

FRET spectroscopy—towards effective biomolecular probing

Abstract

The advent of super-resolution microscopy has been a major breakthrough in bioscience research, allowing accurate molecular signaling analysis of cellular and biological materials. Förster resonance energy transfer (FRET) spectroscopy, for instance, has emerged to be significant over the past few decades, owing to its non-invasive spatiotemporal cellular and subcellular probing abilities. The success of FRET has been the resurgence of fluorescent proteins (FPs) and sophisticated imaging techniques. The developments in FP and FRET-based techniques have made FRET investigations possible in diverse biotechnological fields. However, the current literature suffers a dearth in terms of a review that explains the fundamental principles (with examples) of the major areas of FRET application. This article presents a retrospective overview of the salient exploits and advancements of FRET spectroscopy and discusses the current challenges with some options. Moreover, some of the much anticipated future applications have been highlighted.