



Mobile labs and field sequencing during outbreaks

Laboratory for Urgent Response to Biological Threats (CIBU): Presentation of the mobile laboratory

Who are we?

Laboratory for Urgent Response to Biological Threats (CIBU)



Unit Environment and Infectious Risks

Focused on emerging, dangerous and epidemic-prone pathogens
Identification of new zoonotic pathogens
Persistence in environment / reservoir



Laboratory for Urgent Response to Biological Threats



World Organisation
for Animal Health
Founded as OIE

Detection and identification in humans of emerging animal pathogens and development of tools for their diagnoses



Institut Pasteur, Paris

Who are we?

Laboratory for Urgent Response to Biological Threats (CIBU)



Laboratory for Urgent Response to Biological Threats



Created in 2002, joint impulsion of the French Ministry of Health and Institut Pasteur

2001, new millenium, new threats...



Who are we?

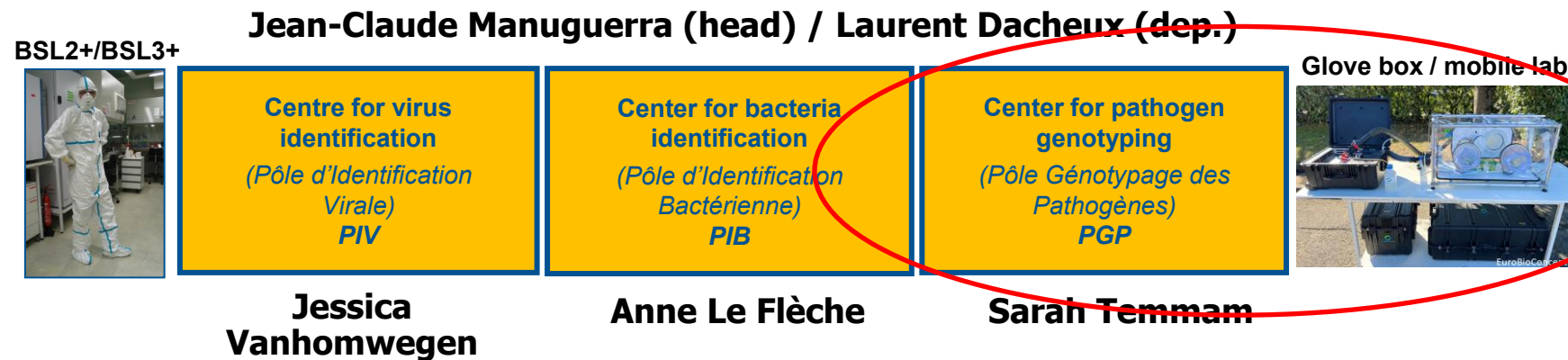
Laboratory for Urgent Response to Biological Threats (CIBU)



