

Near Patient Diagnostics

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Company Background

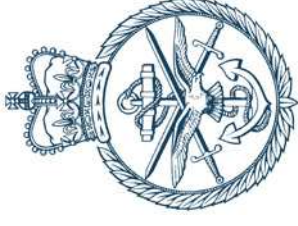
- Formed August 2004
- Spin off from DSTL Porton Down
- Established to commercialise inventions of the DSTL Detection Department
- Global licence to commercialise DSTL PCR patents & know-how
- Key Personnel transferred from DSTL



Enigma Diagnostics

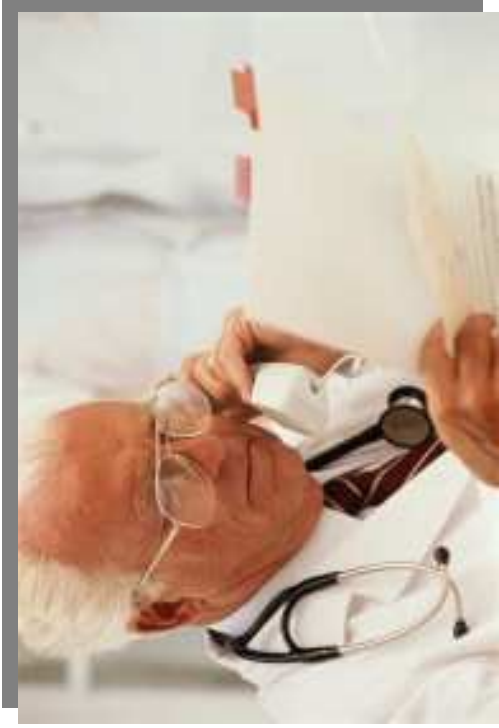
- Defence Science Technology Laboratory (Dstl)
 - Part of Ministry of Defence (MoD)
 - UK's largest Public Sector Research Establishment
 - 3000 scientists
 - 200 patents
 - £350 million p.a. investment in R&D
- Enigma Diagnostics located at Dstl Porton Down
 - Worldwide reputation for CBW defence
 - Access to containment facilities and science base
 - Developed by the MoD

[dstl]



