

Expression and function of dopamine in odontoblasts

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論文内容の要旨

Dopamine (DA) is produced from tyrosine by tyrosine hydroxylase (TH). A recent study has reported that DA promotes the mineralization of murine preosteoblasts. However, the role of DA in odontoblasts has not been examined. Therefore, in this investigation, we researched the expression of TH and DA in odontoblasts and the effects of DA on the differentiation of preodontoblasts (KN-3 cells). Immunostaining showed that TH and DA were intensely expressed in odontoblasts and preodontoblasts of rat incisors and molars. KN-3 cells expressed D1-like and D2-like receptors for DA. Furthermore, DA promoted odontoblastic differentiation of KN-3 cells, whereas an antagonist of D1-like receptors and a PKA signaling blocker, inhibited such differentiation. However, antagonists of D2-like receptors promoted differentiation. These results suggested that DA in preodontoblasts and odontoblasts might promote odontoblastic differentiation through D1-like receptors, but not D2-like receptors, and PKA signaling in an autocrine or paracrine manner and plays roles in dentinogenesis.