Fragile X-associated Tremor/Ataxia Syndrome (FXTAS)

Researchers at Indian Institute of Technology (IIT)-Indore have found that **piperine** can be used as a therapeutic agent against **neurodegenerative disorder, Fragile X-associated tremor/ataxia syndrome (FXTAS).**

- **Piperine is a natural alkaloid present in black pepper,** responsible for the pungency of black pepper. It has been used in some forms of traditional medicine.

Fragile X-associated tremor/ataxia syndrome (FXTAS)

- Fragile X-associated tremor/ataxia syndrome (FXTAS) is characterized by problems with movement and thinking ability (cognition).
- FXTAS is a **late-onset disorder,** usually occurring after age 50, and its signs and symptoms worsen with age.
- It affects males more frequently and severely than females. Affected individuals have areas of damage in the part of the brain that controls movement (the cerebellum) and in a type of brain tissue known as white matter, which can be seen with magnetic resonance imaging (MRI).
- The disorder results in progressive **cerebellar ataxia, action tremor, Parkinsonism** and **cognitive decline.** It is caused by a **mutation in a gene** called **fragile X mental retardation 1 (FMR1)** and occurs due to the **excessive presence of what are called repeats RNA** in a specific region of the gene.
    - The number of repeat RNAs in patients with FXTAS could be up to 200, compared with 55 normally. The excess repeats RNA cause cytotoxicity in neuronal cells. Scientists have been trying to modulate the mutation with chemical molecules but with no success so far.

Advantage of Piperine

- Piperine interacts with repeats RNA and reduces the level of cytotoxicity in the neuronal cell.
- It is known for its anti-carcinogenic activity, hepato-protection, antioxidant, nephron-protective, anti-inflammatory, anti-apoptotic, antidepressant and neuroprotective nature.

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