VACCINE AND BIOLOGICAL CENTER

NIH, ISLAMABAD, PAKISTAN

Prof. Dr. Aamer Ikram (CEO, NIH)
WHO/MPP mRNA Technology Transfer Program
Cape Town, South Africa; 18 April 2023
Gap Between Vaccine Market

Industrialised country-markets vs. Developing country-markets

- **Population**
  - 15% (Industrialised)
  - 85% (Developing)

- **Disease Burden**
  - 7% (Industrialised)
  - 93% (Developing)

- **Vaccine Sales**
  - 82% (Industrialised)
  - 18% (Developing)

Economies of Scale

Volume Product Portfolio cGMP & Consistency of Production

• Number of vaccines manufactured >2
• Depending on the technology – production volumes on par with global average
• Percentage of lots failed <5%
• Consistent number of lots per year
• Consistent number of doses per lot
• Maintenance program and budget
• Planned, significant capital expenditure per year
• Quality assurance budget and program
• WHO-prequalified product(s) or plan to reach prequalification
• Customer’s choice
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• Since its inception in 1967, NIH is providing enormous public services to the country
• Various capacities like vaccine/sera production, surveillance, diagnostics, genomics, food and drug testing, and human resource development, etc.
• National COVID-19 response
01 Biological Manufacturing
Production of Vaccines, Anti-Sera and ORS

02 CDC Pak & FETP
Combating challenges of epidemics, outbreaks and emerging infections; surveillance; IDSR, etc; training programs

03 PHLD
Diagnostics, R&D, Genomics, etc
DCTMD
Analysis and testing the quality of drugs

04 National Data Centre

05 Institute of Nutrition and Health
Monitoring food safety & set nutrition standards through lab diagnosis and research

06 Health Research Institute
Clinical & Medical thematic research
Vaccine and Biological Center (VBC)

- Sole producer of vaccines and anti-sera in the public sector
- Products are manufactured in accordance with the international standards
- Vaccine production units are considered potentially viable as per Drug Regulatory, MoH and WHO
- Both EPI, Non-EPI vaccines and sera are manufactured
Functions of VBC

- Production of vaccines and anti-sera
- Promoting R&D, up-scaling of technologies and introducing newer vaccines
- Collaboration with national & international research institutes
- Conducting clinical trials
- Organizing training courses for vaccine and biologic production
Overview of Current Capacities

- Cell Culture Rabies Vaccine Production Laboratory
- Sera Processing Laboratory
- Tetanus Toxoid Production Laboratory
- Measles Vaccine Production Laboratory
- Typhoid Cholera Vaccine Production Laboratory
- Others
Intended Applications of mRNA Technology

- Beyong COVID-19
  Development of mRNA based Rabies Vaccine

- Development of mRNA based other Vaccines
  And it’s utilization in cancer therapy

- Preparedness for Outbreak

Public – Private Partnership
Steps to Implement Technology Transfer

Acquisition of Cells and Viruses → Research & Development

Lab Scale Vaccine Manufacturing → Pre-Clinical and Clinical Studies

Regulatory Approvals → Pilot Scale Manufacturing

Flooding setback
Need of mRNA Technology in Pakistan

5th largest Population in the World
More than 50% of the population is below 30 years

A step towards Development
Acquiring mRNA technology would be a step forward for responding to emerging and re-emerging infectious diseases

Self Sufficiency
Indigenous production of effective vaccine which would reduce the import bills and overcome the supply chain barriers
Preparation for Technology Transfer

**HR**
- Two teams of scientists trained at IVI Korea
- Master trainers
- Already trained staff available for GMP and vaccine production
- DRAP in loop
- Waiting for training: Afrigen June 2023

**Facility**
- Class A, B and C facilities available having sufficient space; designated for mRNA vaccine production
- Pre-Clinical Studies site (Animal House)
- Clinical Trial Unit

**R&D**
- Consortium with academia Talent Pool
- Studies on the RABV conserved regions for mRNA vaccine
- Exploring other options
- Expanding quality control
- New R&D facility approved worth PKR 8 Bn

**Equipment**
- Well developed labs
- For this project some of the dedicated new equipment is in process
01. Water treatment plant
02. Water purification system
03. Boiler / Chiller
04. HVAC
Our Mission

“To discover, develop and manufacture safe, effective and affordable vaccines/anti-sera for the country and region”

Firdous Nawaz Khan
Chief Engineer

Ghazala Parveen
Chief Scientist

Rahim Shah
Principal Scientist
Conclusion

- We are enthusiastic to move actively with the project
- We have the abilities and trained human resource
- We would like to make it happen
- We would serve the humanity and contribute to the global cause
Challenges

Success

Opportunities
THANKS!

Cape Town

VACCINES