Background: Current treatment approaches for autoimmune conditions comprise primarily of systemic immunosuppressants or cytokine blockade. The concentration of therapeutic molecules to the tissues that are the sites of autoimmunity and inflammation is a significant challenge, and a promising approach is the development of a bifunctional antibody platform that can drive localized immune modulation by combining a "tether antibody" that targets a tissue of choice and an "effector end" that activates specific regulatory immune pathways to restore immune-homeostasis. 

Methods: Biophysical assays were performed to characterize the tethers for drug-like properties and their ability to modulate different arms of the immune system in a tissue specific manner. 

Results: Biophysical characterization of the bifunctional molecules showed desired drug like properties including specificity, stability, and manufacturability. The skin tethered bifunctionals showed effector activity in vitro assays and selectively localized to the skin. Skin localization correlated to a tethered effector activity compared to a non-tether control.

Conclusion: We believe that this therapeutic approach has the potential to drive the resolution of cutaneous inflammation, providing an opportunity for developing new targeted therapies for autoimmune and inflammatory skin diseases.

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