

IndiGen Genome Project

The IndiGen Genome Project is an initiative of the Council of Scientific and Industrial Research (CSIR) to collect and sequence the genomes of the ethnic Indian population in order to develop better public health applications.

The IndiGen Genome Project was launched by the CSIR in April 2019. It was implemented by CSIR-Institute of Genomics and Integrative Biology (IGIB), New Delhi and CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad.

This article will give details about the IndiGen Genome Project within the context of the Civil Services Examination.

What is a Genome?

Before we go into details about the IndiGen Genome Project it is important to know what genomes are first.

The complete set of an Organism's DNA is what we call a genome. It includes genes, where the DNA is located and chromosomes, containing all the required data needed to describe the organism completely, a blueprint of sorts in layman's terms. The process with which these blueprints are understood is called sequencing.

The data gathered from a decoded DNA can be used to analyse how genes function and by understanding genetic mutations scientists learn how a gene functions.

Genetic mutations are what cause diseases like cancer and conditions like vitiligo. Thus by decoding a genome, it can reveal a lot about a person's health. Apart from this it can also reveal how much a section of the population is predisposed to a certain range of diseases.

Overview of the IndiGen Genome Project

The main aim of the IndiGen project is to carry out genome sequencing of 1008 Indian Individuals.

The objective is to create a pilot database of carrier genetic diseases that will in turn enable an affordable carrier screening approach in India. The Human genome dataset would be utilized for prioritising treatments for genetic disease specific for the Indian population.

Further, the IndiGen project will have the following advantages:

- Studying DNA data from patients who suffer a specific disease can also help trace the origin of that disease.
- The research of a specific and significant set of samples derived from a population sub-group will provide useful data on the predisposition of the various diseases common in that particular subgroup.
- By analysing the genomic data, along with reviewing the resulting medical information, victims of rare diseases can reveal the mutations that are the root cause of the disease. This data can be used to improve diagnostics and ensure better treatment.

Need and Challenges of the IndiGen Project

The reason why the IndiGen Project is necessary is as follows:

- The Indian population is uniquely diverse, thus it is important to adequately represent this diversity in terms of genomic data and develop ways to generate, maintain, analyse and communicate large-scale genomic data.
- While there are a few genes that will make an individual immune to few drugs. Genome sequencing can to an extent help in understanding how such an immunity comes about.
- The result will be needed to be utilized for a better understanding of the genetic diversity of the population. It will help in making clinical applications for a better treatment of genetic diseases.

Challenges of the IndiGen Project

- The IndiGen Project targets 10,000 genomes which need substantial expansion. As this expansion happens the sampling approach needs to be identified in order to gather accurate data.
- The next issue is how much of this data can remain in the public domain or would they be shared with commercial ventures. This data contains genetic information along with personal sensitive information.
- It may not be necessarily true that those who give such data are comfortable in sharing it out in the public domain or sharing it with companies that collect them.
- For the successful implementation of this project an extensive training of scientists, and technicians need to be undertaken in order to determine the best course of medical action.

In the end the success of the IndiGen Genome project may lead to the advancement of India's healthcare systems. It will ultimately lead to an improvement in the quality of life of all its citizens.

