

# 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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