

Fluorescence Measurements: Principles and Instrumentation

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Fluorescence measurements are a fundamental tool in various scientific fields, enabling the detection and analysis of fluorescent molecules present in biological cells and tissues with high sensitivity and specificity. This lecture provides an overview of the principles underlying fluorescence, including the concepts of excitation and emission, the Stokes shift, quantum yield, and lifetime. We will explore the key components of fluorescence instrumentation, such as light sources, monochromators, detectors, and optical filters, detailing their roles in optimizing measurement accuracy and sensitivity. By understanding the principles and instrumentation of fluorescence measurements, researchers can effectively utilize this powerful technique to investigate molecular interactions, cellular processes, and tissue properties.