Revolutionizing microbiology with AI

Zoé Ducourau – Product Manager and Senior AI Specialist

IASP Saint-Hyacinthe

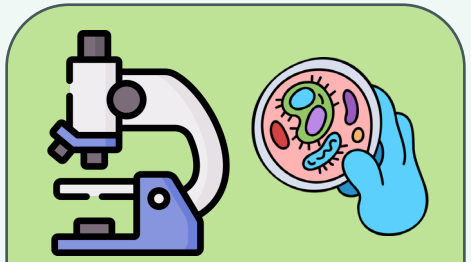
29th May 2025

Bioeureka

Who we are

Bioeureka

Multidisciplinary expertise since 2022



Microbiology

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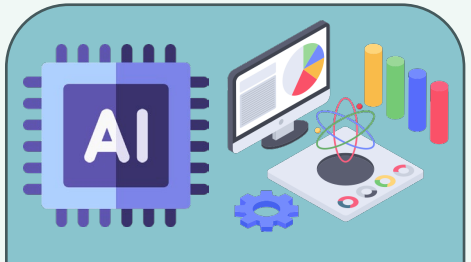


AI and Software

Common goal :

An efficient, fast and affordable solution for identifying pathogens in the lab

Key partners

Mila

CENTECH

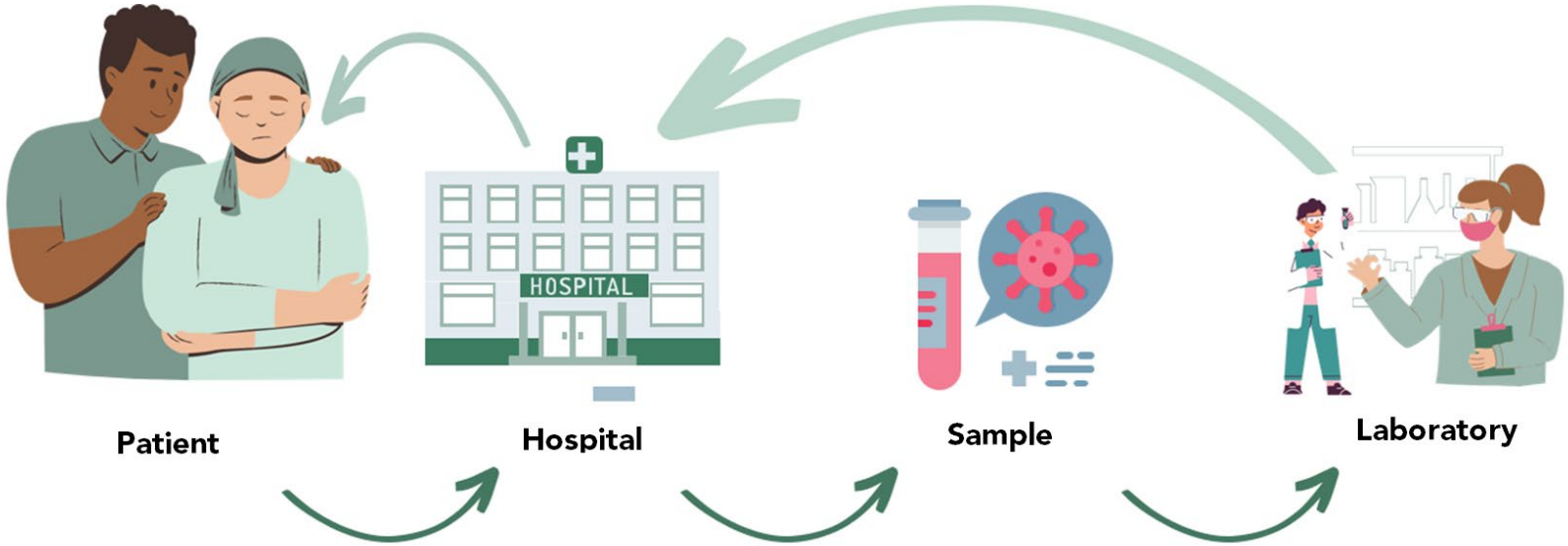
LA CITÉ
LE COLLÈGE D'ARTS APPLIQUÉS ET DE TECHNOLOGIE

