

FOURTEENTH INTERNATIONAL
ROTAVIRUS SYMPOSIUM

MARCH 14–16 **2023** BALI INDONESIA

Learn more on www.sabin.org

Development of Neonatal Rotavirus Vaccine by Bio Farma

14th International Rotavirus Symposium
March 14 – 16 2023, Bali, Indonesia

Adriansjah, PT Bio Farma

Bio Farma in brief



State-owned Enterprise (100 %)
Vaccines & Antisera manufacturer



Established in Aug 6th, 1890
in Jakarta



Relocated to city of Bandung,
West Java in 1923



1500 Employees



Implement Integrated System
GMP, GLP, GCP, ISO9001, ISO14001, OHSAS18001,
ISO 17025, ISO 27001
ERM, CSR Based ISO 26000



WHO pre-qualified Vac (DTP, DT,
TT, DTP-HB, m/b/tOPV, Measles
and TT, HB in Uniject, Td,
DTP/HB/Hib)

BIO FARMA COVERS 2 SITES

20 KM



The main campus is sited in Pasteur no. 28 Bandung, covering an area of 91 210 sq meters. It handles Production, QA and QC activities, Marketing and distribution, Finance, Human Capital and Administration.



Animal breeding in Cisarua-Lembang (the outskirts of Bandung) covering an area of 282 441 sq meters.



G20 INDONESIA
2022



Establishment of Indonesia's state-owned Pharmaceutical Holding Company

In early 2020 the Indonesian government established a State-Owned Enterprise (SOE) Healthcare Holding Company by merging three existing SOEs :

- Bio Farma,
- Kimia Farma,
- Indo Farma

Bio Farma has been designated as the parent company.

Key Objectives :

- Provide a comprehensive solution to health and disease problems in Indonesia
- Strengthen self-reliance in Indonesia's national pharmaceutical industry.
- Increase healthcare product availability
- Create joint innovations in the supply of pharmaceuticals and healthcare products to support the future healthcare ecosystem

Life Science
Products



Chemical Medicines



Herbal Medicines &
Medical Devices



Bio Farma Vaccines WHO PQ Milestones

Year	Vaccine
1997	OPV, measles 10 ds
2001	DTP, DT, TT (vial)
2003	TT (Uniject)
2004	Hep B (Uniject)
2006	DTP-HepB, measles 20 ds
2009	mOPV1
2010	bOPV 20 ds
2011	Td
2014	DTP/Hb/Hib (Pentabio) 5ds, 10ds
2015	bOPV 10 ds
2019	mOPV2
2020	nOPV2 (WHO EUL)

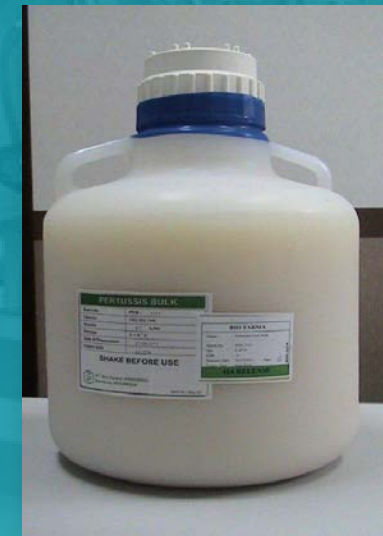
Others :

- SEASONAL FLU Vaccine (Flubio), BCG, sIPV,
- Antisera : Tetanus, Diphtheria, Snake Venom



API

1. Polio bulk
2. Measles bulk
3. Diphtheria bulk
4. Tetanus bulk
5. Pertussis bulk
6. Hib bulk



Novel OPV2 (nOPV2) development

First ever vaccine listed under WHO emergency use

13 November 2020 | Departmental news | Reading time: 2 min (519 words)

WHO today listed the nOPV2 vaccine (Bio Farma, Indonesia) for emergency use to address the rising cases of a vaccine-derived polio strain in a number of African and East Mediterranean countries. Countries in WHO's Western Pacific and South-East Asia regions are also affected by these outbreaks. The emergency use listing, or EUL, is the first of its kind for a vaccine and paves the way for potential listing of COVID-19 vaccines.

The world has made incredible progress toward polio eradication, reducing polio cases by 99.9% in the last 30 years. But the last steps to ending this disease are proving the most difficult, particularly with continuing outbreaks of circulating vaccine-derived polio viruses (cVDPVs).



