

FIGHT

Issue XIII



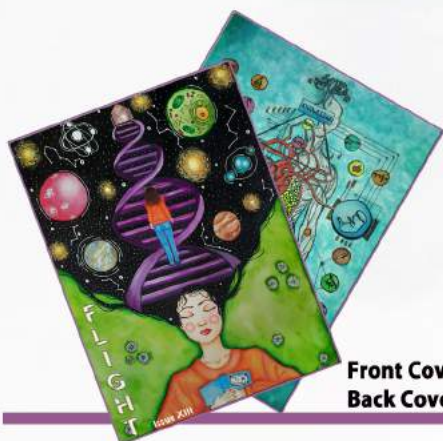
FLIGHT

Fostering the Science
Issue XIII



Albatross

**DEPARTMENT OF ZOOLOGY
GARGI COLLEGE (UNIVERSITY OF DELHI)
YEAR 2019-2020**



Front Cover Page: Ms Himani Mehra (B.Sc (H) Zoology)
Back Cover Page: Ms. Yashika (B.Sc (P) Life Sciences)



Flight

Issue XIII 2020

EDITORIAL TEAM

Students: Ms. Megha Singh, Ms Niti Yadav, Ms. Himani Chawla

Faculty Members: Dr. Thoudam Regina, Dr. Madhu Yashpal

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Message from Principal

Nurturing creativity and inspiring innovation are two of the key elements of a flourishing education, and a college magazine is the perfect amalgamation of both. It harnesses the creative energies of the academic community, and distils the essence of their inspired imagination in the most brilliant way possible.

Hence, I am delighted to know that Department of Zoology is set to release the 13th edition of its annual magazine "Flight" and ready for publication.

I take this opportunity to congratulate the editorial board for bringing out this magazine in spite of the pandemic, which in itself is an achievement considering the effort and time required. May all our students soar high in uncharted skies and bring glory to the world and their profession with the wings of education.

I wish it all success and hope that this tradition that has been set by the current students will be carried through by the following generation of students to come.

I appreciate the perspicacity of the students and teachers for coming up with the appropriate theme "Fostering the Science" explaining how science is an answer to our curiosities for this year issue.

Dr. Promila Kumar
Principal



Message from Teacher In Charge

We present you all with a brand new edition of the Departmental magazine focussing on a very thoughtful and relevant topic 'Fostering the Science'. Before I fathom into the significance of this topic, let me highlight the relevance of this topic in the present scenario i.e. 'the corona time'. The role and impact of science and scientific studies never have been more appreciated than today. We all are desperately waiting for discovery of some anti-viral drug or vaccine against corona virus, so that we all could get back to our normal life routine. This alone accentuates the importance of science and scientific work.

Science is not just for scientist, it's for everyone. It's not only about all those technologies and inventions that has shaped our present life; in fact it's the way of life. Science gave me answer to everything that I could see, hear, feel, and understand. It made sense to everything happening around me. What science offers us is a vision to see and understand things which is based on logic and facts and this knowledge and experience in itself is very empowering. This edition of our departmental magazine 'Flight' is a small genuine effort to put together stories, ideas and thoughts that will foster, encourage and promote science and scientific thinking.

I wish to congratulate the whole Magazine team for effortlessly working out despite all odds to come up with this fabulous edition. Sincere thanks to the student editors, Ms. Megha Singh, Ms Niti Yadav and Ms. Himani Chawla for communicating and comprehending so well with all contributors and teachers online during this corona crisis period. My deepest appreciation to our teacher editors, Dr. Madhu Yashpal and Dr. Thoudam Regina for constantly guiding students at each steps and the result is a beautiful and sensible product which I am sure will be loved and appreciated by all. Lastly I thank all students who contributed to the completion of the magazine.

Dr. Smriti Sharma
Teacher-In Charge



Message from President

Human curiosity, the urge to know is the powerful force and is perhaps best secret weapon of all struggles to unravels the working of natural world . Our inquisitiveness can be promulgated as unique isomorphism of SCIENCE. "Traction between inventiveness and incredulity has fabricated pulchritudinous and unexpected discoveries of science.

ALBATROSS, The Zoological Society of Gargi college firmly believed that science is versification of verisimilitude and perception. It's portrayal of veracity and nature's dragoman. With this contemplation, we bring out 13th edition of our annual publication, FLIGHT themed "Foster the Science" in order to persuade our readers to follow the corroboration wherever it leads and question everything.

Out of those who ruminate that science has stupendous beauty, we have our revered principal, Dr. Promila Kumar and our teacher -in- charge Dr. Smriti sharma along with venerate teachers Dr. Madhu Yashpal and Dr. Regina Thoudam on board who made our expedition from crude to culminating, the stupendous one. I am grateful to all teaching and non-teaching staff for their unreserved succour and to my union members for unceasing and relentless bash.

On personal jotting, from elected as Joint Secretary to Treasurer and then the President of students' council I adore my journey as amazeballs. The ups and down in my journey along with my responsibility and accountability towards my society made me unbend headstrong battler for lifelong. The power to unfold any juncture lies within us. Just hold the conception of IMAGINE, INVENT and INSPIRE as I do.

Ms. Megha Singh
President, Albatross



Dr. Shivani Tyagi

Dr. Mamtesh Singh

Dr. Rashmi Saini

Dr. Chaitali Ghosh

Dr. Neena Kumar



Dr. Jasvinder Kaur



Dr. Udit



Dr. Kuntal



Dr. Supriya Singh

Faculty Members, Department of Zoology

Dr. Madhu Yashpal



Ms. Ishupriya



Dr. Tenzin



Dr. Swati Bajaj



Dr. Smriti Sharma



Dr. Divya Gnaneswari



Dr. Thoudam Regina



Dr. Usha



Ms. Smita Choudhary



Dr. Poonam Sharma

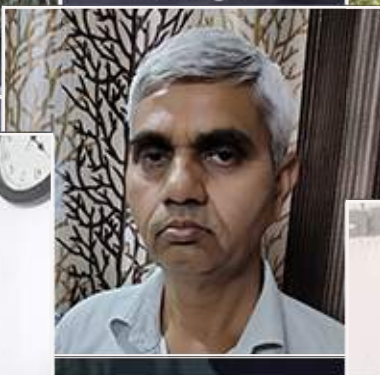


Faculty Members, Department of Zoology

Mr. Govind



Mr. Gopal



Mr. Jai Prakash



Mrs. Madhu



Mr. Mukesh



Mrs. Kiran



Mrs. Manju



Mr. Arvind



Mr. Rajkumar



Mr. Krishna



Mr. Ravi



Laboratory Staff, Department of Zoology

Ms. Chestha
Joint Secretary



Ms. Himani Chawla
General Secretary



Ms. Priyanshi
Proctor

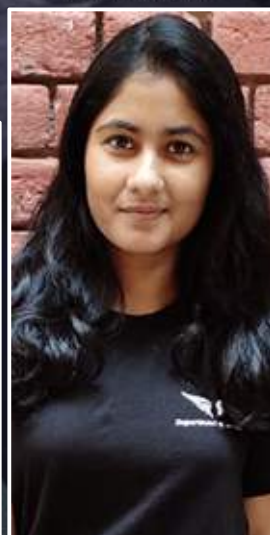


Ms. Preeti
Proctor



Ms. Megha Singh
President

Ms. Niti Yadav
Vice President



Ms. Himaani Mehra
Cultural Secretary

Ms. Taniya Sherwal
Treasurer



Ms. Garima
Proctor

Student Union, Department of Zoology

Glimpse of DEPARTMENTAL

Activities

ALBATROSS
DEPARTMENT OF ZOOLOGY
presents

"KAAVYANJALI"
THE POETRY COMPETITION

- Open Theme.
- Self-composed.
- Time limit:- 2+1 minute.
- Entry on first come, first serve basis.
- Last date of registration:- 9th September, 2019

Exciting cash prizes

DATE:- 11th September, 2019
TIME:- ECA
VENUE:- LT3

Contact:
Megha Singh (President)
94927
94927
94927



warr;or
Choose to keep going...

