

Free and open source hardware in Health

The case of Mboalab, Cameroon

www.mboalab.net

By *Thomas Mboa*
CEIMIA -Mboalab



SANTÉ OUVERTE ET COMMUNS NUMÉRIQUES

WEBINAIRE INTERNATIONAL

28 Février 2023 - 9:00 UTC +1

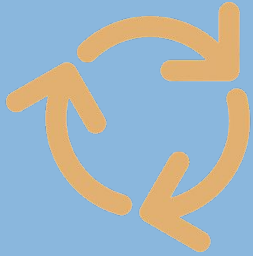
PUBLIC LINK : [HTTPS://LINK.INFINI.FR/OPENHEALTH](https://link.infini.fr/openhealth)



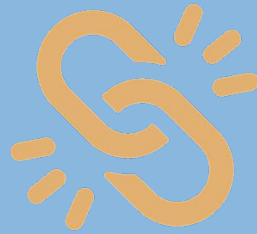
Open science as a key driver



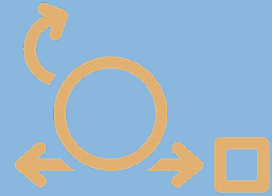
Building a globally inclusive biomanufacturing value chain



**Circular economies
of resources**



**Shortening supply
chains**



**Agile, just-in-time
production**

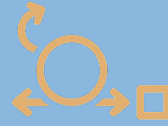
Open Source Enabling Technologies



Circular economies of
resources



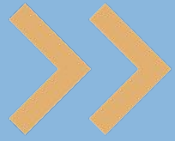
Shortening supply
chains



Agile, just-in-time
production

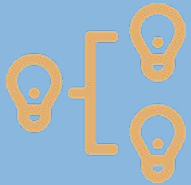
Open Source Technologies for faster and more equitable innovation

Why open source approaches?



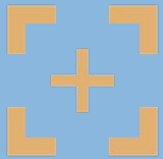
accelerating R&D

reducing friction in access to knowledge and materials



user innovation

more diverse ideas, expanding pool of developers



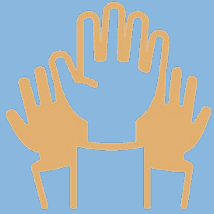
focusing on value-add

know-how, collaborations, using the technologies



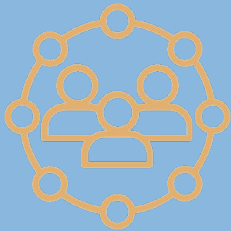
universal access

e.g. availability of specific molecular tools unencumbered by intellectual property;



universal participation

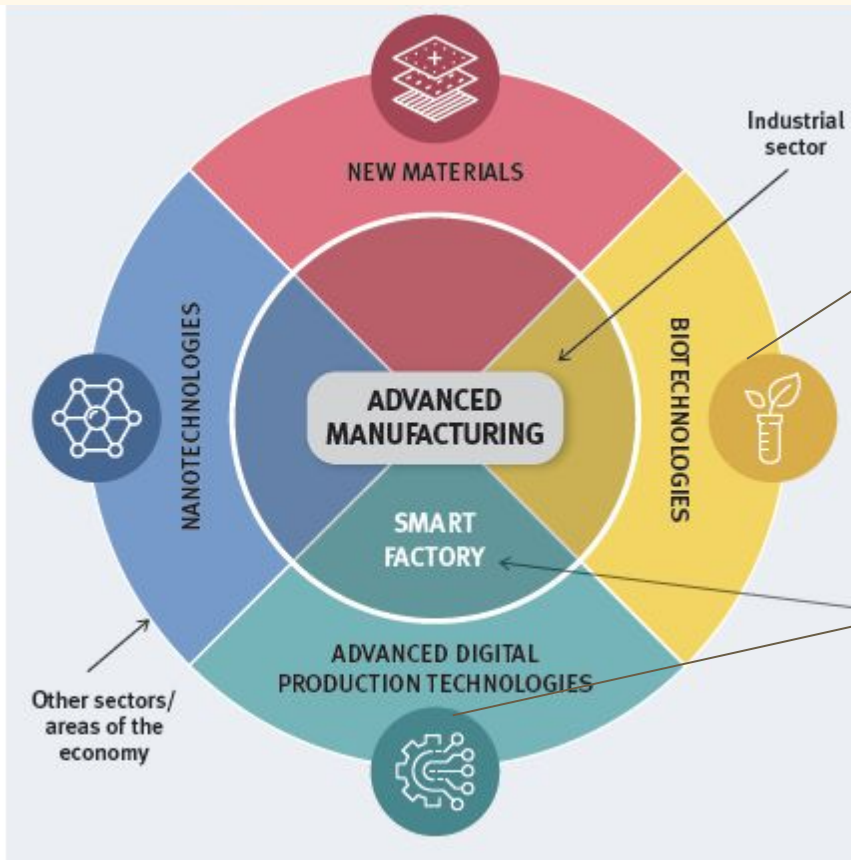
e.g. greater involvement of stakeholders in shaping projects using those tools;



