



Most Trusted Learning Platform



PRACTICE QUESTIONS

Consider the following statements regarding ULLAS: Nav Bharat Saksharta Karyakram:

1. It is a Centrally Sponsored Scheme ✓
 - ✗ 2. It aims to provide higher Education benefits to girls in STEM field
 3. The development of online teaching-learning material, delivery of training and orientation is being done by UGC. **NLERT**
- How many statements given above is/are correct?

- ✓ a. Only one
- b. Only two
- c. All three
- d. None

PRACTICE QUESTIONS

Consider the following statements regarding Graphene-Aurora Program:

1. It will help small and medium enterprises (SMEs) and startups commercialize graphene technologies
2. It was launched by the Ministry of Science and technology ^x
3. It will be implemented by Digital University Kerala

How many statements given above is/are correct?

- a. Only one
- b. Only two ✓
- c. All three
- d. None

PRACTICE QUESTIONS

Consider the following statements regarding Bharatiya Nyaya Sanhita, 2023:

1. It has added community service as a form of punishment. ✓
2. It has repealed sedition as an offence. ✓
3. It has added a new provision of adultery as an offence. ✗

How many statements given above is/are correct?

- a. Only one
- b. Only two ✓
- c. All three
- d. None

PRACTICE QUESTIONS

The Katchatheevu Islands are present in:

- a. South China Sea
- b. Arabian Sea
- c. Red Sea
- d. None ✓

PRACTICE QUESTIONS

Consider the following statements with respect to Tiger Reserves:

1. It can be declared by the Union Government on the recommendation of NTCA. ~~X~~
2. A State Government can de-notify a tiger reserve with the permission of Chief Wildlife warden of the state.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2 ✓

~~NTCA~~
MBWL

Quantum Dots

- Quantum dots are nanoscale semiconductor particles that exhibit unique quantum mechanical properties.
- They are typically composed of materials like cadmium selenide (CdSe), cadmium sulfide (CdS), or other semiconducting materials

Aspect	Description	Examples of Applications
Size	Typically nanoscale (few nanometers in diameter).	1. Display technology (QLED TVs). 2. <u>Biological imaging</u> (cellular and molecular imaging).
Optical Properties	Size-dependent bandgap, emitting various colors of light.	1. Displays (vibrant and efficient color displays). 2. Lighting (efficient and tunable LED light sources). 3. Photovoltaics (improved efficiency in solar cells).

Plethora

Quantum Dots

Aspect	Description	Examples of Applications
Electronic Properties	High electron <u>mobility</u> and tunable energy levels.	1. <u>Transistors</u> (high- <u>performance</u> electronic devices).
		2. <u>Sensors</u> (sensitive detection of chemicals or biomolecules).
		3. <u>Quantum computing</u> (quantum bits or qubits).
Biological Applications	Low <u>toxicity</u> , suitable for in vivo imaging and therapy.	1. <u>Cancer imaging</u> and treatment (targeted therapy).
		2. <u>Drug delivery</u> (controlled release of drugs).
		3. <u>Disease diagnosis</u> (early detection of diseases).

Quantum Dots

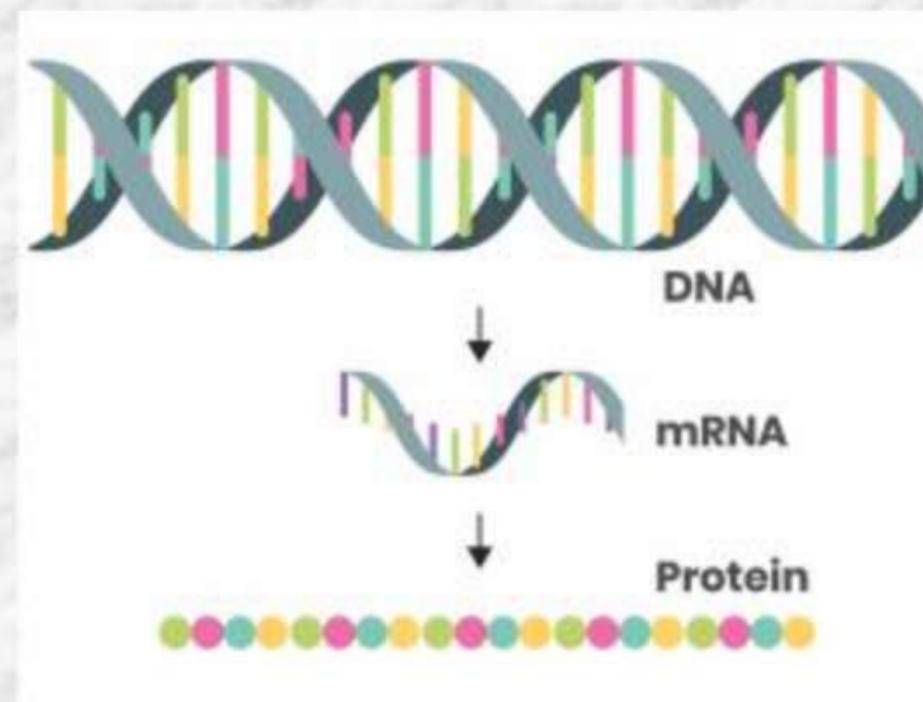
Aspect	Description	Examples of Applications
Environmental Uses	Efficient <u>catalysts</u> for <u>chemical reactions</u> .	1. <u>Environmental remediation</u> (pollutant removal).
		2. <u>Fuel cells</u> (improved catalytic activity).
		3. <u>Water purification</u> (removing contaminants).
Quantum Information	Quantum dots can be used as <u>qubits</u> in quantum computing.	1. <u>Quantum cryptography</u> (secure communication).
		2. <u>Quantum encryption</u> (protecting sensitive data).