Celebrating the suicide prevention awareness month
Rajendra
Albatross union 2019-2020

ALBATROSS
The Zoological society of Gargi College
presents

Doodle Competition
in order to
spread the word
about
Suicide Prevention
THEME: L:FE
your story isn't over yet

Date: 23rd October, 2019 Time: ECA VENUE-LT3
Please bring your own material
Break the silence, end the stigma
For queries, contact
Nishi Vice-President
9871971290

Megha (President)
7409674927

Investiture Ceremony
of
"ALBATROSS" - The Zoological Society

12:00-12:15 PM - Badge distribution to Student union 2019-20
12:15-12:20 PM - Welcome Address
12:20-12:30 PM - Inaugural Lecture on Sleep & Memory
Consolidation-What, how & when?
by DR. Sushil K. Jha
(Associate Professor of Neurobiology,
School of Life Sciences, JNU)

August 23, 2019 | Seminar Hall
Gargi College

ALBATROSS
The Zoological Society of Gargi College
presents its **INAUGURAL LECTURE** on the Topic
Sleep & Memory Consolidation
What, how & when?
by
DR. Sushil K. Jha
ASSOCIATE PROFESSOR OF
NEUROBIOLOGY
SCHOOL OF LIFE SCIENCES, JNU
AUGUST 23 • 12PM • SEMINAR HALL
GARGI COLLEGE

Albatross

DEPARTMENT OF ZOOLOGY

**Faculty Advisors: Dr. Smriti Sharma, Dr. Chaitali Ghosh
& Dr. M. Divya Ganeswari**

The inaugural lecture of the Zoological Society 'Albatross' was delivered by Dr. Sushil K. Jha, Associate Professor of Neurobiology, School of life sciences, JNU on the topic 'Sleep & Memory Consolidation; What, how & when? Also, investiture of the new Union was carried out on August 23, 2019. A poetry competition was organized on September 11, 2019. All the participants left the audience spellbound with their beautiful pieces of poetries on various themes and languages. To unleash the creative and artistic side of the students, a poster making competition was organized on the occasion of WORLD HEART DAY on September 27, 2019. Themed as 'Be a heart hero, make a heart promise. Also, to emphasize the importance of suicide prevention, a doodling competition was organized on October 23, 2019. The theme was L;FE: your story isn' t over yet. Participants doodled their hearts out and spread the word with their imagination. A hands-on workshop in biological techniques was organized from December 13 to December 14, 2019 for III-year Zoology students. The workshop turned out to be of great benefit & provided the students with some new things to learn. An Inter-College Hands- On- Workshop "Biotechnology" was also conducted under DBT- Star College Scheme & IQAC on 23rd and 24th December, 2019. Dr. Rashmi Sharma, Scientist E, Department of Science & Technology, Government of India delivered a lecture on Opportunities in Science & Technology on January 29, 2020. The department also organized bird count in the college campus on February 17, 2020, in collaboration with 'Great Backyard Bird Count' . Early morning watching & observing various types of birds surely made the students learn new things about these beautiful creatures. On the occasion of Annual Sports Day: SPIN' 20 themed 'Prove them wrong' , Department of Zoology performed march past. Leading the team were Megha Singh (President) as the flag bearer and Niti Yadav (Vice President) as the commander and placard holder.



Students' Achievements

*".....There is
no magic
to achievements
its really about
hard work, choices and
persistance....."*





*We...
left our mark*



- o Vijya Singh: 4th position – 100m : Delhi state athletics meet; Reliance Foundation athletics meet: 1st position (gold medal)- 100m, 3rd position (bronze medal)- 200m, 1st position (gold medal) 4x100 m relay; Selected for reliance nationals' athletics meet; Sporty go athletics meet: 1st position (gold medal)- 100m, 1st position (gold medal)- 200m; Inter college athletics meet 2019: 4th position-200m, 1st position- 4x100 relay; Got selected for inter-university nationals
- o Tanisha Goyal: Part of department union at the post of joint secretary; Backed second position at Ram Lal Anand College for quilling; Participated in Thomson's of IIT Roorkee; One-month internship with RAY; Gave the exam for Rio 25
- o Ishita Talwar: Best presentation award (1st position) in the UG Category at National seminar on use of scientific and technical terminologies in sustainable environment development, its challenges, computational analysis and opportunities organized by Department of Zoology, Gargi College and CSTT, MHRD, Govt. of India
- o Anjali Tiwari: Best presentation award (1st position) in the UG Category at National seminar on use of scientific and technical terminologies in sustainable environment development, its challenges, computational analysis and opportunities organized by Department of Zoology, Gargi College and CSTT, MHRD, Govt. of India
- o Aashita Chadha; Stood first in the poetry competition organized by Avni- ECO Club; Poem published in the e-magazine of Avni, Magazine of the botany department and in the annual college magazine; Stood 3rd in the open mic poetry competition organized by Albatross; Participated in the story writing competition organized by Quilliminati; Participated in the poetry competition organized by the botany department; Participated in the inter college poetry competition organized by Encorethe literary society of SGND Khalsa college.
- o Taniya Sherwal; Member, Hues, Gargi College; Represented Gargi college at MOOD INDIGO'19, IIT Bombay; Member, Enactus Gargi; Campus Ambassador of Delhi Technological University (DTU); Consolation prize in Essay writing competition by Indian Society for Remote Sensing-DC Association of Geographical Studies, Delhi and Geography Association, Kirorimal College; Represented Gargi College in Elocution Competition held at Hansraj College; Designed the cover page of Abstract Book of a National Seminar organized by Dept. of Zoology, Gargi College, DU and Commission for Scientific and Technical (CSTT), MHRD, Govt. of India

B.Sc. (H) Zoology II Year

- o Priyanshi Gautam: Judo team won the inter college championship
- o Anshika Kumari: 1st position- long jump, Gargi Olympiad; 1st position- 200m, Gargi Olympiad; 1st position- kho kho team Gargi Olympiad
- o Neha Soni: Cleared leader's level in plastic tide turner challenge; Participated in Rendezvous 2019 at IIT Delhi
- o Seeta Prajapati: Conventional Debate, Bhagwaan Parshuram Institute of Technology college, Venkateshwar College, Daulat Ram College, Kirori Mal College, Janki Devi Memorial College, Shaheed Bhagat Singh Evening College, Nav Uday Convent School, Zakir Hussain Evening College, Gargi College, SJH, VMMS: Parliamentary Debate- Ramjas College, Shaheed Bhagat Singh Evening College; Speech Competition- Hansraj College; Extempore debate competition, Department of Hindi, Gargi college; Participated in Rendezvous at IIT Delhi; Poetry competition, Venkateshwara College; Slam poetry competition, Shivaji College; Editorial board, Gargi college- Poetry competition + Article writing
- o Mitiksha Gupta: 1st position in Conventional Debate, Deshbandhu College; Participated in Conventional debate at VMMC and Kirori Mal college; Participated in Parliamentary debate, Ramjas College
- o Madhurya: 1st prize in Zenith Trivia

