

RESEARCH CENTRE FOR PREVENTIVE HEALTH INNOVATION

Established October 2025

*Creating healthy people and environments
through technology and behavior*

MB&C course 2026

UCLL, Leuven, 06/02/26

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WHY WE EXIST

- Health care systems are under increasing pressure.
- The future of health lies in *prevention* and *sustainability*.
- Accessible technology empowers people to take control.
- Healthy behavior thrives in a healthy environment.

OUR MISSION

We promote a healthier lifestyle and environment through prevention and innovation.

We develop tools that empower people to monitor their health and surroundings and train professionals to apply these technologies.

We collaborate with academia, industry and society, to bring practical innovations into healthcare to support preventive care and reduce pressure on health systems.

HOW WE MAKE A DIFFERENCE

We address preventive health by **integrating technology, behavior, and environment.**

We **connect research, education and practice** to create societal impact.

We work **transdisciplinarily**: scientists, citizens, students, and professionals co-create solutions.

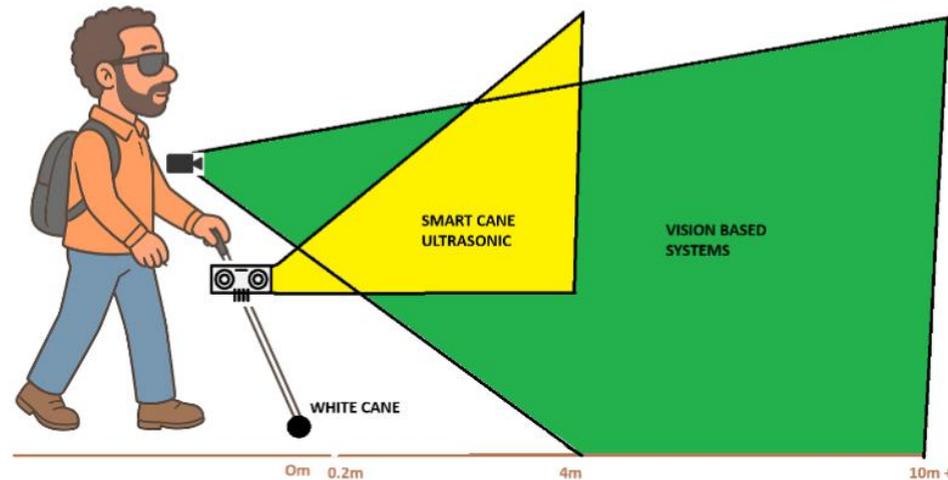
Our home base: Brussels, a diverse city that serves as our microlab for innovation.

OUR RESEARCH PROJECTS



- **Accessible Sensor Technology:** low-cost tools for personal and community environmental monitoring.
- **Ambient Assisted Living Technology:** supportive technologies for people with cognitive or sensory diversity.
- **CoHealth Brussels:** participatory tools for healthy and climate-friendly nutrition and physical activity.
- **ArtScience** (with RC Open Arts & Futures): co-creation at the intersection of art, science, and health innovation.

- Designs context-aware, privacy-preserving tools that **support people** with cognitive or sensory diversity in their daily routines and digital participation.

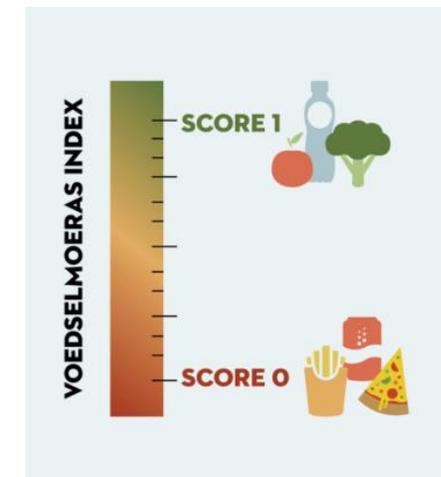


- Co-creates participatory tools with youth to **promote healthy** and climate-friendly **nutrition** and **physical activity** in response to urban inequality.