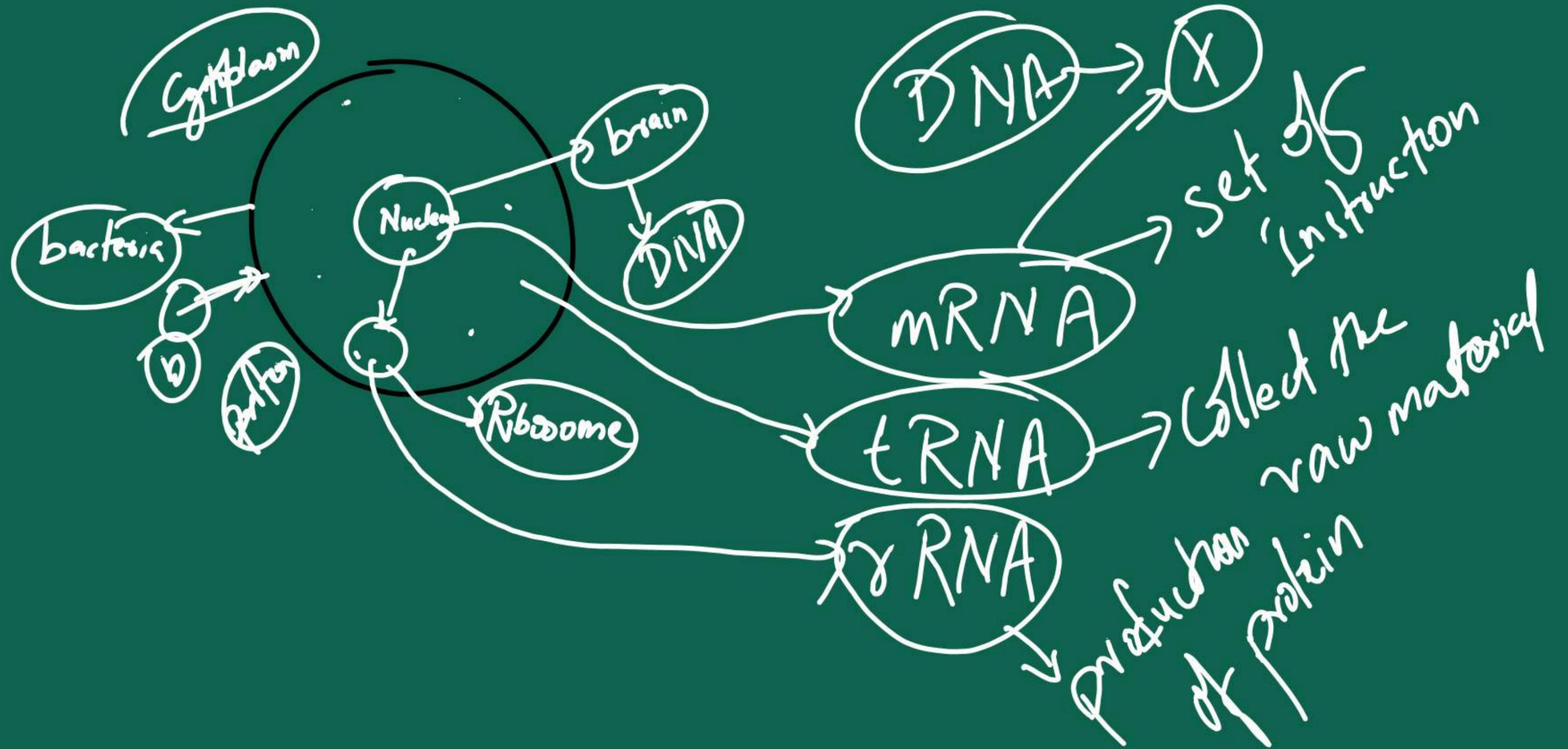
Nobel in Physics

- On October 3, the 2023 Nobel Prize for physics was awarded to Anne L'Huillier, Pierre Agostini, and Ferenc Krausz “for experimental methods that generate attosecond pulses of light for the study of electron dynamics in matter”.
- Attosecond science, including attosecond physics, or attophysics, deals with the production of extremely short light pulses and using them to study superfast processes.
- A major technique to measure the duration of a short light pulse is called RABBIT – and Pierre Agostini and his colleagues at a facility in Paris developed it in 1994.
- Here, the attosecond pulse and another pulse of a longer duration are shined on atoms of a noble gas.

Messenger RNA (mRNA)

