A handheld, rapid, sensitive electrochemical immunoassay Point of Care system
Overview

Ag⁺ have developed a handheld diagnostic platform technology based on our patented electrochemical immunoassay biosensor, delivering the next generation in rapid, quantitative diagnostics.
Company

- Technology developed at National Physical Laboratory, UK
- Spun out officially in 2011
- 10 staff (6 science based)
- Compliant to ISO13845
Application sectors

- Human Clinical
- Human Non-Clinical
- Veterinary
- Sports
- Food
- Military
- Environmental
System capability

- Platform technology
- Fully quantitative
- Rapid time to result
- Single use assay on fluidic chip
- Multiplexing
- Variety of sample matrix
- Handheld reader
Assay and signalling system

- Sandwich and competitive assays
- Electrochemical measurement
- Silver nanoparticles for signalling conjugated to antibodies/antigen\(^1\)
- Magnetic particles (antibody/antigen) for solid phase in assay

\(^1\)Preparation and quality control of silver nanoparticle–antibody conjugate for use in electrochemical immunoassays. Mateusz S. Szymanski, Robert A. Porter
Electrochemical measurement system

\[ \text{NH}_4\text{SCN} \rightarrow \text{Ag(SCN)}_{n}^{1-n} \rightarrow \text{Ag} \]

Diagram showing the reaction of \( \text{NH}_4\text{SCN} \) with silver thiocyanate, indicating the formation of silver metal at different voltages: +0.6 V, -1.2 V, and +0.1 V.
Fluidic chip

Version 1 – serpentine fluidics

Version 2 – blistered fluidics

Working Electrode

Reference Electrode

Counter Electrode

AgPlus diagnostics
Prototype chip
Assay system

Video goes here;
too big to publish online.

To view, please go to
http://www.agplusdiagnostics.com/technology/
Reading device

- Communication enabled
- Full assay control
- Results analysis
- On-board information storage
- Customisable interface
- Battery powered
- Portable
- Hand-held
Assay results

- Hapten and sandwich assay formats on platform
- Sensitivities to down to 8pg/ml
- Other assays on platform
  Progesterone
  TSH
  Testosterone
  Cortisol

<table>
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<tr>
<th>ng/mL</th>
<th>Mean (nC)</th>
<th>%CV</th>
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Conclusion

- Rapid electrochemical immunoassay that achieves key needs of POC diagnostics
- Overcome previous issue of harsh oxidative processes for silver
- Improved conjugation methods
- Development of single use assay chip controlled by handheld reader
- Ability to achieve clinically relevant results
Thank you

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