AXEO

SICARA

The problem we tackle

Pathogen testing is facing challenges around the world:



> Traditional diagnosis is based on laboratory culture of bacteria from patient samples, a process that can take up to a week or more and lacks sensitivity.
>
> - Ian Butler, Principal Clinical Scientist in Medical Microbiology at Barts Health NHS Trust

- **Health and Safety:** Rapid and efficient tests are crucial when lives are at risk and health is threatened.
- **Current Technologies:** Existing methods are lengthy and costly due to "trial and error," requiring multiple tests.
- **Qualified Laboratory Technologists Shortage:** The current shortage of qualified laboratory technologists makes it essential to reduce the time it takes to obtain results.

The problem we tackle – Food industry

48M

Americans get sick from food poisoning every year *

$10M

Average cost to companies in case of recall *

*Report from Grocery Manufacturers Association (GMA) : Economic Impact of Product Recalls. Source : FDA - Foodborne Illnesses: Causes and Statistics.

Stage	Acceptable Quality Limit Measures*	Pathogen Testing at each stage	Bio eureka
Raw Material Sourcing	Supplier audits, sampling	E. coli, Salmonella, Listeria	✓
Harvesting & Processing	Hygiene, cold chain management	Campylobacter, E. coli O157:H7	✓
Manufacturing	HACCP, metal detection	Listeria, yeast & mold	✓
Packaging & Storage	MAP, leak detection	Spoilage bacteria	✓
Transportation	Cold chain monitoring	Surface swabbing	✓
Retail & Distribution	Shelf audits, temp logs	Listeria, E. coli	✓
Consumer & Compliance	Batch testing, recall systems	Regulatory testing	✓

Multiple testing is pricey

71 tests on average for the whole process

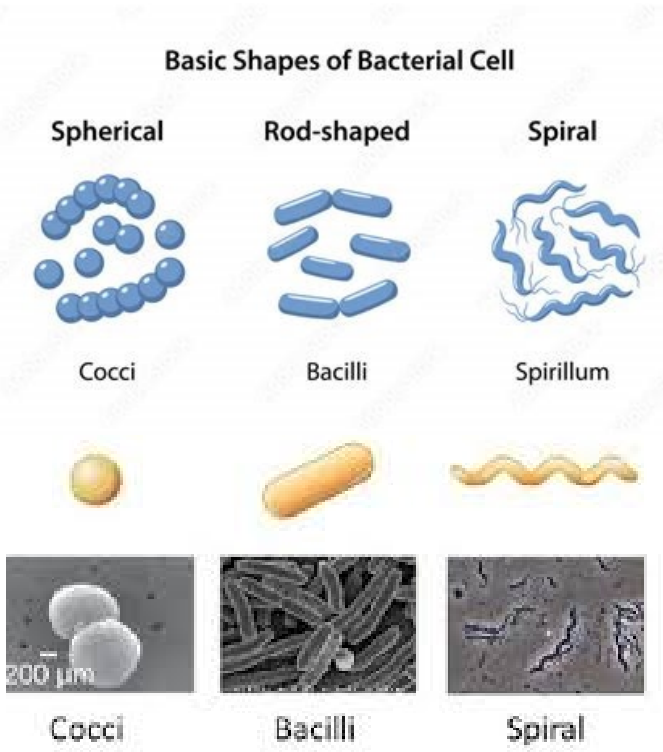
* AQL (Acceptable Quality Limit) is a statistical quality control method used in the food industry to determine the maximum number of defective units acceptable in a batch before the entire lot is rejected. It helps food manufacturers comply with safety regulations and maintain consistent product quality.

