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Sesamin induces melanogenesis by microphthalmia-associated transcription factor and tyrosinase up-regulation via cAMP signaling pathway.

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Source

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Abstract

In this study, we confirmed that sesamin, an active lignan isolated from sesame seed and oil, is a novel skin-tanning compound. The melanin content and tyrosinase activity were increased by sesamin in a dose-dependent manner in B16 melanoma cells. The mRNA and protein levels of tyrosinase were also enhanced after the treatment with sesamin. Western blot analysis revealed that sesamin induced and sustained up-regulation of microphthalmia-associated transcription factor (MITF). Sesamin could activate cAMP response element (CRE) binding protein (CREB), but it had no effect on the phosphorylation of p38 mitogen-activated protein kinase (MAPK) or Akt. Moreover, sesamin activated protein kinase A (PKA) via a cAMP-dependent pathway. Consistent with these results, sesamin-mediated increase of melanin synthesis was reduced significantly by H-89, a PKA inhibitor, but not by SB203580, a p38 MAPK inhibitor or by LY294002, a phosphatidylinositol-3-kinase (PI3K) inhibitor. Sesamin-mediated phosphorylation of CREB and induction of MITF and tyrosinase expression were also inhibited by H-89. These findings indicated that sesamin could stimulate melanogenesis in B16 cells via the up-regulation of MITF and tyrosinase, which was, in turn, due to the activation of cAMP signaling.

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