collaborative production

e.g. multiple partners working together for a common goal

Local distributed manufacturing : The Case of Mboalab in Cameroon



Synthetic Biology

IDR 2020 will focus on advanced digital production (ADP) technologies applied to manufacturing:

- INDUSTRIAL INTERNET OF THINGS
- BIG DATA ANALYTICS
- ADVANCED ROBOTICS
- ARTIFICIAL INTELLIGENCE/ MACHINE LEARNING
- CLOUD COMPUTING
- ADDITIVE MANUFACTURING



Cameroon Based
Community
Innovation Hub
founded in 2017



**Catalyse Local Sustainable
Development Through Open Science**

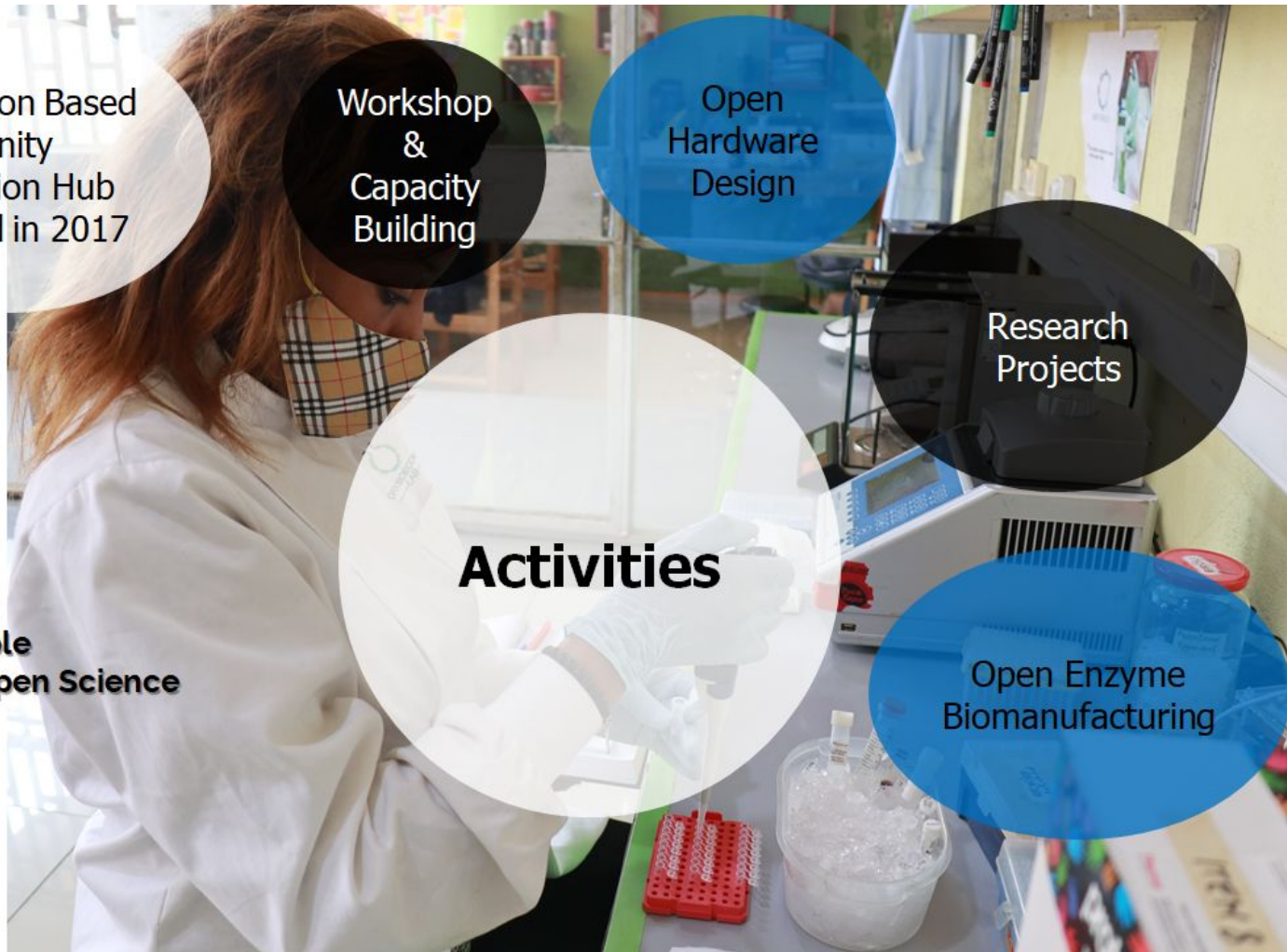
Workshop
&
Capacity
Building

Open
Hardware
Design

Research
Projects

Activities

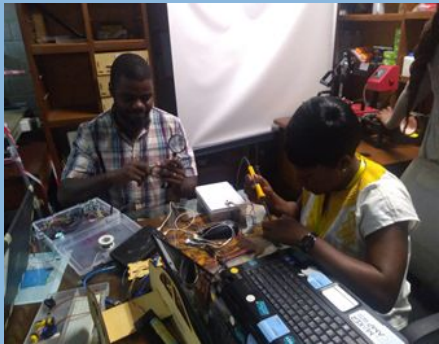
Open Enzyme
Biomanufacturing



Open Hardware prototyping



Open-source incubator for microbiology.
 Developed at Mboalab under the [BFOSH](#) project supported by the [Mozilla Foundation](#)



- MboaLab Shaking Incubator; Funded by Open Bioeconomy Lab and Shuttleworth Foundation.



Why GitHub? Team Enterprise Explore Marketplace Pricing

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FOSH-following-demand / Incubator Public

Code Issues Pull requests Actions Projects Wiki Security Insights

master 2 branches 0 tags

File	Commit Message	Time
Notes	Moved misc files into Notes folder	15 months ago
documentation	Added images	15 months ago
hardware	Update BOM.md	15 months ago
software	Merge pull request #7 from FOSH-following-demand/arduino_code	15 months ago
LICENSE	Add files via upload	2 years ago
README.md	Added photo	15 months ago