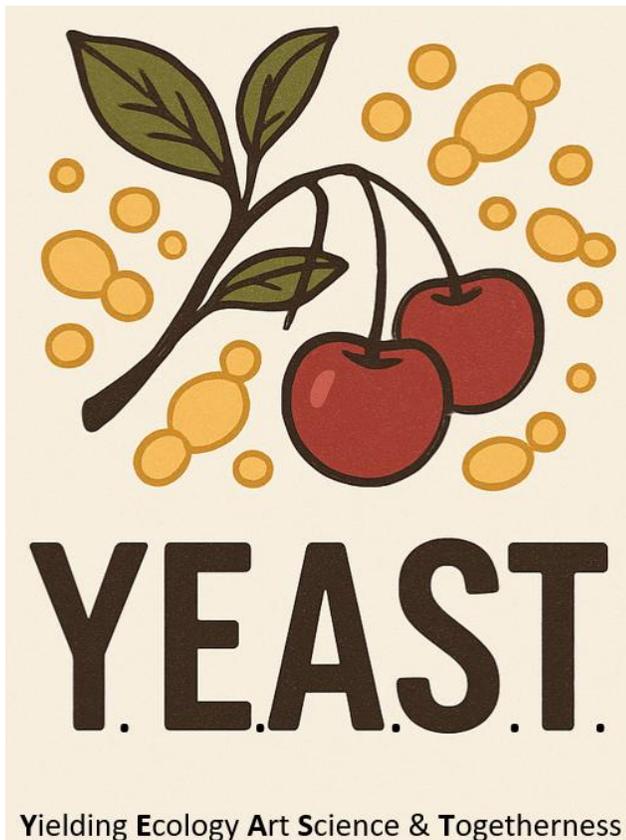
Bijna heel Vlaanderen is een voedselmoeras – rood of oranje op onderstaande kaart. In steden word je gebombardeerd met pizzeria's, snackbars, enz. Verder gaat het bij de meeste bezorgopties ook om ongezond eten.



Voedselmoerassen in België (rood/oranje). Bron: onderzoek Smets, Cant & Vandevijvere



- Brings artists, scientists, and societal actors together to **co-create** knowledge, stimulate dialogue, and critically reflect on health prevention and technological innovation.



1. Artistic Part:

developing a subjective atlas of the trees and their microbiome. Development of an artefact by Matthijs De Block.

2. Scientific Part:

Citizens, students, ... swab trees to isolate and identify yeasts.

3. Final event:

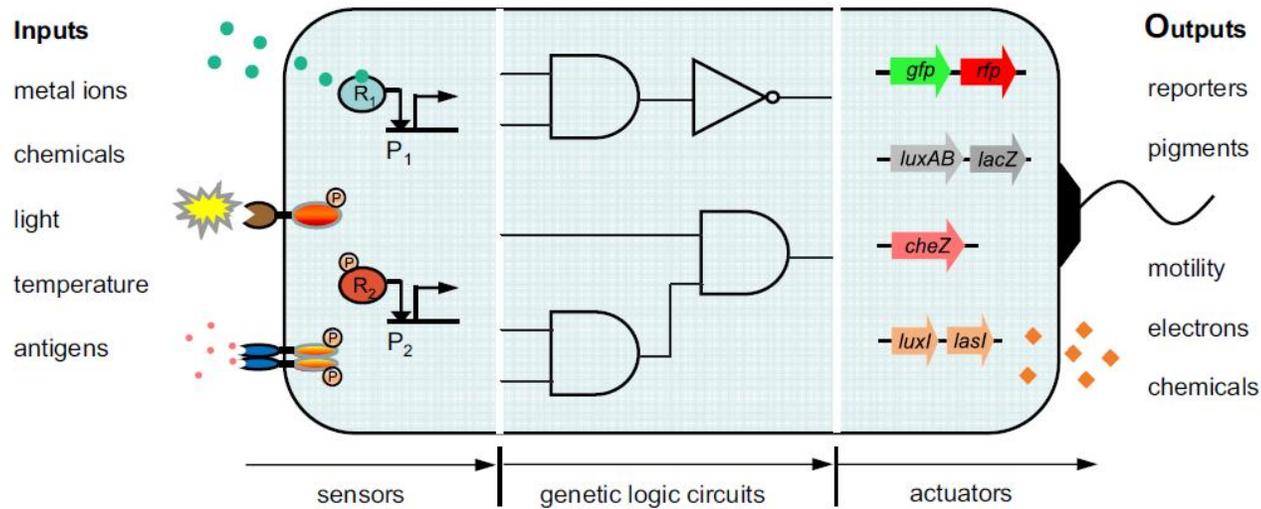
Artefact on display + lectures & workshops.



