

3D Microscope

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3D Microscope Latest News

For the first time, the Indian Army's Department of Ophthalmology at Army Hospital (Research and Referral), New Delhi, has successfully performed Minimally Invasive Glaucoma Surgery (MIGS) using a 3D Microscope.

What is a Microscope?

- A **microscope** is an instrument that **magnifies small objects**, making them visible to the naked eye by **bending (refracting) light rays** through **curved lenses**.
- The most commonly used microscopes are optical microscopes, where visible light is focused through lenses to create an enlarged image.

What is a 3D Microscope?

- A 3D microscope produces images with depth information (X, Y, and Z axes), allowing researchers to visualize and measure the topography, volume, and internal structures of samples.

- Unlike traditional light microscopes, which provide flat, 2D images, 3D microscopes use **advanced optical, electron, or computational techniques** to capture and reconstruct three-dimensional data.
- This is particularly useful for studying complex biological or environmental samples, such as **soil microbes, aquatic organisms, or microplastics**.

Features of the 3D Microscope

- **The 3D Microscope uses advanced three-dimensional visualisation, assisting in complex eye surgeries** such as treatment for **squint, cataract, corneal diseases, glaucoma, and retinal conditions**.
- It employs **special 3D polarisation glasses** for surgeons and a **55-inch 4K ultra-HD display**.
- **Key advantages** include:
 - **Reduced surgical time and lower complication rates** compared to conventional microscopes.
 - **Decreased endoilluminator power requirements**, thereby reducing **photo-toxicity** risks.
 - **Ease of performing surgeries in complex and rare cases**.

3D Microscope FAQs

Q1: What is a 3D Microscope?

Ans: A 3D Microscope is an advanced imaging tool that creates three-dimensional, highly detailed visualizations of microscopic samples, enhancing depth perception.

Q2: Which technologies are used in 3D Microscopy?

Ans: Techniques like confocal microscopy, two-photon microscopy, and light-sheet fluorescence microscopy are commonly used for 3D imaging.

Q3: How does a 3D Microscope differ from a traditional microscope?

Ans: Unlike traditional microscopes that provide flat, two-dimensional images, 3D microscopes generate volumetric images that can be rotated and analysed from different angles.

Source: [PIB](#)

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