code_of_conduct.md	Update code_of_conduct.md	15 months ago

amchagas Merge pull request #12 from hojui/patch-1 8c8157a on 4 Nov 2020 114 commits

About

We want to build an open source Incubator for biology lab in Cameroon; since most of them are under-equipped due to the high cost of lab equipment. We believe that DIY and Open Science Hardware, can facilitate access to low-cost and high-quality equipment for biology labs in Cameroon and Africa. We are a team of 4 people, based in Yaounde, Camer...

science opensource hardware

Readme

GitLab

Shaking Incubator

Open Bioeconomy Lab Shaking Incubator

Project information

Repository

Issues 4

Merge requests 0

Requirements

CI/CD

Deployments

Monitor

Packages & Registries

Analytics

Wiki

Snippets

Shaking Incubator

Project ID: 23096302

8 Commits 1 Branch 0 Tags 113.2 MB Files 113.2 MB Storage

Shaking incubator designed by MboaLab in collaboration with Ongola FabLab. Funded by Open Bioeconomy Lab and Shuttleworth Foundation

master shaking-incubator

History Find file Download Clone

Update README.md Jenny Molly authored 9 months ago 91972bec

README No license. All rights reserved

Name	Last commit	Last update
Documentation	Update folder names	9 months ago

<https://github.com/FOSH-following-demand/Incubator>

<https://gitlab.com/open-bioeconomy-lab/shaking-incubator>



DIY Shaker incubator



DIY Dessicator



Microbiology incubator



DIY Vacuum chamber

Access to reagents through local production in Cameroon

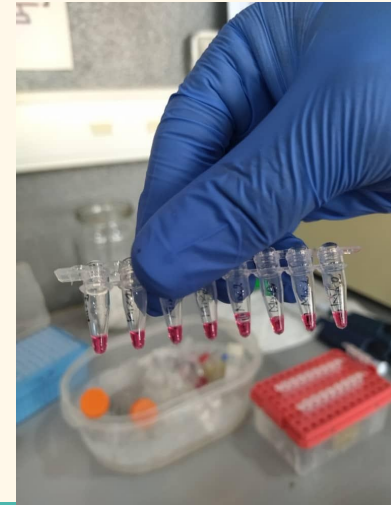


OpenVent DNA Polymerase

PCR Master Mixes (Rubis & Saphir)