Dstl is part of the
Ministry of Defence

Point-of-use



Clinical



Veterinary



On the production line



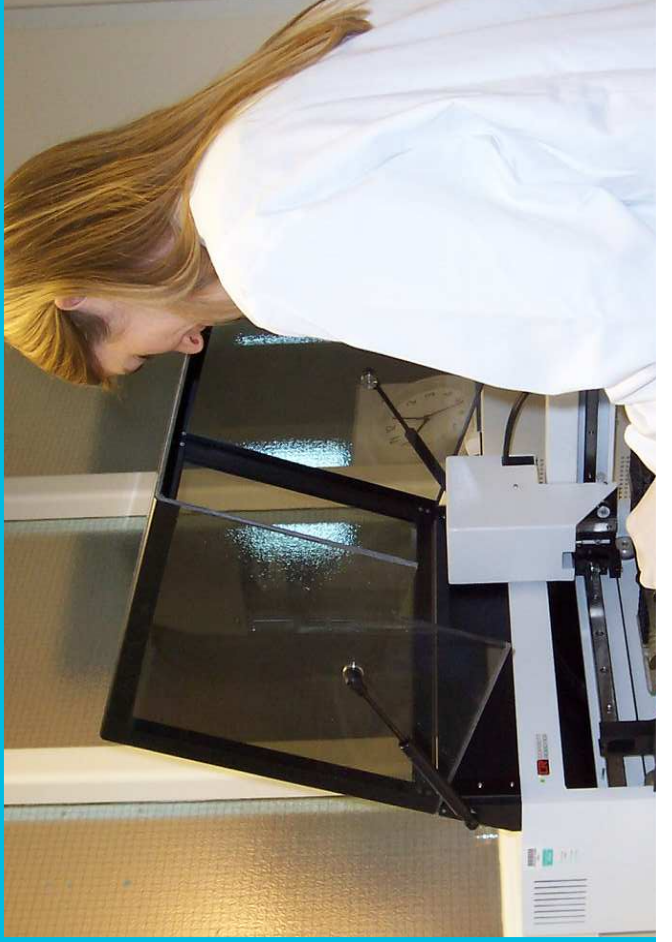
Bio defence

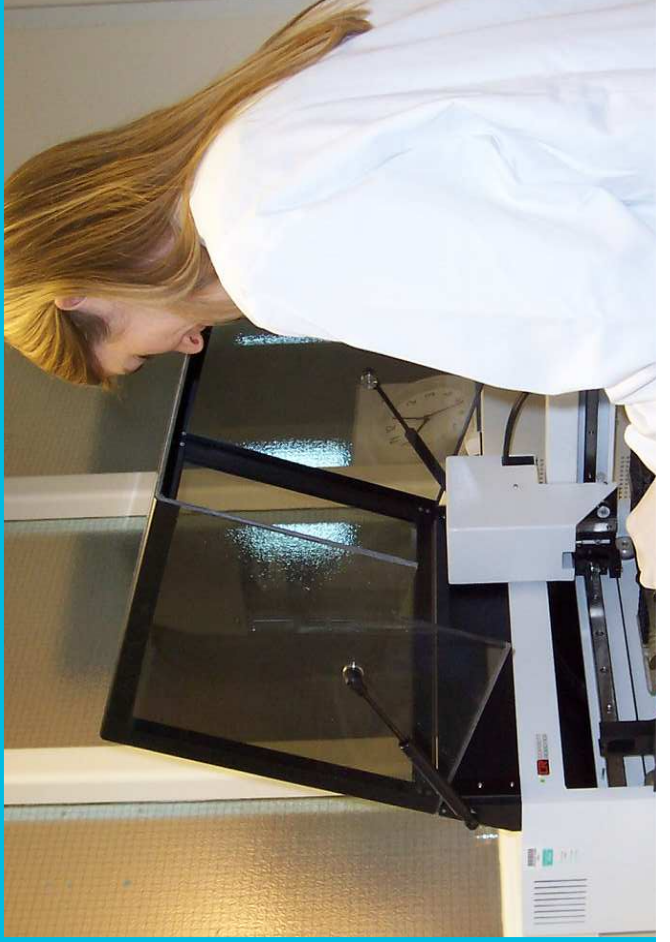
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Existing Systems

- Modified laboratory instruments
- Space needed in a make shift laboratory facility
- Mains power
- Frozen reagents & cold storage chains
- Glass capillaries
- Sample preparation carried out manually or on separate instrument
- Total process >1 hour
- Can not detect toxins
- Difficult to operate when wearing NBC suit