B.Sc. (H) Zoology I Year

- o Akshita Raina: Volunteer of National Service Scheme, Gargi College; Creative Head in NSS, Gargi College
- o Vishnupriya Ajith: Member, Nazakat and represented Gargi college in 33 inter-college competitions. Won 18 competitions; 1st position- Daulat Ram College Maharaja, Agrasen College, Maitreyi College, Dyal Singh College (evening), DTU; 2nd Position- Kalindi College, Dr. Akhilesh Das Gupta Institute of Technology & Management Keshav Mahavidyalaya, JDMC, SGND, SGGSCC; 3rd Position- Miranda House, Motilal Nehru College, Kamla Nehru College, Vivekananda College, SGTB
- o Stuti Garg: Scintillation's 18 - Secured 3rd position in Scientific Fashion Walk; Co-convenor, Placement Cell
- o Sadiyah Afroz: 1st prize in poster making competition Dept. of Zoology; Editor at VOICES, Social media manager at VOICES (2019-20); BEEP committee member; Worked as a fundraiser at Youth Empowerment Foundation; 2nd Position in Quiz Competition at Department of Zoology
- o Itibaw Farooq: Awarded for the best Interjector in a debate competition on Darwin's Day; Completed 120 hours as a volunteer of NSS Gargi; General Secretary, NSS - DU Unit
- o Neha Shukla: General Secretary in Enactus Gargi; Represented Enactus Gargi at Enactus India Nationals Symposium and Competition held at IIT Delhi
- o Tanya: Editor for our college magazine - VOICES (2019-20)
- o Manasi Chandra: Interned with Contentwhale and Ann (2019); Secured 2nd Position at Kavyanjali-Slam Poetry organized by Department of Zoology, Gargi College
- o Mahima Rawat: President, Western dance society - Enliven; Treasurer, Western Dance Society - Enliven; 1st position - SRCC, IIT Delhi, Miranda College, Hindu College, NDIM, MAIT, KMC, JIIT, SSCBS, PGDA (evening), BML Munjal, Lady Irwin College, Manipal University, Shiv Nadar University; 2nd Position - NSIT, Rajdhani College, IHE, CVS, IP, Lady Hardinge Medical College, DTU, Mata Sundari, Symbiosis University, Ramanujan College, IIIT, LSR, Zakir Hussain, Sri Aurobindo College; 3rd Position - SGGSCC, IIT Bombay.
- o Megha Singh: Campus ambassador of IIT Roorkee, IIM Indore, IIT Delhi, The Rising Bharat Campaign; Social media manager, RAY (Right Action Youth); Worked at Indian's biggest Mental Health Festival in association with AIIMS and MHFI; Represented Gargi college in debate competition organized by national research center, Faridabad; Secured 2nd position in Debate competition organized on Darwin day; 2nd position in doodling competition on World Mental Health Day; 3rd position in poem competition at Mata Sundari College for Women; 3rd position in poster making competition on World Heart Day; Selected as delegate in Asia Youth Model United Nation
 - o Sonia Agroiya: Co-convenor of Union Creative Team; Third position in card making competition, Department of Botany, Gargi College
 - o Kashish: Won 1st prize in Trashion (costume designing) in IIT Bombay; 3rd position in Botanical Card Making Competition (Department of Botany, Gargi College); 2nd position in Face Painting Competition (Department of Zoology, Gargi College); 2nd position in Rangoli Making Competition (Department of Chemistry, Gargi College); Consolation prize in Doodling Competition (Department of Zoology, Gargi College); Convenor, Union Creative Team; Treasurer, Hues (Fine Arts Society, Gargi College).
 - o Swapnil: Vice-President, NSS, DU Unit; Represented Gargi at NSS adventure camp, ABHIMAS, Himachal Pradesh amongst 20 students from DU; Completed 120 hrs of NSS volunteer service.; Managed about 20-25 events in NSS; Core member of ZISTATVA; Subject expert at Chegg; Volunteered for WWF-India Earth Hour
 - o Sakshi: Member, NCC, Gargi College; Vice President (Science) of College Students Union
 - o Preeti: Worked for 2 months in a Project KFA (Knowledge for All) under Umeed, A Drop of Hope (NGO); Working in a Research Project on 'Applications of Biosynthesized Gold Nanoparticles'
 - o Niti: Proctor II; Vice-President; First prize in Extempore competition organized by chemical society; 1st prize in Turncoat competition in inter-college science festival; Member, Enactus Society, Gargi College
 - o Megha Chouhan: 3rd position in debate competition organized by Albatross, the Zoological Society; Interned with Hareem teamwork
 - o Sundaram Thakur: Member in Quilluminati, The English Writing Society; Proctor Science of Student's Union; Editor at college magazine - VOICES; President, College Student's Union; Pioneer, #BEEP Project; Pioneer, #La Expression
 - o Sagrika: Selected for Meritorious Award; 2nd Position in the Wildlife quiz organized by Department of Zoology, Gargi College
 - o Aanchal Gupta: Poster Making Competition on Mosquito borne disease in India at Department of Zoology, Hindu College; Slogan Writing Competition on Mosquito borne disease in India at Department of Zoology, Hindu College; Monograph Writing Competition on Role of ethics in disaster management at Jawaharlal Nehru University; Member, Eco club AVNI and NSS; E magazine formation - article on (cultivating peace within) in (ECO CLUB); Debate Competition on National Science day at RCB; Completed RAY Social Media Intern

Fostering the Science

Devising the youth to foster the science is the key to make nation unfettered and Untrammelled

Inducement, Surveillance and Experiment are holy trinity of science. From understanding why sky is blue to the purification of our drinking water, we interact with life sciences on daily basis – making it essential to encourage the study of subjects . This thought persuaded us to the theme – Foster the Science.

“We are all born basic Scientist”. We should not underestimate the basic scientific research. Fundamental inquiry is essential, because that's what make us HUMAN . You never know the most stupid question asked once, can lead to great invention one day as it empowers us to answer fundamental questions about ourselves and thus is common thread of life. The question arises how can we make life sciences an appealing field to Research?

The research and increased use of technology, while encouraging and fostering curiosity of science among youth can be one of the possible solution but this is not enough to promote science in India. We need to understand its link to economy. The way forward for India is through a science for a sustainable society , but lack of cooperation between academics and industries prevent effective and increasing investment in nation's science and technology sector .India's national research institute are being underutilized and remain under sourced.

Throughout Asia, the national economies that have grown rapidly have been successful because of their investment in science and technology. Science and technology were never prioritized in India. Now, environmental challenges and rapid economic growth have made the government, industry, and civil sectors turn to science and technology to come up with innovative solutions for sustainable growth. “If we want to grow as a country, we need to focus and create opportunities in science and technology,” The current methods being used to teach science, technology, engineering, and mathematics (STEM) education in India's schools today have become both inefficient and ineffective — but that can be changed. Today, the STEM curriculum in primary and secondary schools, and even in leading engineering colleges, has become obsolete. Now, it has become more important than ever to encourage a paradigm shift in the way students are taught in India.

By promoting problem-solving and critical thinking through STEM education, students will be better prepared for future careers. In turn, this new approach will build an entrepreneurial ecosystem in India that promotes job creators — not job seekers.

