

## Efek asam poliaspartik dalam proses PILP pada remineralisasi intrafibrillar dentin dan ukuran kristal hydroxyapatite = The effect of polyaspartic acid in the PILP process on intrafibrillar remineralization dentin and the size of hydroxyapatite crystal.

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### Abstrak

Latar Belakang: *Polymer Induced Liquid Precursor* (PILP) merupakan remineralisasi biomimetik dengan menggunakan bahan polimer anionik sintetik yang dapat menggantikan peran protein non kolagen dalam remineralisasi intrafibrillar. Asam poliaspartik merupakan salah satu material analog protein non kolagen yang penting dalam proses PILP. *Nanodroplet* yang terbentuk dalam proses PILP mampu berdifusi ke dalam intrafibrillar kolagen ataupun *gap zone* yang memiliki ukuran 40 nanometer dan mengalami kristalisasi.

Tujuan: Menganalisis remineralisasi intrafibrillar dan ukuran kristal hidroksiapatit yang terbentuk.

Metode: Evaluasi efek asam poliaspartik dalam proses PILP pada remineralisasi intrafibrillar selama 3, 7 dan 14 hari melalui TEM dan ukuran kristal hidroksiapatit yang terbentuk melalui XRD.

Hasil: Ada perbedaan signifikan secara evaluasi deskriptif antar kelompok remineralisasi 3, 7 dan 14 hari terhadap kelompok *demineralized dentin* pada remineralisasi intrafibrillar. Tidak terdapat perbedaan bermakna antar kelompok remineralisasi maupun kelompok *demineralized dentin* terhadap ukuran kristal hidroksiapatit.

Kesimpulan: Asam poliaspartik dalam proses PILP memiliki potensi dalam remineralisasi intrafibrillar.

.....Background: *Polymer Induced Liquid Precursor* (PILP) is a biomimetic remineralization using synthetic anionic polymer material that can replace the role of non-collagen proteins in intrafibrillar remineralization. Polyaspartic acid is one of the non collagen protein analog materials that is important in the PILP process. Nanodroplet formed in the PILP process is able to diffuse into intrafibrillar collagen or gap zones that have a size of 40 nanometers and crystallize. **Purpose:** To analyze the intrafibrillar remineralization and the size of hydroxyapatite crystal formed.

Methods: Evaluation of the effect of polyaspartic acid in PILP process on intrafibrillar remineralization for 3, 7 and 14 days through TEM and the size of hydroxyapatite crystal formed through XRD.

Result: There was a significant difference in descriptive evaluation between remineralization groups of 3, 7 and 14 days against the demineralized dentin group in intrafibrillar remineralization. There were no significant differences between the remineralization group and the demineralized dentin group to the size of hydroxyapatite crystals.

Conclusion: Polyaspartic acid within PILP process has potential ability in intrafibrillar remineralization.