Feasibility Evaluation of Blow Fill Seal Process and Compatibility with Aluminum Phosphate Adjuvanted Recombinant RSV F Nanoparticle Vaccine

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INTRODUCTION
Respiratory syncytial virus (RSV) is one of the common causes of childhood acute lower respiratory tract infections (ALRI) in infants and young children worldwide. In a 2015 analysis, six million estimated episodes of RSV-severe ALRI occurred in children younger than 5 years of age in low-income and middle-income countries (LMIC). The overall RSV-ALRI mortality was estimated to be as high as 118,200. In children younger than six months, 1.4 million hospital admissions and 27,300 in-hospital deaths were due to RSV-ALRI.

ResVax (Pre-fusogenic RSV F nanoparticle vaccine) is currently being assessed in the Prepare™ (Phase 3) trial for the protection of infants via maternal immunization in healthy third trimester pregnant women. To ensure cost effective and cold chain efficient vaccine for LMIC, a novel product presentation is needed in contrast to conventional glass vials and syringes.

CONCLUSIONS
➢ Product uniformity can be achieved using the BFS technology.
➢ The stability profile of RSV F nanoparticle vaccine in BFS under accelerated and intended storage conditions appears comparable to the profile in glass vials and syringes.
➢ The result of this feasibility assessment provides data to enable a potential cost-effective product presentation of the RSV F nanoparticle vaccine for WHO pre-qualification pathway.

REFERENCES

BOLOW-FILL-SEAL (BFS) TECHNOLOGY
➢ BFS technology has been a robust method to produce aseptic pharmaceuticals since the late 1960’s.
➢ In the past, the technology was not generally feasible for protein based biopharmaceuticals and vaccines due to elevated process temperature.
➢ To avoid product uniformity issues aluminum phosphate particles need to be continuously mixed in a product holding tank and continuously recirculated in the fill line.

➢ Process control decision for potential cost effective product presentation for WHO pre-qualification pathway.

ADVANCES IN CONTROLLING BFS PROCESS TEMPERATURE ENABLE APPLICATION FOR PROTEIN BASED BIOPHARMACEUTICALS AND VACCINES
➢ The data above show the temperature profiles within the mould and inside the ampoule. The BFS process with cooling shows that temperature can be controlled within a range that is acceptable for proteins.

FEASIBILITY ASSESSMENT OF ALUMINUM PHOSPHATE ADJUVANTED RSV F VACCINE WITH BLOW-FILL-SEAL

Objective
➢ Evaluate BFS technology for product compatibility and process feasibility with aluminum phosphate adjuvanted RSV F nanoparticle vaccine.
➢ Enable data driven decision for potential cost effective product presentation for WHO pre-qualification pathway.

Process Control Challenge with Aluminum Phosphate Adjuvanted Product
➢ To avoid product uniformity issues aluminum phosphate particles need to be continuously mixed in a product holding tank and continuously recirculated in the fill line.

RSV F Nanoparticle Vaccine Stability at 2-8 °C

Stability Testing with and without Moisture/Gas Barrier Secondary Packaging

Limited water loss even if BFS containers were not stored in gas / moisture barrier secondary packaging.

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ACKNOWLEDGEMENT
➢ Bill & Melinda Gates Foundation for grants to Rommelag and Maropack that supports this study.
➢ Ray Prasad, Tina Lorenson, and Torey de Rozario at Bill & Melinda Gates Foundation; Russel Wilson and Matt Lawlor at Novavax for their support and discussion to initiate this feasibility study.
➢ Matthew Peters and Nel Peterson at Global Good for their work on compact BFS container design and BFS fill recirculation system.
➢ Greg Glenn, Amy Fix, Lou Fries, Erika Trahan, and Robert Fuentes for their review and comments; Caitlin Cavares for her assistance in preparing this poster.