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Phelligrudin D (*Phellinus baumii*) modulates homeostasis of periodontal ligament and osteoblast cells

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Objective: Phelligrudin D is a hispidin analogue from the mushroom *Phellinus baumii* that is widely used as a food source in East Asia. This study tested Phelligrudin D for anti-inflammatory and anti-oxidational effect in human periodontal ligament cells (HPDLCs), osteoblast like cells (MC-3T3 E1), and biocompatibility of dental implant with alveolar bone.

Material and Methods: Primary HPDLCs were isolated from healthy teeth, MC-3T3 E1 cells were cultured and used. The multi-biological function, mechanism, and biocompatibility molecules were verified with Western blot analysis and *in vivo* models.

Results: HPDLCs and MC-3T3 showed increased inflammatory molecules such as ICAM-1 and VCAM-1, and decreased osteogenic proteins BMP-7, Osterix and RUNX-2 by LPS treatment. Phelligrudin D decreased inflammatory molecules, and increased osteogenic molecules via down-regulation of ERK 1/2 and p-JNK pathway among MAPKs, followed by blocking of NF- κ B translocation from cytosol to nucleus. Finally, the anti-inflammatory and anti-oxidant function of Phelligrudin D promoted the periodontal differentiation of HPDLCs and osteogenesis of MC-3T3. Further, Phelligrudin D promoted bone regeneration around nanotube Ti implant surface by increasing the levels of BMP-2/7 and OPG in a rat model.

Conclusions: These results suggest that Phelligrudin D has the character of supporting teeth on alveolar bone against outside stress, and may be used as an anti-inflammatory compound for the prevention of periodontitis or periodontal regenerative related disease.

Biography

Ho-Keun Yi is currently working in Chonbuk National University, Korea.

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