TYPE 2 INNATE LYMPHOID CELLS INDUCED FOLLOWING VIRAL VECTOR-BASED VACCINATION ARE BOTH ROUTE AND VECTOR DEPENDENT.

Jaeson MI[1], Roy S[1], Li Z[1] and Ranasinghe C[1]
[1]Molecular Mucosal immunology Laboratory, Department of Immunology and Infectious Disease, The John Curtin School of Medical Research, The Australian National University, Canberra.

Background:
In the context of HIV vaccine design, route of delivery, vaccine vector and cytokine milieu play a significant role in modulating both the innate and adaptive arms of the immune system. Recently, type 2 innate lymphoid cells (ILC2) have been identified as the first responders following viral vector-based vaccination, notably they express IL-13, a key regulator of downstream adaptive immune outcomes. Therefore, in this study we have evaluated the ILC2 and their genetic biomarker profile, according to the route and viral vector, 24 hours post-vaccination.

Methods:
Mice were vaccinated with range of recombinant viral-vector vaccines. 24 hours post vaccination, single cell suspensions of lung and muscle were prepared and ILC profiles were assessed using flow cytometry. Next, the different ILC2 subsets were sorted (lung, IL-33R^{+} ILC2 and muscle, IL-33R^{-} IL25R^{-} TSLPR^{-} ILC2) and Fluidigm 48.48 gene expression assay was performed with 42 different ILC related and potentially novel biomarkers and analysed using principal component analysis (PCA).

Results:
Flow cytometry data revealed a novel ILC2 population in the muscle that expressed an IL-33R^{-} IL-25R^{-}TSLPR^{-} phenotype which produced IL-13. rFPV induced lowest ILC2-derived IL-13, whist Ad5 induced the highest. PCA revealed that the genetic profile of ILC2s was dependent on the route of vaccination and vaccine vector. Furthermore, the expression profile of STAT6, GATA3, RORα, IL-5, IL-7R and IL-9R (well-known ILC2 markers) were route and vaccine vector dependent. Interestingly, novel markers, STAT3, TGF-β1, and IFN-γR1 were detected in all vaccination conditions.

Conclusion:
Both route of vaccination and vaccine vectors significantly influence the type of ILC2 recruited to the vaccination site. Our data for the fist time reveal that STAT3, IFN-γR1 and TGF-β1, are new biomarkers associated with ILC2, involved in regulation of ILC2-derived IL-13. Understanding the ILC driven IL-13 regulation will aid in improving vaccine design against HIV.

Disclosure of Interest Statement:
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