

第 1 会 場

IS-01～04



# 国際セッション口演

(第 1 会場)

5月23日（金）第1会場 9：00～9：40

## IS-01

Exploring the role of IFITM3 in periodontal inflammation and its potential link to amyloid  $\beta$  production  
Qingling Li

**Keywords:** IFITM3, Periodontitis, Alzheimer's disease,  $\gamma$ -secretase, Amyloid  $\beta$

**Objectives:** IFITM3 is a membrane protein primarily known for its role in regulating viral infections. Interestingly, we found that IFITM3 is highly expressed in periodontal ligaments (PDLs). However, its role in periodontitis remains unknown. Since it was recently reported that IFITM3 modulated  $\gamma$ -secretase activity in Alzheimer's disease (AD), we hypothesized that periodontal IFITM3 may lead to increased amyloid  $\beta$  (A $\beta$ ) production and potentially exacerbating AD.

**Materials and methods:** A murine ligature-induced periodontitis (LIP) model and human PDL cells stimulated with inflammatory cytokines were utilized to assess the expression of amyloid-related substances.

**Results:** *In vitro*, inflammatory stimuli including TNF- $\alpha$  and IL-1 $\beta$  increased the expression of IFITM3, amyloid precursor protein (APP) and  $\gamma$ -secretase subunits in PDL cells, while IFITM3 knockdown suppressed this inflammatory upregulation. *In vivo*, LIP elevated IFITM3 and  $\gamma$ -secretase subunit expression in gingival tissues and increased A $\beta$ 40 and A $\beta$ 42 levels in the plasma. In the hippocampus, mice with periodontal inflammation exhibited increased mRNA level of IL-1 $\beta$  and BACE1, alongside a reduction in APP isoform levels.

**Conclusions:** IFITM3 enhances APP expression and  $\gamma$ -secretase activity under inflammatory conditions. Periodontal inflammation elevates plasma amyloid levels and hippocampal inflammatory markers, suggesting that IFITM3 may be involved in the connection between periodontitis and neurodegenerative diseases. Further studies are required to explore its potential as a therapeutic target.

## IS-03

Is transmucosal healing of an implant as effective as submerged healing when simultaneous guided bone regeneration is performed? A preclinical study  
Jin-Young Park

**Keywords:** Guided bone regeneration, Transmucosal healing, Pre-clinical study, Collagen membrane, Bone grafting

**Background:** To investigate whether transmucosal healing is as effective as submerged healing in terms of buccal bone regeneration when guided bone regeneration (GBR) is performed simultaneously with implant placement.

**Materials and methods:** In six dogs, buccal dehiscence defects were created in the edentulous mandibular ridge, sized 5  $\times$  5  $\times$  3mm (length  $\times$  height  $\times$  depth). In each defect, a bone-level implant was placed, and four experimental groups were randomly assigned as follows: (i) transmucosal healing with GBR (T-GBR), (ii) transmucosal healing without GBR (T-control), (iii) submerged healing with GBR (S-GBR) and (iv) submerged healing without GBR (S-control). Data analyses were based on histological slides 5 months after implant placement.

**Results:** The T-GBR group showed significant differences compared to the control groups regarding defect height resolution, buccal bone thickness and mineralized tissue area ( $p < .05$ ), but showed no significant differences when compared with the S-GBR group ( $p > .05$ ).

**Conclusion:** The mode of healing (transmucosal vs. submerged) does not influence bone regeneration at implant sites. The clinician may therefore choose the approach based on further clinical and patient-specific parameters.

## IS-02

Characterization of eggshell-derived hydroxyapatite and its biocompatibility in *Oryctolagus cuniculus*  
Regine Stelle Santiago Rodriguez

**Keywords:** bone regeneration, Hydroxyapatite, egg-shell derived hydroxyapatite, two-wall infrabony defect, periodontitis

Hydroxyapatite is exceptionally associated with the bony apatite structure. This study analysed the biocompatibility and regenerative capacity of an eggshell-derived hydroxyapatite (EDHA). Hen eggshells were locally sourced then processed before experimentation. *Oryctolagus cuniculus* were assigned to two groups: untreated group and treated group with EDHA. A 4mm bone defect was surgically-induced in the mesio-buccal alveolar bone of the maxillary central incisors of the rabbits in both groups. EDHA was examined using pH analysis, FT-IR, FE-SEM, and viability assay. Assessment of bone regeneration was done by analyzing clinical attachment level (CAL) and radiographic bone level (RBL) at 4th and 8th weeks post-operative. The results of CAL and RBL showed significant changes in bone regeneration of the defect site at 4-weeks post-operative relative to baseline. EDHA has an alkaline pH which is associated with rapid bone mineralization. EDHA also exhibits inorganic components comparable to human bone. FT-IR analysis showed presence of chemical groups in the hydroxyapatite structure. Cytotoxicity result authenticated EDHA as non-cytotoxic (ISO 10993-5:2009). EDHA at 80,000 $\times$  magnification is sized at 100nm, verifying it as a nanoparticle. EDHA was a biocompatible, non-cytotoxic, nanosized bone replacement graft that facilitated bone regeneration in the surgically-induced defect.

## IS-04

Efficacy of collagen sponge on palatal wound healing: A randomized controlled clinical trial  
Pei-Hui Ding

**Keywords:** collagen sponge, gelatin sponge, gingival grafting, palatal wound, randomized controlled trial

**Aim:** To evaluate the clinical outcomes of collagen sponge (CS) on the palatal wound healing following gingival graft harvesting, and compare its efficacy with gelatin sponge (GS).

**Materials and methods:** Thirty-two participants utilizing free gingival grafts or de-epithelialized gingival grafts were randomized into CS group or GS group. Wound healing rate and complete epithelialization of the palatal wound were evaluated at 1, 2, 3 and 4 weeks. Postoperative pain was evaluated at 1, 3 and 7 days. In addition, willingness to repeat graft harvesting and delayed bleeding were recorded at 7 days, and aesthetic outcomes were assessed at 3 and 4 weeks.

**Results:** CS group had a higher wound healing rate than GS group at 1 and 2 weeks (24.44  $\pm$  25.13% vs. 5.56  $\pm$  8.76%,  $p < 0.01$ ; 91.54  $\pm$  12.79 % vs. 75.56  $\pm$  19.07%,  $p < 0.05$ ). All patients in both groups showed complete epithelialization at 4 weeks. Postoperative pain in VAS was lower in CS group at 1 day compared with GS group (1.6  $\pm$  1.5 vs. 3.1  $\pm$  2.1,  $p < 0.05$ ). No significant difference could be detected in willingness to repeat graft harvesting, delayed bleeding and aesthetic outcomes.

**Conclusions:** Compared with GS, CS could promote the palatal wound healing and have a positive effect on minimizing the postoperative pain following gingival graft harvesting.