Our solution

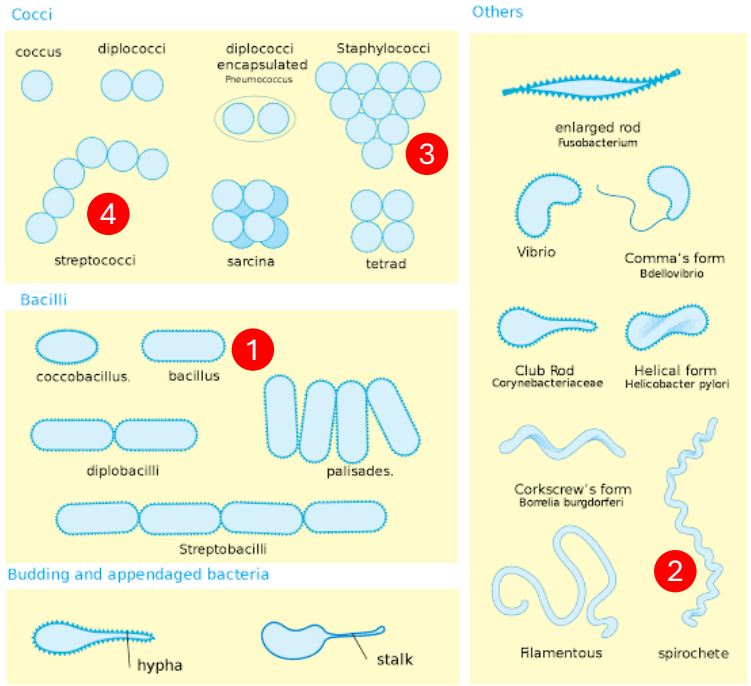
Link

How does it work?

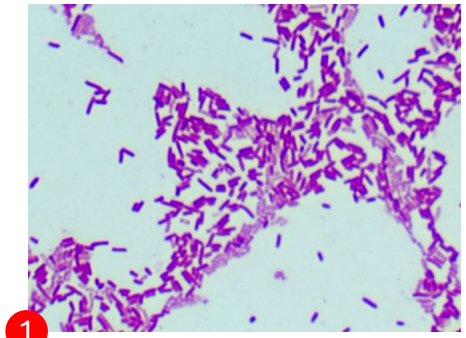
Morphology (alone)



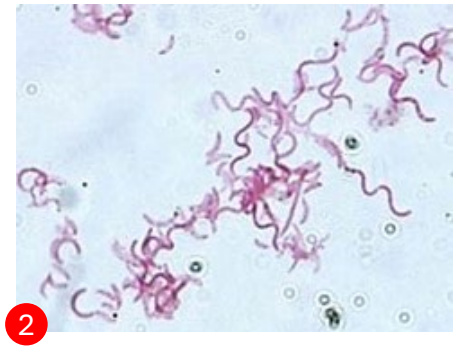
Grouping (together)



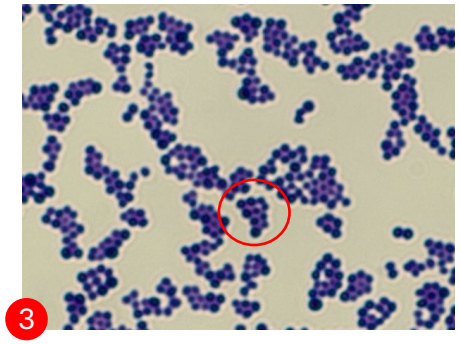
Examples:



