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The Lack of Fam83h Mediated Reduction of Wnt/β-Catenin Signaling Pathway and Expression Levels of Dental Mineralization Genes.

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Background: FAM83H has been identified as an essential gene for dental enamel formation and may be related to Wnt/β-catenin.

Methods: levels of Fam20a, Dspp, Dmp1, Enam, Ambn, Sppl2a, Mmp20, Fgf10, and the mediators of Wnt/β-catenin pathway were measured in the dental root of both Fam83h-KnockOut and wild-type mice by using Q-PCR at 5,11 and 18 days after birth. The expression of Fgf10 and the mediators of Wnt/β-catenin were also evaluated in the skin of KnockOut and wild-type mice by using Q-PCR and also, The histology of hair follicles was compared. the Fam83h-KnockOut mice recruited in this study confirmed by Sanger sequencing and western blot analysis.

Results: Our results showed that Ambn, Mmp20, Dspp, and Fgf10 significantly reduced in Fam83h-KnockOut mice in the dental root, associated with marked reduction of CK1a, CK1e, and β-catenin expression in Fam83h-KnockOut mice in the dental root. The Fgf10, CK1a, CK1e, and β-catenin were significantly decreased in the skin of Fam83h-KnockOut mice. In the absence of Fam83h, the accumulation of unemployed CK1a is expected to elevate the β-catenin destruction complex. The reduction of CK1e may also decrease the signaling of Dvl-1, leading to the suppression of the Wnt/β-catenin pathway. Simultaneous reduction of both mineralization genes and Wnt/β-catenin pathway due to the absence of Fam83h has a potential to be related to the deficiency of dental formation and mineralization. Further, concurrent reduction of Fgf10 gene expression and Wnt/β-catenin pathway may also affect the maturation of hair follicles as confirmed by histological examination.

Conclusion: it seems that in the lack of Fam83h, dental mineralization is induced by simultaneous decrease of Wnt / β-catenin mediators and the mineralization-related genes, suggesting acting in a cumulative effect manner and probably behaving as a multi-factorial trait.

Biography

I'm Sherko Nasseri, Ph.D. in molecular medicine, Assistant Professor, from Kurdistan University ofMedical Sciences, Iran. During my Ph.D. Thesis, I worked on the generation of Fam83h Knockout Mice by using the CRISPR/Cas9 method. Fam83h KO has shown the scruffy cover, dry eye phenotypes, and also these mice were smaller than the same age normal mice. In continuation of this project, we found that the WNT/B-Catenin pathway decreased. The Fam83h gene has a high expression level in the gastrointestinal tract. Given all that has been said, it brings me a critical question that how the fam83h gene play role in the gastrointestinal tract?

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