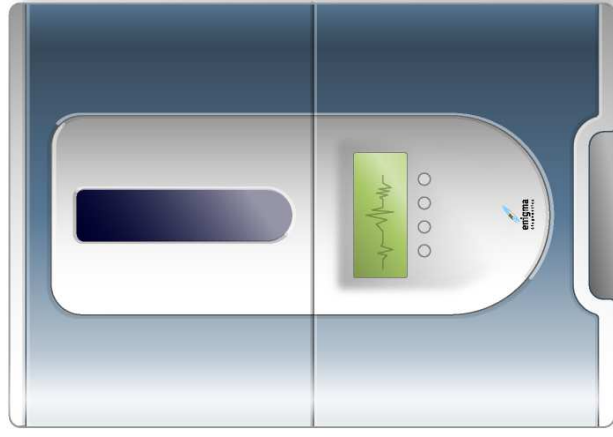




Enigma-FL Production Instruments

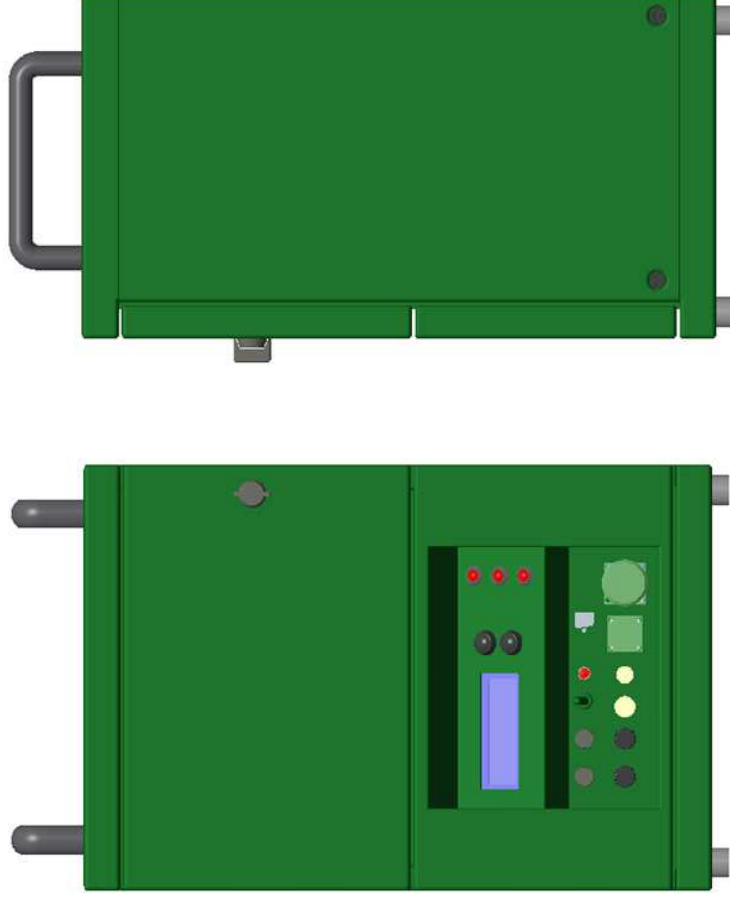
Simplified user interface

Smaller & lighter



Larger door with easier access

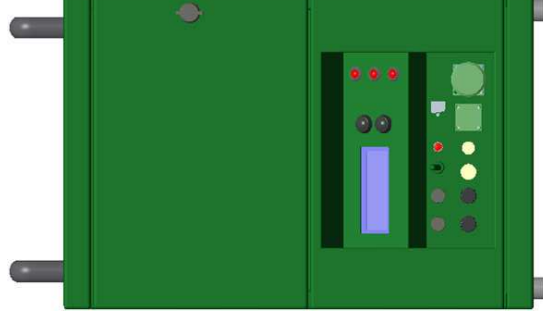
Footprint less than 1 sqr foot





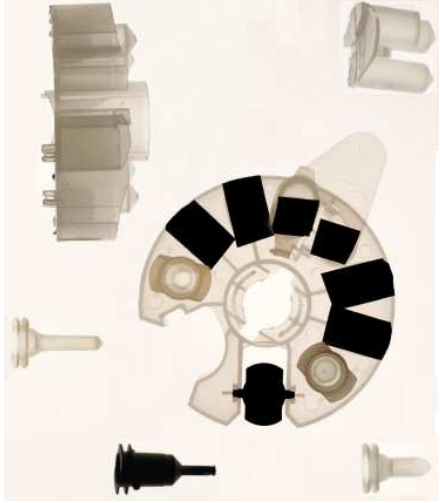
Enigma-FL[®]

- Rapid, on-site agent confirmation
- Man-portable, fully automated
- Robust, automated sample preparation
 - Environmental samples, powders
 - Swabs, tissue, blood
 - Food samples
- Raw sample to result in under 20 minutes
- Ruggedised for in-field testing
 - Tested in extreme condition -11°C to + 55°C
 - Humidity and temperature sensing
 - Cabinet may be heated
- Multi-agent assays in single tube
- Positive/negative display
- Minimal operator training
- Battery or mains
 - 12 to 36 volts
- Field, facility or vehicle operation
- Stabilised reagents eliminate cold storage chains
 - Lyophilisation reduces the logistics burden of field based testing



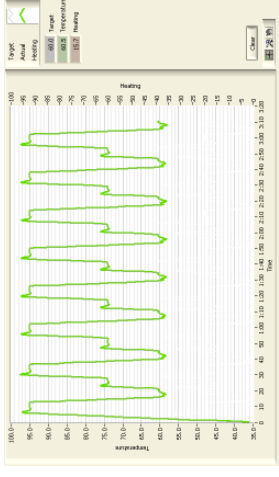
Sample Processing

- Magnetic bead
- Robotic Processing
- Stabilised Reagents



Thermal Cycler

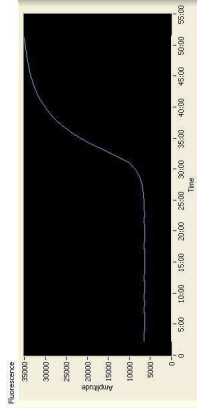
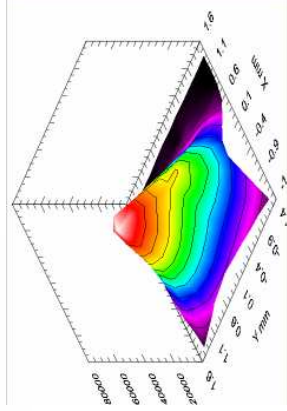
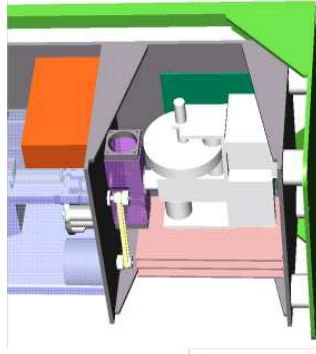
- Rapid Transitions