Matthijs De Block



- Develops low-cost, user-friendly **biosensors** that enable personal and community-based environmental health monitoring.



Wang et al. 2013

A **whole-cell biosensor** is a microorganism that constitutively expresses the genes for the **detection** of an analyte together with the conditional production of a convenient **signal**.



AMERICAN SOCIETY FOR MICROBIOLOGY

Bacterial Biosensors: The Future of Analyte Detection

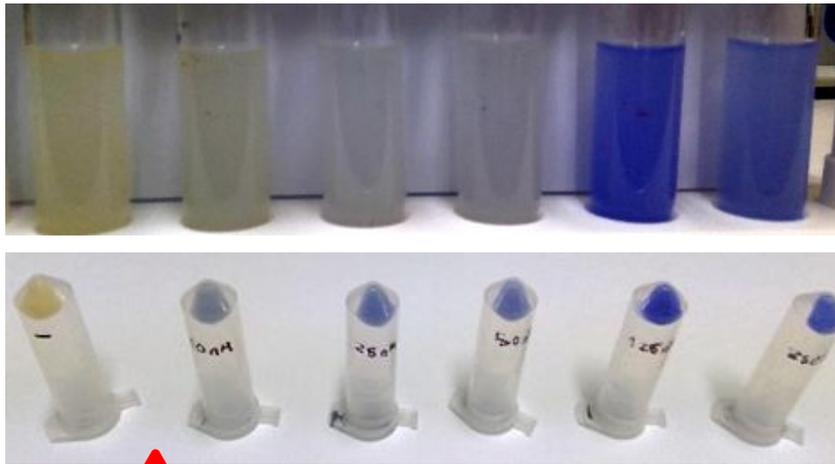
Sept. 25, 2023

Scientists can do some nifty things with microbes, including engineer bacterial cells to sense and signal the presence of specific compounds. These **microbial whole-cell biosensors** have numerous purposes, from detecting toxins in the environment to signaling infections or disease in humans. Propelled by advances in **synthetic biology**, researchers are continuing to refine the methodology for creating bacterial biosensors, and developing new ways in which these devices may be applied to promote human and planetary health.

