

eTect Electronic Biomarker Detection: An Introduction



eTect biosensors: USP



- Electrochemical Biosensor
 - ▶ Proteins, R/DNA...
- Inherently multiplexed, label-free
- Robust design, no moving parts
- Rapid, low-cost platform
addresses multiple markets

ELISA

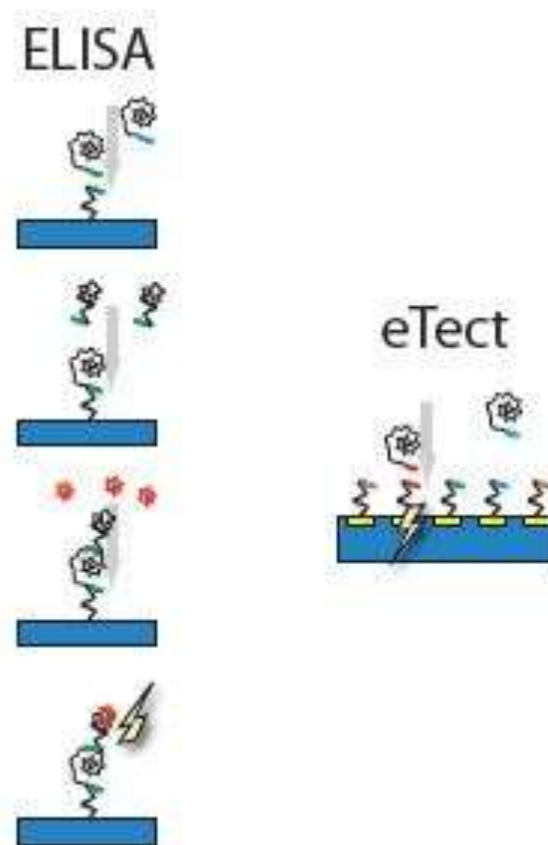


eTect



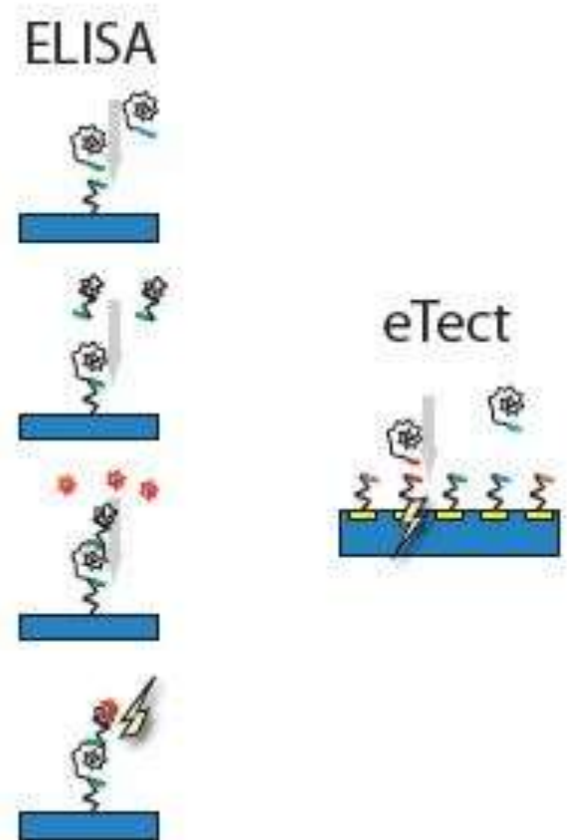
Next-generation multiplexed biosensor platform

- Future-proof:
 - ▶ Inherently multiplexable
 - ▶ Flexible digital read-out
 - ▶ Works with proteins and R/DNA
 - ▶ Sensitivity exceeds market leaders
- Lower assay costs:
 - ▶ No expensive optical readers
 - ▶ No labels, no wash required
 - ▶ Faster results



Next-generation diagnostic platform for labs, point-of-care and home diagnostics

- Lower costs
 - ▶ Smaller samples, multiple markers
 - ▶ One step digital read-out: screening by non-clinicians
 - ▶ Shorter, more patient-centred pathways
- Unlocking personalised medicine
 - ▶ Patient stratification: outcome payments for molecular drugs
 - ▶ Home-based screening and monitoring



