

Advancing Life Science and Public Health in Africa

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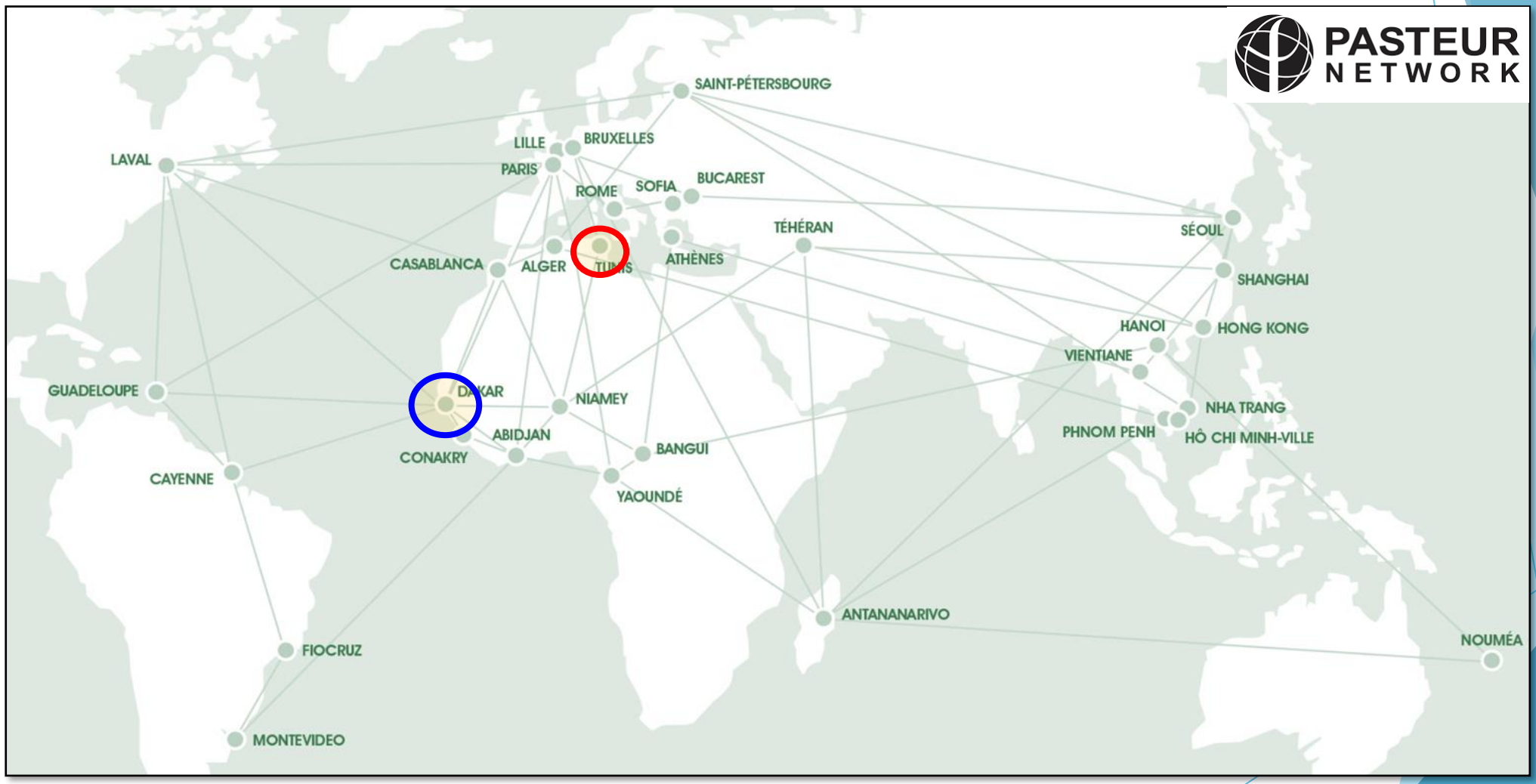
IPD, a member of the Pasteur Network