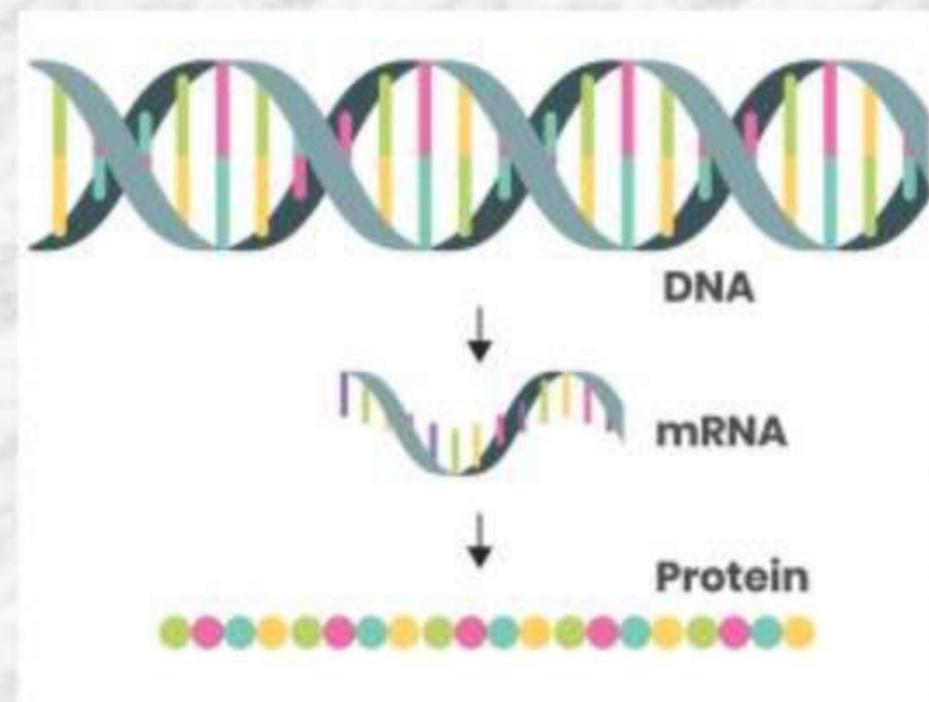
- mRNA—or messenger RNA—is a molecule that contains the instructions or recipe that directs the cells to make a protein using its natural machinery.
- To enter cells smoothly, mRNA travels within a protective bubble called a Lipid Nanoparticle.
- Once inside, our cells read the mRNA as a set of instructions, building proteins that match up with parts of the pathogen called antigens.
- The immune system sees these foreign antigens as invaders—dispatching defenders called antibodies and T-cells—and training the immune system for potential future attacks.
- So, if and when the real virus comes along, the body might recognize it—sounding the alarm to help defend against infection and illness.