Mr Megha Singh
B.Sc (H) III Year





Coronavirus Disease 2019 (Covid-19)

Coronaviruses (Cov) are a large family of viruses that cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-Cov) and Severe Acute Respiratory Syndrome (Cov). Covid-19 is a new strain that was discovered in 2019 and has not been previously identified in humans. Coronaviruses are zoonotic, meaning they are transmitted between animals and people. Common signs of infection include respiratory symptoms, fever, cough, shortness of breath and breathing difficulties. In more severe cases, infection can cause pneumonia, severe acute respiratory syndrome, kidney failure and even death.

The novel coronavirus pandemic has infected 207,860 people across the globe and killed more than 8,600 since the virus first emerged in central Chinese city of Wuhan late last year. Like many respiratory viruses, including flu, Covid-19 can be spread in tiny droplets released from the nose and mouth of an infected person as they cough. A single cough can produce upto 3,000 droplets. These particles can land on other people, clothing and surface.

We can protect ourselves and help prevent spreading the virus to others by washing our hands regularly for 20 seconds, with soap and water or alcohol-based sanitizer. Cover our nose and mouth with a disposable tissue when you cough or sneeze. Avoid close contact (1 meter or 3 feet) with people who are unwell. Use masks when you step out of your home. Stay home and self-isolate from others in the household if you feel unwell. Don't touch your eyes, nose, or mouth if your hands are not clean.

There's currently no vaccine to prevent coronavirus disease (COVID-19).

“In a bid to rest the debate on what comes first — **smartphone addiction or depression** — a new study has found that young people who are hooked on to their **smartphones** may be at an increased risk of **depression and loneliness**”

WHAT COMES FIRST: SMARTPHONE DEPENDENCY OR DEPRESSION ?

In ongoing research across the globe, it was established that there exists a correlation between smartphone addiction and depression. However, it was not clear that if smartphone dependency precedes the symptoms of depression and loneliness or its other way around-depression and loneliness make them a smartphone addict.

According to a recent report by University of Arizona, young people who are clung to their smartphones could be at increased risk for depression and loneliness. Dr. Matthew Lapierre and his colleagues found in a study on 346 youngsters of age 18-20, that smartphone addiction predicts higher levels of depression-like symptoms and depression. Lapierre, an assistant professor in the Department of Communication in the College of Social and Behavioral Sciences said, "There's an issue where people are entirely too reliant on the device, in terms of feeling anxious if they don't have it accessible, and they're using it to the detriment of their day-to-day life."

Knowing the trajectory of the relationship between smartphone addiction and poor psychological effects is the key to understand how best to tackle the issue. It has been proposed that if mental health symptoms lead to dependence on smartphones, we could lessen the addiction by altering individuals' psychological wellness; but if smartphone dependency precedes, we have to work on it for people's wellbeing.

Older adolescents are the center of the study since they have been using smartphones for a long time now, the degree of addiction can be assessed

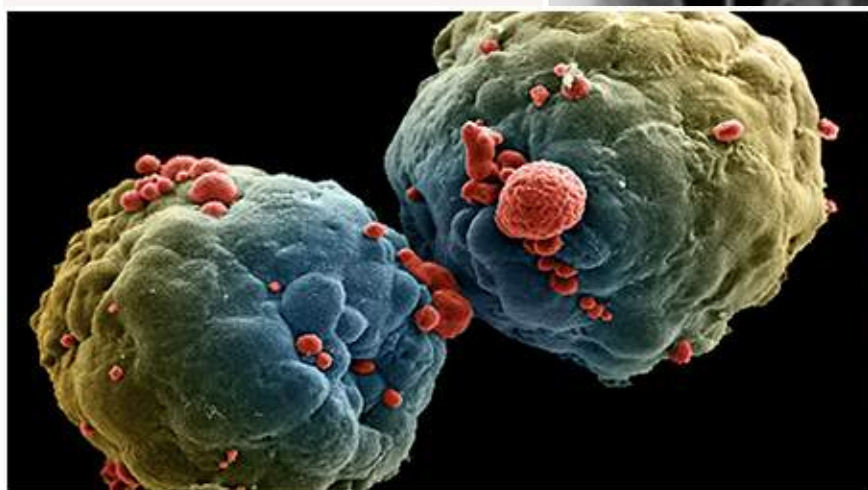
easily. And also, they are at the transitional stage of their life where they are vulnerable to adverse psychological health problems. In the study, a series of questions were designed to measure loneliness, depressive symptoms and daily smartphone usage, and the participants were asked to answer them on a four-point scale. This was done twice, once at the start of the study and then three to four months later.

Now the gloomy outcomes of smartphone addiction have already been documented, its recommended that we should self-assess the extent of addiction to smartphones and implement the necessary limits on ourselves. When people feel stressed, they turn to their cellphones. They should instead seek other sound approaches like conversing with a dear companion, or doing some workout routines, yoga or meditation.

Smartphones are nevertheless notably an innovation and specialists throughout the globe are working to figure out all the potential effects of it on human lives. Since now the researchers have realized the nature of correlation between smartphone addiction and its adverse psychological effects, the future works need to be concentrated on addressing the basis of this relationship - 'why is this the case'.



Mammograms are the lead method for screening breast cancer but fail to be 100% accurate in showing if a woman has breast cancer. Screening of mammograms do not find about 1 in 5 breast cancers, according to the American Cancer Society.



The AI model both detected cases of breast cancer at higher rates than radiologists and reported fewer false positives.

GOOGLE AI MODEL BEATS HUMANS IN DETECTING BREAST CANCER

Google is developing artificial intelligence to help doctors identify breast cancer. The model, which scans X-ray images known as mammograms, reduces the number of false negatives by 9.4%.

Today, breast cancer is the second leading cause of death in women; beat out only by lung cancer in its deadliness and overall prevalence. Early detection is the best defence most people have in identifying and treating the disease. While mammograms are the most common detection tool, they miss a large number of cases. Researchers used anonymized mammograms from more than 25,000 women in the UK and 3,000 women in the US and tried to follow the same principles radiologists might follow.

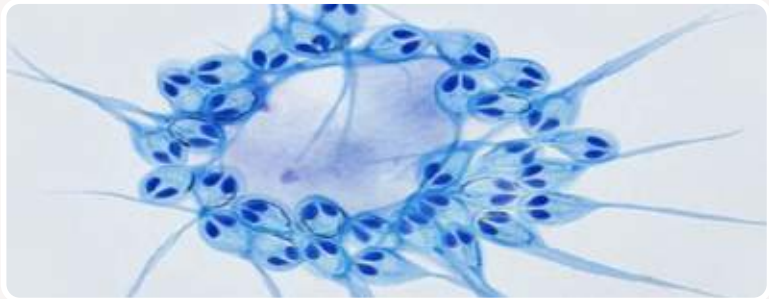
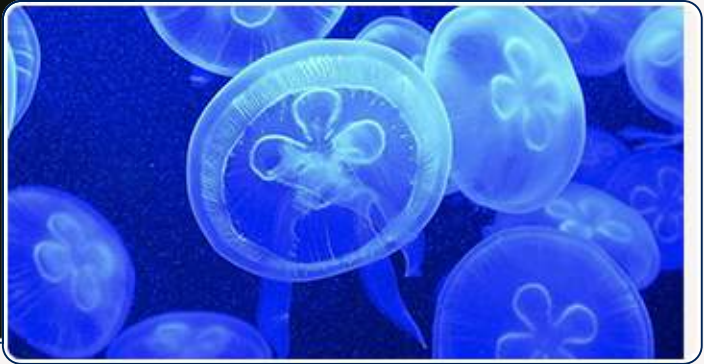
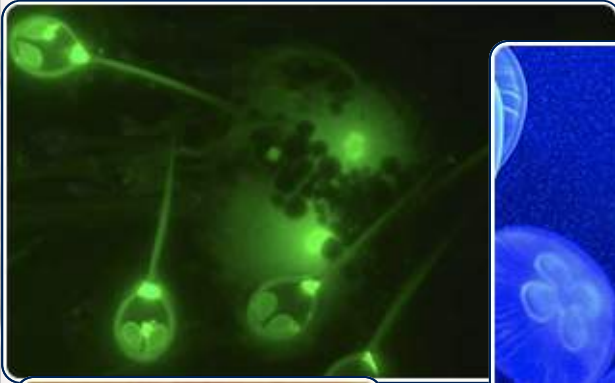
The team first trained AI to scan X-ray images, and then looked for signs of breast cancer by identifying changes in the breasts of the 28,000 women. They then checked the computer's guesses against the women's' actual medical outcomes. Ultimately, they were able to reduce false negatives by 9.4 per cent and cut down false positives by 5.7 per cent for women in the US.