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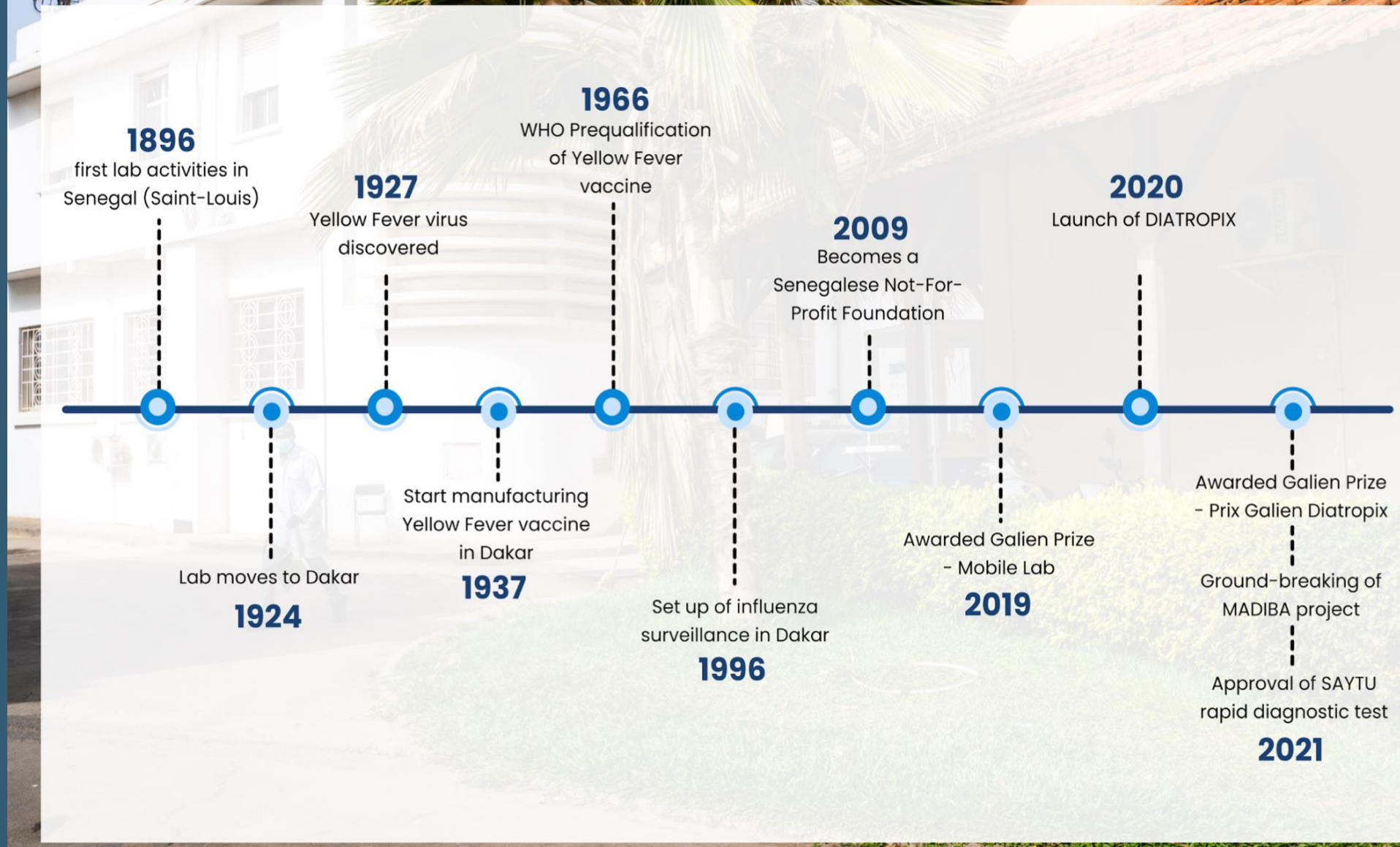
Institut Pasteur de Dakar History



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Institut Pasteur de Dakar Vision

First detector, first responder

Educate, innovate, transform

CARE

Equitable Access

Priority Activities

Health Care Solutions & Laboratory Services

Epidemic intelligence & outbreak response

Human Capital Development

Biomedical Research & Innovation

Biomanufacturing

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IPD's Human capital development









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IPD workshop human capital development on vaccine biomanufacturing



AFRICA CDC
Centres for Disease Control and Prevention
Safeguarding Africa's Health

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saMRC advancinglife

February 2023

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Innovation Roadmap

DISCOVER

1 Rapid & genomic surveillance:
Deploy rapid diagnostic tests across surveillance sites, shorten laboratory confirmation of febrile syndromes to less than 7 days, distribute genomic sequencing capability across Senegal.