- Development in collaboration with Bill & Melinda Gates Foundation (BMGF)
- Development of a type 2 Oral Polio Vaccine that is safer and yet having immunogenicity profile comparable to the current sabin type 2 Oral Polio Vaccine.
- App. 560 mio doses administered across 26 countries since issuance of WHO EUL

Implementation of Global Serialization and Agregation System (Track & Trace)



BADAN POM

National Agency of Drug and Food Control (NA-DFC)

Receiving Product data



Internet

Product data report



TRACK & TRACE
Product information database



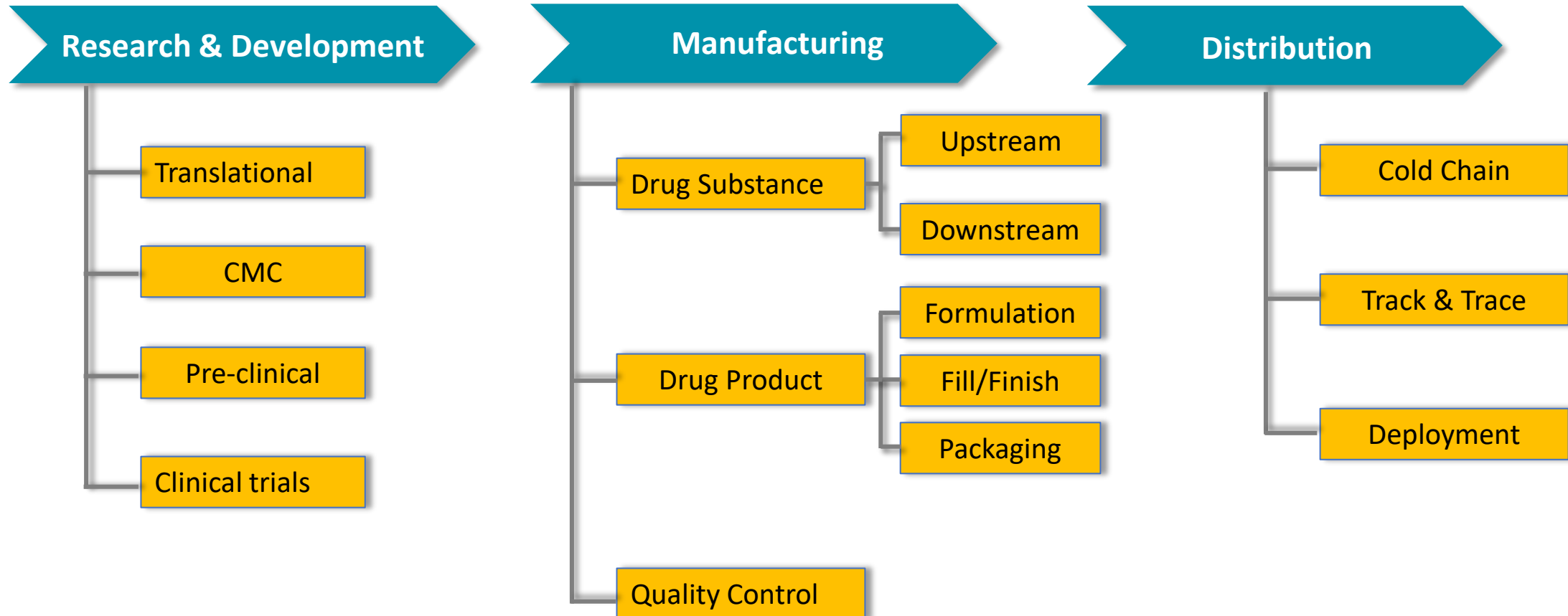
AIDC* Integration

*Automatic Identification & Data Capture



Implemented in Bio Farma's covid vaccine (IndoVac)

