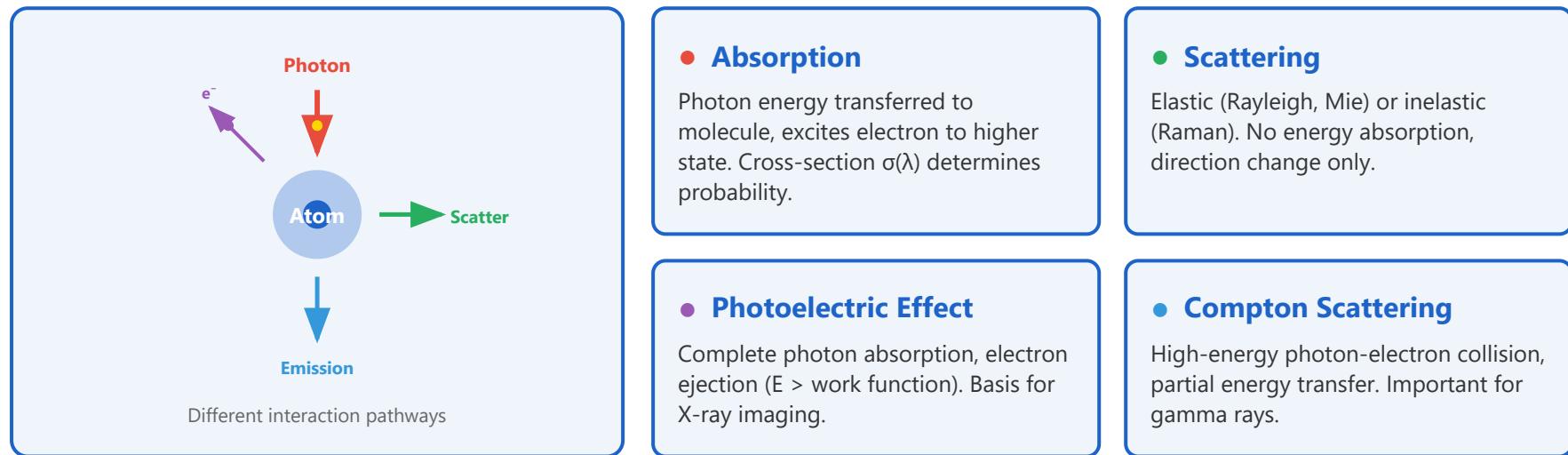


Photon-Matter Interactions



⚠ Biological Damage Thresholds

UV: DNA damage, thymine dimers (<320 nm)

Visible/NIR: Generally safe, but high intensity causes thermal damage

Ionizing (X-ray, γ): Direct DNA breaks, ROS generation

Photobleaching: Fluorophore destruction limits imaging time