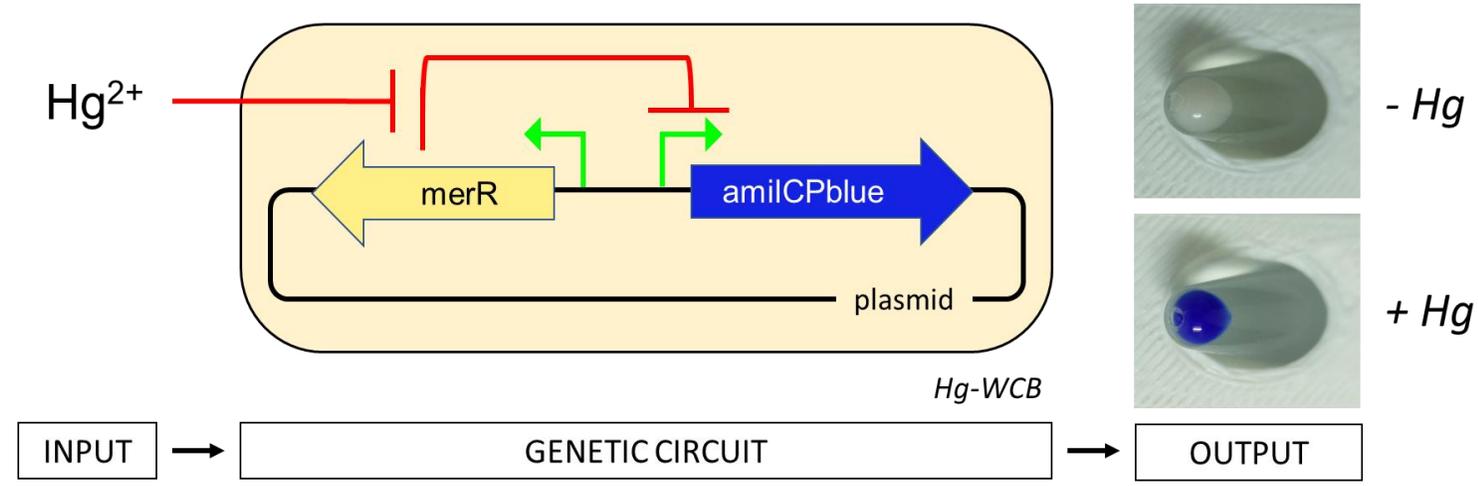
<https://t.ly/iUUC5>

A selective and sensitive Hg-WCB

The Hg-WCB is **sensitive**



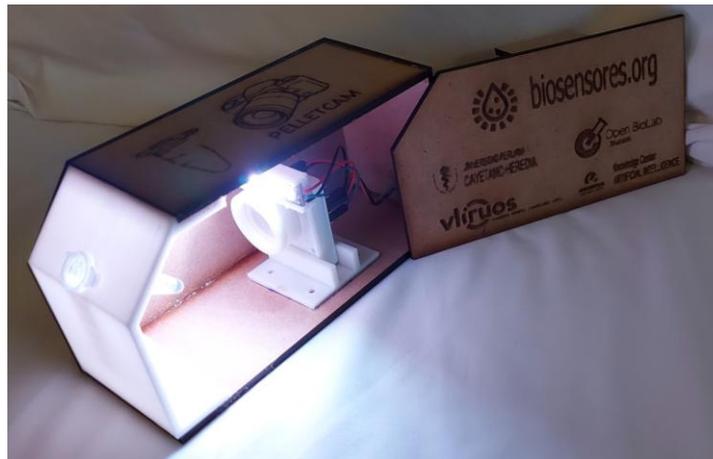
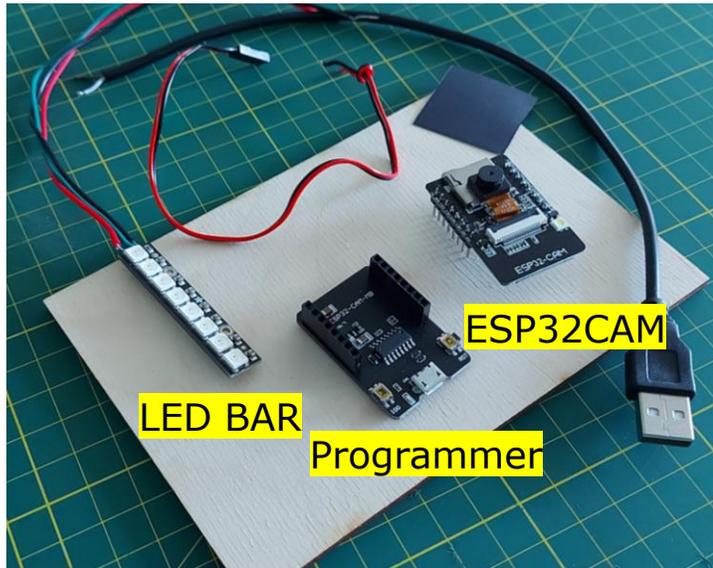
0  10 25 50 125 250
Safety limit = 5 nM [Hg²⁺] nM



