

Red light-regulated reversible nuclear localization of proteins in mammalian cells and zebrafish

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Protein trafficking in and out of the nucleus represents a key step in controlling cell fate and function. Here, we demonstrate the first red light-inducible and far-red light-reversible synthetic system for controlling nuclear localization of proteins in mammalian cells and zebrafish. Based on Arabidopsis phytochrome B and phytochrome-interacting factor 3, we control nuclear localization and activity of transcription factors by the spatiotemporal projection of light patterns.