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World Trade Organisation (WTO) (Source: Down To Earth)

- **Establishment:** The World Trade Organization (WTO) was established on January 1, 1995, replacing the General Agreement on Tariffs and Trade (GATT) under Marrakesh Agreement (1994)
- **Purpose:** The primary objective of the WTO is to facilitate smooth and free trade across the globe, ensuring that trade flows as smoothly, predictably, and freely as possible.
- **Headquarters:** Geneva, Switzerland.
- **Members:** 166 countries, representing 98% of global trade.
- **Key Bodies:**
 - Ministerial Conference (MC): Highest decision-making authority.
 - Dispute Settlement Body (DSB): DSB resolves trade disputes.

Core Functions

- The WTO provides a forum for negotiations among member countries to reduce barriers to trade and create agreements on various trade-related issues.
- The WTO has a robust dispute settlement mechanism to resolve trade disputes between members, ensuring that trade rules are respected and applied consistently.
- Regular reviews of member countries' trade policies are conducted to ensure transparency and understanding of trade policies and practices.
- The WTO assists developing countries in building their trade capacity through technical assistance and training programs.

Subsidies

- In WTO terminology, subsidies in general are identified by “Boxes” which are given the colours of traffic lights: green (permitted), amber (slow down – i.e. need to be reduced), red (forbidden).

Key Agreements

- **GATT:** The General Agreement on Tariffs and Trade, which focuses on reducing tariffs and other trade barriers.
- **GATS:** The General Agreement on Trade in Services, which governs international trade in services.
- **TRIPS:** The Agreement on Trade-Related Aspects of Intellectual Property Rights, which sets minimum standards for the protection of intellectual property.
- **TBT and SPS:** The Agreements on Technical Barriers to Trade and Sanitary and Phytosanitary Measures, which address regulations and standards to ensure they do not create unnecessary obstacles to trade.



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2 Parliamentary Privileges (Source: The Indian Express)

- *Parliamentary privilege refers to rights and immunities enjoyed by Parliament as an institution and MPs in their individual capacity, without which they cannot discharge their functions as entrusted upon them by the Constitution.*
- *The powers, privileges and immunities of either House of the Indian Parliament and of its Members and committees are laid down in Article 105 of the Constitution.*

Collective Privileges

- Parliament has the right to publish its reports, debates and proceedings and also the right to prohibit others from publishing the same.
- It can exclude strangers from its proceedings and hold secret sittings to discuss some important matters.
- It can make rules to regulate its procedure and the conduct of its business.
- It can punish members as well as outsiders for breach of its privileges.
- It has the right to receive immediate information about the arrest, detention, conviction, imprisonment and release of a member.
- The courts are prohibited to inquire into the proceedings of a House or its committees.
- No person (either a member or outsider) can be arrested, and no legal process (civil or criminal) can be served within the House without the permission of the presiding officer.

Individual Privileges

- Members of Parliament cannot be arrested during the session of Parliament and 40 days before the beginning and 40 days after the end of a session.
 - This privilege is available only in civil cases and not in criminal cases or preventive detention cases.
- They have freedom of speech in Parliament. No member is liable to any proceedings in any court for anything said or any vote given by him in Parliament or its committees.
- They are exempted from jury service. They can refuse to give evidence and appear as a witness in a case pending in a court when Parliament is in session.



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What is breach of privilege?

- There are no clear, notified rules to decide what constitutes a breach of privilege, and the punishment it attracts.
- Any act that obstructs or impedes either House of the state legislature in performing its functions, or which obstructs or impedes any Member or Officer of such House in the discharge of his duty, or has a tendency, directly or indirectly, to produce such results is treated as a breach of privilege.
 - E.g. It is a breach of privilege and contempt to print or publish libel reflecting on the character or proceedings of the House or its Committees or on any member of the House for or relating to his character or conduct as a legislator.