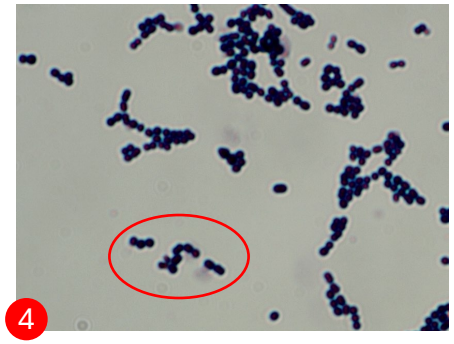
Escherichia Coli



Spirillum Volutans



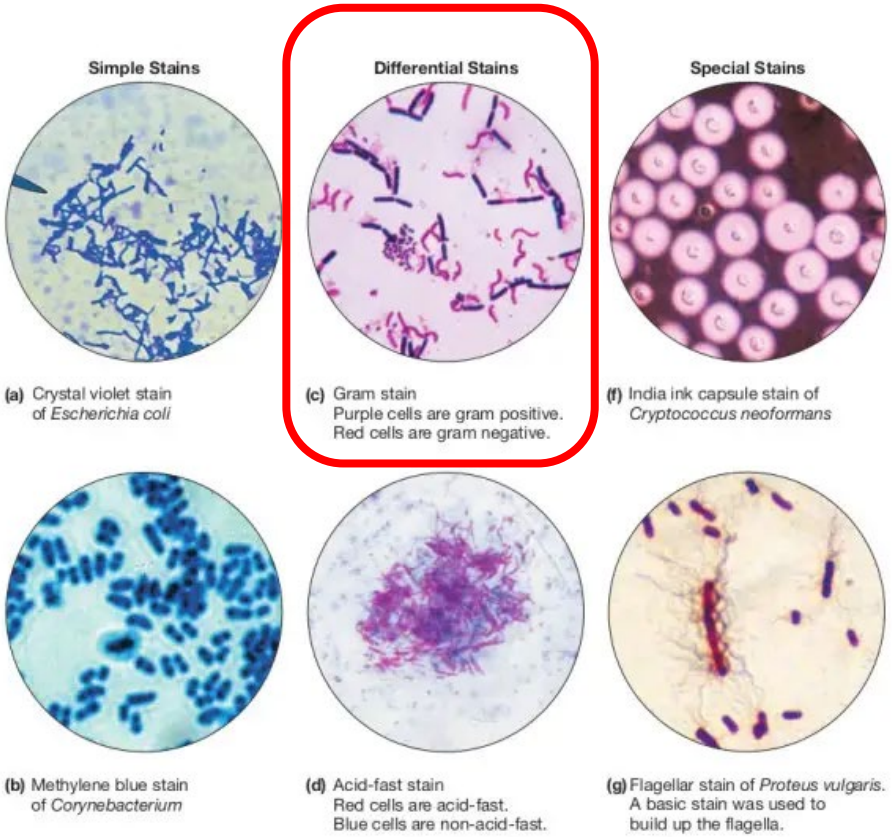
Staphylococcus Aureus

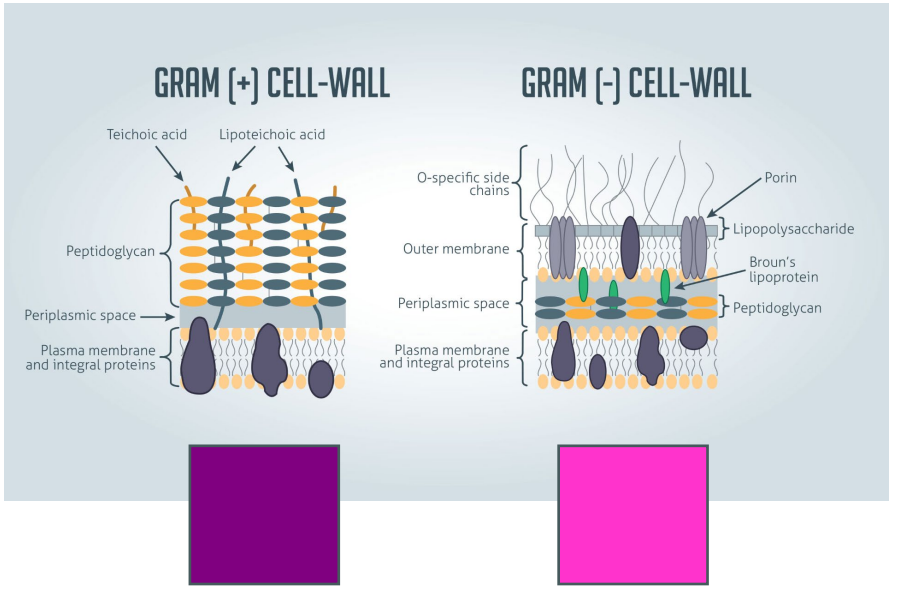


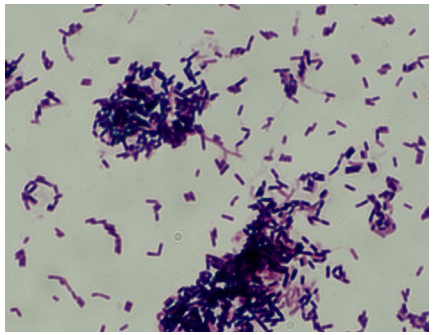
