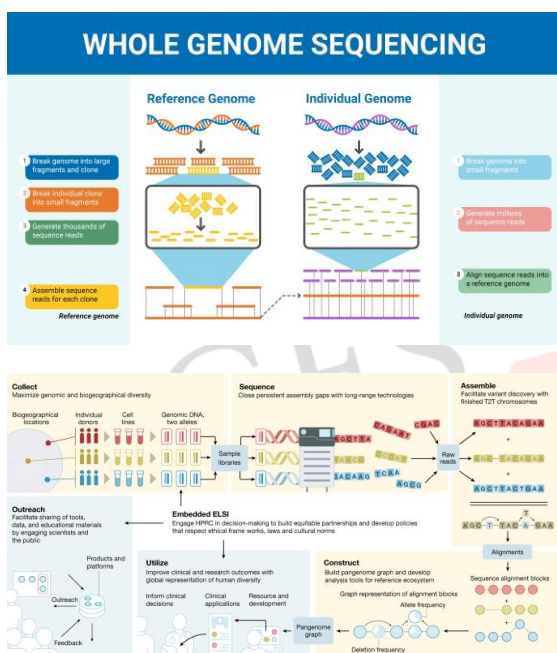


Pangenome map



What is a genome?

The genome is the blueprint of life, a collection of all the genes and the regions between the genes contained in our 23 pairs of chromosomes

What is a reference genome?

When genomes are newly sequenced, they are compared to a reference map called a reference genome.

This helps us to understand the regions of differences between the newly sequenced genome and the reference genome.

What is a pangenome map?

Unlike the earlier reference genome, which is a linear sequence, the pangenome is a graph.

The graph of each chromosome is like a bamboo stem with nodes where a stretch of sequences of all 47 individuals converge (similar), and with internodes of varying lengths representing genetic variations among those individuals from different ancestries.

Why is a pangenome map important?

Although any two humans are more than 99% similar in their DNA, there is still about a 0.4% difference between any two individuals.

This may be a small percentage, but considering that the human genome consists of 3.2 billion individual nucleotides, the difference between any two individuals is a whopping 12.8 million nucleotides.

A complete and error-free human pangenome map will help us

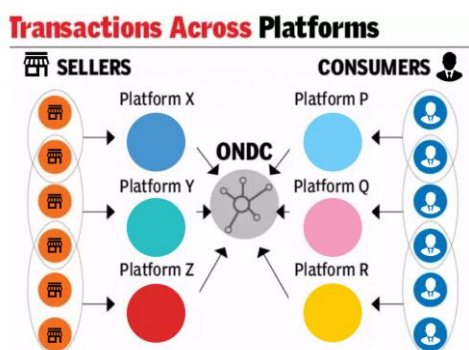
understand those differences and explain human diversity better.

It will also help us understand genetic variants in some populations, which result in underlying health conditions.

The pangenome reference map has added nearly 119 million new letters to the existing genome map and has already aided the discovery of 150 new genes linked to autism

THE HINDU

ONDC



What is the ONDC?

The government wants to change the fundamental structure of the e-commerce market from the current “platform centric model to an open network model”. The ONDC is modelled after the Unified Payments Interface (UPI) project that is seen as a success by many.

The UPI project allows people to send or receive money irrespective of the payments platforms on which they are registered. Similarly, the government wants to ensure that buyers and sellers of goods in the e-commerce market can transact regardless of the platforms on which they are registered.

So under ONDC, a buyer registered on Amazon, for example, may directly purchase goods from a seller who sells on Flipkart.

To make such transactions a reality, the government has ordered companies to list themselves on the ONDC

Why is the Centre pushing for it?

The government believes that the ONDC will put an end to the domination of the e-commerce market by a few large platforms. It says that the e-commerce market is currently broken into “silos” operated and dominated by private platforms.

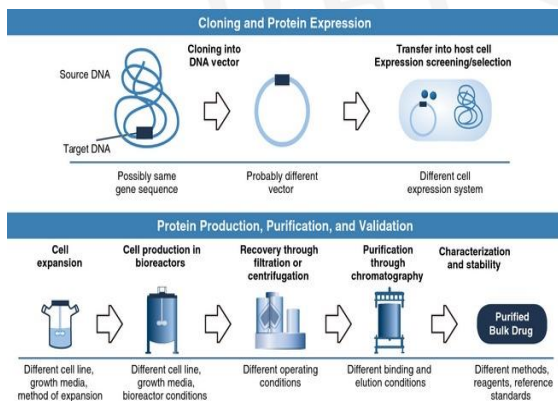
Amazon and Flipkart, for instance, have been accused of promoting certain seller entities in which they hold indirect stakes.



THE HINDU

Bio manufacturing map

Bio manufacturing is a type of manufacturing or biotechnology that utilizes biological systems to produce commercially important biomaterials and biomolecules for use in medicines, food and beverage processing, and industrial applications.



In March 2021, the Quad (Australia, India, Japan, and the United States) set up a Critical and Emerging Technology Working Group to facilitate cooperation, monitor trends, and scout for opportunities related to developments in critical and emerging technologies, that included biotechnology.



Bio manufacturing uses living systems, particularly microorganisms and cell cultures, to produce molecules and materials on a commercial scale.

It has the potential to transform the global industrial system, with up to 60% of physical inputs to the global economy expected to be producible using this technology.

India's National Biotechnology Development Strategy also envisions the country as a "Global Bio-manufacturing Hub" by 2025.

The U.S. has significant funding capability, while all three (Japan, Australia, and the U.S.) also possess advanced biotechnology innovation ecosystems and intellectual property.

India has skilled manpower and the potential to provide affordable scale.

Concerns about China's dominance in APIs pushed India to launch a production linked incentive scheme that allocated \$2 billion to the pharmaceutical sector to make biopharmaceuticals, APIs, key starting materials, and related products. Such dependence on the biomanufacturing sector will be detrimental to both India and the Quad.

To scale up the biomanufacturing sector, India needs to uplift its workforce quality. While there are many life science professionals in the

country, they lack access to cutting-edge technology and training.

To address this, permanent training facilities can be established in universities around the Quad hub, with experts from other Quad countries providing the training.

To facilitate cross Quad collaboration, the biomanufacturing hub can house all current bilateral government efforts and establish a research collaboration office for this purpose.

The hub can also harmonise language, regulations, and data sharing regarding biomanufacturing to secure supply chains for Quad nations and facilitate international collaboration.

THE HINDU

Astara Rasht valley

The **Rasht Valley** is located in Tajikistan and composes a significant portion of the Region of Republican Subordination, including the six districts of Lakhsh, Rasht, Roghun, Tavildara, Tajikobod and Nurabad.

Historically the Rasht Valley has been called Karotegin or Karategin. During the 1992-1997 Tajikistan Civil War, the region was a stronghold for

forces opposed to the government of Emomalii Rahmon and became the site of numerous battles. Notably, four members of the United Nations Mission of Observers in Tajikistan were murdered in the Garm district in 1998. From the 1920s until 1955 the Rasht Valley was within the Gharm Oblast.



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