- Fluorimeter**
- Sensitive Detector
- Six filters
- Dual wavelength Excitation

Algorithms

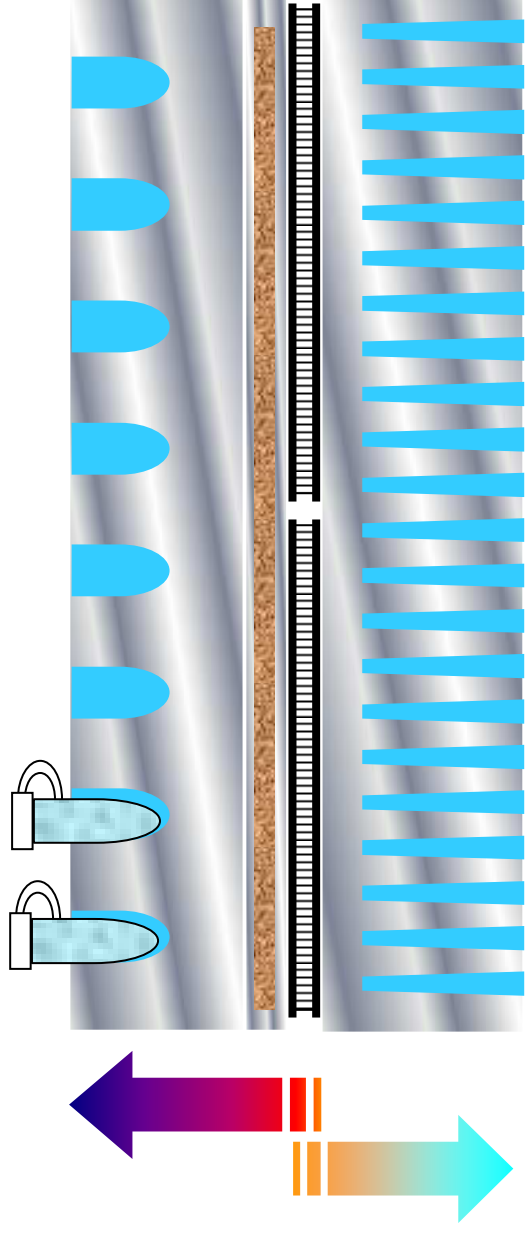
- Automated analysis
- Traffic light display
- GPS time & location



Sample Processing

- Based upon magnetic beads
- A magnet within a “wand” moves beads
- Extraction is based upon chaotropic salts
- Can utilise other principles
 - Immuno capture
 - Oligo specific
 - Ligand

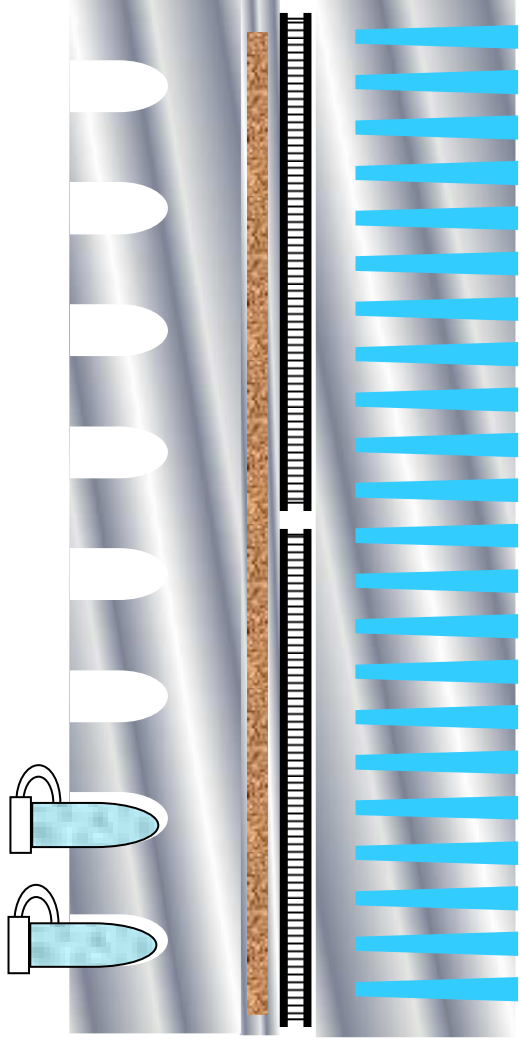
Electrically Conducting Polymer Technology