Positioning vs Luminex MAGPIX®



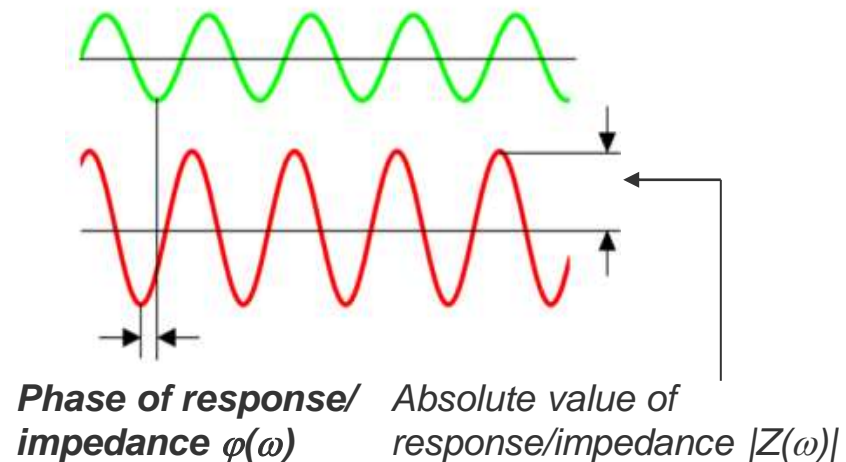
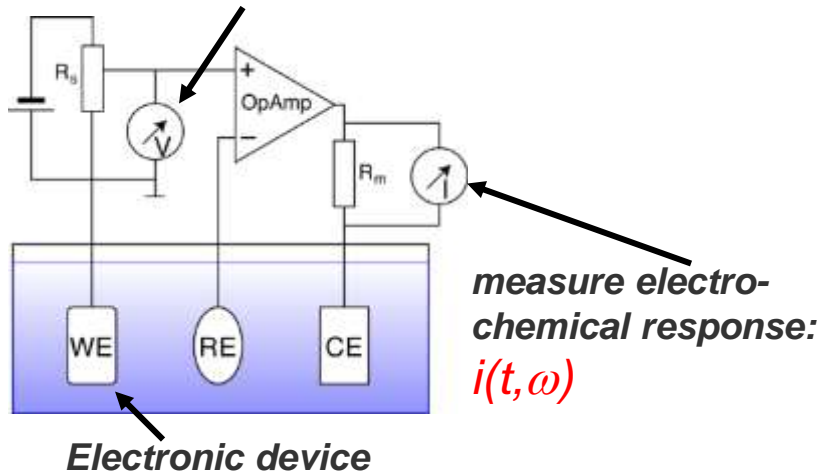
| | |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Luminex MAGPIX® | <ul style="list-style-type: none">• >1 hour time-to detection• Labelling required• Washing required• Expensive optical reader required• Suitable for laboratory or desk-top applications |
| eTect | <ul style="list-style-type: none">• <30 minutes time-to-detection• No labelling• No washing• Direct electronic read-out: no optical reader required• Suitable for laboratory, desk-top, hand-held, consumer applications |

Intellectual Property: Patent 1

Highly sensitive electrochemical analyte detection (PCT/GB2007/003465)

