



The Cancer Genome Atlas 2020 Conference

Why in News

The **Minister of Science and Technology** has virtually inaugurated the **2nd TCGA (The Cancer Genome Atlas) 2020 Conference** in **New Delhi**.

- The Conference brings together scientists and clinicians from across the globe to build **Indian Cancer Genome Atlas (ICGA)**.

Key Points

▪ Indian Cancer Genome Atlas (ICGA):

- It aims to create indigenous, open-source and comprehensive **database of molecular profiles of all [cancers](#) prevalent in Indian population**.
- Diverse molecular mechanisms including **genetic and lifestyle factors contribute to cancer**, posing significant challenges to treatment.
- Therefore, it is necessary to better understand the **underlying factors** patient by patient.

▪ About TCGA:

- It is a landmark **cancer genomics program** that molecularly characterized over 20,000 primary cancer and matched normal samples spanning 33 cancer types.
 - Genomics aims to **sequence, assemble, and analyse** the structure and function of **genomes**.
 - **Genome** is **all genetic material of an organism**. It consists of DNA (or RNA in RNA viruses).
- TCGA is a joint **effort of** the National Cancer Institute (NCI) and the National Human Genome Research Institute (NHGRI), which are both part of the National Institutes of Health, **U.S. Department of Health and Human Services**. It was **started in 2006**.
- TCGA generated a huge amount of genomic, epigenomic, transcriptomic, and proteomic data.
 - Transcriptomics technologies are the techniques used to **study an organism's transcriptome**, the sum of all of its RNA transcripts.
 - A Proteome is a **set of proteins** produced in an organism.
- This data has led to improvements in the ability to **diagnose, treat, and prevent cancer**.
- On similar lines, the establishment of an **'Indian Cancer Genomics Atlas (ICGA)'** has been initiated by a consortium of key stakeholders in India led by **[Council Of Scientific And Industrial Research](#)**, Government of India in which several government agencies, cancer hospitals, academic institutions and private sector are partners.

▪ Other Similar Missions:

◦ [Genome India](#):

- Its aim is to ultimately build a grid of the Indian **"reference genome"**, to fully

understand the **type and nature of diseases and traits that comprise the diverse Indian population.**

- The mega project hopes to form a grid after collecting **10,000 samples in the first phase from across India**, to arrive at a **representative Indian genome.**
- **IndiGen Genome Project:**
 - The initiative was implemented by the **CSIR-Institute of Genomics and Integrative Biology (IGIB), Delhi** and **CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad.**
 - The IndiGen programme aims to undertake **whole genome sequencing of thousands of individuals representing diverse ethnic groups from India.**

Cancer

- It is a **large group of diseases** that can start in almost any organ or tissue of the body when abnormal cells grow uncontrollably, go beyond their usual boundaries to invade adjoining parts of the body and/or spread to other organs. The latter process is called **metastasizing** and is a major cause of death from cancer.
- A neoplasm and malignant tumor are **other common names** for cancer.
- Lung, prostate, colorectal, stomach and liver cancer are the **most common types of cancer in men**, while breast, colorectal, lung, cervical and thyroid cancer are the **most common among women.**
- **Government Initiative:** [National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke \(NPCDCS\)](#) is being implemented under [National Health Mission \(NHM\)](#) for up-to the district level activities.

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