# **IVI Cholera Program 2019**

# **Future Vaccine Supply**

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### **IVI Cholera Program Strategy and Projects**

| Goals                          | Program<br>Objectives  | Current Projects  | Future Projects   |
|--------------------------------|--|---|---|
| Ensure<br>OCV Supply           | Continue Supporting<br>Manufacturers and<br>Create New Supply                    | <ul> <li>Critical Reagents</li> <li>Cholvax</li> <li>BIBCOL</li> <li>Reformulation of<br/>OCV</li> </ul>                              |   |
| Improve<br>Cholera<br>Vaccine  | Improve Vaccine<br>Efficacy<br>(Especially in <5 y.o.)<br>and Flexibility of Use | <ul> <li>Euvichol-P CTC Label</li> <li>Pre-clinical<br/>development of<br/>Cholera conjugate<br/>vaccine (CCV)</li> </ul>             | • Clinical evaluation of CCV  |
| OCV<br>Introduction<br>and Use | Generate Evidence<br>to Support Endemic<br>Countries<br>Introduction and Use     | <ul> <li>CSIMA (PAVE)</li> <li>MOCA (PAVE)</li> <li>Modeling Impact of<br/>Global Roadmap (PER)</li> <li>Extended Analysis</li> </ul> | <ul> <li>ECHO- Nepal<br/>(2020)</li> <li>ECHO-<br/>Mozambique<br/>(2020)</li> </ul> |

## **OCV Supply**

**Cholvax** - Technology Transfer of OCV to Incepta (Incepta, BMGF)

- Phase 3 met primary end-point of non-inferiority to Shanchol
- Technical issues have delayed registration in Bangladesh
  - Application for registration in Bangladesh (only) expected in 2020
- 4-6 M doses/yr initial capacity

**BIBCOL**-Technology Transfer of OCV to Government of India manufacturing facility (THSTI, BIBCOL, GOI-DBT)

- 3-5 years to reach 2-4 M doses/yr capacity

Goal

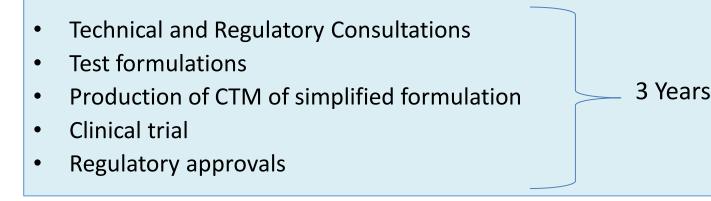
- Manufacturing OCV according to global GMP standards to meet domestic supply needs in support of national vaccine security
- Objectives
- 1. Successful transfer of OCV manufacturing technology to a manufacturing facility in India: **Bharat Immunologicals and Biologicals Corporation Limited** (BIBCOL)
- Successful transfer of technology and know-how of SBA to Translational Health Science and Technology Institute (THSTI) to support clinical development and registration of the OCV in India
- 3. Support conduct of pre-clinical/clinical studies for registration of OCV in India

3

## **Reformulation of OCV**

#### Rationale

- OCV contains 5 distinct components:
- Redundant heat and formalin inactivated O1 components
- Vibrio cholera O139 was included under concern that it might become a pandemic pathogen
- Could a simplified formulation containing only two current components, O1 Inaba (Phil El Tor) and O1 Ogawa (classical Cairo 50), and inactivated by a single method (formalin), be equally effective?
- Anticipate 25% reduction in costs and 38% increase in production capacity



| Composition   | Quantity   |
|---|------------|
| V. Cholerae O1 inaba classical Cairo 48, Heat inactivated     | 300 L.E.U* |
| V. Cholerae O1 Phil 6973 El Tor, Formalin inactivated         | 600 L.E.U  |
| V. Cholerae O1 Ogawa classical Cairo 50, Formalin inactivated | 300 L.E.U  |
| V. Cholerae O1 Cairo 50, Heat inactivated                     | 300 L.E.U  |
| V. Cholerae O139 4260B, Formalin inactivated                  | 600 L.E.U  |



#### New Cholera Vaccines

**Cholera Conjugate Vaccine (CCV)** (Ed Ryan- Mass General Hospital, Harvard University, IVI, Eubiologics) [RIGHT, IVI]

- Novel conjugation chemistry links key protective epitope (OSP) to carrier protein (rTTHC) in sunburst display
- Potential for a single dose injectable vaccine, durable immune response, improved immunogenicity in < 2 yo</li>
  - Delivered through EPI to infants
  - Combinable with other antigens (shigella conjugate in earlier stage development)
  - Complementary to OCV used in mass vaccination by protecting or priming <5 yo</li>
- Process development initially done at Paragon
- Technology transfer to Eubiologics as manufacturing partner for CTM
- Expect CTM available in 2021 for FIH