- Sensor area independent
- Inherently multiplexed, label-free

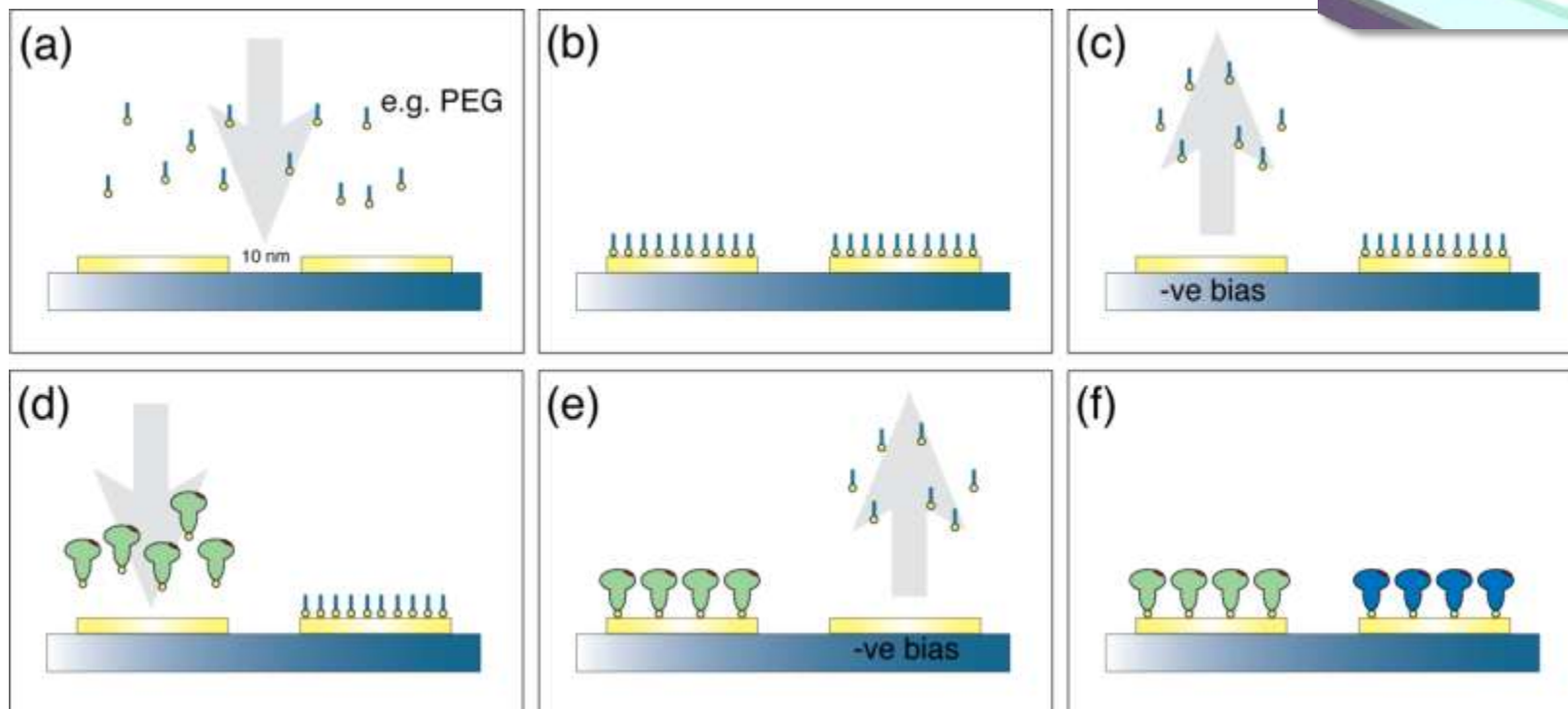
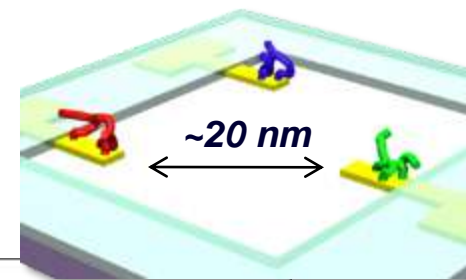
dc + small ac electrochemical potential: $\phi(t)$



D. Evans et al. Journal of Biology (2008)

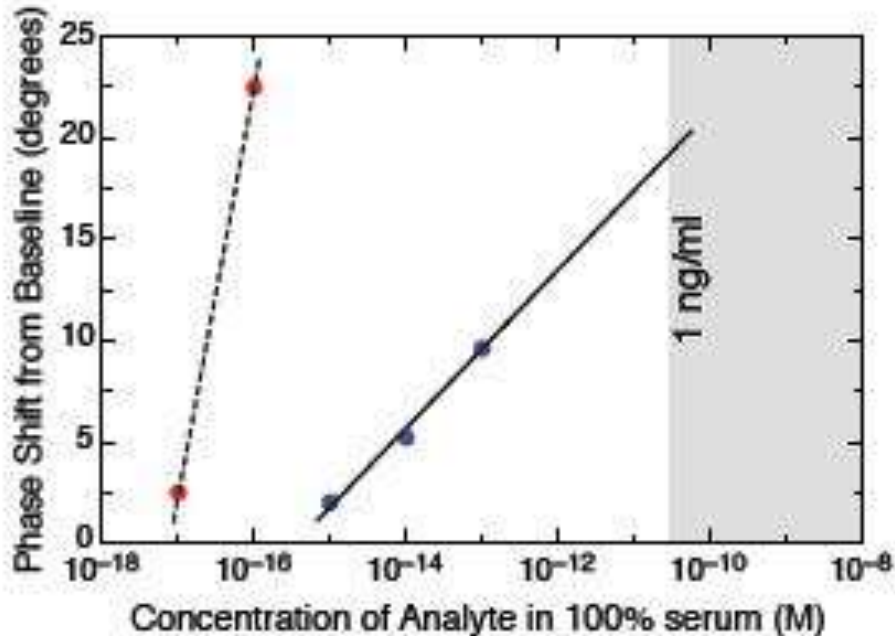
Intellectual Property: Patent 2

Biological functionalisation of high-density, nanoscale electronic devices (Patent granted in USA, EU, Japan)



C. Wälti et al. Langmuir (2003), PCT/GB2003/004368

Sensitivity: Future-proofing



Biomarker in 100% Serum

Blue: 15 minute incubation
Red: 30 minute incubation

Performance

| | |
|--------------------------|--------------|
| Limit of detection | 10^{-17} M |
| Dynamic range | 4 logs |
| CV at limit of detection | 0.19 |

