VAC_27 - Vaccine development at the speed of life

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Introduction: The immune system is like an orchestra, with cells and soluble factors cytokines, antibodies, extracellular vesicles (EVs) working together to fight off infections. Vaccines play a crucial role in supporting the immune system and increasing lifespan. By simplifying and speeding up the vaccine development process, we can develop new vaccines more efficiently. This is not only important for emerging infectious diseases but also for conditions like cancer, Alzheimer's disease, and allergies, and for specific populations such as infants and the elderly.

Objectives: We propose solutions that can make the vaccine development cycle easier. We will highlight how our technologies, such as DURAClones for sample treatment and CytoFLEX/Cytobank for flow cytometry analysis, can add robustness to the measurement of immune responses. Additionally, we will explore the use of extracellular vesicles (EVs) as a new class of biologics.

Methodology: EVs have the potential to deliver molecules to specific cells and organs, similar to lipid nanoparticles used in mRNA delivery. We will discuss how CytoFLEX nano can be used to characterize EVs and how understanding their biology can contribute to their future use.

Results: Lastly, we showcase the benefits of automation in streamlining the screening and manufacturing of biologics. By automating certain processes, we can increase efficiency and accuracy, ultimately improving the development of biologics.

Conclusion: Overall, we aim to provide insights into how our solutions can enhance the vaccine development cycle, from research to manufacturing.

Keywords: Vaccine development; Extracellular vesicles; CytoFLEX platform