Bio Farma's capabilities across the biologics value chain



Bio Farma's Contribution To The World



More Than
152 Countries

Have Used Bio Farma
Vaccine Products



More Than
3,2 Billion doses

The production capacity
per year



More Than
50 Countries

Member Organisation
of Islamic Cooperation

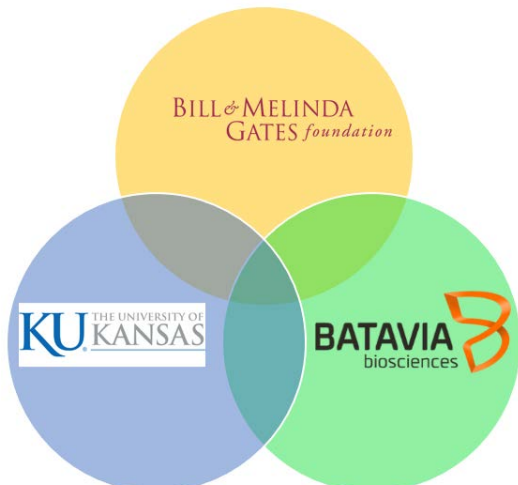
Rotavirus vaccine development



RV3 BB Parent Seed Lot *Transfer technology*



University of Gajah Mada, Indonesia (UGM)
Clinical trials



- *Develop a low-cost and commercially viable process for manufacturing* the RV3 rotavirus vaccine
- *Vaccine Formulation* (Alternative formula) for existing formulation

Goal :

To develop and subsequently commercialize attenuated oral rotavirus vaccine in Bio Farma

Considerations in developing rotavirus vaccine

Technology

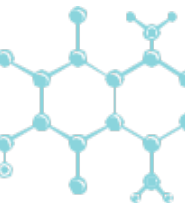
- Adaptable to current platform : similar to OPV
- Scalable
- Product presentation

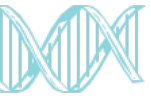
Halal

- “non porcine” materials

Affordability

- Pricing suitable for national immunization program (public sector)

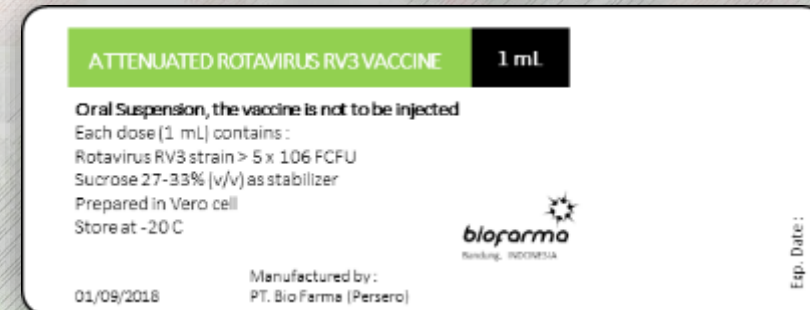




Development of Rotavirus RV3-BB Vaccine in Bio Farma

RV3-BB Vaccine (liquid Frozen)

- 1mL Frozen-Liquid.
- Stable up to 2 years in -20 C (stability on going)
- Glass vial format, similar to OPV
- Porcine-free !



RV3 ROTAVIRUS VACCINE



RV3 is a ***Naturally Attenuated Human Rotavirus Strain*** (G3P[6]) that was isolated from newborn with asymptomatic diarrhea infection in an obstetric nursery in Melbourne, Australia

Rotavirus RV3 is suitable for dosing at birth (neonatal vaccine), potentially reducing the incidence of intussusception