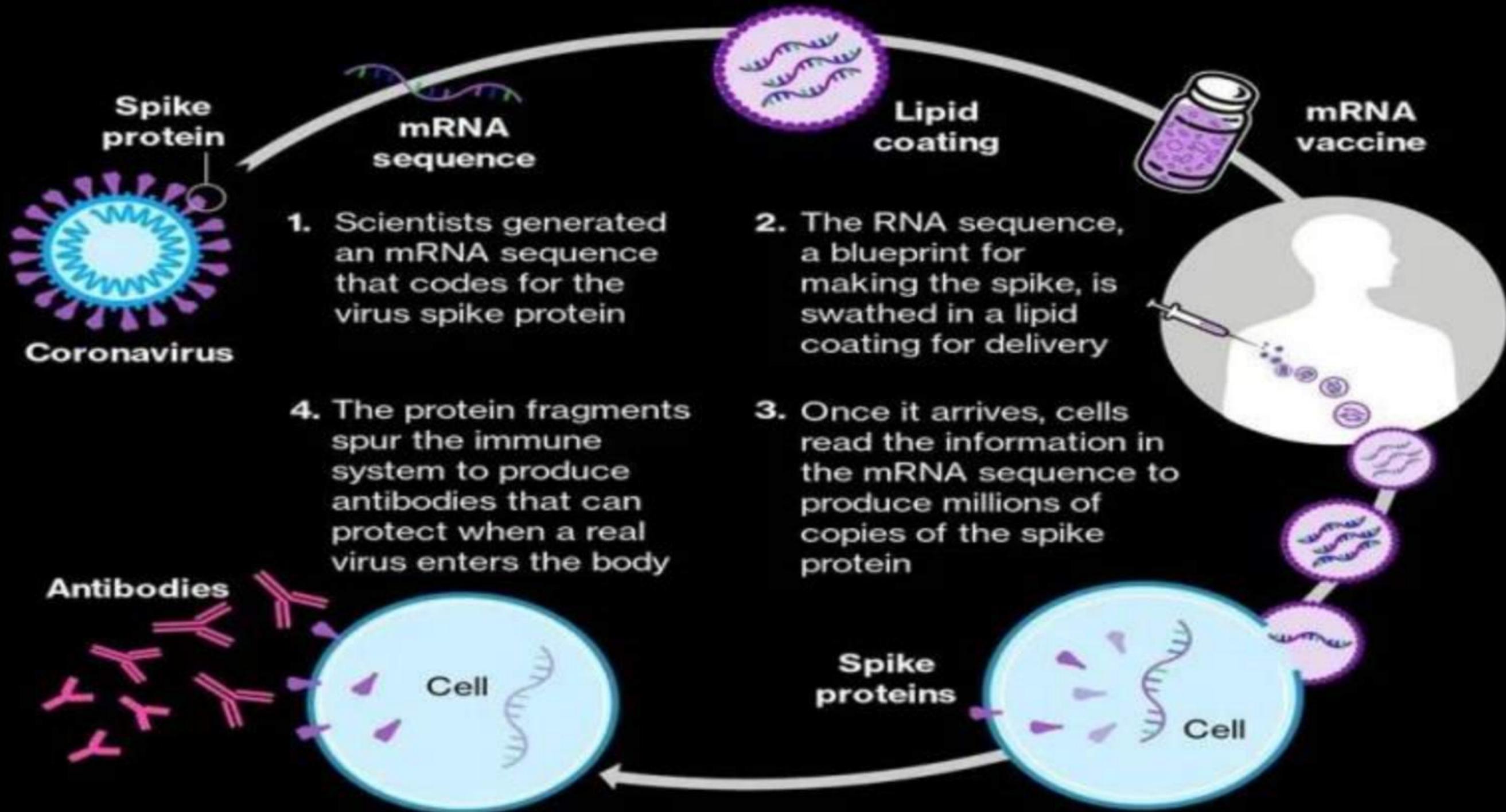
Messenger RNA (mRNA)

- Like other vaccines, the mRNA vaccine also attempts to activate the immune system to produce antibodies that help counter an infection from a live virus.
- However, while most vaccines use weakened or dead bacteria or viruses to evoke a response from the immune system, mRNA vaccines only introduce a piece of the genetic material that corresponds to a viral protein.
- This is usually a protein found on the membrane of the virus and is called spike protein. Therefore, the mRNA vaccine does not expose individuals to the virus itself.



