

# Novel adhesive patch capable of treating oral lichen planus and recurrent aphthous stomatitis

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A study exploring the development of "Dental Tough Adhesive (DenTAI)", a novel bioinspired adhesive patch with robust mechanical properties, capable of strong adhesion, and able to carry out extended release of clobetasol-17-propionate, the first-line drug for treating oral lichen planus (OLP) and recurrent aphthous stomatitis (RAS) was presented at the [52nd Annual Meeting & Exhibition of the AADOCR](#), held in conjunction with the 47th Annual Meeting of the CADR. The AADOCR/CADR Annual Meeting & Exhibition took place at the Oregon Convention Center in Portland on March 15-18, 2023.

The study, led by David T. Wu of the Harvard University School of Dental Medicine, characterized *ex vivo* adhesion to diverse oral tissues (tongue, lip, gingiva, buccal mucosa) with mechanical testing. *In vitro* cytotoxicity was examined with WST cell viability assay on primary human gingival epithelial cells cultured in DenTAI conditioned media. Clobetasol-17-propionate release was assessed with liquid chromatography-mass spectrometry (LC-MS). *In vitro* immunomodulation assay was performed.

DenTAI were found to have superior physical and adhesive properties compared to existing oral technologies, with ~2-100x adhesion (up to 1600 J/m<sup>2</sup>) to oral tissues and ~3-15x stretchability. Clobetasol-17-propionate incorporated into the DenTAI was released in a tunable sustained manner over weeks and demonstrated

immunomodulatory capabilities in vitro, evidenced by reductions in several cytokines including TNF-a, IL6, IL10, MCP5, MIP-2, and TIMP-1.

The study's findings suggested that DenTAI may be a promising device for intraoral delivery of small molecule drugs applicable to the management of painful oral lesions associated with inflammatory conditions such as OLP and RAS.

**More information:** This research was presented as part of the Interactive Talk presentation, "Tough Adhesive Hydrogel for Intraoral Drug Delivery," which took place on Saturday, March 18th, 2023, at 9 a.m. Pacific Daylight Time (UTC-07:00) during the "Keynote Address: Oral Cancer, Chronic Inflammatory Conditions, & Therapeutic Innovations" session from 8 a.m.—10 a.m.

Provided by International Association for Dental Research

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