2 Immunological assessment:
Focus on novel antibody discovery leveraging the GIISER platform, correlates of protection with IPD joining as a CEPI centralized laboratory in Africa, and platform to support development of essential and epidemic vaccines.

DEVELOP

3 Advanced vaccine bioprocessing:
IPD has launched a dedicated team mastering cutting edge techniques to accelerate the vaccine development in Africa. Skilled across a range of technological platforms including mRNA, viral vector, plasmids, novel adjuvants. A library of pathogen sequences and vaccine candidates for regionally relevant epidemics will be established

4 Clinical trial platform:
Establish phase 1 -2b clinical trial capability in Senegal and valuable platforms for biomanufacturing, including services for diagnostic evaluation and vaccine trials such as IPD's plaque reduction neutralising assays.

DELIVER

5 Responsive manufacturing:
MADIBA facility to produce essential and epidemic vaccines in vials at pouches at scale. Production of mRNA, viral vector, protein subunit, and live virus vaccines.

6 Human capital:
Next generation systems for education, training and leadership development to drive innovation and delivery of new products. IPD is establishing CARE, the Centre for African Resilience to Epidemics and launching the Grand Challenges Senegal innovation fund to support African investigators and entrepreneurs.

CONNECTING THE DOTS

7 From genomic sequencing to immune assessment, from studying vectors to developing diagnostics for arboviruses, & from mobile laboratories enhancing outbreak response to producing essential & epidemic vaccines, the institute has built capabilities to advance public health and life science in Africa.

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Vaccine innovation

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Strategy

Manufacturing in Africa for Africa

- Leveraging experience as a WHO Prequalifed Manufacturer
- Bringing expertise and innovation from international partners in Africa and at the global level
- Manufacturing Capacity (MADIBA & AfricAmaril)
- RCCC with Africa CDC
- Human capital development initiatives (KWAME)
- Spoke of the RNAm Hub in south Africa

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Project Madiba in nutshell

MADIBA project is an opportunity to manufacture and supply high quality, affordable and relevant vaccines for Africa in Senegal with IPD as a centre of excellence

Components of the project

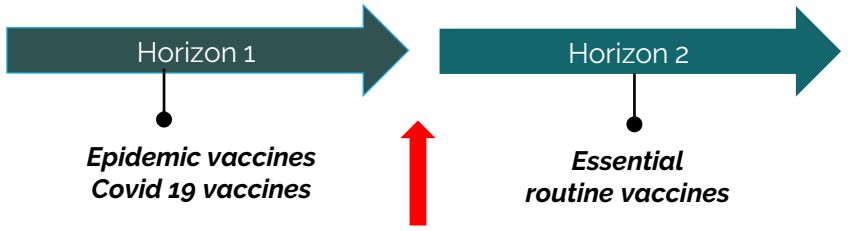
Drug Substance (DS): MADIBA require the capacity to make vaccines from scratch and as will require a vaccine substance production facility

Fill and Finish (FF): Given the urgency to increase supply of vaccines against Covid-19 in Africa, the priority is for the new facility to be equipped and able to Fill & Finish bulk vaccine of a WHO approved COVID vaccine

Technology: Innovative technology with dual options of pouches and vials

Vaccine commercialization: Vaccines will be marketed through purchase agreements to be signed with potential buyers (e.g. UNICEF, COVAX, ECOWAS etc.)