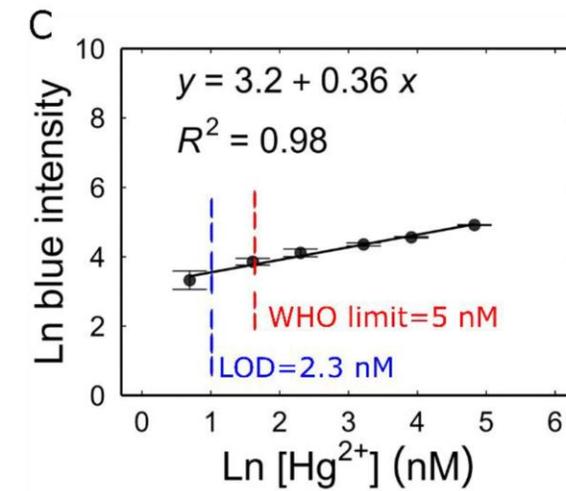
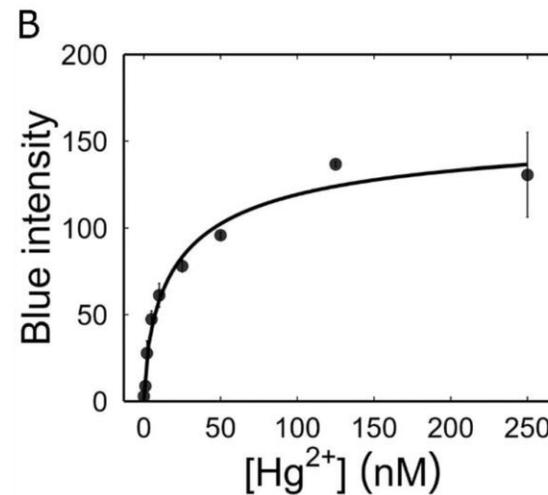
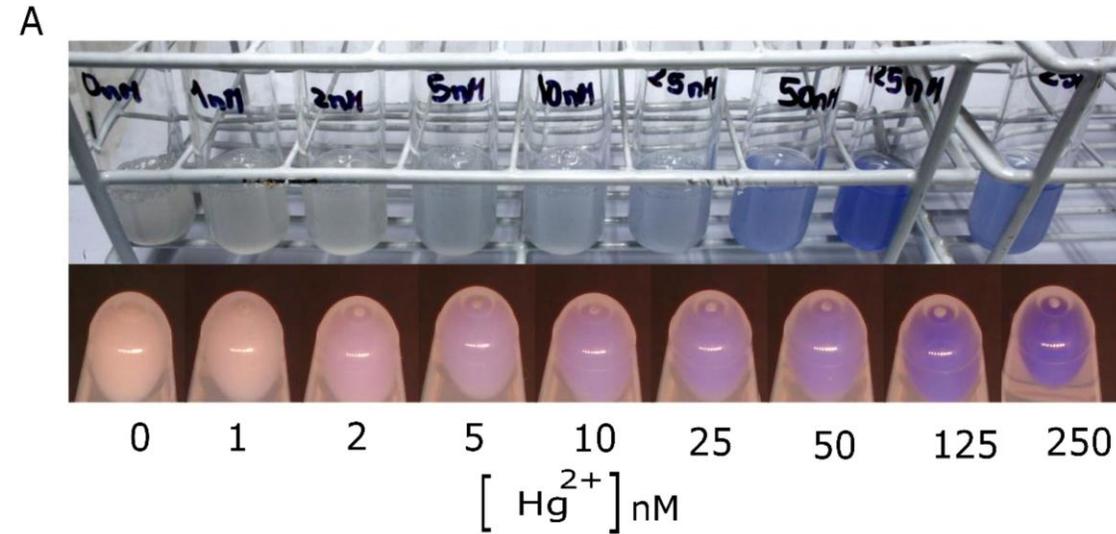
The Hg-WCB is **selective**