Thermal Blocks

- Slow temperature transitions
- Poor temperature uniformity
- Gradients across and within samples
- Thermal junction at tube-heater interface

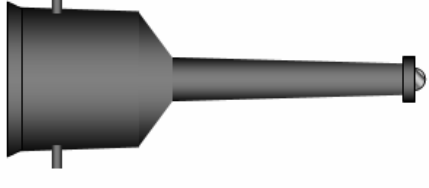
Electrically Conducting Polymer Technology



Block

Heater Element
Peltier heat pump

Heat Exchanger

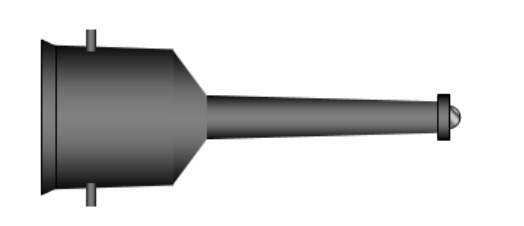
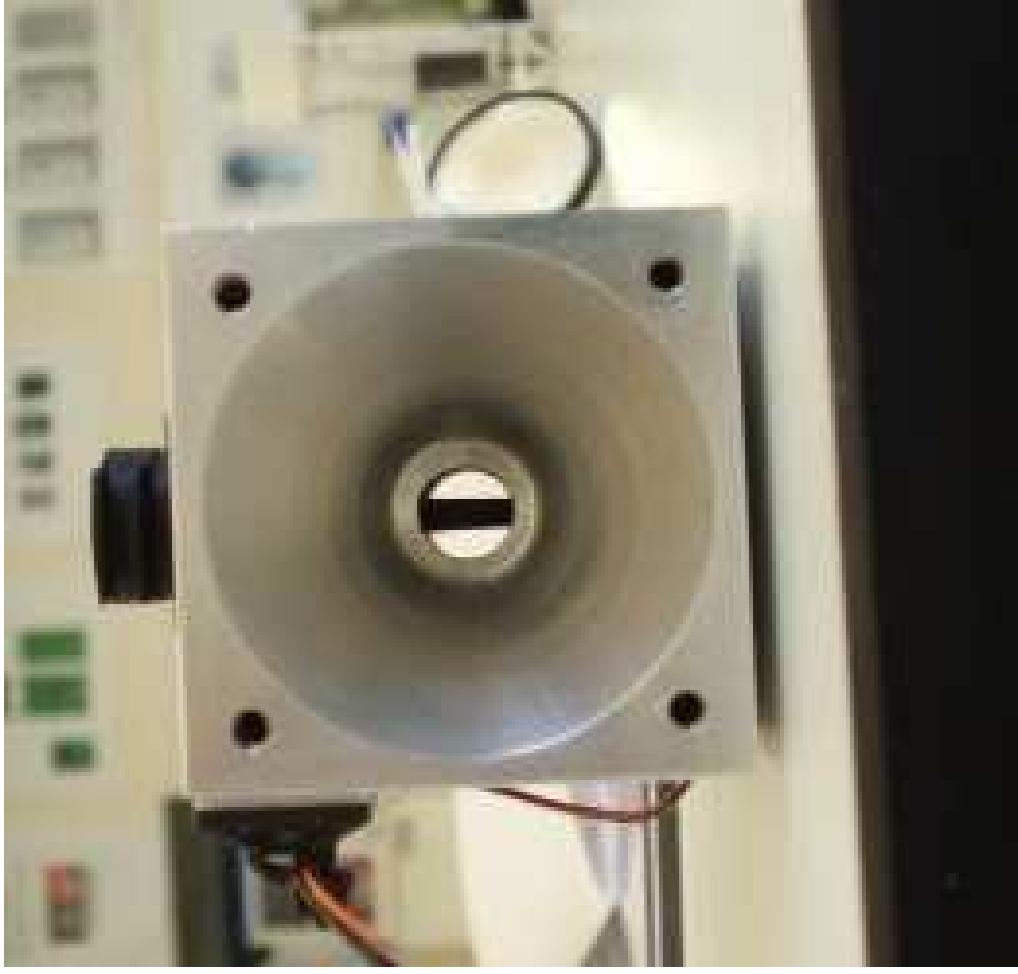


Heater Element

Direct Heating

- Accurate & precise temperature control
- Individual tube control
- Rapid temp transitions (20°C/sec)
- Reduced gradients

