



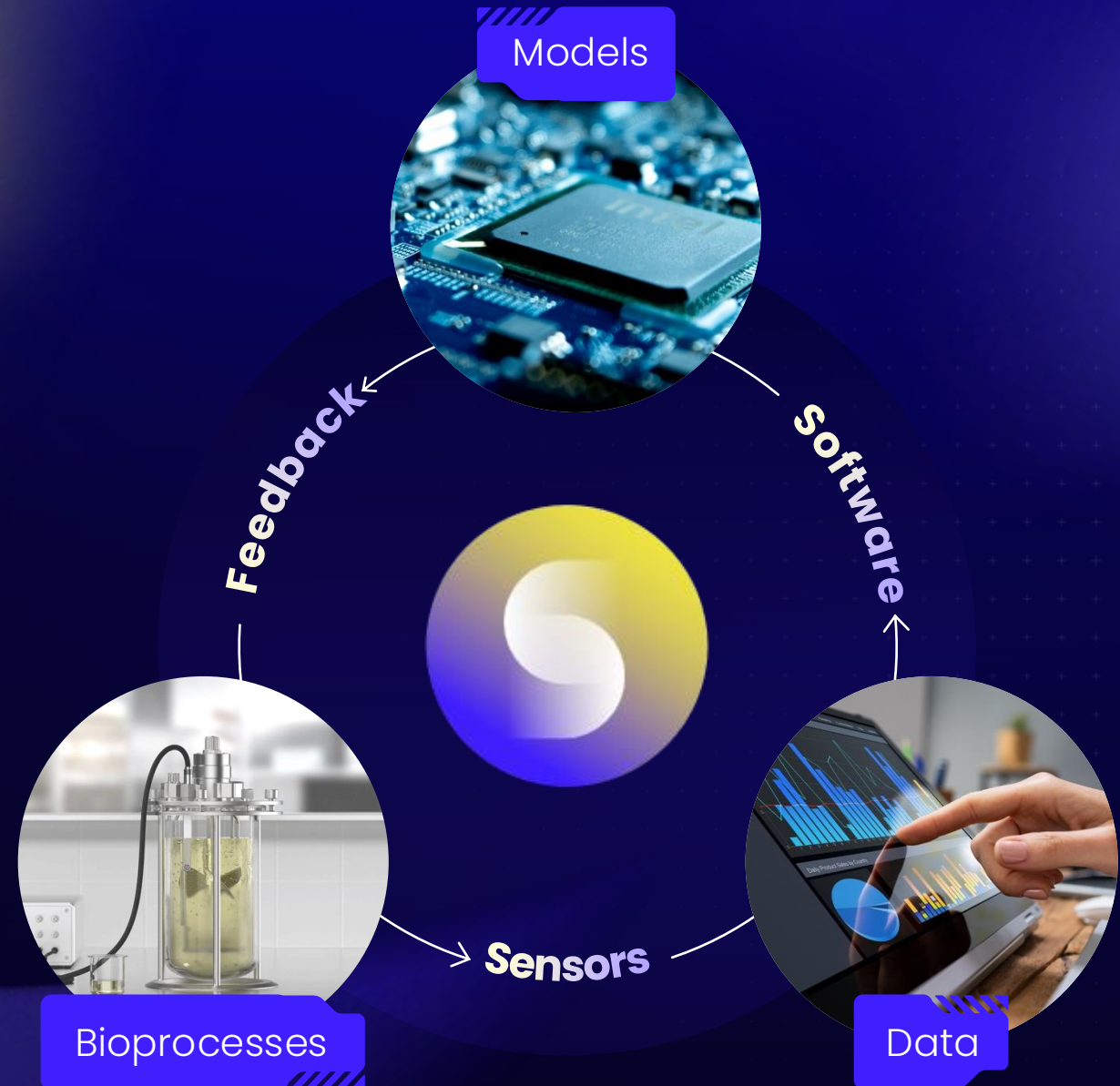
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Chip-based multi-parameter sensor for real-time bioprocess monitoring, enabling data-driven models



How to improve bioprocessing development?