In UK, the model cut down false negatives by 2.7% and reduced false positives by 1.2%.The model performs better than an individual radiologist in both UK and US. While researchers found that AI outperformed doctors in identifying breast cancer in most cases, there were also instances where doctors flagged cancer that the model originally missed. Google has been trying to frame this project as one that will help radiologists, not replace them. Bringing the two together could strengthen the overall results. All this is possible when science and technology combines.

The technology that we develop not only helps us in our everyday lives; it also helps scientists increase human knowledge even further.

Science is the pursuit of knowledge about the natural world through systematic observation and experiments. Science is really about the process, not the knowledge itself. It's a process that allows inconsistent humans to learn in consistent, objective ways. Technology is the application of scientifically gained knowledge for practical purpose, whether in our homes, businesses, or in industry.

Ms. Niti Yadav
B.Sc (H) III Year



Henneguya salminicola: Anaerobic parasite

In the case of this non-oxygen breathing organism, evolution turned it into a simpler organism that shed “unnecessary genes” responsible for aerobic respiration.

The organism is *Henneguya salminicola*, also known as *Henneguya zschokkei*, is a fewer-than-10-celled microscopic parasite that lives in salmon muscle.

As the organism evolved, it gave up breathing and stopped the consumption of oxygen for the production of energy, to rely on anaerobic respiration. 'They lost their tissue, nerve cells, muscles, everything' as reported by co-author Dorothee Huchon, an evolutionary biologist at Tel Aviv University in Israel. 'And now we find they have lost their ability to breathe.'

Other organisms such as fungi and amoebas that are found in anaerobic environments lost the ability to breathe over time. The new study shows that the same can happen in the case of animals, too.

During sequencing of genes, one of the researchers saw that it did not have a mitochondrial genome. Mitochondria is the “powerhouse” of the cell, which captures oxygen to make energy and its absence in the *H. salminicola* genome indicates that the parasite does not breathe oxygen.

Ms. Niti Yadav
B.Sc (H) III Year

Shutter up!!!



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CLOWNFISH (*Amphipiron ocellaris*)

Clownfish live in the corals off the coast of Australia and Southeast Asia as far as northeast Japan. Most clownfish are orange with three bands and black. They are found mainly around certain kinds of anemones, a creature that anchors itself to the sea floor and uses its tentacles to attract food. The anemone's tentacles have stinging cells called nematocysts that release a toxin when prey or predator touches it. Clownfish, however, develops immunity to the toxin by very carefully touching the tentacles with different parts of the body. A layer of mucus builds up, protecting the clownfish from the toxin. This pair forms a symbiotic relationship.

All clownfish are hermaphrodites. They all are born male. They have the ability to turn themselves female, but once the change is made, they can't go back to being male. Two males will become the mates and the larger dominant fish will become the female. They live in groups that are led by one dominant female. The second largest fish is the dominant male while all of the other fish in the group are dominant males. If, the female dies, the dominant male will become a female to replace her. Before, spawning the male prepares a nest by clearing a spot on bare rock near the anemone. He then courts a female with a show of extended fins, biting and chasing, according to the Florida, museum of natural history. He chases the female to the nest, but after that it is up to her to mate the next move. She will make several passes over the nest before depositing her eggs. She will lay from 100 to 1,000 eggs which are 3 to 4 mm long. The male then passes over the nest and releases sperm to fertilize the eggs. Then, the female swims off. The male does most of the egg sitting. He will fan them and eat eggs that are infertile or damaged by fungus. The eggs hatch 6 to 8 days later. The larvae float away and spend about 10 days drift. They start their lives clear or transparent, but as they begin to mature they start to gain the colour of their species.

Ms. Chestha Murteja
B.Sc (H) I Year



**MASS ANIMAL DEATHS WITH
ENVIRONMENTAL CHANGES AND THE ROLE
OF SCIENCE IN THEIR CONSERVATION**

Environmental change is an evident problem in the present times and human actions are largely to blame. Various human activities to blame include deforestation, farming, pollution which are harming natural habitats, while carbon emissions are causing the oceans to heat up. Environmental hazards have led to extreme climate change, ozone layer depletion, loss of biodiversity, land degradation, changes in ecosystems, etc. It has negatively affected most biological systems on our planet and is becoming of increasing concern for the well-being and survival of many species.

These environmental changed impacts the survival of the species on earth immensely, several cases of strange sudden mass animal deaths have been reported like thousands of birds dropping dead from the sky out of nowhere, honeybee populations declining, thousands of starfishes melting at the shores, Saigas dropping dead suddenly while grazing. These are all examples of MME: Mass mortality events.

According to the paper published in 2015 in Proceedings of National Academy of Sciences, 727 accounts of MME involving 2,407 animals since 1940 have been recorded. It suggests that MME have since been on a rise, with 1 event per year. These reports suggest that the World is going through the sixth mass extinction event to affect the Earth. Over the past year many animal populations have undergone MME, few cases to be mentioned are:

- In January 2020, at least 25,000 koalas are believed to have died in a horrific wildfire in South Australia. Besides koalas, population of many other species as well, many of them endemic to Australia were also impacted.
- In February 2020, due to food poisoning - specifically avian botulism, thousands of migratory birds were found dead at a natural reserve on Iran's Caspian coast warning environmentalists. Avian botulism is spread by the consumption of infected maggots, and is often associated with a rise in water temperatures.
- Similarly, in 2019, millions of fish were found dead in Lake Toba, the biggest lake in Indonesia. It's believed that incident occurred due to a sudden depletion of oxygen in the water, as a result of an increasing pollutants in the lake, unfavourable weather conditions and unsustainable practices by local aquafarmers.
- In another incident, around 150 Oliver Ridley turtles and a bottlenose dolphin were found dead in Odisha's Puri in January 2016. Forest department officials believe that the turtles washed ashore after being hit by fishing trawlers.
- Alaska has been in the throes of an unprecedented heat wave this summer, and the heat stress is killing salmon in large numbers. Scientists have observed die-offs of several varieties of Alaskan salmon, including sockeye, chum and pink salmon.
- A prolonged and mysterious die-off has been observed in the honeybee's population, a trend worrisome both to beekeepers and to farmers who depend on the insects to pollinate their crops, which has apparently worsened greatly last year.

All these incidents show how human activities have deteriorated the environment and is now affecting the survival of species on earth. These rapid rates of mass deaths of animals are alarming for environmentalists and people in general all over the world.

