Scattering refers to the physical process in which particles, waves, or radiation (such as light, sound, or subatomic particles) deviate from a straight trajectory due to irregularities or interactions with other particles, surfaces, or fields.

In the context of light: Light scattering is the phenomenon where light rays change direction due to interaction with small particles or fluctuations in a medium. It is a fundamental concept in optics and is used in many imaging and diagnostic techniques.

Types of light scattering include: Rayleigh scattering – occurs when particles are much smaller than the wavelength of light; explains why the sky is blue.

Mie scattering – occurs when particles are about the same size as the wavelength; relevant in fog or biological tissue.

Tyndall effect – visible scattering of light by colloidal particles in a solution.

Raman scattering – inelastic scattering where light changes energy, useful in chemical analysis.

In biomedical imaging, scattering helps in:

Visualizing tissue structure

Tracking nanoparticles

Analyzing cells without labels

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