Synopsis of Original Research Paper

Regulation of Melanin Biosynthesis

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Tyrosinase is a rate-limiting enzyme in melanin biosynthesis and tyrosmase-related protein (TRP) is responsible for the formation of black melanin rather than brown. To identify the cis-acting element (s) required for pigment cel1-specific gene transcription, we analyzed the promoter function of two pigment cel1-specific genes encoding human tyrosmase and TRP by transient expression analysis. The fusion genes were constructed by inserting the 5'-flanking region of the human tyrosmase gene or TRP gene upstream from the firefly luciferase gene and were introduced into human melanoma cells and cervical cancer cells (HeLa cells). We thus identified the enhancer sequence of 39 base pairs (bp), located about 1.8 kb upstream from the transcription initiation site of the human tyrosmase gene, that is responsible for its pigment cel1-specific expression. Furthermore, we found the presence of enhancer-1ike activity in the first intron of the human TRP gene that enhances th e transient expression of the reporter (luciferase) gene. However, this enhancer-1ike activity is detected not only in melanoma (pigment) cells but also in HeLa cells.