

# VACCINE PRODUCTION PLATFORM

ELLBO

**Presented By** 

Dr. Rahul Joshi, PhD

Global Business Head HiMedia Laboratories Pvt. Ltd, India









Hollow microcarriers (HMCs) to increase cell density and infection

- Microcarriers are used in bioreactor to increase cell density and ultimately increase viral production.
- HMCs protect cells from shear stress in bioreactors.
- Microcarriers can be used for both suspension and adherent cells.
- Using microcarrier BioNOC viral yields of SARS-CoV2 is increased up to 7.3 log 10 TCID<sub>50</sub>/ mL in vero cells (Offersgaard et al., 2021).
- HiMedia has developed their own Microcarrier (CarrierIn1)



\* TCID: 50% tissue culture infectious dose.

\* PFU: Plaque forming unit.



## Increase productivity using Perfusion culture

Bioreactor	HiMedia Cell line	HiMedia Culture Method	Virus	Expected Viral yields	
Perfusion bioreactor	Vero	Serum free	SARS-CoV-2	1.2 × 10 <sup>12</sup> VP/mL	<ul> <li>Drop of productivity in virus-cells expression system when cells are infected at high cell densities.</li> <li>'Cell density effect' can be limited by perfusion culture.</li> <li>With some modification and adjustment, the perfusion culture media needs only half perfusion rate to maintain a cell density 3 x 10^7 cells/ ml (Lin et al., 2017).</li> </ul>
Perfusion bioreactor	Vero	Serum free	Enterovirus	1.2 × 10 <sup>7</sup> TCID50 /mL	
Perfusion bioreactor	MDCK	Complete (FBS)	H1N1	15 log10 TCID50 /mL	
Perfusion bioreactor	Vero	Complete (FBS)	Enterovirus	8 log10 TCID50 /mL	

• TCID: 50% tissue culture infectious dose.

• VP: viral particles.



### Serum free media for better infectivity and cost: CELLin1<sup>™</sup> , HEKin1<sup>™</sup> & BHKin1<sup>™</sup>



HIMEDIA For Life is Precious

## **Optimum Virus Productivity**

### **Consistent Cell Growth**

### Foot-and-Mouth Disease (FMD) Vaccine Media



Standardized
 Reproducible results
 Assurance of High Viral Titer

#### SFM006AP

#### BHKin1™

Chemically defined, Animal component free, Serum free BHK-21 Virus Production Medium

# Glasgow's Minimum Essential Medium GMEM, Modified

With L-Glutamine and Hydrolysate Without Sodium bicarbonate *Customized formulations* 

#### Hydrolysates

750 tons of powdered media manufactured per year. Out of which **100 tons of FMDV Media is supplied globally** 

# Allied products for vaccine industries



- Aluminum phosphate Potassium aluminum sulphate (alum)
- Cetyl trimethyl ammonium
- White mineral oil



### Preservatives

- Thiomersal
- Phenoxyethanol
- Benzethonium chloride



### **Stabilizers**

- Sugars e.g. lactose and sucrose
- Amino acids or their salts e.g. glycine
- Monosodium glutamate
- Gelatin Povidone
   (Plasdone C)
- Polysorbate 80
- Span 80



# Chemicals for inactivation of Viruses

- Beta-Propiolactone
- Bromoethyl amine hydrobromide
- Formaldehyde sol, 35%
- Glutaraldehyde, 50%



# THANKYOU

- HiMedia Laboratories Pvt. Ltd. 🛛 💄
  - +022-61169797
  - atc@himedialabs.com
- rahul.joshi@himedialabs.com 🖂
  - www.himedialabs.com 💊