Cd²⁺ Cr³⁺ Fe³⁺ Cu²⁺ Ni²⁺ Zn²⁺ Pb²⁺ Ag⁺ **Hg²⁺** -



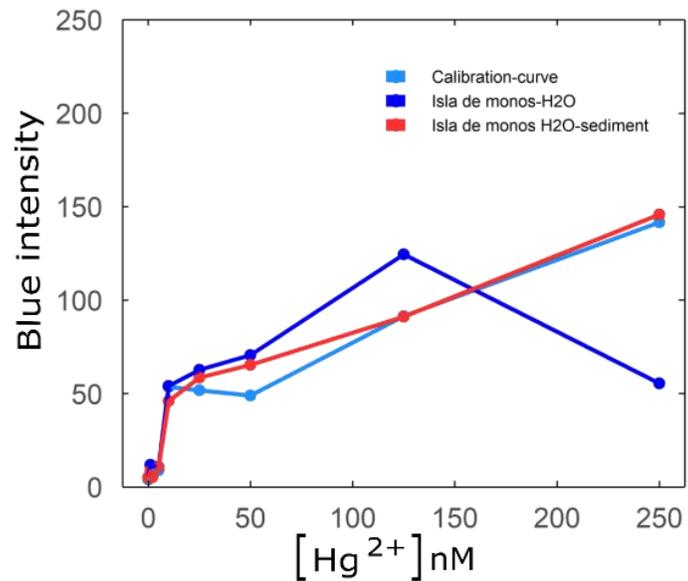
The 2.0 version was built for under 10 € using readily available fablab equipment



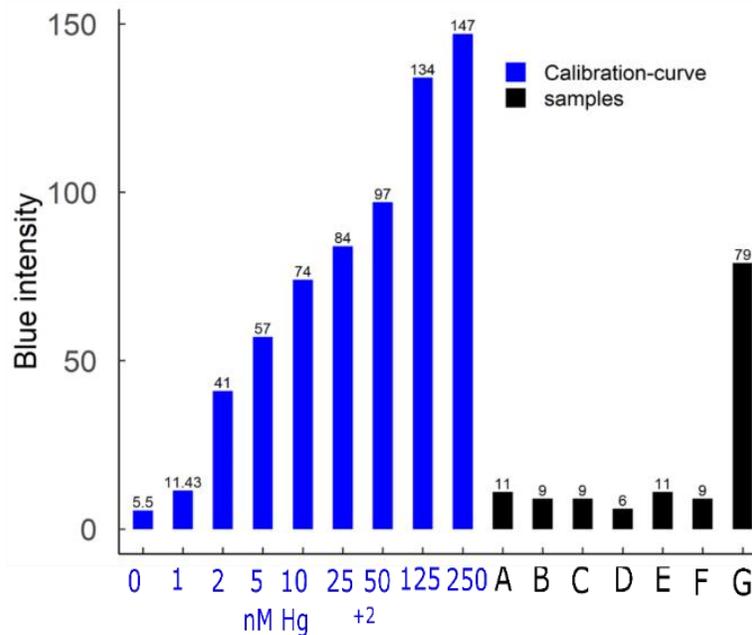


Calibration curve

0 1 2 5 10 25 50 125 250
[Hg²⁺]nM



Hg- SPIKED ENVIRONMENTAL SAMPLES



0 1 2 5 10 25 50 125 250 [Hg²⁺] nM



Enviromental samples

A B C D E F G



non- SPIKED ENVIRONMENTAL SAMPLES (Madre de Dios, Peru)

OUR TEAM



Dr. Fien De Block
Behavioral Sciences



PhD(c) Padin Fazelian
LLM, AI, NLP



Dr. Evelien Mertens
Dietetics



Dr. Veerle Van Raemdonck
Kinesiology



Ing. Maarten Dequanter
Robotics, AI, LLM



Dr. Tom Peeters
Biotechnology
Head

<https://www.erasmushogeschool.be/nl/research-centre-preventive-health-innovation>

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