Current monitoring solutions are **limited** on several aspects

High CapEx & OpEx

One parameter per probe

No interpretation

Sterilisation for re-use

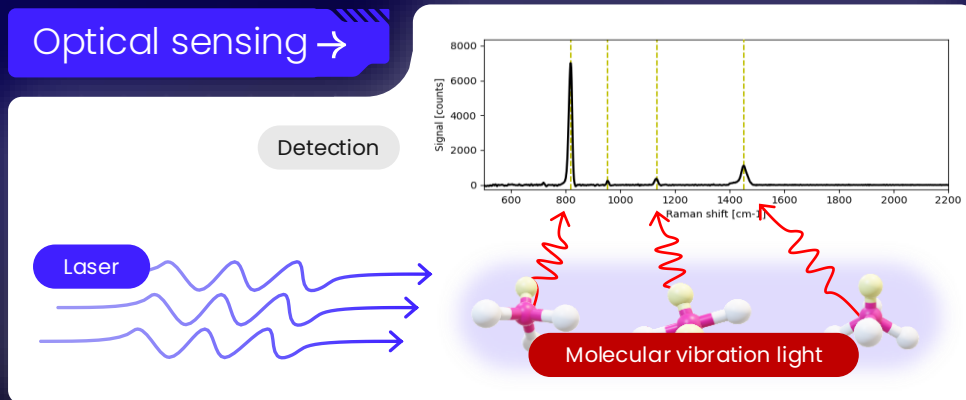
Off-line



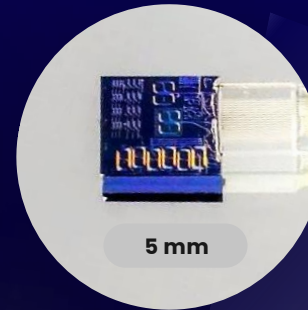
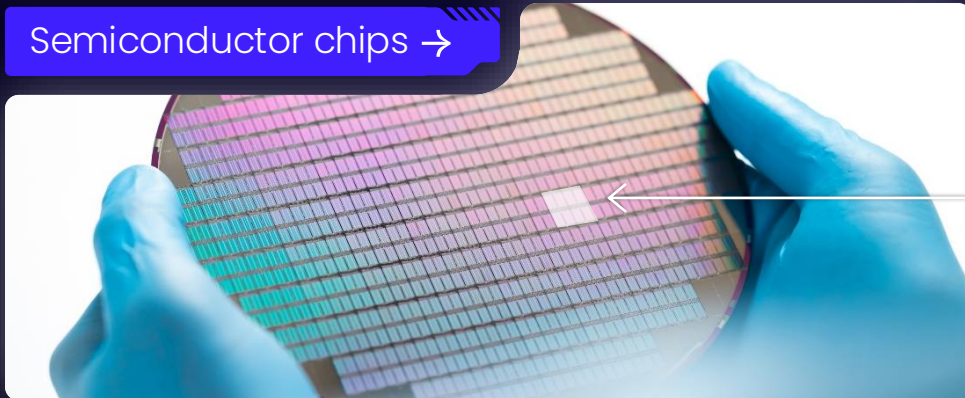


InSpek delivers cutting-edge on-chip sensing...