Laboratory for Urgent Response to Biological Threats



Combination of 3 complementary areas of expertise



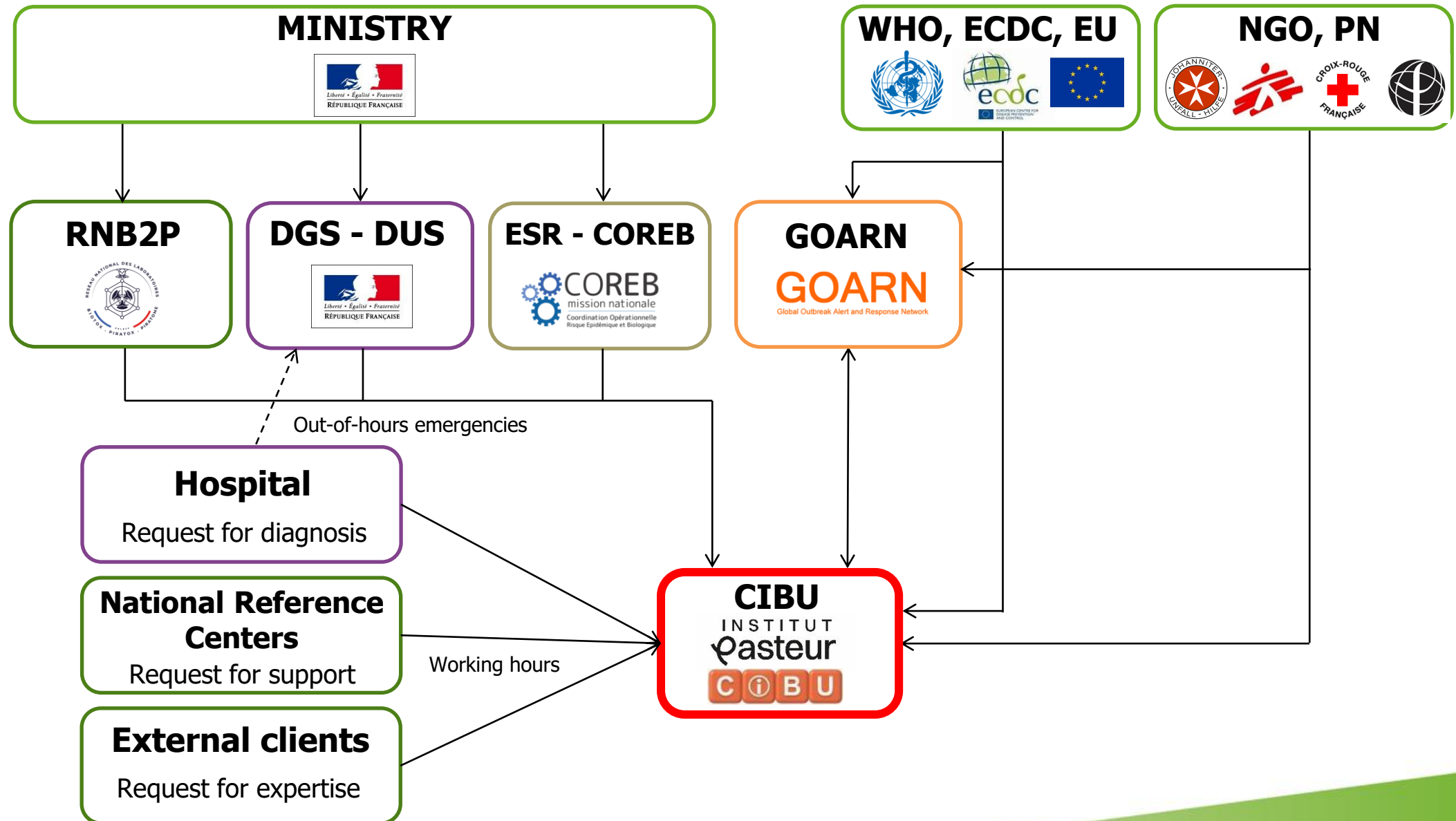
Main CIBU's missions

- Response to **microbiological emergencies 7 days a week** and **24 hours a day** at the express request of the French Ministry of Health
- Maintaining scientific and technical capabilities for **emergency detection and identification of infectious agents**
 - **Agents covered by public health plans**
 - **Other infectious agents** in support of national reference centers (NRC)
- **Responding to the emergence** of infectious agents
 - **An operational capacity** for the detection and identification of unknown agents
 - **Development of innovative techniques** enabling the rapid identification of unknown agents
 - **Development of multiplex and/or rapid analysis techniques** for the detection of a panel of pathogens
- Member of the **national biotox-piratox-piratox network** (rn1b2p)
- **Mobilizing international expertise** in the event of an emergency posing a threat to public health in France or internationally

Main CIBU diagnostic capacities

- **Two principal diagnostic approaches**
 - **Targeted diagnostics:** specific techniques
 - **Non-targeted diagnostics:** syndromic, pathogen group/family or metagenomic approach
- **Different diagnostic techniques available**
 - **Classical molecular techniques:** specific techniques: PCR / qPCR / RT-qPCR, even LAMP
 - **Sequencing techniques:** Sanger / Illumina / Nanopore
 - **Isolation techniques:** viral / bacteria isolations
 - **Serological techniques:** Luminex, seroneutralization, ELISA

Main CIBU's interactions



CIBU's outbreak and field interventions

Two modes of intervention

- **Direct mode**

Independent laboratory conducting training, outbreak intervention, consulting, research

- **Indirect mode**

Logistics support (human and material resources) to another laboratory (Reference centre, WHOCC, ...)



