Department of Biostatistics and Medical Informatics Seminar

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Friday, October 28, 2022
12:00-1:00 pm
Biotech Center Auditorium -or- via Zoom Link
https://uwmadison.zoom.us/j/93783330401

Sexual-dimorphism in human immune system aging and vaccine responses

Abstract: Differences in immune function and responses contribute to health- and life-span disparities between sexes. However, the role of sex in immune system aging and immune responses is not well understood. By profiling peripheral blood mononuclear cells from 172 healthy adults (22–93 years old) using ATAC-seq, RNA-seq and flow cytometry we uncovered an accelerated aging phenotype in men; where T and B cell inactivation and monocyte activation with age was more pronounced in men compared to women. To study whether there are sex-differences in vaccine responses of older adults, we recruited 40 older adults (60 years and older) and studied their responses to two available pneumococcal vaccines: T-dependent Prevnar and T-independent Pneumovax. Using flow cytometry, bulk and single cell RNA-seq we uncovered an activated baseline immune phenotype which was negatively associated with Prevnar vaccine responses. Individuals with this activated phenotype had more circulating pro-inflammatory Th17 cells and more cytotoxic CD16+ NK cells, and less Th1 cells. This immune phenotype was associated with age and sex of donors, where older men were more likely to have this phenotype and did not mount strong responses to Prevnar. Overall, our study uncovered how older adults respond to different pneumococcal vaccines and demonstrated the significance of considering biological sex and the baseline immune state while administering these vaccines.

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