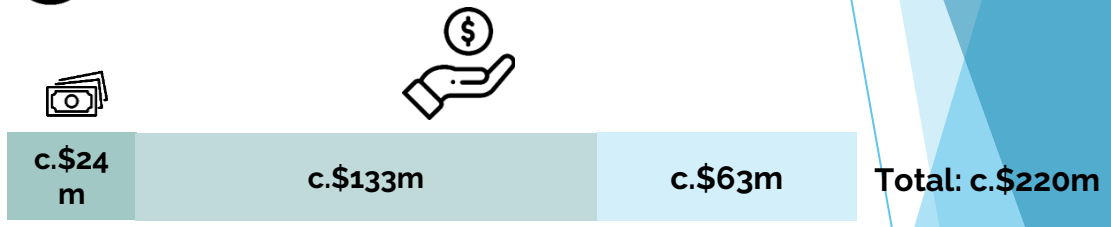
Phases of the project



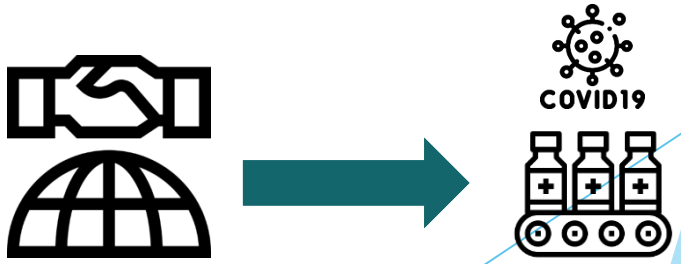
We are here in terms of strategy

MADIBA priorities

1 ***Securing quickly funding needs to keep project timeline***



2 ***Strategic partnerships***



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IPD's Vaccine and biotechnology hub in the new city of Diamniadio





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Vaccine and biotechnology hub



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March 2023

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Flexible and Responsive Vaccine Manufacturing for Africa

MANUFACTURING IN AFRICA FOR DISEASE IMMUNIZATION & BUILDING AUTONOMY

MADIBA

YF Vaccine

- ✓ 30M doses
- ✓ 100 FTE

Essential + Epidemic + pandemic Vaccines

- ✓ 300M doses
- ✓ 200 FTE



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IPD-CEPI: a landmark 10-year partnership

Rapid response manufacturing:
Facility for outbreaks

Workforce development:
High-tech and manufacturing jobs



Innovation:
Vaccine pouches, next generation equipment

Reference laboratory:
Dangerous pathogens and assay development

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Vaccine pipeline

PLATFORM	ACTIVE PROGRAM	PARTNER	POTENTIAL PIPELINE
Egg based	Yellow Fever	IPD	
Viral vector	Measles / Rubella	Batavia Biosciences Partners to be announced	Lassa Fever Filovirus
Fill & Finish	EPI, epidemics and pandemic vaccines	To be publicly announced	Innovative mass immunisation candidates (pouch vs vial filling)
mRNA	Technology transfer for R&D	Afrigen and the WHO hub	Epidemics
mRNA	RVF	UTMB, Emervax, Afrigen..	Dangerous pathogens

BIONTECH

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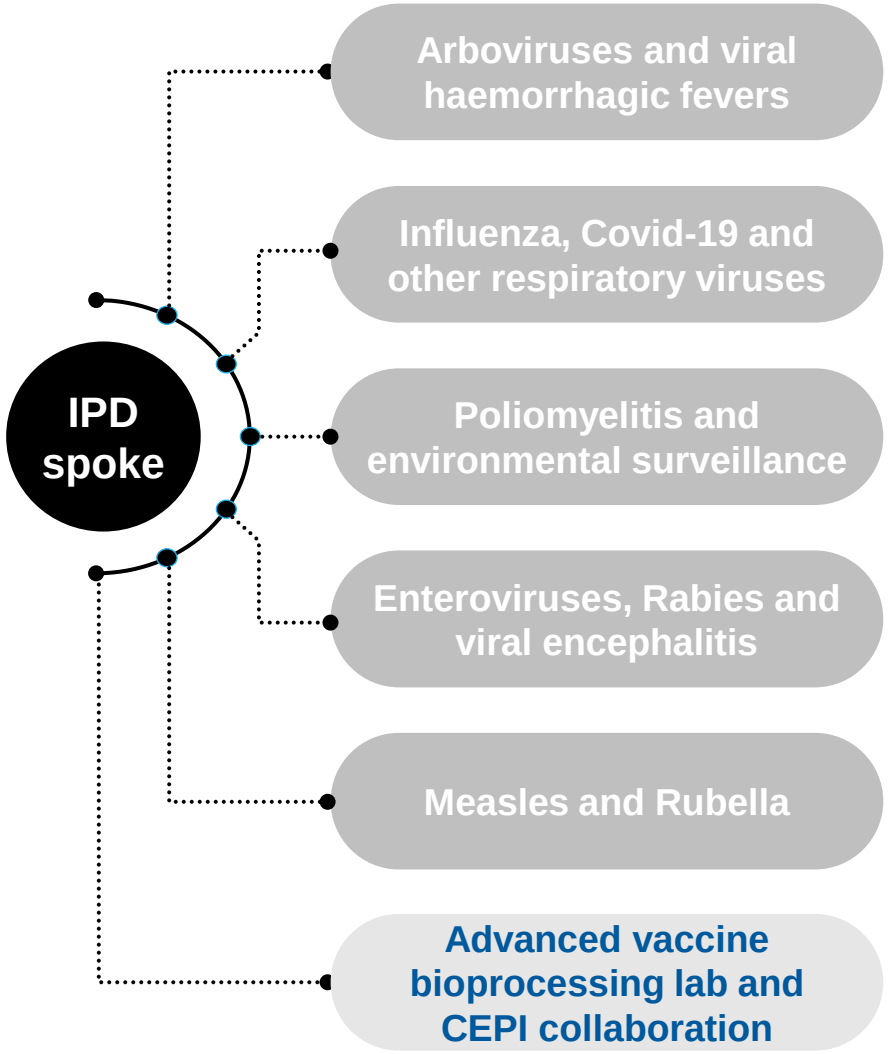
mRNA pipeline

