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**Ido Golding\*** (golding@bcm.edu), Dept of Biochemistry and Molecular Biology, Baylor College of Medicine, Houston, TX 77005. *Deciphering the Stochastic Kinetics of Gene Regulation.*

Gene activity is the prime mover in the living cell, driving a cell's function at any given time. I will report on recent advances in our ability to describe the stochastic kinetics of gene regulation, achieved through the combination of single-molecule microscopy in individual cells, novel image analysis algorithms, and theoretical modeling. We apply our approach to explore gene regulation in a number of organisms representing a gradation of complexity: *E. coli* bacteria, *Drosophila* embryos and mouse embryonic stem cells. (Received June 05, 2017)