Optical sensing →



Semiconductor chips →



IP portfolio | including 2 MIT & 3 InSpek exclusive patents →



The first on-chip multi-molecular sensor

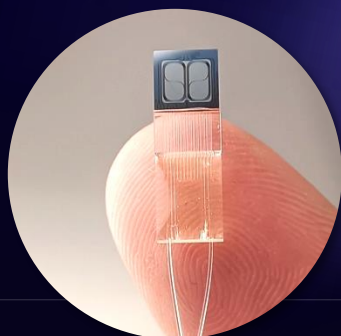
What makes InSpek different? →

1

Cost & time saving in process development

2

Analytical performance in process monitoring



Real-time



Reusable or single-use

Flexible integration



Miniaturized

For all process scales



Multiplexing

Several measurement points in parallel



Affordable

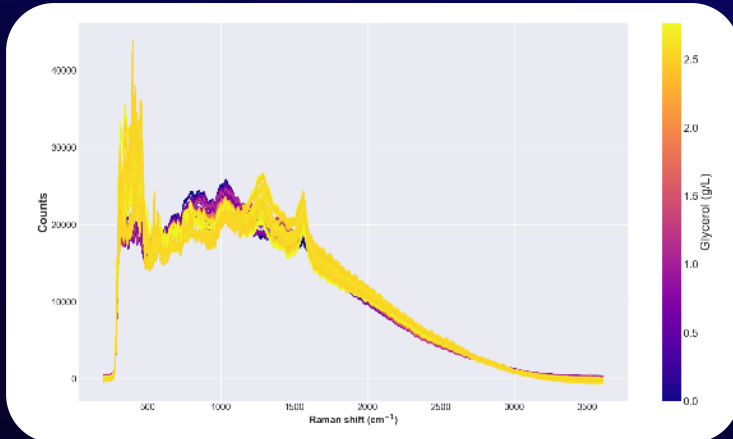
COGS 10-100x lower

Our system in action



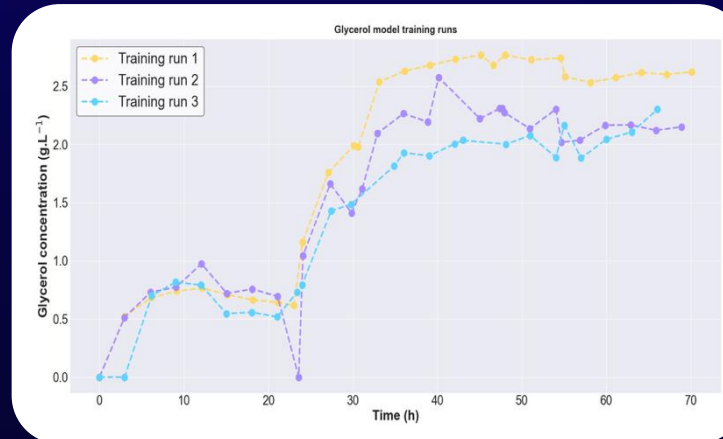
Case study: model for real-time glycerol monitoring

① Data acquisition in bioreactor



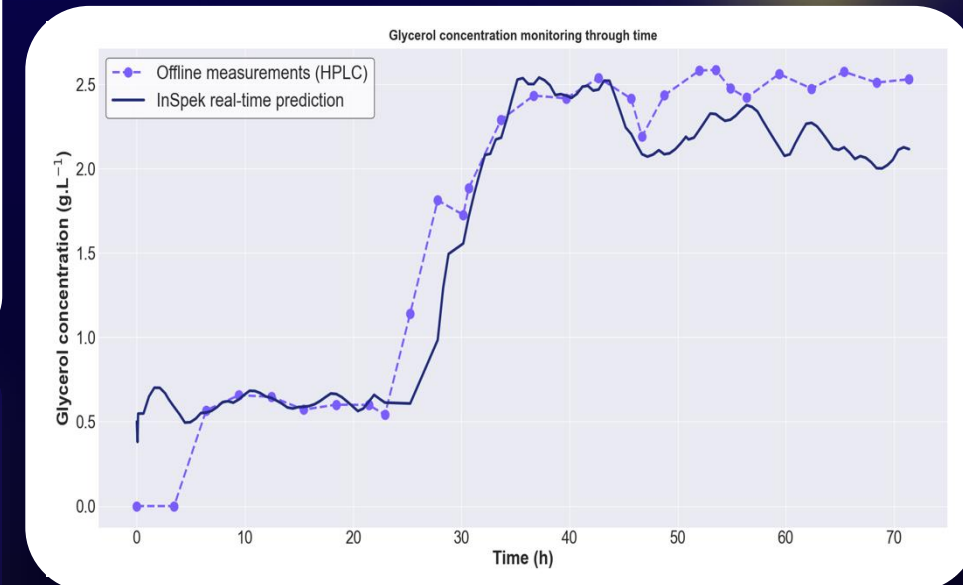
- Culture type: Yeast (*S.Cerevisiae*)
- Culture volume: 3L
- Culture time: 3 days
- Product of interest: Glycerol