Sources of Privileges

- **Constitutional Provisions**
 - **For Parliament (Union Legislature):** Article 105 outlines the freedom of speech in Parliament, immunity from legal proceedings for statements made or votes cast, and the power of Parliament to define its other privileges.
 - **For State Legislatures:** Article 194 grants parallel powers, privileges, and immunities to the members and committees of state legislative assemblies.
- **Various Laws Made by Parliament**
 - **Code of Civil Procedure, 1908 (Section 135A):** Grants members freedom from arrest and detention under civil process during the continuance of a meeting of the House or its committees, and for 40 days before and after such meetings.
- **Rules of both the Houses**
 - Under Article 118 (for Parliament) and Article 208 (for State Legislatures), each House is empowered to make rules to regulate its own procedure and conduct of business.
- **Parliamentary Conventions**
- **Judicial Interpretations**

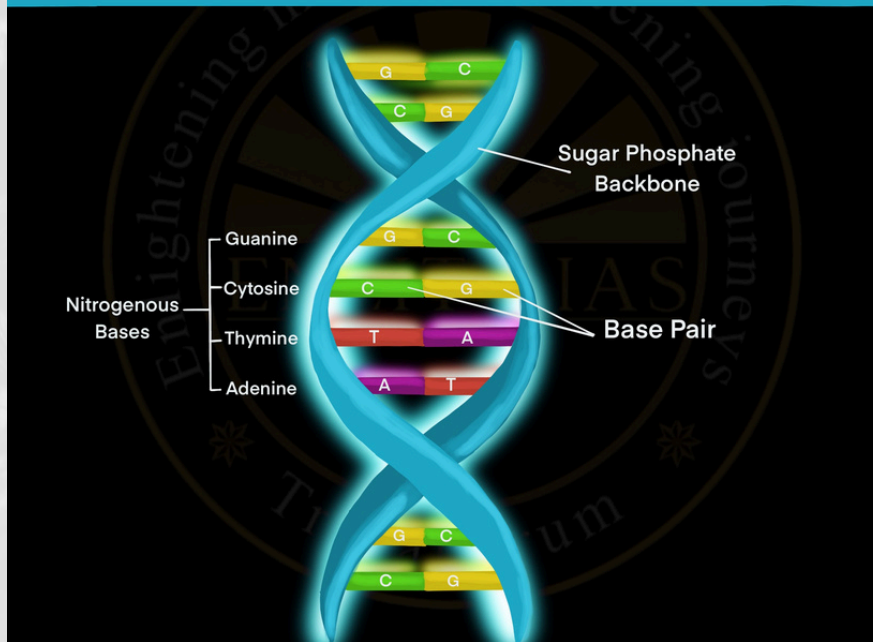


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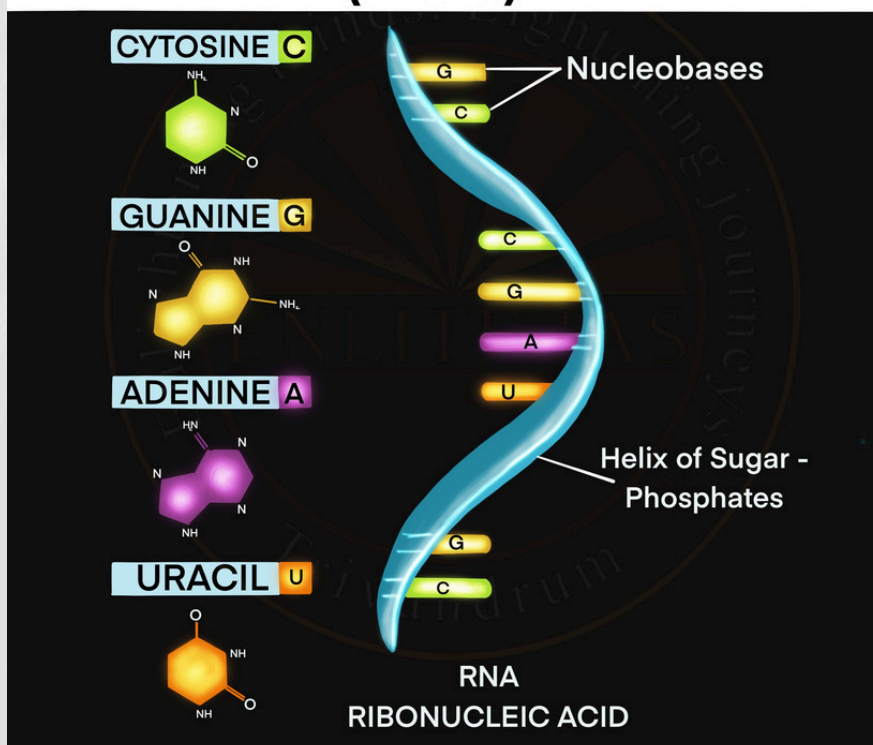
3**DNA vs RNA (Source: The Hindu)**

