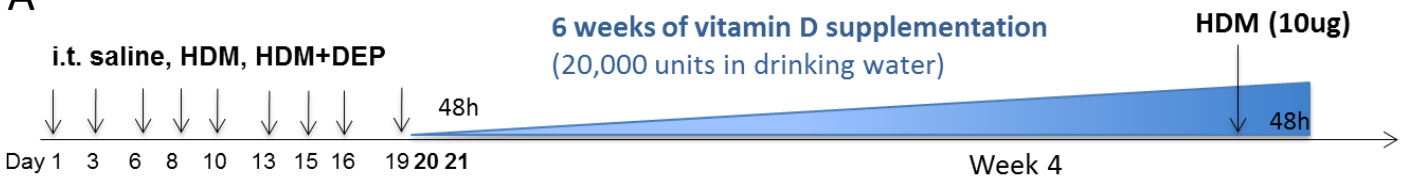
Supplemental

Figure 1

A



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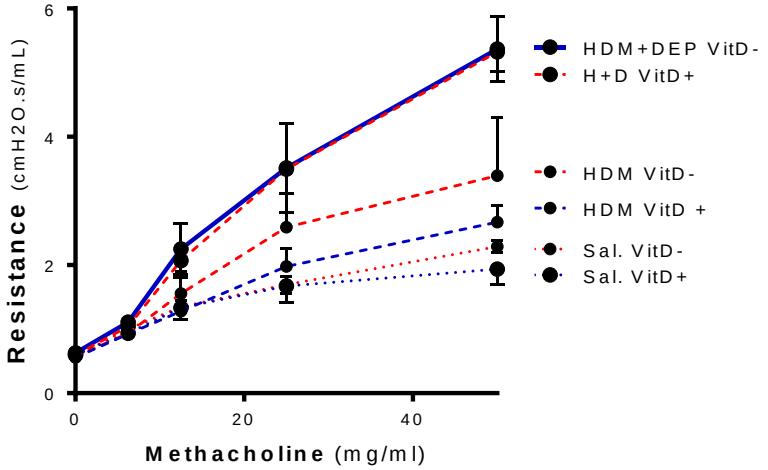
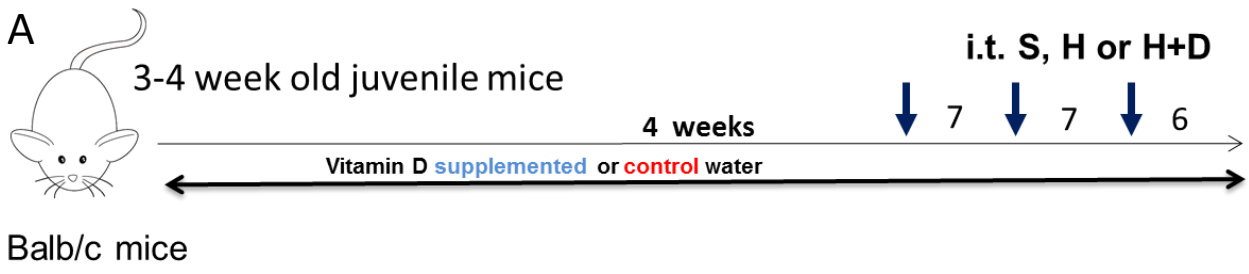
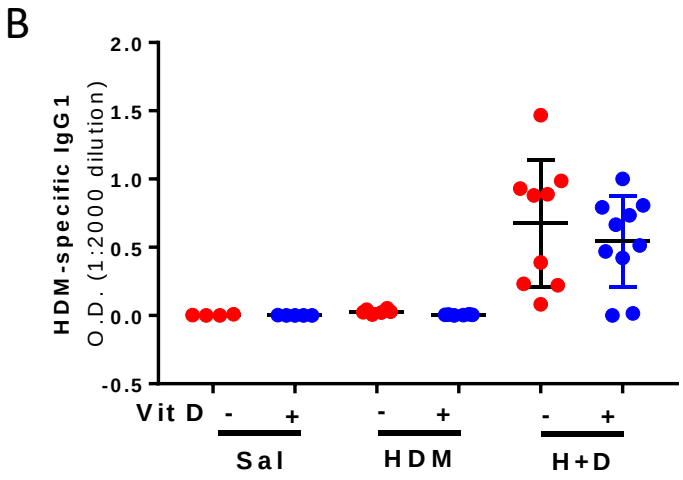
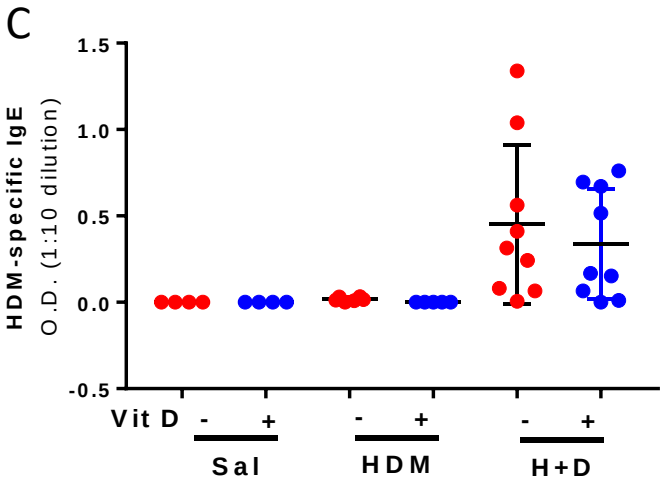