The food web existing in an ecosystem is, like a tapestry, held together not by tacks or glue, but by interdependence—one strand stays in place because it is entwined with many other species. The same concept keeps our planet working. Removing one piece, one species, and small changes lead to bigger problems that aren't easy to fix. In the words of the World Wildlife Fund, "When you remove one element from a fragile ecosystem, it has far-reaching and long-lasting effects on biodiversity." The need of the hour is that we understand the impact of our actions and activities on the environment and take charge of our actions before making any more species on earth undergo extinction. In these times of conservation crisis, we have to use the tools which are available to us, through fostering scientific practices. Genetically guided selective breeding is one of the techniques that can be used, while another is genetic modification. Another upcoming field that can be highly useful is CRISPR.

A scientist in the field, Dr Gharbi says "The CRISPR technique is what people are really excited about at the moment, possibly to target particular genetic defects in the genomes to try and remove disease alleles [gene variants]. It's not GMO – genetically modified organism – as we've known it in the last few decades where you introduce a piece of foreign DNA coming from a different species into another species. This technology is different, it's acting directly on the genome of a particular species, a particular individual, and editing it."

With tools of such potential it may be that species that are functionally extinct – where animals are alive but there seems no chance of it making a successful comeback – could still have a future by using genes from such animals to artificially inseminate a similar subspecies or something like that. There are many techniques which are coming up that could be useful. We have to switch our practice to sustainable scientific research and techniques to save this world for the future generations as, "If we have technology to continue to allow us to continue living unsustainably, that doesn't really help anything.

Ms. Sadiyah Afroz
B.Sc (H) III Year

RESEARCH ON CORONAVIRUS TREATMENT

The US Centers Disease Control have earlier said that covid-19 spread within the US is inevitable.

Covid-19 has now become a pandemic and billions of individuals are hoping for a drug or vaccine.

Since there's no proven treatment yet for the virus and the pneumonia it causes, there are more than 60 drugs or drug combinations potentially worth trying, consistent with the World Health Organization.

Virus Blockers

The injectable drug remdesivir - may be a broad-spectrum antiviral that Francis Collins, head of the National Institutes of Health, says he's "optimistic" about. It works against viruses like Covid-19, whose genetic material is made of RNA.

The drug forms a misshapen version of a protein that causes misfolding in nucleotide products that the virus needs to build new copies of itself, thus preventing it from multiplying.

Vaccines

Vaccine is the most effective treatment for a disease, but has the drawback that such drugs usually take three or four years to reach the market and it's not unusual for vaccines to simply fail. One company developing a coronavirus vaccine is Sanofi. It is targeting the manufacture of specific viral protein which will act as antigen and trigger immune response against the virus.

Antibodies from survivors

Another approach is to infuse plasma from survivors to another person. A person who got infected with the coronavirus but dodged the infection will have its blood swarming with antibodies to the virus. While plasma isn't bound to work, quite a number of people are already listed as recovered from coronavirus in China, so these people might themselves be the treatment for this deadly disease.

Chloroquine

Some say that the cure for coronavirus is already known, and it's the old anti-malaria drug chloroquine. Though it's not proven, initial laboratory tests suggest the drug, discovered in 1934, may be highly effective.



Across

2. Quantity having only magnitude, not direction
5. Prokaryotic model organism
6. Name of salivary amylase
7. Longest span of geological time
8. The entire class unites for this
10. Chemical name of hormonal vitamin
11. Thing that holds water, and is common name of an animal group
12. State of physiological equilibrium
13. A person excessively worried about having a serious illness
14. Leaves are green because of this phenomenon

Down

1. Father of Evolutionary Biology
3. Washing machine works on this principle
4. Secret of your beauty
9. Doctor's headphone

Ms. Preeti
B.Sc (H) IiI Year

10 GREATEST SCIENTIFIC DISCOVERIES AND INVENTIONS OF 21ST CENTURY

For the past centuries, there have been countless of developments and advancements in the world. Scientists and researchers have continued to discover new things and expand our understanding and knowledge of the natural phenomena happening around us.

In the 21st century, there are thousands of scientific breakthroughs. These have helped in improving our way of living while some are the key to greater innovation in the future. In this article, we ranked the greatest scientific discoveries and inventions of the 21st century.

Detection of Gravitational Waves

Albert Einstein first predicted in his theory of relativity that time travel will be possible. Now, it has been proven by the recent findings. The LIGO project based in the United States has detected gravitational waves that could allow scientists to develop a time machine and travel to the earliest and darkest parts of the universe. This was the first time that the witnessed the “ripples in the fabric of space-time”.

Evidence of Water on Mars

The National Aeronautics and Space Administration confirmed last September 2015 that there is evidence proving the existence of liquid water in Mars. Using the imaging spectrometer of NASA's Mars Reconnaissance Orbiter (MRO), scientists detected hydrated salts in different locations on Mars. During the warm season, the hydrated salts darken and flow down steep. However, they fade in cooler seasons. The detection of hydrated salts means that water plays a vital role in their formation.

Robotic Body Parts

Through the help of biomechanics and engineering, scientists from University of Twente have devised robotic body parts like robotic arms that can aid those individuals affected by Duchenne muscular dystrophy. This will allow patients to amplify residual function in the arm. They also applied Darpa's Revolutionizing Prosthetics project of creating prosthetics to wounded US military personnel, in developing robotic limbs. Today, scientists are studying on the viability of making these robotic body parts or exoskeletons controlled by the mind to help disabled individuals, survivors of stroke and elderly people.

T. Rex Tissue

Paleontologists have discovered a partially fossilized and decomposing femur of a Tyrannosaurus rex which was believed to be 70 million years old. Mary Higby Schweitzer of North Carolina State University found out flexible and transparent vessels. This soft tissue discovered is preserved because of the iron between the leg bones. The T. Rex tissue is very essential in determining the physiology of dinosaurs and to study its cellular and molecular structures. They have found out that dinosaurs are closely related to big birds, like the ostrich.

Advancement in HIV Cure

According to HIV.gov, there are over 36.7 million people worldwide living with HIV/AIDS, out of which 1.8 millions are children. HIV/AIDS remain to be one of the deadliest diseases in the world. On the other hand, HIV treatment has been available in Germany for more than two decades already. Antiretroviral therapy

allows HIV/AIDS patients to live longer. However, no definite cure is still discovered. In 2007, Dr. GeroHütter was the first one to successfully cure an HIV/AIDS patient named Timothy Ray Brown by transplanting bone marrow from an HIV-immune patient.

Existence of Dark Matter

In 2006, a team of researchers has found an evidence that proves the existence of dark matter. They inferred the presence of dark matter by measuring the bullet clusters or the location of mass in the collision of galaxies. According to Maxim Markevitch of the Harvard-Smithsonian Center for Astrophysics in Cambridge, the dark matter can be proven by the bulk of visible matter in the clusters that have been disconnected to the rest of the mass. According to NASA, it is still a complete mystery. What they can prove for now is that 68% of the universe is composed of dark energy.

Sequencing Genome of Cancer Patient


In 2003, scientists completed the sequencing of the human genome or genetic blueprint that points out the mutations leading to cancer. It took three years for them to finish drafting the three billion letters that compose the human DNA. The Human Genome Project helped scientists in treating a deadly type of skin cancer and understanding the genes involved in leukemia, eczema, and diabetes. Now, cancer genome sequencing is integrated into medical care facilities. It characterizes and identifies DNA or RNA sequences of cancer cells

Creation of Human Organs

The Stem Cell research has paved the way to greater access to organs, instead of waiting for donors or taking harsh medications. Scientists from Massachusetts General Hospital and Harvard Medical School have discovered how to regenerate the function of human heart tissue through adult skin cells. Through stem cells, humans can grow another organ. This is associated with the regenerative nature of living organisms. Recently, various research all around the world enables growing fallopian tubes, heart, brain, lung, and kidney, among others through stem cells.