Heating with ECP

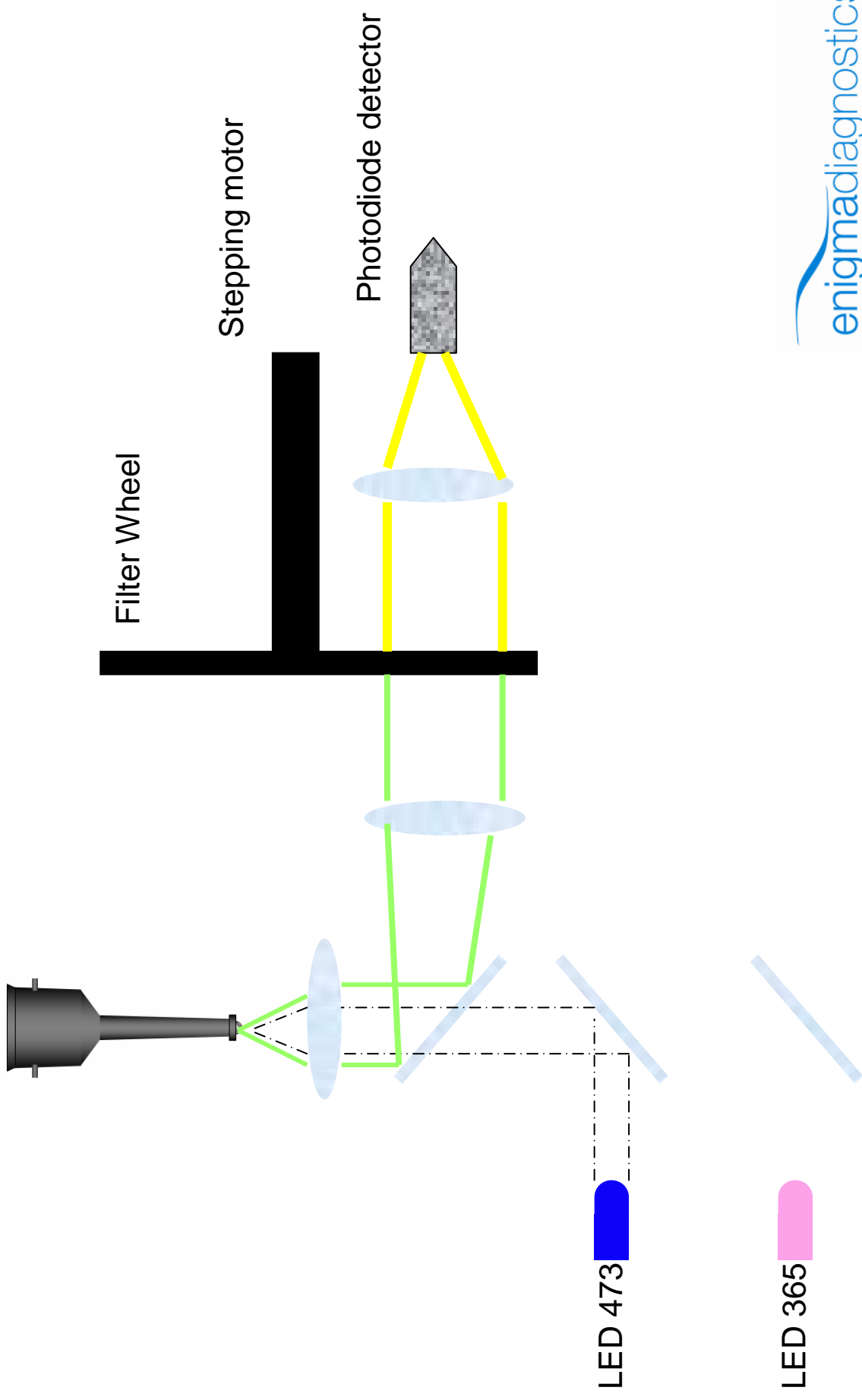




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Optical System

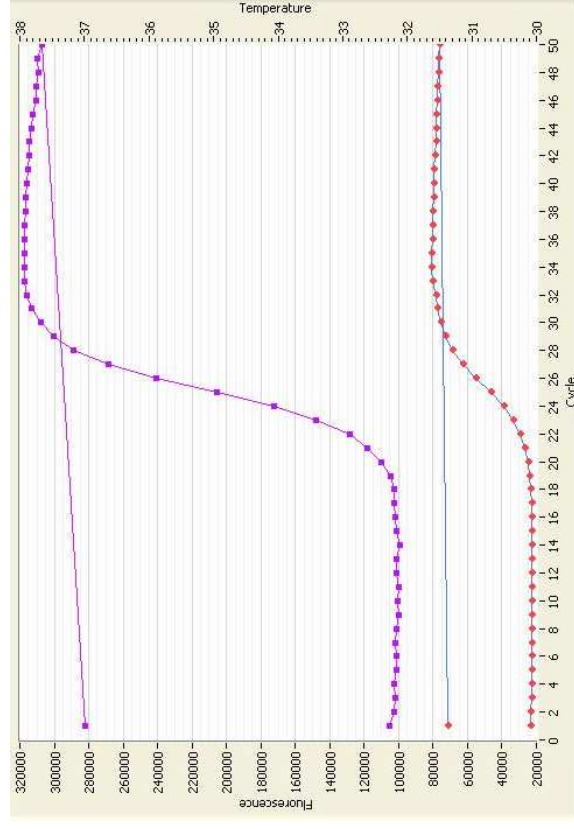


Optical System

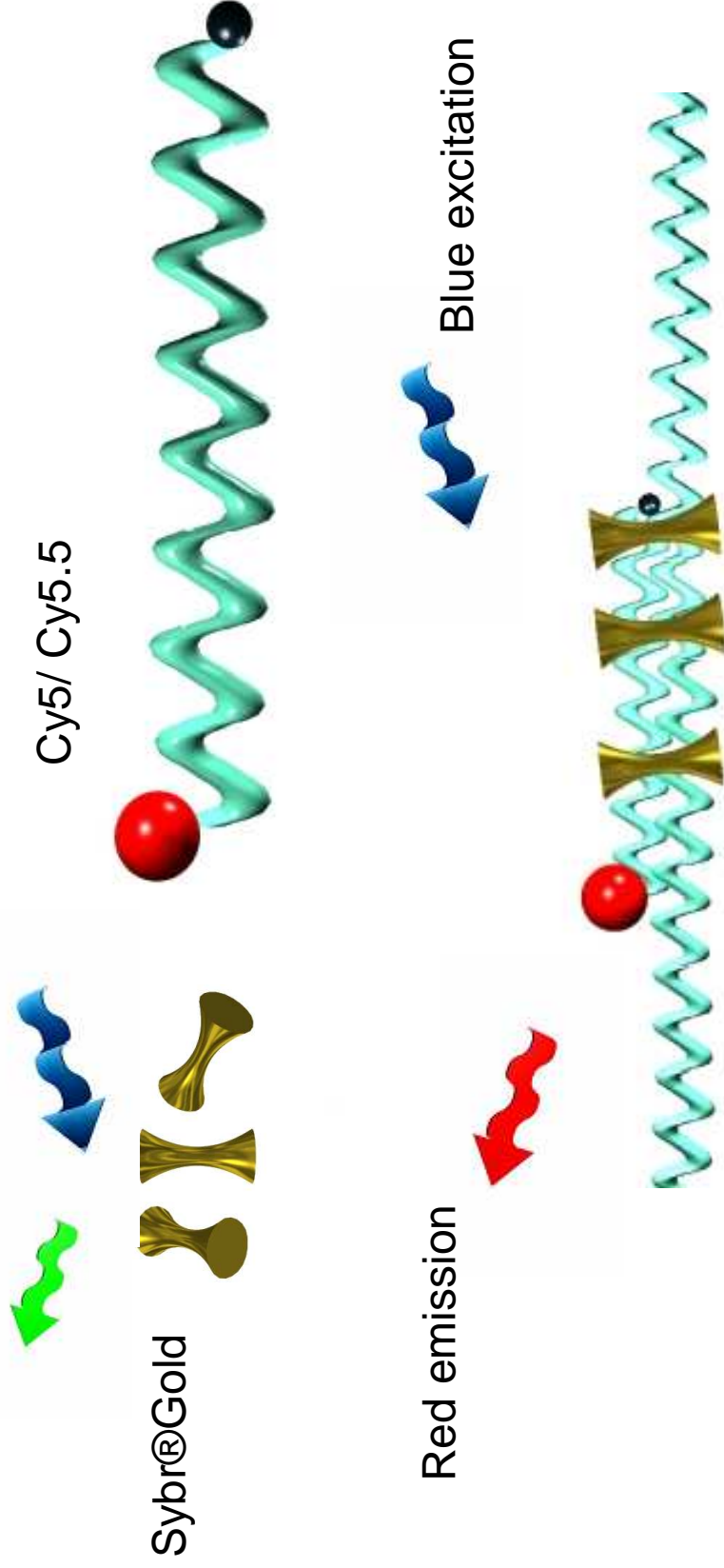