Reference laboratories and surveillance



Prospective candidate

- Examplar: Rift Valley Fever
- Crimean Congo hemorrhagic fever?
- Neglected pathogen?

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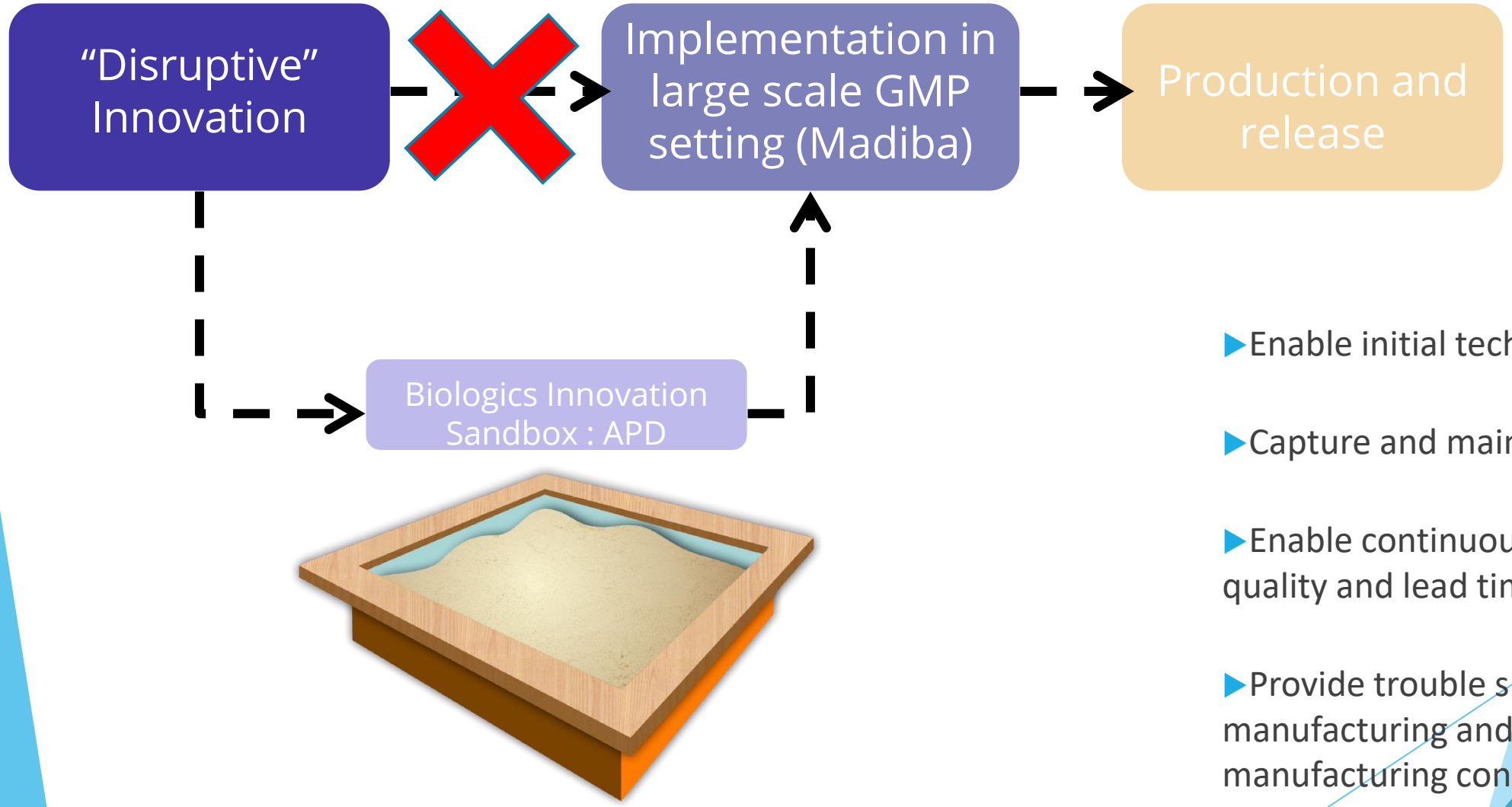
Advanced Vaccine Bioprocessing Lab