Ms. Megha Singh
B.Sc (H) III Year



“Memory plays a crucial role in our lives. Just as musical notes are recorded as grooves on a record, it appears that our brains store memories in neural firing patterns that can be replayed over and over again.”

-Dr.Karcem Zaghloul

SCIENTISTS MONITOR BRAINS REPLAYING MEMORIES IN REAL TIME

Our brains use distinct firing patterns to store and replay memories

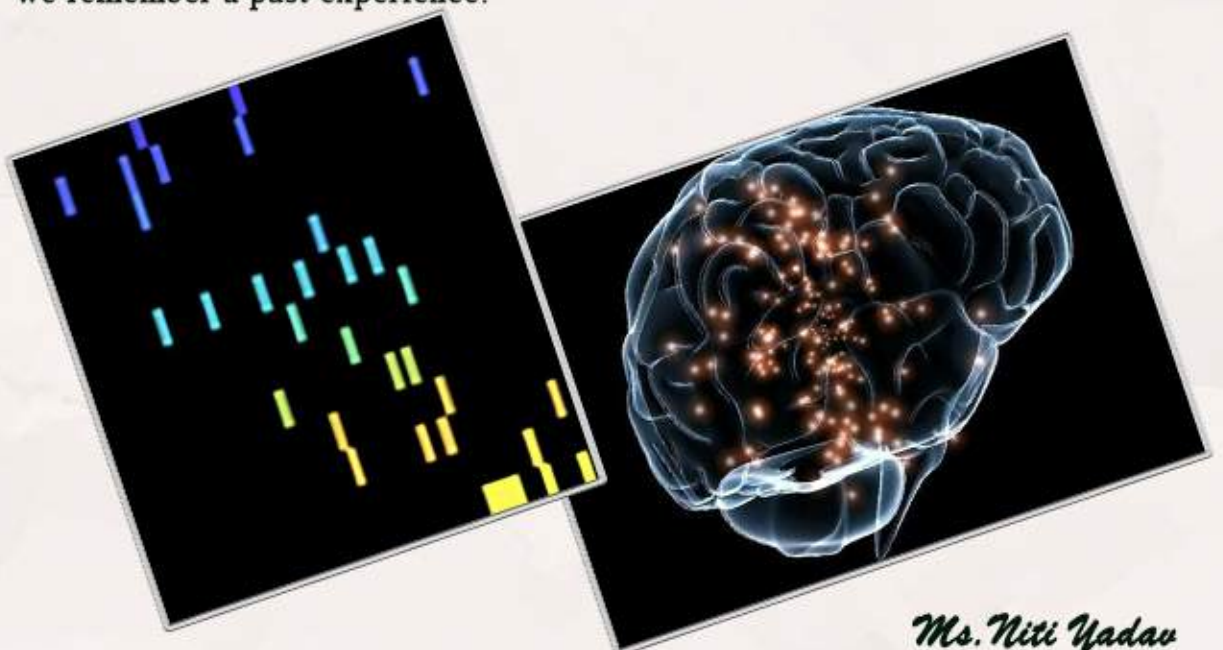
As a part of an National Institutes of Health Clinical Center trial for patients with drug-resistant epilepsy whose seizures cannot be controlled with drugs, researchers at NIH performed memory tests in epilepsy patients and monitored the electrical activity of thousands of individual brain cells, called neurons. It was found that the firing patterns of the cells that occurred when patients learned a word pair were replayed fractions of a second before they successfully remembered the pair.

The basis for this research can be traced all the way back to another epilepsy patient in 1957. This patient referred to as HM, lost the ability to form new memories after a portion of his brain was removed to stop his seizures. This was modern medicine's first indicator that our memories are stored within specific neural regions.

Dr. Kareem Zaghloul, M.D., Ph.D., a neurosurgeon-researcher at the NIH's National Institute of Neurological Disorders and Stroke (NINDS) and his team has been recording electrical currents of drug-resistant epilepsy patients temporarily living with surgically implanted electrodes designed to monitor brain activity in the hopes of identifying the source of a patient's seizures.

In this study, scientists examined the activity used to store memories of our past experiences, called as episodic memories. To do this they analysed the firing patterns of individual neurons located in the anterior temporal lobe, a brain language center. Currents were recorded as patients sat in front of a screen and were asked to learn word pairs such as "cake" and "fox." The researchers discovered that unique firing patterns of individual neurons were associated with learning each new word pattern. Later, when a patient was shown one of the words, such as "cake," a very similar firing pattern was replayed just milliseconds before the patient correctly recalled the paired word "fox."

As stated by the authors results obtained suggest that our brains may use distinct sequences of neural spiking activity to store memories and then replay them when we remember a past experience.



Ms. Niti Yadav
B.Sc (H) III Year

THE PANDEMIC OF COVID-19 HAS NATURAL ORIGIN

Coronaviruses are a large family of viruses that can cause illnesses ranging widely in severity. The first known severe illness caused by a coronavirus emerged with the 2003 Severe Acute Respiratory Syndrome (SARS) epidemic in China. A second outbreak of severe illness began in 2012 in Saudi Arabia with the Middle East Respiratory Syndrome (MERS). Further, in December 2019, there was an outbreak of a novel strain of coronavirus named as SARS-CoV-2 triggering grave illness.

An analysis of public genome sequence data from the novel SARS-CoV-2 and related viruses found no evidence that the virus was engineered in laboratory. According to findings published today in the journal Nature Medicine, the novel SARS-CoV-2 coronavirus that emerged in the city of Wuhan, China in December 2019 and has since caused a large scale COVID-19 pandemic and spread globally is proved to be originated through natural processes.

Shortly after the epidemic began, Chinese scientists sequenced the genome of SARS-CoV-2 and made the data available to researchers worldwide. Several research institutions used this resulting genomic sequence data to explore the origins and evolution of SARS-CoV-2 by focusing in on several tell-tale features of the virus. The scientists analysed the genetic prototype for spike proteins, outside armatures of the virus that it uses to grab and breach the outer walls of human and animal cells. More explicitly, they focused on two important features of the spike protein: the receptor-binding domain (RBD), a kind of clasping hook that grips onto host cells, and the cleavage site, a molecular can opener that allows the virus to crack open and enter host cells.

Evidence for natural evolution

The scientists revealed that the RBD of the spike proteins had evolved to effectually target Angiotensin converting enzyme 2 (ACE2) receptor, which is involved in regulating blood pressure. The SARS-CoV-2 spike protein was so effective at binding the ACE2 receptors on outside the human cells, in fact, that the researchers resolved that it was the result of natural selection and not due to the genetic engineering.

This substantiation for natural evolution was supported by data on overall molecular structure of SARS-CoV-2's backbone. If any laboratory's personnel were trying to engineer a new coronavirus as a pathogen, they would have constructed it from the backbone of a virus known to cause illness. But the scientists found that the SARS-CoV-2 backbone differed substantially from those of already known coronaviruses and mostly resembled related viruses found in bats and pangolins. Thus the mutations in the RBD portion of the spike protein and its distinct backbone rules out the possibility of any laboratory manipulation as a potential origin for SARS-CoV-2.

