In vivo visualization of alternative splicing

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The February 1 cover of G&D features an unprecedented use of fluorescent proteins to visualize developmentally regulated alternative mRNA splicing in a living organism.

Dr. Hidehito Kuroyanagi and colleagues at the Tokyo Medical and Dental University engineered a transgenic alternative splicing reporter system to monitor the developmentally regulated switching of let-2 alternative splicing in live C. elegans worms.

The splicing of let-2 changes during the lifetime of the worm: Embryos and early larvae express exon 9, while adult worms express exon 10. By linking exons 9 and 10 with differently colored fluorescent proteins (green and red, respectively).

Drs. Kuroyanagi & Hagiwara's team was able to visually monitor let-2 splicing patterns during the life of an individual worm. “The reporter system enables experimental analysis of regulation mechanisms underlying the developmental or cell-type-specific profiles of alternative splicing in living organisms. We are coming to realize that the molecular mechanisms of alternative splicing are highly conserved throughout metazoan evolution,” explains Dr. Kuroyanagi.

Source: Cold Spring Harbor Laboratory