② Model training on runs 1-3



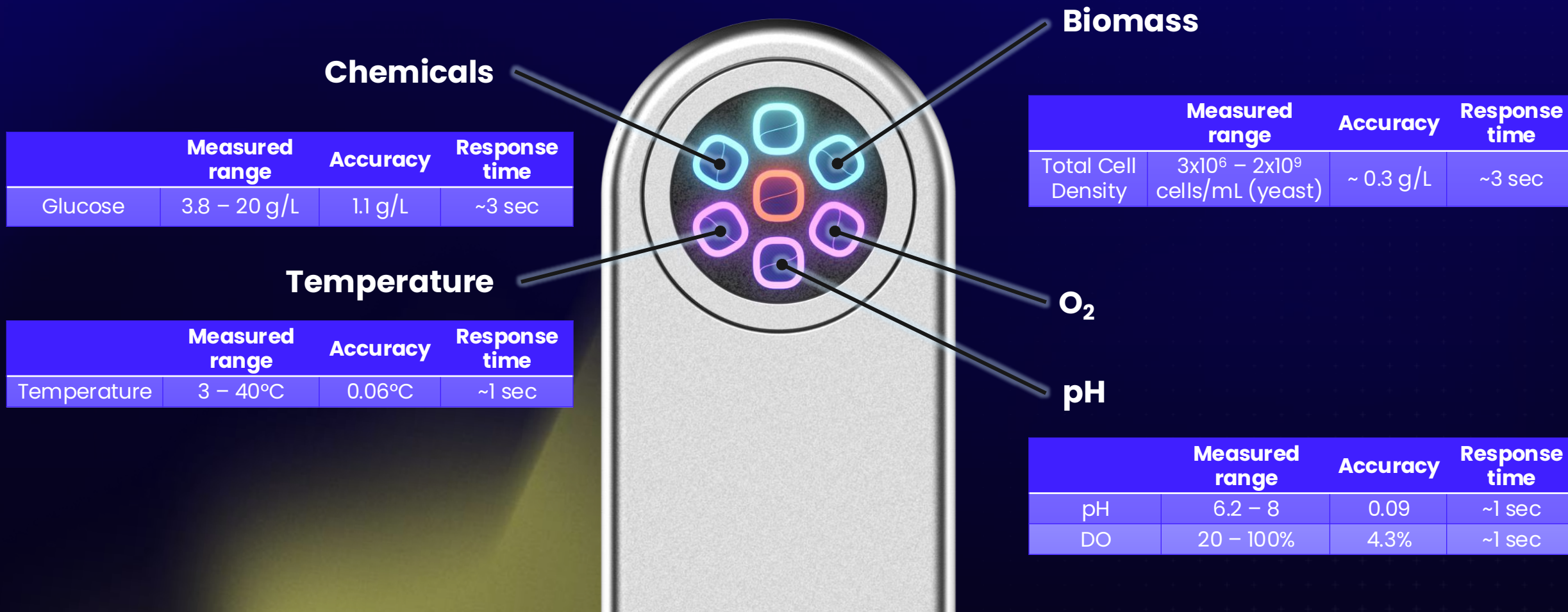
- Offline monitoring with HPLC for training
- AI-based Raman model development
 - Automated signal processing & model tuning
- Scalable to any metabolite visible with Raman

③ Real-time concentration prediction during the process



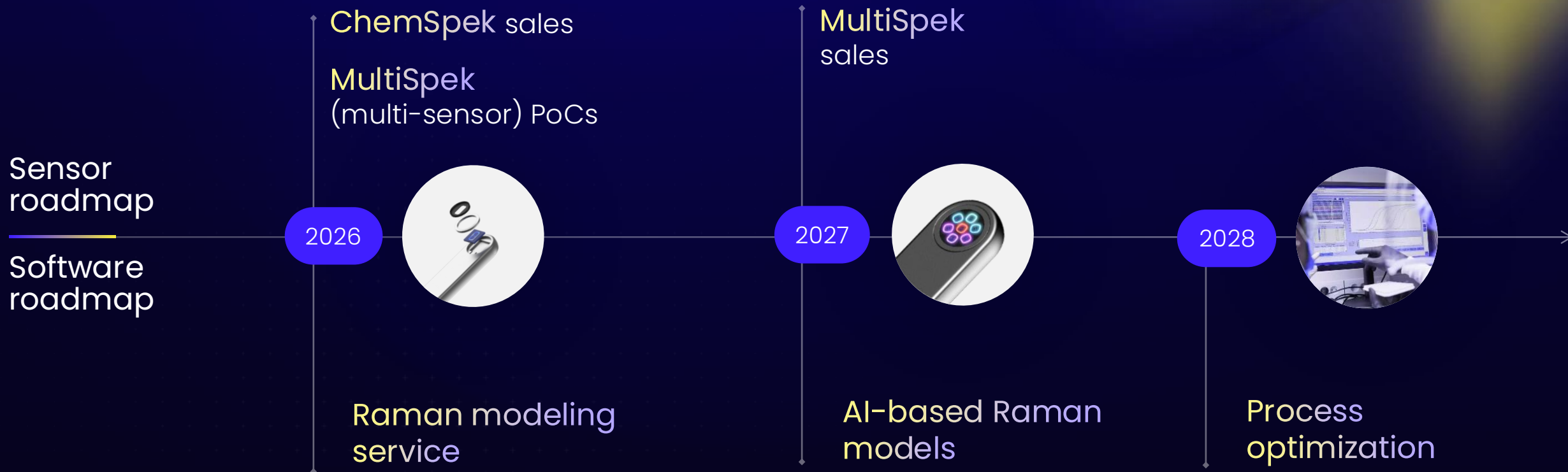
Strong alignment between offline measurements and InSpek's model predictions

