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Single molecule fluorescence microscopy is a recent technique that has been developed to aid in the real-time, *in vivo* imaging and monitoring of nanometer-scale features. These capabilities make it a powerful technique for imaging molecular-scale rearrangements. It has been used to determine the walking pattern of Myosin V<sup>1</sup>, to detect conformational changes in proteins<sup>2</sup>, elucidate the mechanism of protein folding within a chaperonin molecule<sup>3</sup>, and study the kinetics of gold nanoparticle-catalyzed reactions<sup>4,5</sup>. Two main microscope systems, confocal and total internal reflectance fluorescence, in combination with super-resolution techniques<sup>6</sup>, have been able to bring the nano-scale world to the bench-top.

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