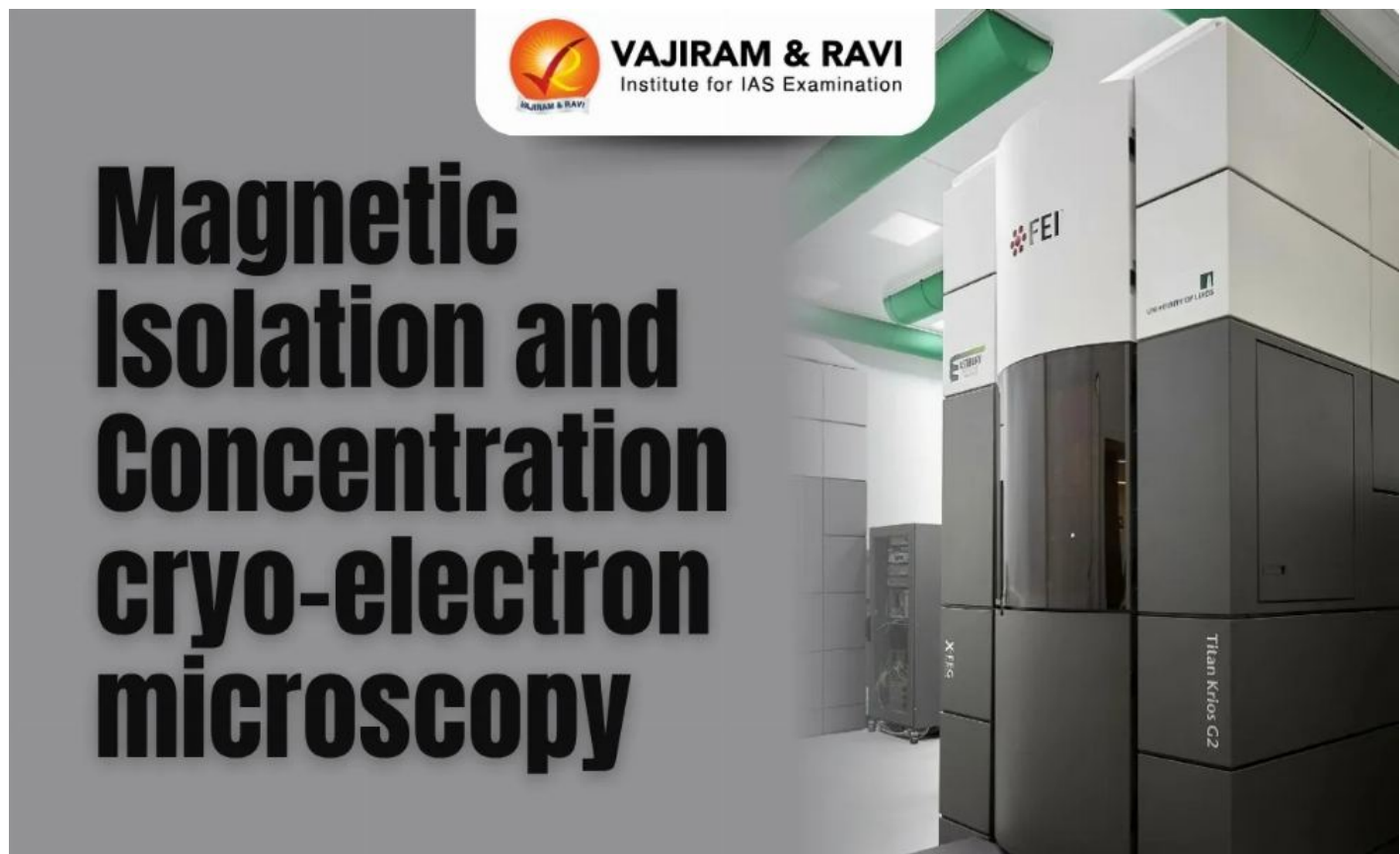


Magnetic Isolation and Concentration Cryo-Electron Microscopy

June 10, 2025 • vajiramandravi.com



Magnetic Isolation and Concentration Cryo-Electron Microscopy Latest News

Researchers in the U.S. have created Magnetic Isolation and Concentration cryo-electron microscopy (MagIC) which can study samples 100x more dilute than before.

About Magnetic Isolation and Concentration Cryo-Electron Microscopy

- It helps researchers to **study samples 100 times** more dilute than before.
- It is a technique **enabling direct structural analysis** of targets captured on magnetic beads, thereby reducing the targets' concentration requirement to <0.0005 mg/mL.

Working of Magnetic Isolation and Concentration Cryo-Electron Microscopy

- It uses **magnetic beads (50-nm size beads)** to hold molecules in place.
- This **greatly reduces** the amount of protein needed in the initial sample.
- A refined analysis method **called** Duplicated Selection To Exclude Rubbish (DuSTER) was designed in parallel to help capture the structure of **smaller molecules**.
- MagIC-cryo-EM and DuSTER will allow scientists to use cryo-EM to examine the structure of proteins which are smaller, challenging to isolate or present in minute quantities inside cells.
- **Application:** The knowledge gained from these findings could help us better understand a wide **range of biological processes**.

Key Facts about Cryo-Electron Microscopy (Cryo-EM)

- It is a technique that allows researchers to **directly visualize proteins**.
- The approach first requires **flash-freezing a sample at extremely low temperatures**, and then sending a beam of electrons through the specimen from several angles.
- The resulting series of two-dimensional images are analysed using advanced algorithms to construct a final three-dimensional protein model.
- **Limitations:** Despite its power, cryo-EM also has limitations, including requiring very large quantities of protein in the initial sample. The algorithms currently available for Cryo-EM analyses also struggle to determine **the structure of smaller molecules**.

Source: TH

Source: <https://vajiramandravi.com/current-affairs/magnetic-isolation-and-concentration-cryo-electron-microscopy/>

© Vajiram & Ravi. For personal use only.