Streptococcus Agalactiae

How does it work?

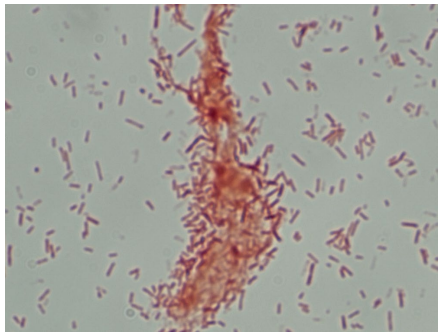
Gram stain is widely used in the industry







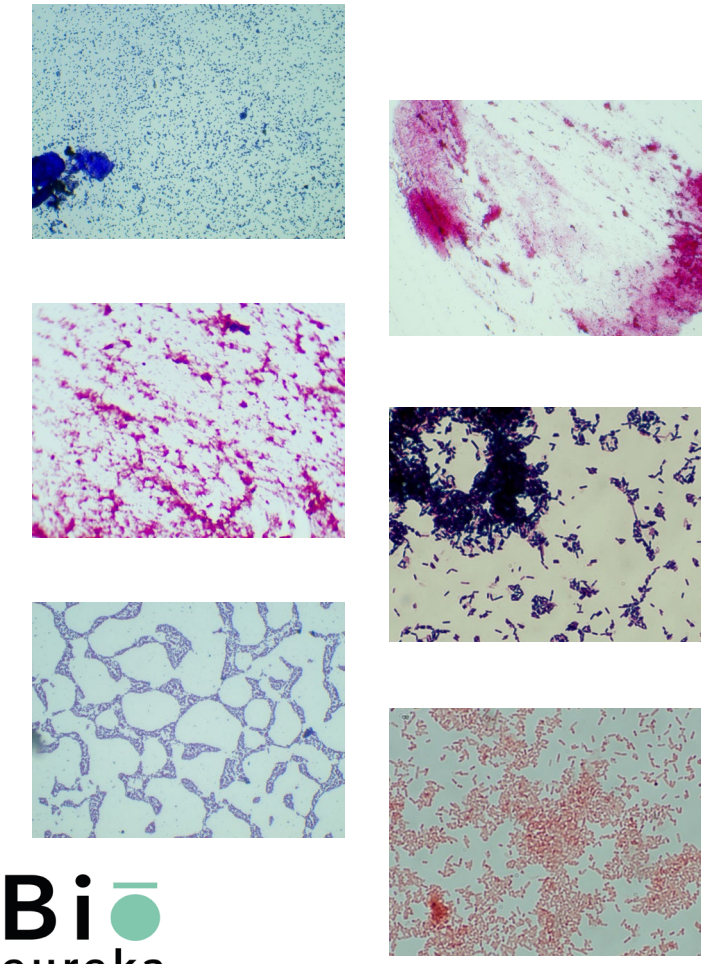
Listeria Monocytogenes



Pseudomonas Aeruginosa

How does it work?

