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Short Communication

COVER

Lycopene is one of the strongest natural antioxidants and the main carotene in ripe tomato. Light is one of the most important environmental stimuli influencing lycopene biosynthesis in tomato. This study applied supplemental blue and red lighting on tomato plants after anthesis to monitor their effects on lycopene synthesis. The results showed that supplemental blue/red lighting induced higher lycopene content in tomato fruits; the expression of key genes in the lycopene synthesis pathway was induced by supplemental blue/red light. The expression of light signaling components, such as red-light receptor phytochromes (*PHYs*), blue-light receptor cryptochromes (*CRYs*) and light interaction factors (*PIFs*, *HY5*) were up- or down-regulated by blue/red lighting. Thus, blue and red lights increased lycopene content in tomatoes by inducing light receptors that modulate *HY5* and *PIFs* activation to mediate *PSY1* gene expression. These results provide a sound theoretical basis for further elucidation of the light regulating mechanism of lycopene synthesis in tomatoes, and for instituting a new generation of technological innovations for the enhancement of lycopene accumulation in crop production. The photo here shows tomato fruits at different stages under different lights, provided by Prof. Liu Houcheng from College of Horticulture, South China Agricultural University. See pages 590–598 by Xie *et al.* for more details.