Possible origins of the virus

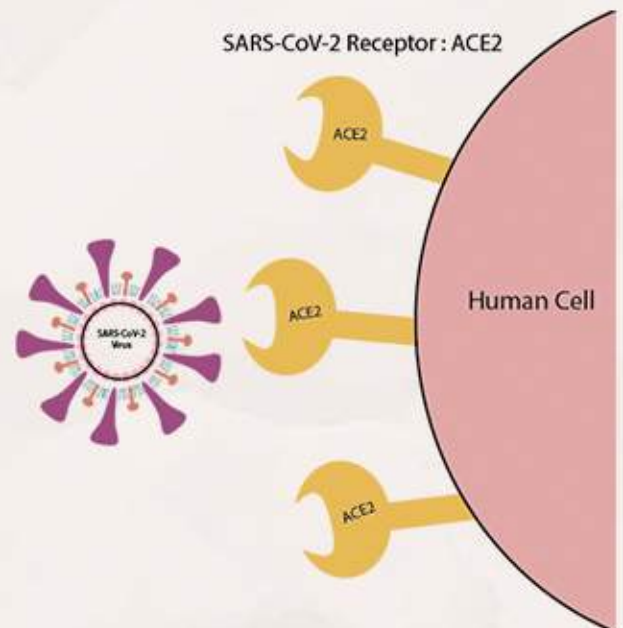
Based on the genomic sequencing analysis, researchers deduced that the most likely origins for SARS-CoV-2 followed one of two probable set-ups.

In one scenario, the virus is thought to be evolved to its current pathogenic state through natural selection in a non-human host and then jumped to humans via an intermediate host. This is how previous coronavirus outbreaks have emerged, with humans contracting the virus after direct exposure to civets (SARS) and camels (MERS). The researchers

proposed bats as the most likely non-human host for SARS-CoV-2 as it is very similar to a bat coronavirus. There are no documented cases of direct bat-human transmission, however, suggesting that an intermediate host was likely involved between bats and humans. In this set-up, both of the unique features of SARS-CoV-2's spike protein - the RBD portion and the cleavage site - would have evolved to their current state prior to entering humans. In this case, the current outbreak would possibly have surfaced rapidly as soon as humans were infected, as the virus would have already evolved the features that make it pathogenic and able to spread between people.

In the other projected scenario, a non-pathogenic version of the virus jumped from an animal host into humans and then evolved to its current pathogenic state within the human population. For example, some coronaviruses from pangolins, armadillo-like mammals found in Asia and Africa, have an RBD structure very similar to that of SARS-CoV-2 and a coronavirus from such mammals could possibly have been transmitted to a human, either directly or through an intermediary host such as civets or ferrets. Further, one of the distinctive spike protein features of SARS-CoV-2, the cleavage site, could have evolved within a human host and soon kicked off the current epidemic. The researchers revealed that the SARS-CoV-2 cleavage site, appears similar to the cleavage sites of strains of bird flu that has been shown to transmit easily between people.

At this point of time it is impossible to know that which of the set-ups is most likely to fit in the current scenario. If the SARS-CoV-2 entered humans in its current pathogenic form from an animal source, it raises the possibility of impending outbreaks, as the illness-causing strain of the virus could still be circulating in the animal population and might once again jump into humans. The chances are lower of a non-pathogenic coronavirus penetrating the human population and then evolving properties similar to SARS-CoV-2.



Ms. Megha Singh
B.Sc (H) III Year

Answers to Crossword

Across- 2. Scalar; 5. Escherichia; 6. Ptyalin; 7. Eon; 8. Mass Bunk; 10. Calciferol
11. Sponge; 12. Homeostasis; 13. Hypochondriac; 14. Reflection
Down- 1. Darwin; 3. Centrifugation; 4. Vitamin E; 9. Stethoscope

Out of the Box !!

STONE SPHERES OF COSTA RICA



Scientists aren't sure who made them, how old they are or what purpose they might have had.

The stone spheres of Costa Rica are an assortment of over three hundred petrospheres found in Costa Rica, located on the Diquís Delta and on Isla del Caño. Locally, they are also known as bolas de piedra (literally stone balls).



CAVE OF ALTAMIRA



The prehistoric paintings that adorn the walls of the Cave of Altamira in Spain were discovered in 1879 by an amateur archaeologist and his young daughter. The Paleolithic drawings, which were made with charcoal and natural earth pigments, depict bison, aurochs (an extinct species of wild cattle), horses, deer and the outlines of human hands. Scientists believe that most of the drawings were created between 14,000 and 18,500 years ago, though a recent study suggests that some of the artwork at Altamira was created about 35,600 years ago — at a time when humans were just starting to inhabit northern Europe.

MADABA MAP

The Madaba map is the oldest surviving map of the Holy Land (particularly Jerusalem) and is part of a floor mosaic in the Byzantine church of Saint George in Madaba, Jordan. The map was uncovered during renovations at the church in 1884 and dates to somewhere between 560 and 565 A.D. While the map originally depicted a large swath of the Middle East, from southern Syria to central Egypt, much of the mosaic map was already destroyed when it was first uncovered. However, the part of the map depicting Jerusalem remained in tact and includes an oval-shaped walled city with six gates, 21 towers and several dozen buildings and structures.



RAPA NUI



The most mythical element of the island is the Moais - marvelous monolithic bodies crafted out of tuff stone (volcanic ash).

Located in the southeast Pacific, Rapa Nui, or Easter Island, is best known as the home of approximately 1,000 giant "head" statues, or moai. There are an estimated 900 moai on Rapa Nui, which were carved and erected sometime between the 11th and 17th centuries A.D., according to UNESCO. The moai, and the ceremonial platforms (ahu) around which they typically stand, were built by a group of Eastern Polynesian settlers, who came to the island sometime around the first century A.D.

NAZCA LINES



visible from the air or nearby hilltops. They were created between 500 BCE and 500 CE. Despite being studied for over 80 years, the geoglyphs—which were designated a UNESCO World Heritage Site in 1994—are still a mystery to researchers.



The Nazca Lines are a collection of giant geoglyphs—designs or motifs etched into the ground—located in the Peruvian coastal plain about 250 miles south of Lima, Peru. There are about 300 different figures, including animals and plants. Composed of over 10,000 lines, some of which measure 30 m wide and stretch more than 9 Kms, the figures are most



STAFFORDSHIRE HOARD



The hoard objects are the possessions of Anglo-Saxons kings and princes, their royal households and warrior retinues. The Staffordshire Hoard contains both Christian and pagan symbolism, and shows influences from many different times and places. Stylised animals, intricate geometric patterns and complex symbolism mean that every object carries coded meanings that would have been powerful and significant for their owners.

The Staffordshire Hoard is the largest hoard of Anglo-Saxon gold and silver metalwork yet found. It consists of over 3,500 items, amounting to a total of 5.1 kg of gold, 1.4 kg of silver and some 3,500 pieces of garnet cloisonné jewellery. It's a trove of military items which lay hidden for 1400 years. The Staffordshire Hoard is composed of small and incredibly fine objects, breath-taking in their beauty and minute detail. The hoard objects are the



AZTEC RUINS



by the ancestral Pueblo until 1300 AD. Modern Mexico City is built atop the sinking lake and ruins that once

formed part of the Aztec Empire's principal city; Tenochtitlán. Tenochtitlán was an Aztec city that flourished between A.D. 1325 and 1521. Built on an island on Lake Texcoco, it had a system of canals and causeways that supplied the hundreds of thousands of people who lived there.

Pueblo people describe this site as part of their migration journey. Aztec Ruins was built as a public ceremonial, economic, and political center around 1100 AD and remained occupied





Future Zoologists

