AI-designed Proteins to Generate Immune Cells

Source: TH

Harvard scientists have used **AI-designed proteins** to generate large numbers of **immune cells,** boosting immunity against diseases like **cancer and viral infections**.

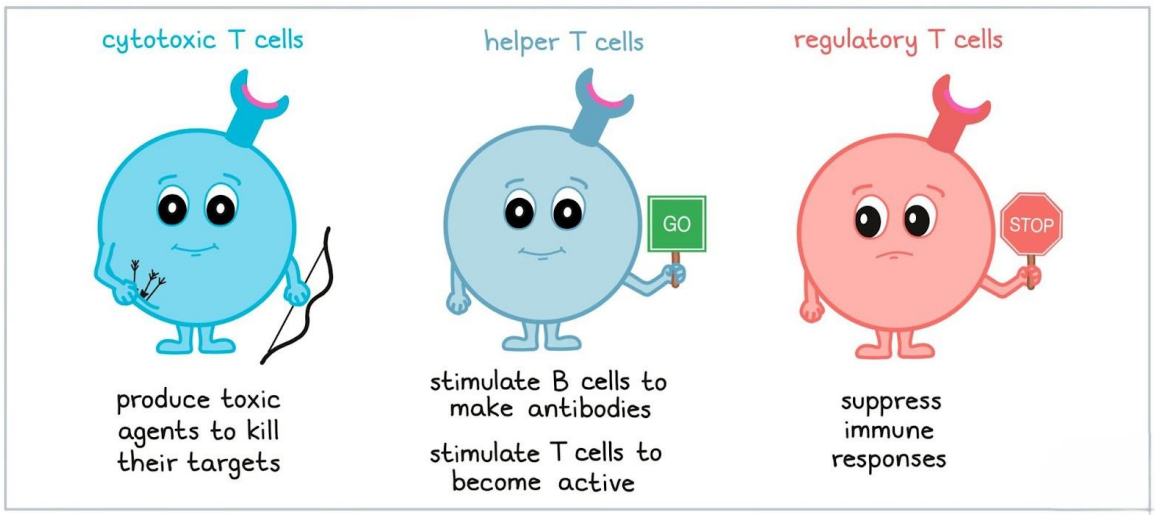
- They engineered a synthetic activator for the **Notch signalling pathway**, which is crucial for **transforming immune progenitors into T cells.**
- Notch signalling helps maintain tissue balance and stability in the body**.**
- **Progenitor cells are i**ntermediate cells between **stem cells** and **mature cells** that **divide** and **differentiate** into specific cell types, essential for **tissue development** and **regeneration**.

AI-designed Proteins

- **Mechanism: Using AI-based protein design techniques, researchers engineered synthetic protein activators that are safe and effective for use within the human body.**
  - **David Baker** was awarded the **2024 Nobel Prize in Chemistry** for his groundbreaking work in **computational protein design**, leveraging **AI-based techniques.**
- **Impact & Applications:**
  - Enabled **large-scale T cell production** in lab bioreactors, aiding **CAR-T therapies.**
  - In **animal trials**, these proteins enhanced T cell response and promoted **long-lasting Memory T cells**, boosting **vaccine efficacy**.
  - Potential for future therapies, **targeted protein designs** could connect **T cells to cancer cells**, enhance **anti-tumor immunity**, and counter **tumor-induced immune suppression**.

T Cells:

- **T cells** are a type of **white blood cell (WBC)** essential to the **immune system,** responsible for **identifying and responding to pathogens**.



Read More: CAR-T Cell Therapy