Azorubine
Bromophenol Blue



Raising Awareness and Access

PCR Starter Pack



- Extensive communication
- Collaboration: Beta testers
- New products

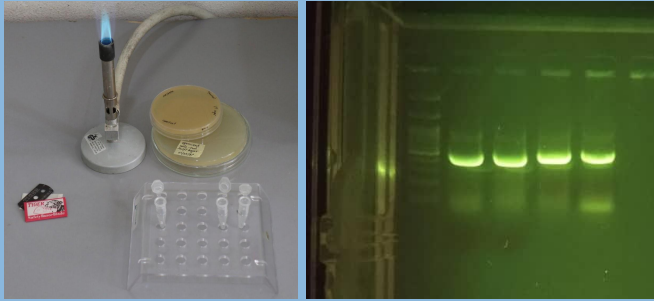
Capacity building of local experts



Developing Products using Low-cost Production Methods

- Lactose based protein induction:
- Solid Surface protein expression

1. Plate protein Expression



2. Lactose instead of IPTG

- Commercial Lactose
- Boiled Milk
- Fresh Milk
- Whey (Home Made)



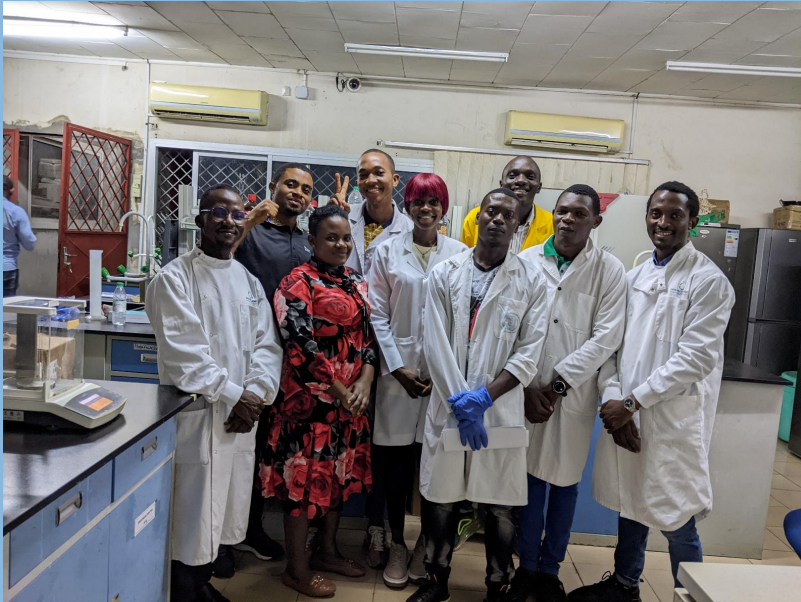
3. Locally Made Instruments



• Training at Local Universities

Advanced Molecular Diagnostics Workshop: 28/10/2022

- >40 Postgraduates students (20 during practical sessions)



Team



DR. THOMAS MBOA

CO-FOUNDER, STRATEGIC MANAGEMENT



STEPHANE FADANKA

CO-FOUNDER, EXECUTIVE DIRECTOR



YANICK DIAPA

CO-FOUNDER, DIRECTOR, INNOVATION ECOSYSTEM AND SPECIAL PROJECTS



NADINE MOWOH

QUALITY CONTROL



THERESE MINFFIH

OPERATION AND LOGISTICS



MINETTE SHALO

RESEARCH AND DEVELOPMENT



DR. JENNY MOLLOY



DR. CHIARA GANDINI

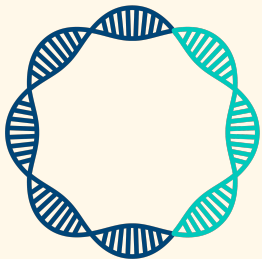


LENSHINA AGBOR



DR. LINDA KAHL

Advisors



BENEFICIAL.BIO



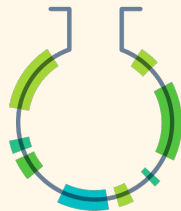
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directors@beneficial.bio

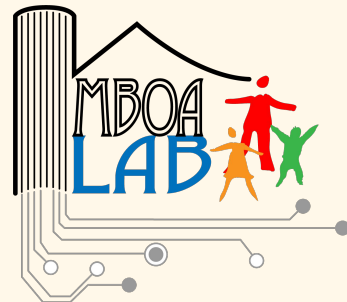


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Thank you