How mRNA Vaccines Work

The vaccine spurs healthy cells to produce viral proteins that stimulate a potent immune response



DANGER (Deleterious and Anticipatable Guides Evaluated by RNA-sequencing)

- It provides a way for the safer design of genome editing in all organisms.
- The gene editing using CRISPR technology presents some challenges.
- The first challenge is that the phenotypic, or observable, effects caused by unexpected CRISPR dynamics are not quantitatively monitored.
- The second challenge is that the CRISPR technology generally depends on basic genomic data, including the reference genome.
- The reference genome is like a template that provides researchers with general information on the genome.
- Unexpected sequence editing with mismatches can occur

DANGER (Deleterious and Anticipatable Guides Evaluated by RNA-sequencing)

- The DANGER analysis quantified the phenotypic risk at the gene ontology term level, without a reference genome.
- This success showed that DANGER analysis can be performed on various organisms, personal human genomes, and atypical genomes created by diseases and viruses

CORAL REEF BREAKTHROUGH

- The International Coral Reef Initiative (ICRI), a network including 45 countries who represent over 75% of the world's coral reefs has launched Coral Reef Breakthrough
- It has launched the Coral Reef Breakthrough in partnership with the Global Fund for Coral Reefs (GFCR) and the High-Level Climate Champions (HLCC) at the 37th International Coral Reef Initiative General Meeting.
- The Coral Reef Breakthrough aims to secure the future of at least 125,000 km² of shallow-water tropical coral reefs with investments of at least US\$12 billion to support the resilience of more than half a billion people globally by 2030.
- The Coral Reef Breakthrough is grounded on science-based, measurable, and achievable goals for state and non-state actors to collectively conserve, protect, and restore coral reefs at the scale that is needed to secure the future of these vital ecosystems and their critical contributions to humanity

CONOCARPUS TREES

- It is an invasive mangrove species, recently banned by Gujarat government citing harm to the environment and human health.
- There are two species of Conocarpus (buttonwood) trees, with several varieties and hybrids — *Conocarpus erectus* (native to South America) and *C. lancifolius* (native to East Africa).
- Serious pollen allergies and respiratory problems have been reported in the vicinity of their plantations, which has led to civic agencies taking action to ban them.
- It was initially introduced in India as ornamental trees.



CONOCARPUS TREES



GLOBAL HUNGER INDEX (GHI)

- It is prepared and released by Irish NGO Concern Worldwide and German NGO Welthungerhilfe
- India ranks 111 out of a total of 125 countries in the Global Hunger Index (GHI) 2023
- India's ranking is based on a Global Hunger Index score of 28.7 on a 100-point scale where 0 is the best score (no hunger) and 100 is the worst
- It combines four indicators
 - Under-nourishment
 - Child stunting
 - Child wasting
 - Child mortality

Global Bond Index

- India has been recently included in JP Morgan's emerging market index
- A global bond index is a financial benchmark that provides a comprehensive measure of the performance of a specific segment of the global bond market.
- These indices typically track a diverse range of fixed-income securities, such as government bonds, corporate bonds, municipal bonds, and other debt instruments, from various countries and regions worldwide.
- Examples of global bond indices include the Bloomberg Barclays Global Aggregate Index and the J.P. Morgan Global Aggregate Bond Index.
- These indices cover a wide range of bond markets and play a crucial role in the investment world by guiding asset allocation decisions and risk management strategies for bond investors.
- It was the first time Indian G-Secs were added to a major global bond index

International Dyslexia Awareness Month

- The entire month of October was celebrated as dyslexia awareness month, with the North Block and South Block of Rashtrapati Bhavan, as well as India Gate and the Indian Parliament in Delhi being lit up in red to mark the occasion on 29th of October
- About the Event:
- Every year International Dyslexia Awareness Month is observed in October.
- The theme for this year was 'Go Red.'
- UNESCO MGIEP and its partner Changelinkk Foundation had sought for the government's support in the 'Go Red' campaign post in which many important buildings and monuments throughout Delhi displayed red lighting on October 29th evening

Go Red
Campaign

International Dyslexia Awareness Month

- The 'Go Red' campaign aims at removing the stigma associated with dyslexia, eradicating discrimination, and increasing public knowledge around the subject as well as the many strengths of dyslexic thinking.
- Dyslexia:
- It is a learning disorder that involves difficulty reading due to problems identifying speech sounds and learning how they relate to letters and words (decoding).
- It can make it difficult to process and remember information, which can affect learning and literacy skills.
- Dyslexia can be caused by differences in the parts of the brain that enable reading.
- It tends to run in families and appears to be linked to certain genes that affect how the brain processes reading and language

International Dyslexia Awareness Month

- **Causes:**
- **Genetics.** Dyslexia is highly genetic and runs in families. A child with one parent with dyslexia has a 30% to 50% chance of inheriting it. Genetic conditions like Down syndrome can also make dyslexia more likely to happen.
- **Disruptions in brain development and function.** Infections, toxic exposures and other events can disrupt fetal development and increase the odds of later development of dyslexia.



KHAN GLOBAL STUDIES

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THANKS FOR WATCHING

