alone justify the syndrome, and the real reason has to be a combination of two or more such factors.

by Anjali Priya, 3st Year

ACHIEVEMENTS

The students of 2019-20 batch brought laurels to the Zoology Department by winning various competitions on the university and state level. Our students won in various different fields ranging from sports, yoga, debates etc.

Sr. No.	Name of the Student	Name of the activity	Nature of Award	Level of Award
1.	Riya Arora	Just A Minute	First	University
2.	Shreya Mishra	YOGA	Second	University
3.	Harshita Sharma	Action Reaction Competition	Third	University
4.	Smaranjot Kaur	Jam	Consolation	University
5.	Diksha	Action Reaction	Third	University
6.	Kumkum Rana	Table Tennis Championship	Second(Youth) , Third (Women)	State
7.	Shivani Mishra	Online elocution competition	Third	University

ALUMINI SECTION

The students of 2019-20 batch have secured admission in various prestigious institutes of India for their post graduation. These include Delhi University, Forest Research Institute Dehradun, IIM Rohtak etc.

1.	Sherin Babu	M.Sc. Zoology	University Of Delhi
2.	Kajal	M.Sc. Bioinformatics	Maharishi Dhayanand University (MDU)
3.	Khushbu	M.Sc.	S.S. Jain Subodh College University Of Rajasthan
4.	Ruchira Agarwal	Postgraduate - Msc. Zoology	University Of Delhi
5.	GARIMA YADAV	M.Sc.(Lifesciences)	Babasaheb Bhim Rao Ambedkar University (Lucknow)
6.	SHALINI SHARMA	M.Sc Zoology	J.C BOSE UNIVERSITY OF SCIENCE AND TECHNOLOGY, YMCA, FARIDABAD
7.	Shibangi Bhattacharya	M. Sc Environmental Management	Guru Gobind Singh Indraprastha University
8.	Anju Kumari	B.Ed	Army Institute Of Education (Affiliated To IPU)
9.	Aakriti Singhal	Postgraduate (Msc Zoology)	University Of Delhi
10.	Kanika Sahni	M.Sc. Forensic Science	University Of Delhi
11.	Mansi Gaur	Msc (Zoology)	Choudhary Charan Singh University, Meerut
12.	CHARU	MEG: Master Of Arts (English)	Indira Gandhi National Open University

13	Ragini	Masters In English (MEG)	IGNOU
14.	Nehal Singh	Postgraduate Programme (MBA)	Indian Institute of Management, Rohtak
15.	Diksha Dhiman	Postgraduate, M.SC. Microbiology .B.ED, CRSU	CCSU, MEERUT, UP.
16	Sonakshi Mehrotra	PhD- forest Geoinformatics	Indian institute of Remote sensing- Forest research institute
17.	Radhika Malhotra	Product Manager(Analytics)	Moglix.Com
18.	DIKSHA DHIMAN	EDUCATOR (TGT SCIENCE)AND ACADEMIC COUNSELLOR	THE KHAITAN SCHOOL NOIDA , GYAN VIGYAN , GYAN MANDIR PUBLIC SCHOOL
19.	KAJAL BHATI	ASSISTANT TEACHER (PRIMARY SCHOOL)	Composite School (govt. school) at KHURJA BULANDSHAHAR
20.	Shilpa Anand	Bancassurance Sales Manager	Reliance General insurance company ltd

KANIKA SAHNI
Rank 1 in DUET for M.Sc. Forensic Science
Rank 13 in DUET for M.Sc. Zoology
Rank 3 in IPU CET for M.Sc. Forensic sciencesubheading

RUCHIRA AGGARWAL
Rank 8 in DUET For MSc. Zoology.
Rank 5 in PET for MSc. Zoology (BHU)
Rank 13 in DUET for MSc Genetics
Rank 11 in DUET for MSc. In Biochemistry

SHERIN
Rank 9 in DUET for M.Sc. Zoology
Rank 93 in GATE Biotech 2021
Score of 69.5 in CUCET (Got selected in CU Punjab, CU Haryana, CU Kerala)a subheading

STUDENTS PURSUING INTERNSHIP

Students of 2020-21 batch and 2022 batch pursued internships in various different arenas to hone their talent and satiate their scientific inquisitiveness. These include internships on Covid 19, women's health, content writing etc.

Name of the Student	Duration From- To	Name of the organization/ company/ Institution	Title/topic of internship
	15 June – 26 July 2020 (six weeks)	Shivaji College (Delhi University)	Covid – 19 : Epidemiology and Impacts
Malika Kapoor	July to October October to November November to March March to present	Ace Everse, Ecochirp Foundation, De Hath society, Hope For everyone(currently doing)	Content writer
Mahak Bagai	15 June 2020 to 26 July 2020	Shivaji College (University of Delhi)	Covid-19 : Epidemiology and Impacts
Simran Jha	March- April, 2021	Stone Soup Trust	Sustainable Menstruation Campaign Volunteer

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Dr.Mamta Tripathy
Co-convenor

Simran Jha
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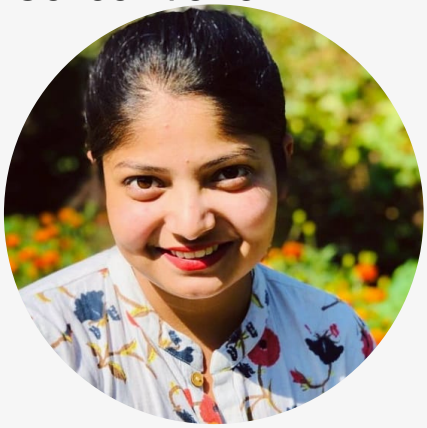

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Neha
Cultural
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Kumkum Rana

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Priya Karn

Picture Courtesy: Kumkum Rana