Deoxyribonucleic Acid (DNA)	Ribonucleic Acid (RNA)
- DNA is an organic chemical that contains genetic information and instructions for protein synthesis. - DNA is a key part of reproduction in which genetic heredity is passed down through DNA from parents to offspring	RNA is a nucleic acid principally involved in the synthesis of proteins, carrying the messenger (ex: mRNA) instructions from DNA, which itself contains the genetic instructions
It has a deoxyribose and phosphate backbone having four distinct bases: Adenine, Cytosine, Guanine & Thymine (ACGT).	It has a ribose and phosphate backbone with four bases: Adenine, Cytosine, Guanine & Uracil (ACGU).
Found in the cell nucleus and Mitochondria.	Found in the Cytoplasm, nucleus, and ribosomes.
Has 2-deoxyribose.	Has Ribose
A double-stranded molecule with a long chain of nucleotides.	A single-stranded molecule with a shorter chain of nucleotides.
Self-replicating	Synthesized from DNA when required.

DNA STRUCTURE



RIBONUCLEIC ACID (RNA)



4 Optogenetics Technology (Source: The Indian Express)

Optogenetics Technology

What is Optogenetics?

- Optogenetics is a technique that uses **light to control the activity of genetically modified cells**, usually neurons, with high precision.
- It combines **genetic engineering** and **optics** to make **specific cells responsive to light**.
- It allows scientists to **activate or inhibit** targeted neurons and study their function in real time.
- It is a powerful research tool to understand brain circuits, behaviour and disease mechanisms.

How Does It Work?

- 1 Introduce light-sensitive genes**
Genes encoding light-sensitive proteins (opsins) are inserted into target cells using viral vectors (e.g., AAV).
- 2 Expression in neurons**
Target neurons express light-sensitive proteins (e.g., Channelrhodopsin or Halorhodopsin) on their membranes.
- 3 Light stimulation**
A specific wavelength of light (delivered by LED, laser or optic fibre) stimulates the target neurons.
- 4 Control of neuronal activity**
Light opens or closes ion channels in opsins, activating or inhibiting neurons.

Key Components

- Light-sensitive proteins (Opsins)**
 - Channelrhodopsin (activates neurons)
 - Halorhodopsin / Archaelhodopsin (inhibits neurons)
- Gene delivery system**
 - Viral vectors (e.g., AAV) to introduce opsin genes into target cells.
- Light source**
 - LEDs or lasers of specific wavelengths.
 - Optical fibre to deliver light to precise brain regions.
- Target cells**
 - Specific neurons or other cell types modified to express opsins.

Major Applications

- Neuroscience research**
Understanding brain circuits, behaviour, learning and memory.
- Neurological and psychiatric disorders**
Research on Parkinson's disease, epilepsy, depression, autism etc.
- Vision restoration**
Activating retinal neurons to restore vision.
- Pain management**
Modulating pain pathways.
- Drug discovery**
Studying neural circuits for developing new therapies.
- Beyond neuroscience**
Control of heart cells, immune cells and other genetically modified cells for therapeutic research.

Advantages

- High spatial and temporal precision (control specific cells at specific times).
- Reversible and repeatable control of cell activity.
- Targeted manipulation of specific neuronal circuits.
- Minimal invasiveness compared to traditional methods.
- Useful for understanding complex brain functions and diseases.

Limitations and Challenges

- Requires genetic modification (ethical and safety concerns).
- Invasive delivery of light (optic fibres) for deep brain regions.
- Limited light penetration in tissues (restricts use to small or accessible regions).
- Potential immune response to viral vectors.
- Primarily used in animal models; limited application in humans.
- Technical and cost challenges.

Recent Update – 2026

2026 Nobel Prize in Physiology or Medicine

- Awarded to **Karl Deisseroth, Peter Hegemann and Georg Nagel** for their discoveries concerning light-gated ion channels and optogenetics.
- The recognition highlights the transformative impact of optogenetics in understanding brain function and its wide-ranging applications.
- It continues to drive research in brain disorders, sensory restoration and development of next-generation light-sensitive proteins.