Variety of data
(zoom, dilution, focus...)



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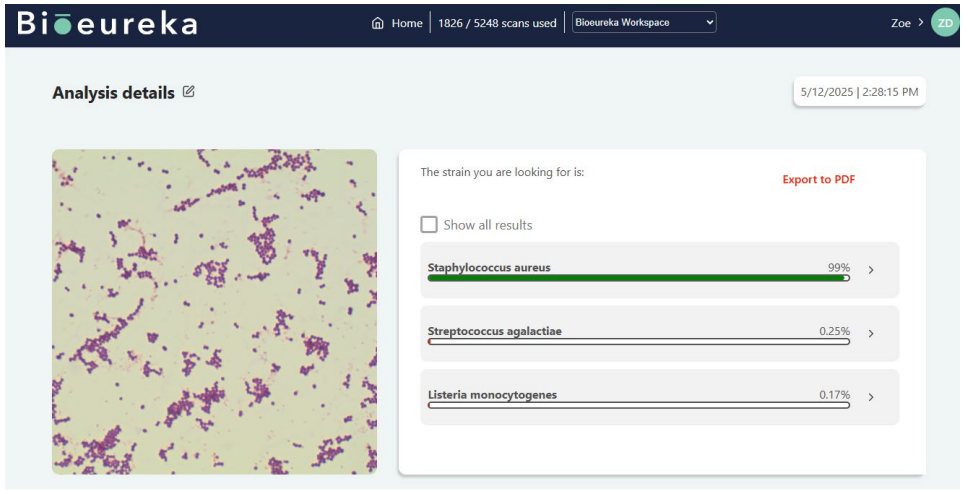
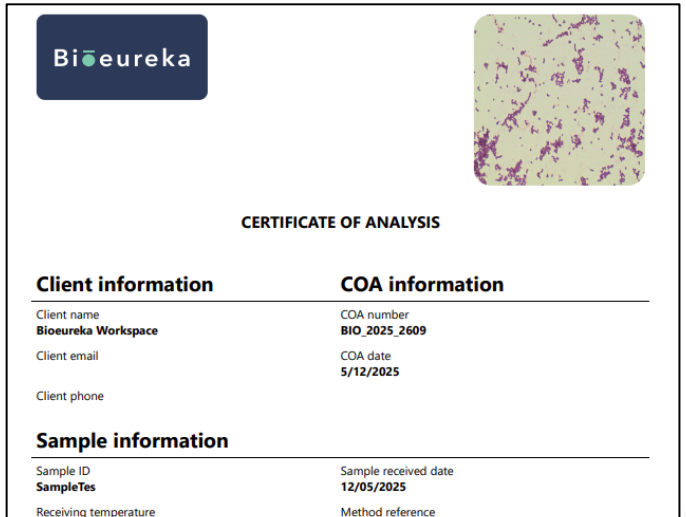
AI

98% accuracy + CoA compliant





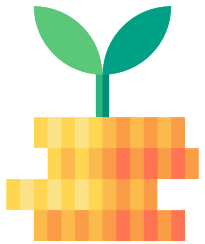
Proved results

Reliability

- **98% AI model accuracy**
- **Calibration** step to ensure reliability

Efficiency and scalability

- **A few seconds to compute**
- No delays with **on-site** testing
- **Adaptable** to any lab, pathogen, virus, fungi…



Cost-effectiveness

- Up to **60% of reagents (consumables) costs saved** (fewer testing)
- Up to **50% of wages saved** with time gained in testing
- **Prevents costly recalls**

Sustainability and access

- **Reduces single-use equipment**
- Facilitates access to advanced diagnostics **in resource-limited settings**

Thank you for your attention !

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