Sensor Concept Designs

Flexible sensor options leverage \$5bn annual semiconductor R&D spend

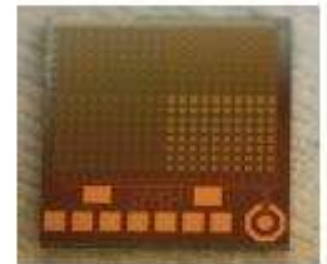
1. Multiplexed sensor with integrated microfluidics and whole blood filter



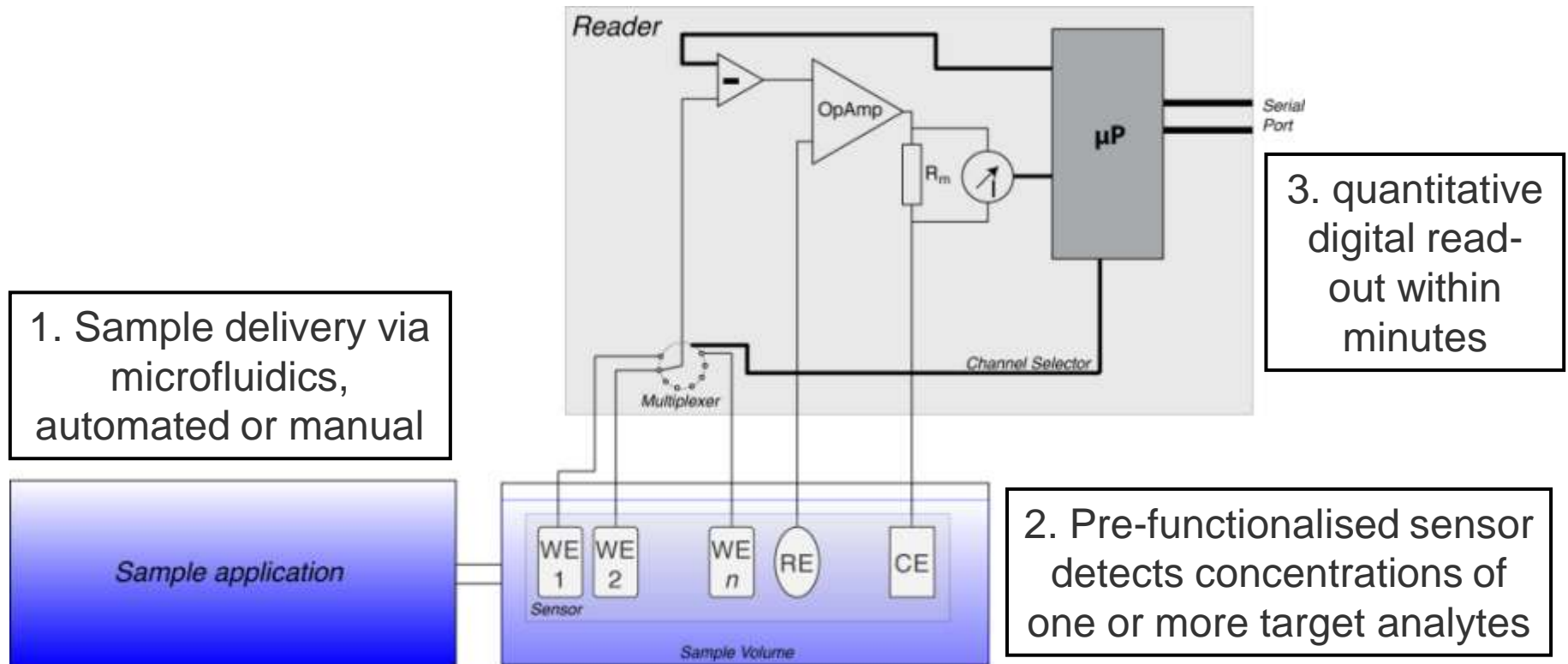
2. 14 biomarker chip. Flexible size to meet application requirements.



3. 8 mm x 9mm, 10,000 biomarker chip.



Instrumentation



Current Focus



- Preparing for Scale-Up
 - ▶ Fabrication protocols
 - ▶ Assay protocols
 - ▶ Building initial menu of validated markers
- Review of market and competition
 - ▶ Pricing and packaging
 - ▶ Competitive positioning
 - ▶ Funding options

Summary



- Robust, multiplexed next generation biomarker detection technology
 - Life science research
 - Clinical diagnostics
- Future-proof, flexible solution
- Pre spin-out: focus on building assay menus and market prototyping

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