- Enable initial technology transfer,
- Capture and maintain know-how,
- Enable continuous improvements (in cost, quality and lead time),
- Provide trouble shooting capabilities for manufacturing and pilot advanced manufacturing concepts

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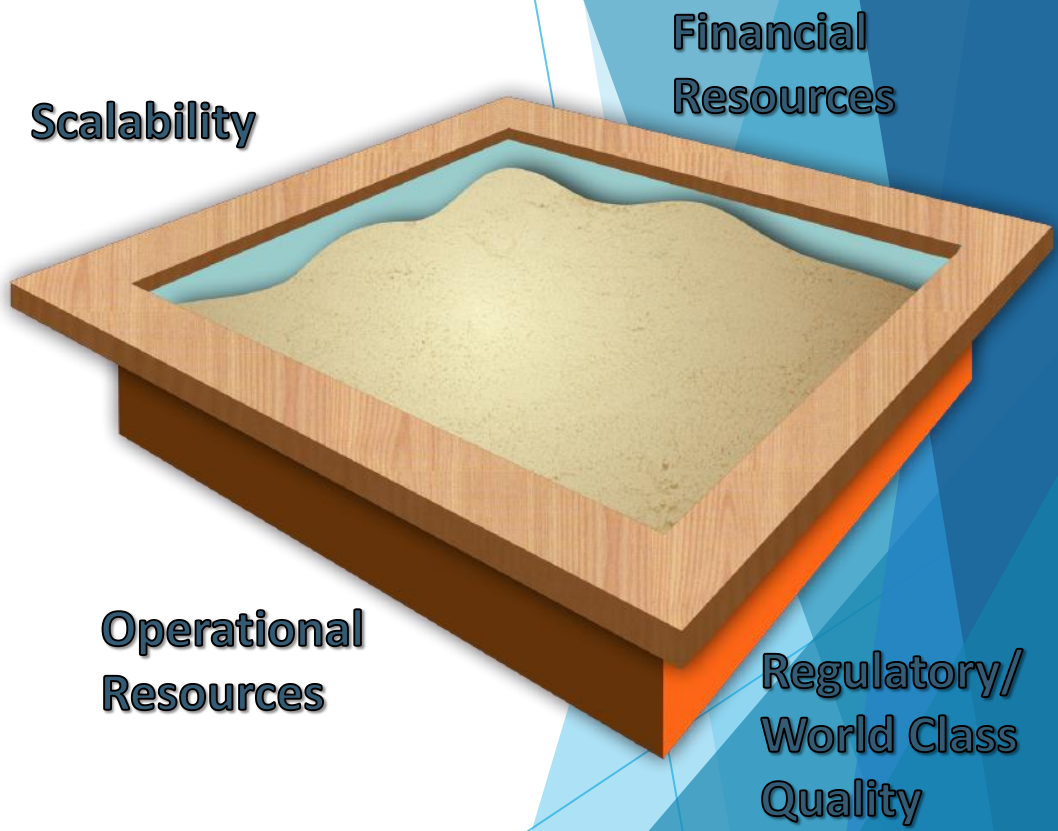
Innovation within defined boundaries

1. Vector design and production laboratory: plasmids and DNA, model to support cell culture production and mRNA technology.
2. E.coli expression system and plasmid processing
3. Cell line engineering laboratory
4. Upstream process development laboratory
    - Viral Vaccine Production Suite with adherent and suspension cell lines
    - mRNA and LNP production suite to support in vitro translation (IVT) production of mRNAs and LNP-related chemistry
5. Downstream processing suite
6. Analytical suite for biologics, including mRNA, equipped with advanced analytical tools
7. Formulation laboratory
8. A process analytical technology and data science capability to support process development and technology transfer to manufacturing capability.
9. Select process units will be dedicated to the production of clinical grade material (phase 1 / 2)