Beyond chemicals: we're developing a multi-sensor probe





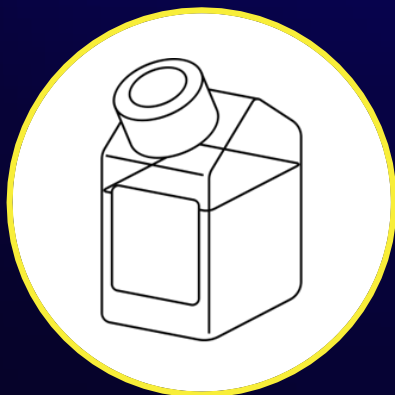
Path to leadership: from sensing to autonomous optimization





How we can collaborate for pilot testing

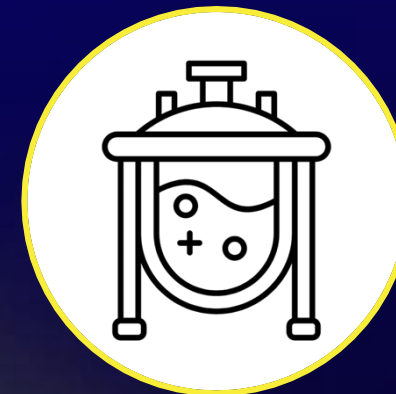
At InSpek



Molecule(s) in culture medium

1. List of interesting molecules
2. Measurements of dilutions
→ LoD, range, and precision

On-site



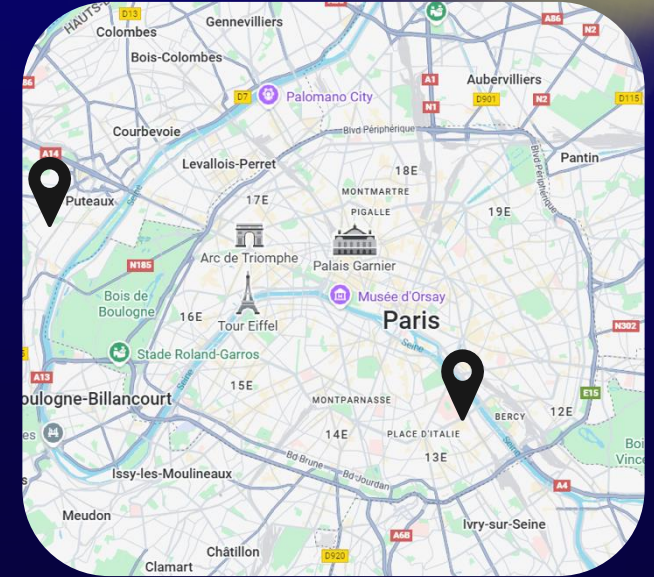
In bioprocess

In-line measurements
alongside reference
measurements

Join our waiting list

InSpek at a glance

- **Founded in 2021** after >4 years of development
- **Offices & labs in Paris & Suresnes, FR**
- **>8M€ funding** from investors, public agencies, PoC customers
- **15 FTE (inc. 7 PhDs)** with expertise in optics, bioprocessing, AI



**Jérôme
Michon, PhD**
CEO



**Ivan-Lazar
Bundalo, PhD**
CTO



**Yasmine
Ibrahimi, PhD**
Photonics Lead



**Christopher
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Bioprocess Lead



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Enabling Biomanufacturing 4.0
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