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## The effects of propolis and MTA on odontoblastic differentiation in dental pulp cells

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**Background & Aims:** Propolis has been widely used as a traditional medicine for broad purposes including infection and inflammation control and recently used as an alternative capping materials. However, the potential of propolis as an odontogenic inducer in dental pulp cells has not yet been studied. Therefore, this study aimed to evaluate effects of propolis or combined propolis and mineral trioxide aggregate (MTA), used as an effective pulp-capping material, on odontoblastic differentiation in dental pulp cells and their possible mechanism.

**Methods:** Dental pulp cells were isolated from the extracted teeth for orthodontic purposes. Cell viability was monitored for any toxicity of MTA and propolis, based on tetrazolium salts. The odontoblastic differentiation was assayed by alkaline phosphatase (ALP) staining and expression of odontoblast-specific cell differentiation marker genes using real time PCR. Mineralization was identified with Alizarin Red staining. To observe the involvement of ERK signaling in their effects, western blot analysis was performed.

**Results:** MTA and propolis upregulated expression of dentin sialophosphoprotein (DSPP) and dentin matrix protein 1 (DMP-1), odontoblast differentiation markers and facilitated mineral nodule formation is indication of calcium deposits required for dentin formation. The treatment of MTA, propolis or combination increased the phosphorylation of ERK, known to odontoblast differentiation mediator. However, increased calcium deposits in combined MTA and propolis were attenuated by U0126, an inhibitor of ERK.

**Conclusion:** Taken together, this study suggested that combined propolis and MTA promoted dental pulp cell differentiation and mineralization in human pulp cells via ERK signaling pathway.

### Biography

Seon-Mi Kim has graduated in 1992 and has completed Master's degree in 1995. She has completed her PhD in 1998 from the Dental school in Chonnam National University, South Korea. She has published large number of papers in renowned journals and is actively involved in clinical pediatric dentistry.

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