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Viral vector vaccine manufacturing platform

BILL & MELINDA GATES foundation

Human capital development

unizima Univercells Biologics for all

Process optimization and Technology transfer

BATAVIA biosciences

THE WISTAR INSTITUTE



Equipment

UNIVERCELLS Technologies

Vaccine analytics and Formulation

KU THE UNIVERSITY OF KANSAS

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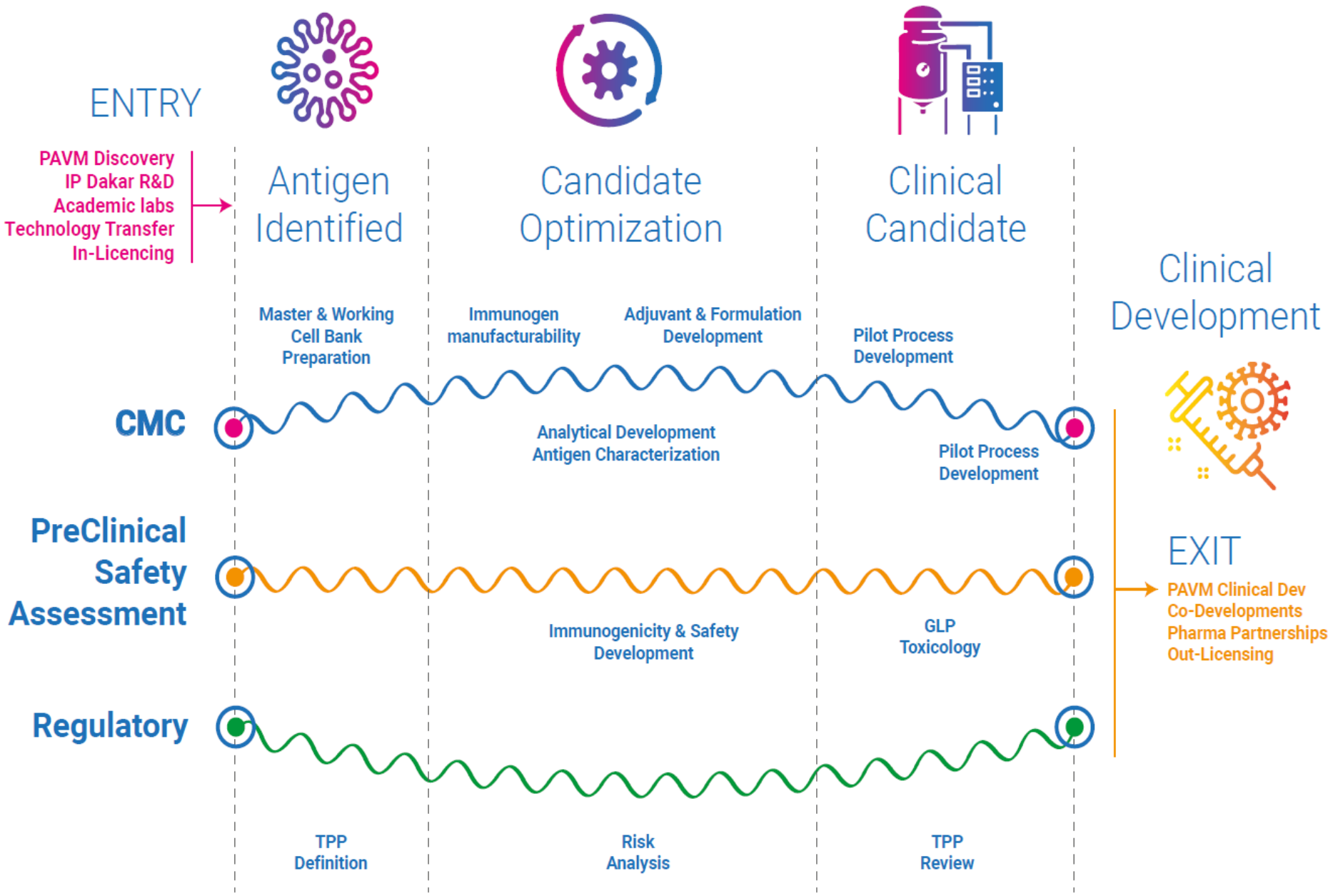

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Training of IPD team at Afrigen 3-5 April 2023



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THANK YOU
Jërëjëf

Dolley Jën Ndox!

Senegalese proverb

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