



# drishti

## Preventive Methods for Alzheimers

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### Why in News

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Researchers at the **Indian Institute of Technology-Guwahati** (IIT-G) have found methods for preventing the accumulation of **neurotoxic molecules** in the brain, which leads to **Alzheimer's** disease.

### Key Points

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- The cause of Alzheimer's is the **accumulation of amyloid-beta peptides** (neurotoxic molecules) in the brain.
  - **Peptide** is similar to the plaque that blocks arteries and affects blood supply, leading to cardiovascular diseases.
  - **Peptide aggregation/accumulation** means their formation of one over the other, **deforming the cortex of the brain** which leads to Alzheimer's.
  - The peptide molecules need to have a **certain structure to aggregate**.

- **Preventive Methods:**
  - **Use of Trojan Peptides:**
    - In this approach, the purpose is to design a **deceitful peptide** with **“negative syncretical points”** for checking the plaque formation.
    - **Trojan peptide** (deceitful peptide) has the same structure as the peptide in the body but its **function is contrary to aggregation**.
    - It adopts a similar **approach of deceit** to impede the aggregation of the amyloid peptide, and reduce poisoning of nerve cells that leads to memory loss.
    - The degeneration of poisoned cells can be delayed by intravenous injection of the trojan peptide, which in turn, can delay the onset of disease by 10 years.
  - **Application of a low-voltage electric field:**
    - The electric field can **prevent amyloid plaques from aggregating**.
    - The use of an external electric or magnetic field **modulates peptide molecules** to pull back the possibility of Alzheimer’s to a certain extent.
- **Earlier Discoveries:**
  - In **July 2019**, an Indian-American scientist at the **University of New Mexico** developed an **early version vaccine** for Alzheimer’s disease.  
Vaccine intervention could **rescue memory impairments and prevent neurons from dying** by reducing tau tangles.
  - In **November 2019, China** approved the **world’s first multi-targeting and carbohydrate-based** drug **GV-971** for Alzheimer’s.

## Alzheimer’s Disease

- It is a **neurological disorder** which causes brain cells to **degenerate and die**. This leads to loss of memory, problems with words in speaking or writing, poor judgment, changes in mood and personality, confusion with time or place, etc.  
At the **first stage**, these symptoms are **mild** but they become **more severe with time**.
- Alzheimer’s is the **most common cause of dementia** among older adults.  
**Dementia** is a group of brain disorders that cause the loss of intellectual and social skills.
- Alzheimer’s is caused by the **build-up of proteins** known as **tau tangles or plaques** within the brain and is also known as the **third type of diabetes**.  
**Tau** is a protein that when it occurs in tangled formations in the brain of Alzheimer patients, disrupts the ability of neurons to communicate with one another in the brain.
- Alzheimer’s is an **incurable disease**, as the death of brain cells cannot be reversed.
- **Women have a higher risk** of having Alzheimer’s disease than men.

## Way Forward

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- **Around 100 potential drugs** for the treatment of Alzheimer's disease **failed** between 1998 and 2011 and now these developments are a **big step** in the direction.
- The cure is important for **India** because it **stands at the third position after China and the USA** in the number of Alzheimer's patients. Along with cure, India also needs to clearly define public health strategy with a significant focus on research into degenerative diseases and investment in the training of healthcare personnel.

**Source: TH**