

THP-1 monocytes as a model for the characterization of potential agents for hypersensitization observed in AGS

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Research performed by the Moore Lab

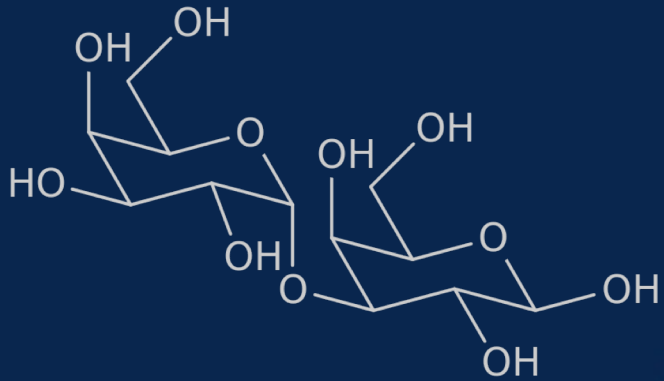
Performed for Liberty University Research Week 2023



What is AGS?

AGS is a type 1 hypersensitivity to the epitope galactose-alpha-1,3-galactose (α -gal)

α -gal is a disaccharide present in most mammalian tissue (except notably humans and old-world apes)



What is Special about AGS?

Development of AGS is not solely linked with interaction with the molecule α -gal, rather it is linked with the bite of the *Amblyomma americanum* (Lone Star Tick)

α -gal is an unusual epitope since it is a disaccharide

Active attacks are delayed multiple hours after exposure to α -gal.



Research Relevance

With the spread of the Lone Star Tick, cases of α -gal have increased dramatically over the past decade

Due to its delayed nature AGS often is diagnosed much later in comparison to other hypersensitivities

The prevalence of red meat in the American diet represents a huge risk to unnoticed sensitization leading to potentially life-threatening anaphylaxis appearing out of nowhere



Research Goals:



Goal 1: Develop an in vitro model
for screening possible cofactors



Goal 2: Use said model to isolate
possible proteins from
homogenized tick proteins



Goal 3: Characterize the isolated
proteins and begin in vivo research
to confirm causative factors



Materials and Methodology

Model: THP-1 Monocytes

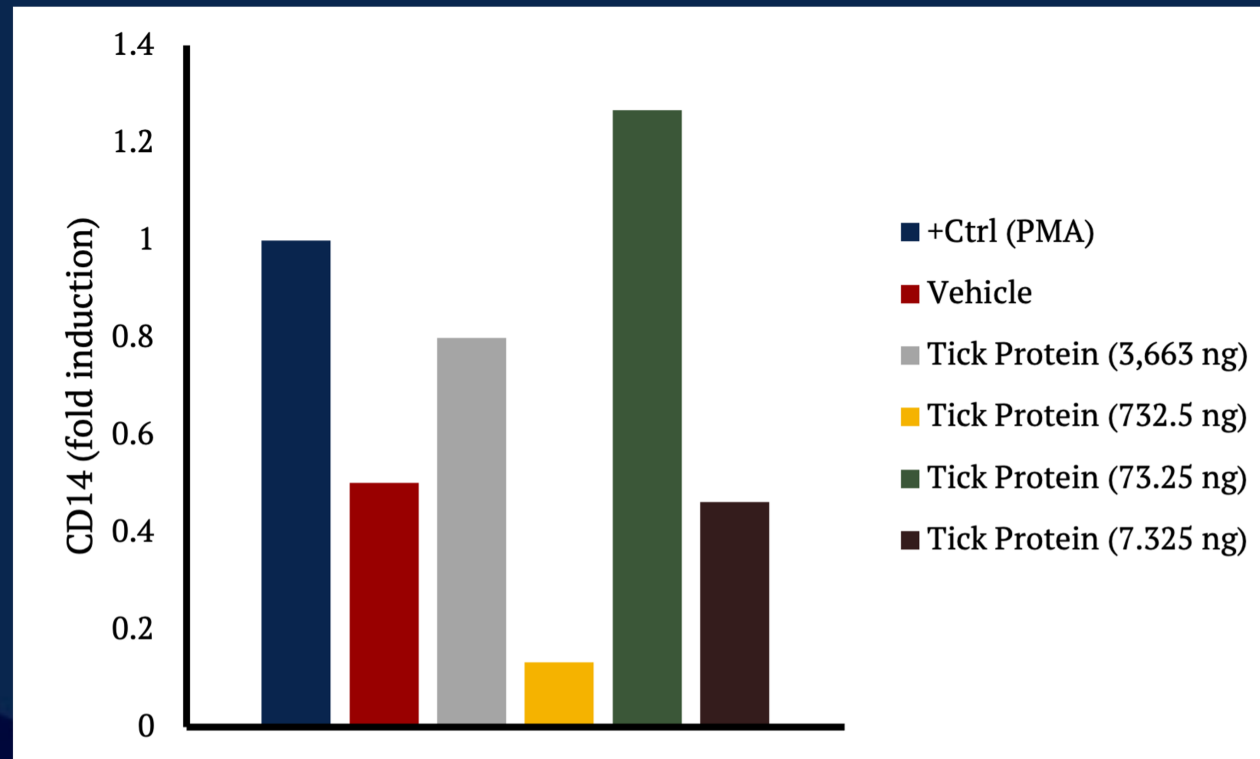
- In vitro model
- Contains PRRs which allow for modulation
- Responsible for antigen presentation

