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Center

TLR4 Agonist Glucopyranosyl Lipid A (GLA) Induces T-regulatory Cells and Suppresses Th2 Cytokines in PBMC from Cashew-Allergic Donors

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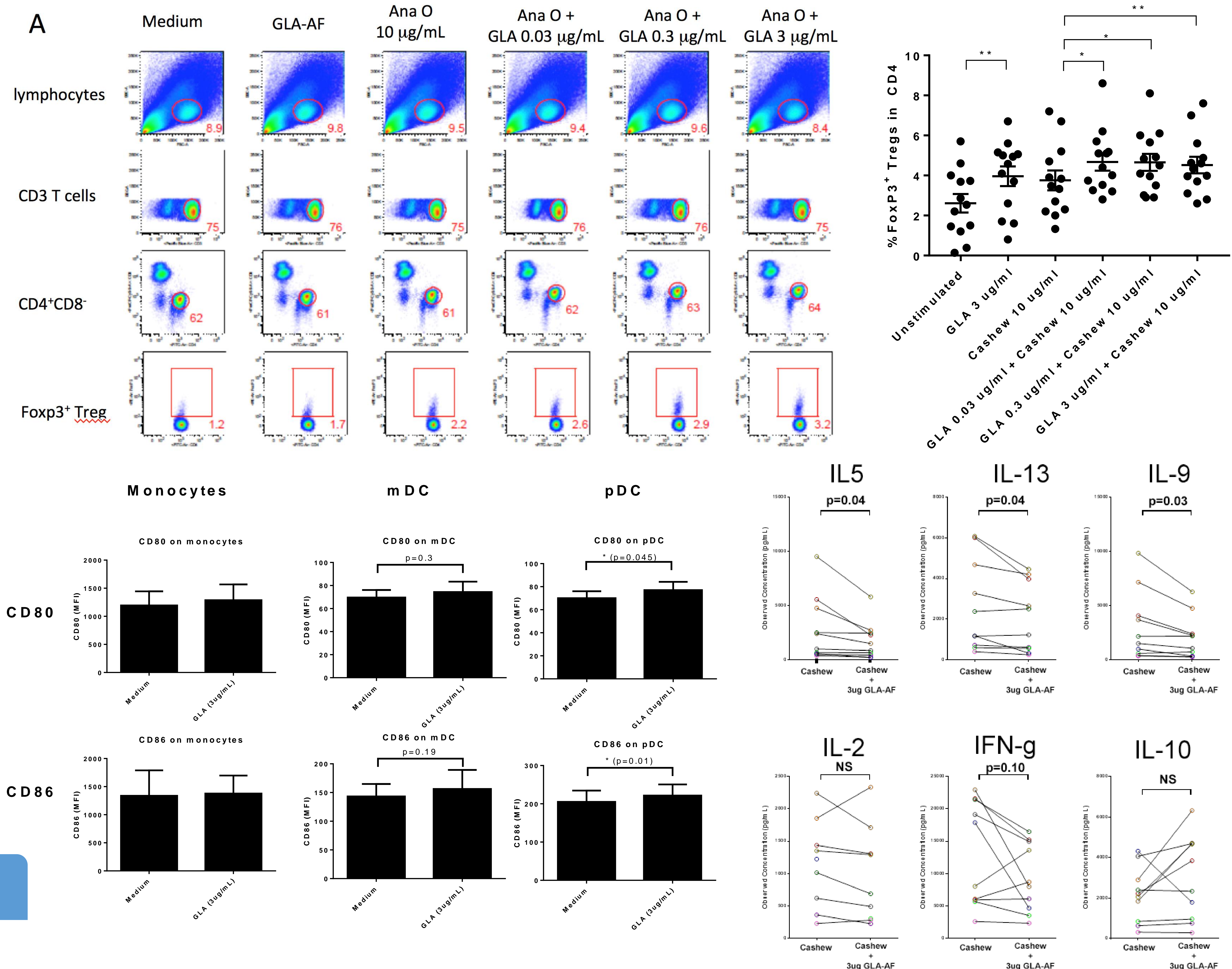
INTRODUCTION AND BACKGROUND

- There are several clinical trials intended to treat food allergies that desensitize the patient to the allergen and reduce the risk of anaphylaxis, but rarely achieve the goal of true tolerance.
- An alternative approach would be to utilize adjuvants such as toll-like-receptor (TLR) agonists to alter the immune system.
- TLRs play a key role in activation of the innate and adaptive immune system.
- TLR4 agonists specifically have been reported to enhance allergen-specific T-Helper type 1 (Th-1) responses and decrease T-Helper type 2 (Th-2) responses.
- Their effects on T-regulatory cells (Tregs) remain unknown.

METHODS

- Peripheral blood mononuclear cells (PBMC) were isolated from 15 individuals with history confirmed cashew allergy with clear ingestion history.
- PBMC were incubated for 6 days with the synthetic TLR4 agonist, Glucopyranosyl lipid A in an aqueous formulation (GLA, 3 ug/mL), cashew extract (10 ug/mL), or cashew plus GLA (0.03, 0.3, or 3 ug/mL).

RESULTS



DISCUSSION

- This pre-clinical ex-vivo study demonstrates that GLA in the presence of an allergen can suppress Th2 response and induce tolerogenic Treg cells in PBMC from sensitized individuals.
- This may indicate a potential avenue of treatment utilizing small doses of cashew allergen with GLA to alter the immune response to the allergen and induce tolerance.
- Further clinical studies will need to be done to assess the viability and safety of this approach.