Synthetic Human Genome Project

Prelims: Current events of national and international importance | Science and technology

Why in news?

Recently a UK-based laboratory started Synthetic Human Genome Project initiative to construct human DNA from scratch.

- **Synthetic Human Genome Project** – It is considered a world-first project in **synthetic** human DNA construction.
- **Initiative by** – It is led by researchers from the MRC Laboratory of Molecular Biology, Cambridge.
- **Aim** – It aims to assemble **artificial chromosomes** in the lab.
- **Objectives –** To explore how genes govern repair, development, and illness.
- To enable the creation of disease-resistant cells that can help regenerate damaged organs like the heart, liver, and immune system.
- **Funding** – It is backed by an initial grant of £10 million from the Wellcome Trust, the world's largest medical charity.
- **Relevance on Human Genome Project –** The Synthetic Human Genome Project builds directly on the Human Genome Project achievements.
- While the Human Genome Project focused on reading existing DNA, the synthetic project aims to construct human DNA from scratch, including artificial chromosomes.
- **Potential benefits** – It could revolutionise treatment for genetic disorders and age-related diseases.
- It opens the possibility of new therapies to improve health and longevity.
- It could lead to breakthroughs in creating disease-resistant cells for repairing organs like the heart, liver, and immune system.
- **Ethical concerns and risks –** Fears of creating **designer humans** or **synthetic life** with unforeseen consequences.
- Risk of misuse for harmful purposes, including **biological warfare**.
- Concerns about who controls and regulates synthetic human DNA technology.
- **Ethical oversight mechanism** – A parallel mechanism is established,

which involves sociologists, ethicists, and public consultations to understand public perceptions, benefits, and concerns.

Reference

[The Indian Express| Synthetic Human Genome Project]