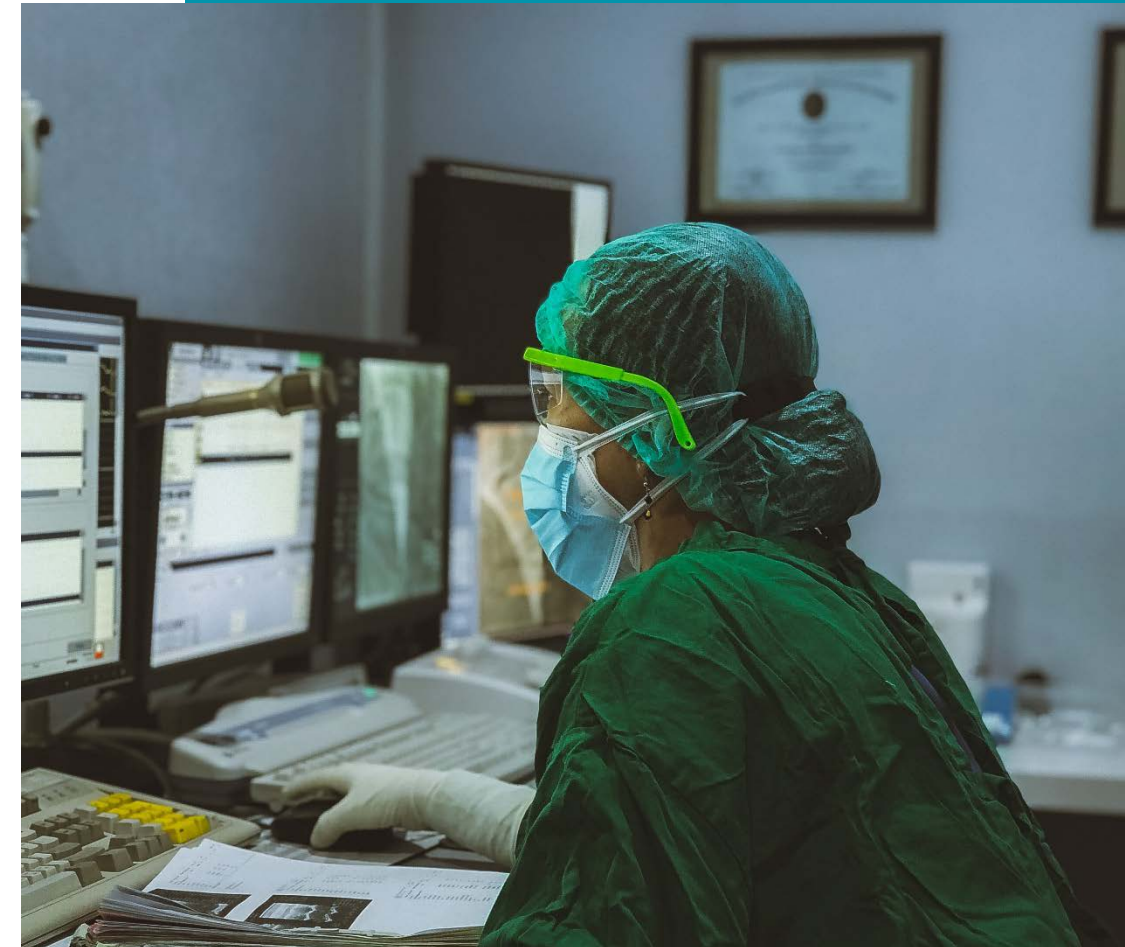
Manufactured with non-porcine materials



TARGET PRODUCT PROFILE (TPP)

of Bio Farma Rotavirus Vaccine

Item	Rotavirus - Bio Farma (1 mL)
Compositions	Rotavirus RV3 Strain , live attenuated $> 5 \times 10^6$ fcfu/mL Sucrose 30% in DME
Administration route	Oral
Administration dose	3 doses
Co-administered	N/A
Immunization Schedule	At the age of 0-5 days; 8-10 weeks; 12-14 weeks
Open Vial policy	Store at +2°C to +8°C for 6 hours; Room temperature for 20 minutes
Storage	$\leq -20^\circ \text{C}$ for 2 years
Presentation	1 dose : 1 ml vial + dropper
Dosage	1 mL
Efficacy	TBA
Trypsin used	Recombinant



Clinical trial overview

Phase I

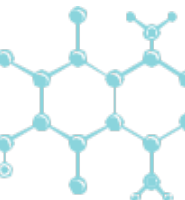
- Randomized, double-blind, placebo-controlled study
- Safety and immunogenicity study in Adults, Children and Neonates
- Results show that the RV3 rotavirus vaccine is well tolerated in all participant cohorts (adults, children, and neonates)
- Publication : <https://doi.org/10.1016/j.vaccine.2021.06.071>

Phase II

- Randomized double-blind, placebo-controlled trial in Indonesia to evaluate the efficacy of an oral human neonatal rotavirus vaccine (RV3-BB) in preventing rotavirus gastroenteritis
- J.E. Bines, J. At Thobari, C.D. Satria, et.al., Human Neonatal Rotavirus Vaccine (RV3-BB) to Target Rotavirus from Birth. N Engl J Med 2018;378:719-30. DOI:10.1056/NEJMoa1706804. <https://www.nejm.org/doi/full/10.1056/nejmoa1706804>

Phase III

- Randomized, double-blind, placebo-controlled study
- Efficacy study in neonates
- Final report estimated in September 2023.



Production Plan



- Rota vaccine rolled out in Indonesia estimated in Q4 2024
 - Drug Substance production sharing same facility with another product
 - New facility under construction to meet capacity needs