- **2003:** SARS epidemic - Vietnam
- **2004:** H5N1 avian flu - Cambodia
- **2005:** Tsunami - Sri Lanka
- **2011:** Cholera - Haiti
- **2014:** Chikungunya - Cayenne
- **2014-2015:** Ebola - Guinea
- **2015:** Zika – French Polynesia
- **2016:** Zika - Brazil
- **2016:** Yellow fever - DRC
- **2017:** Plague - Madagascar
- **2018:** Ebola – Rwanda
- **2020:** COVID-19 - French Guiana, Italy
- **2021:** COVID-19 - Guinea, Algeria
- **2022:** Monkey Pox – France, CAR
- **2023:** RVFV - Mauritania

CIBU's outbreak intervention - Examples

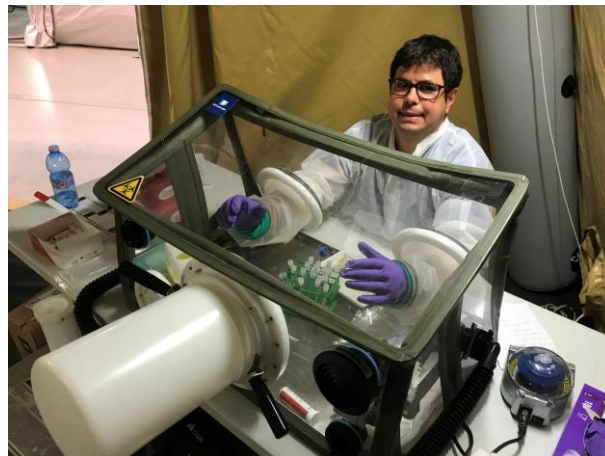
Ebola virus disease outbreak intervention – Guinea, 2014-2015



CIBU's outbreak intervention - Examples

Support During the COVID-19 Pandemic – Italy, 2020

Human and material support for the Belgium mobile laboratory B-Life



CIBU's mobile lab capacity

Mobile lab type II (box-based)

Logistics equipment



Laboratory equipment



Containment and decontamination



➡ Now, fully operational Mobile lab type II

Evolution of CIBU's mobile lab

Full integration into the RRML network

- Member of the **core group** under WHO Euro leadership since 2019
- Moving to the **GOARN-DISC** since 2024, acting as member of the coordination board
- Participation to the **Mobile lab classification** guide and the **Minimum operational standards** and typology for rapid response mobile laboratories



Evolution of CIBU's mobile lab

Trainings

- Participation to the **virtual table-top exercises** as well as the **field exercises** in Kazan (Russia, 2021) and Istanbul (Turkey, 2023), observer in Kachreti (Georgia, 2024) organized by WHO-EURO and GOARN



- **Training courses** providing by Robert Koch Institut (RKI) (2025) and EMLab (planned, 2026)



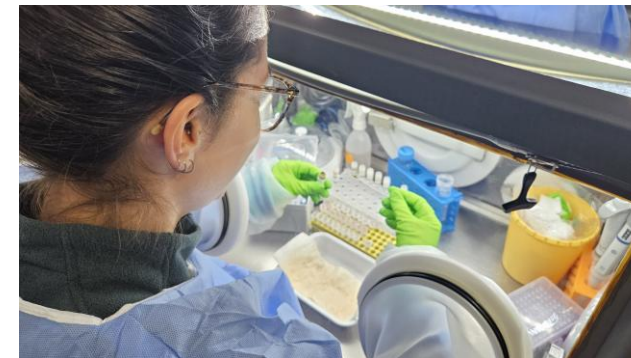
Evolution of CIBU's mobile lab

Integration into Emergency Medical Teams

- **Field exercises** with Robert Koch Institut (RKI) and with the NGO EMT Johanniter

ArhValley (Germany, 2024)

Lisbon (EUMODEX, Portugal, 2025)



Evolution of CIBU's mobile lab

Full integration into the European Civil Protection Pool and expansion of diagnostic activities

- Short-term goal of **achieving recognition** by the WHO and GOARN-DiSC through the **mobile laboratory recognition system**, which will be rolled out starting in 2026
- Paves the way for **integration and full participation** in field operations alongside French and international medical teams
- **Expansion of diagnostic activities**, with multiplex approaches, integrating a **One Health approach** (human, animal, and environmental) through international mobile lab

➡ **Example with the deployment in Mayotte, 2025**

Commentary

BMJ Global Health

Integrating mobile laboratories into global health security: advancing collaboration through GOARN-DiSC

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Storozhenko O, et al. Integrating mobile laboratories into global health security: advancing collaboration through GOARN-DiSC. BMJ Glob Health 2025;10:e022083. doi:10.1136/bmjgh-2025-022083

Members of the ERI-CIBU
team involved in mobile lab

Medical and General Direction
Logistic, informatics and
technical departments

GenEpi-BioTrain team



Members of RRML network



Partners of GOARN-DiSC



EuroBioConcept



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Acknowledgements

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