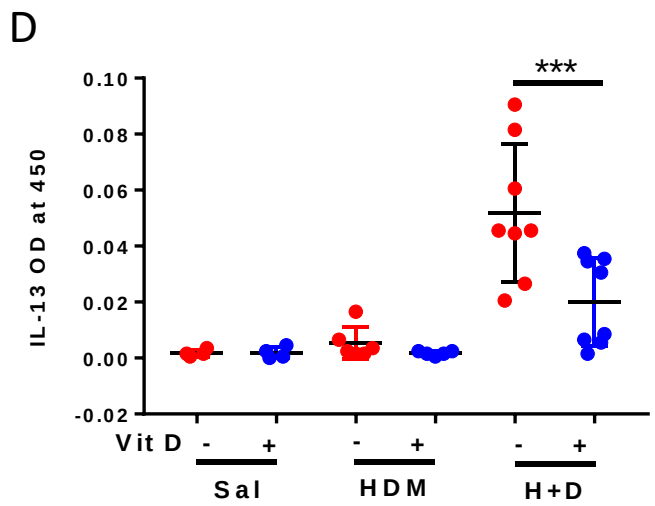
Supplemental

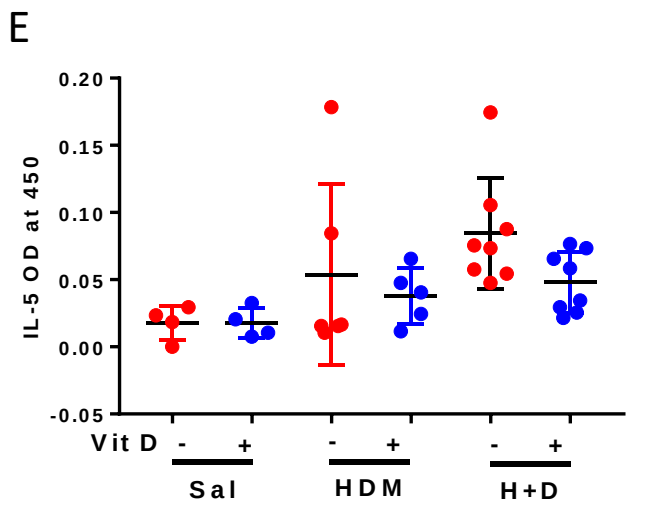
Figure 2











Online Repository Materials

Supplemental Methods

Murine Models

To assess vitamin D as a treatment, BALB/c mice were challenged intratracheal with saline, HDM, and H+D three times a week for three weeks to establish airway disease. Then a subset of mice was given either control water or water supplemented with 20,000 IU cholecalciferol (Sigma) *ad libitum* for 6 weeks (to attain sufficient vitamin D levels) prior to a single HDM (10µg) intratracheal challenge. For the vitamin D sensitization experiment, mice were challenged once a week for three weeks with saline, HDM, or HDM+DEP. Six days after the last intratracheal challenge, lungs, spleen, and mediastinal lymph nodes were plated at 100,000 cells per well in triplicate and *ex vivo* stimulated with HDM (25µg) for six days prior to supernatant collection.

ELISA

Plasma HDM-specific IgE and IgG1 levels and supernatant IL-13 levels (free and IL-13Rα2-bound) were assessed as previously described(13). IL-5 levels were determined using the IL-5 ELISA kit (Biolegend, San Diego, CA).

Supplemental Figure 1. Vitamin D restoration after established asthma had no impact on AHR upon re-challenge with HDM.

(A) Protocol: BALB/c mice were exposed to saline, HDM, or HDM+DEP. A subset of mice were placed on vitamin D supplemented water for 6 weeks to restore vitamin D levels. The mice then received a single challenge of HDM (10µg). (B). Airway responsiveness was measured 48 hours after the last challenge. (n=4-8 mice per group).

Supplemental Figure 2. Vitamin D does not significantly impact sensitization.

(A) Protocol: Vitamin D supplemented or deficient BALB/c mice were exposed to saline, HDM, or HDM+DEP once a week for three weeks. Mice were sacrificed six days later and lung cells were *ex vivo* stimulated with HDM for 6 days prior to culture supernatant collection. (B) HDM specific IgG1 levels. (C) HDM specific IgE levels. (D) IL-13 O.D. levels (E) IL-5 O.D. levels . ****p< 0.0001, ***p <.001, **p <.01, *p < 0.05 using 1-way ANOVA with Bonferroni's multiple comparison test. (n=4-9 mice per group).