Method of Analysis: ELISA

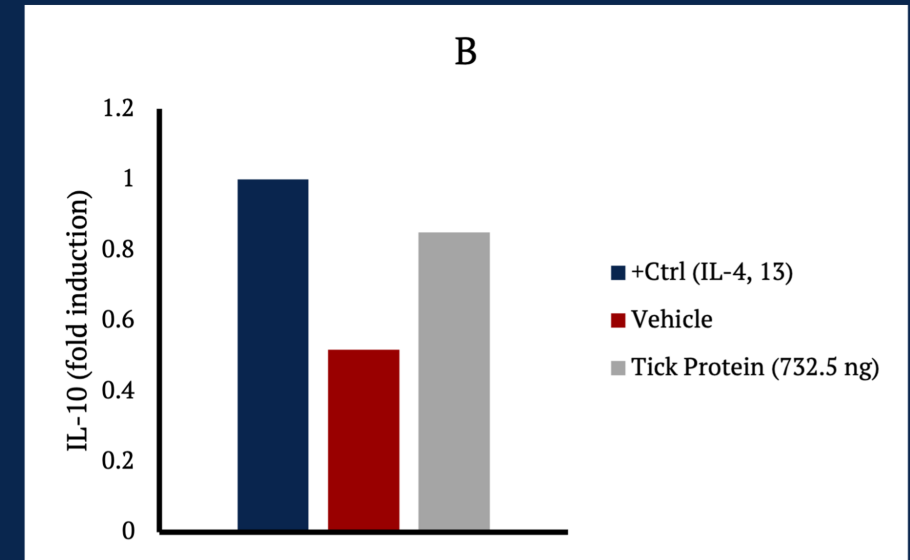
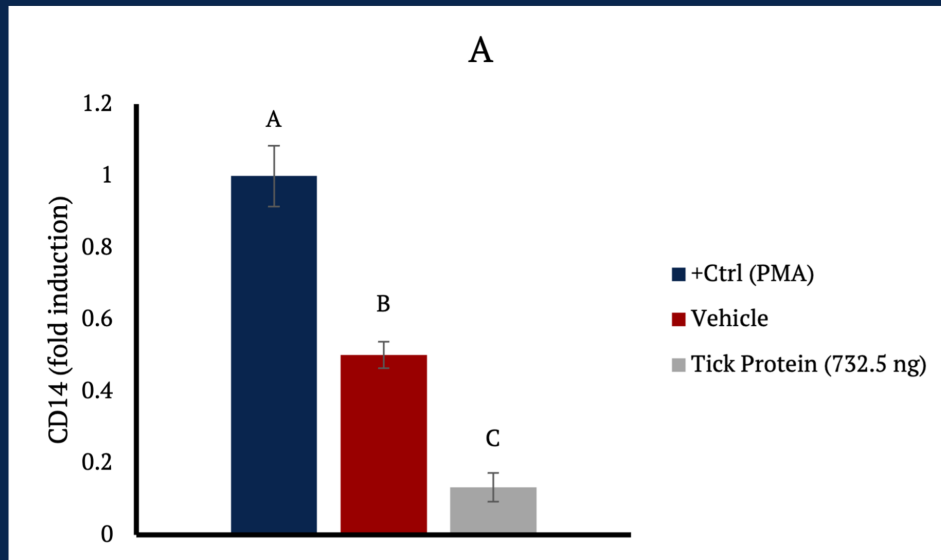
- Biomarkers: CD14, IL10



Result: Treatment of THP-1 monocytes with crude tick homogenate resulted in modulation of CD14 expression



Result: In cases where CD14 was repressed, a trend was seen where IL-10 was expressed



Discussion

Preliminary data suggests that tick homogenate leads to monocyte differentiation

No statistical significance can be derived as of yet, rather our data points to a trend to be further investigated



Future Work

- 1- Protein isolation of potential causative proteins
- 2- Protein characterization
- 3- In vivo testing

