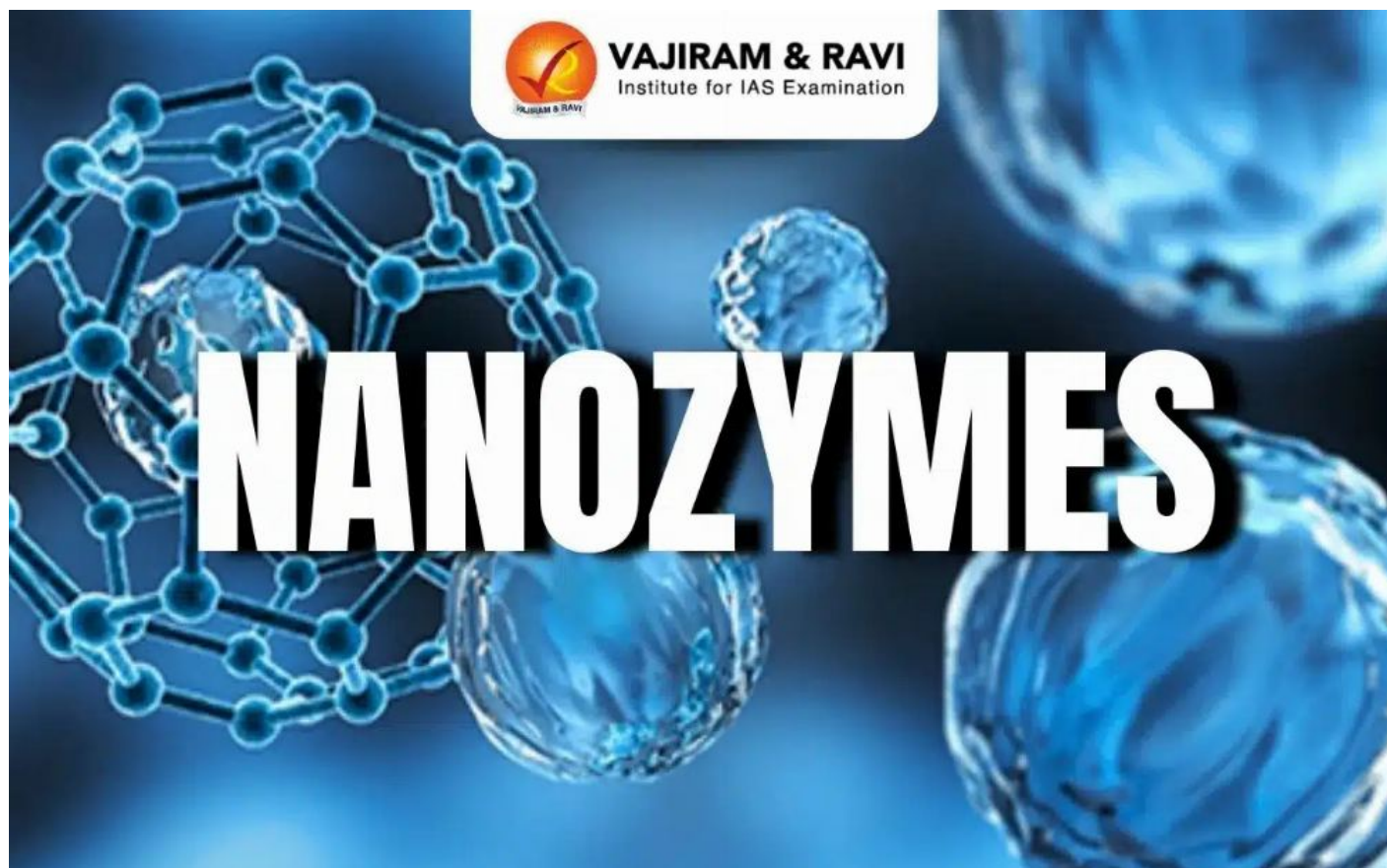


Nanozymes

June 4, 2025 • vajiramandravi.com



Nanozymes Latest News

Researchers at the Indian Institute of Science (IISc.) recently developed an artificial metal-based nanozyme that can potentially be used to clamp down on abnormal blood clotting caused by conditions like pulmonary thromboembolism (PTE).

What are Enzymes?

- Enzymes are **proteins that help speed up metabolism**, or the chemical reactions in our bodies.
- They **build some substances and break others down**.
- **All living things have enzymes**.
- Our **bodies naturally produce** enzymes. But enzymes are **also in manufactured products** and food.

About Nanozymes

- Nanozymes are **nanomaterials that display enzyme-like characteristics**.

- They may be **metallic, metal oxide-based, carbon-based**, or of other types.

Nanozymes Advantages

- They are **less expensive** and **recyclable**.
- Nanozymes can also be **easily manufactured** and **stored for long periods of time**, further reducing their cost.
- **Typical inorganic enzymes require high temperature, high pressure, and extreme pH** conditions. In contrast, **nanozymes are able to work in** environments closer to **physiological conditions** and **respond to a range of external stimuli**.
- The most important advantage is the **display of size/composition-dependent activity**, meaning that nanozymes **can be designed with a range of catalytic activity** by simply varying shape, structure, and composition.
- Nanozymes also have unique properties compared to other artificial enzymes, including **integrated multi-functions not related to catalysis**.
- Nanoscale materials provide **large surface areas**, allowing greater ease in further modifications and bioconjugation.
- The **ability to self-assemble** also mimics an important strategy in biology, meaning that **biological components can be easily incorporated**.

Nanozymes Applications

- Nanozymes have a large range of applications for **diagnostic medicine, targeted therapy, and biosensing**.
- In recent years, it has been found that various nanozymes have **antioxidant activity**, allowing them to simulate the endogenous antioxidant system and play an **important role in cell protection**.
- Therefore, nanozymes can be **applied in the treatment of reactive oxygen species (ROS)-related neurological diseases**.

Nanozymes FAQs

Q1: What are nano enzymes?

Ans: Nanozymes are nanomaterials that display enzyme-like characteristics.

Q2: What makes nanozymes cost-effective?

Ans: They are recyclable and easy to manufacture.

Q3: Why do nanozymes offer better control over enzyme activity compared to natural enzymes?

Ans: Their activity can be tuned by modifying size, shape, and composition.

Source: TH