Excitation Detection

LED 473 435 nM Naphthalene
 465 nM EDANS

LED 365 520 nM Fluorescein, Sybr®Green-1
 555 nM Joe
 670 nM Cy5
 690 nM Cy5.5



ResonSense® I



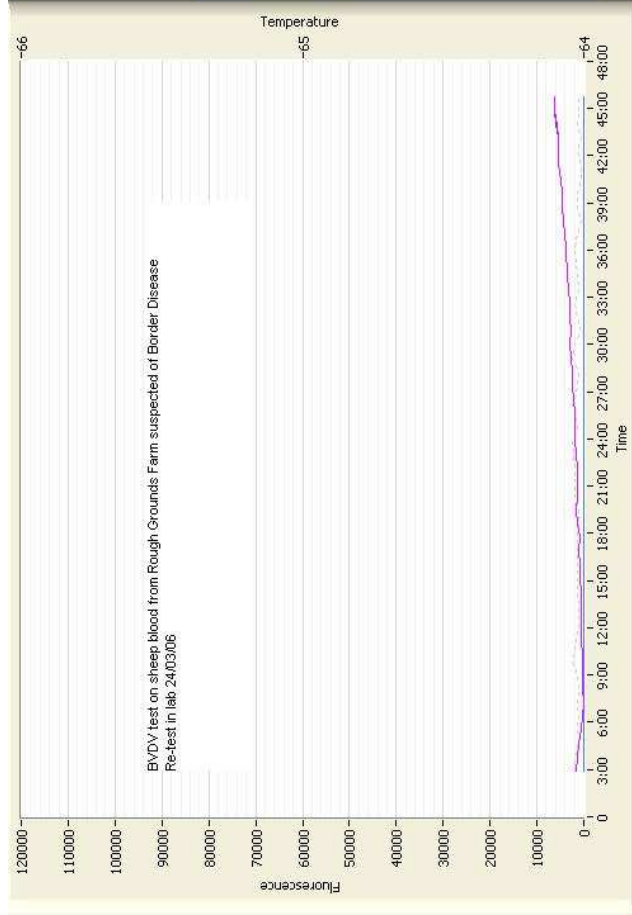
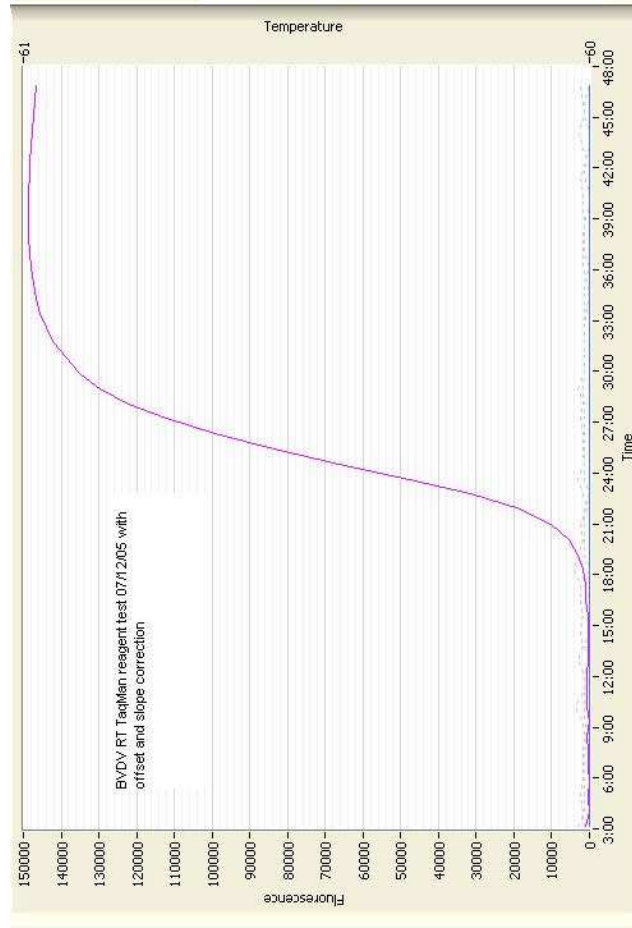
Veterinary Field Trial

- Collaborative project for in-field evaluation
 - Enigma Diagnostics Ltd
 - Veterinary Laboratory agency
 - Regional veterinary labs
- Test for BDVD
 - Blood
 - Boom extraction process (magnetic bead)
 - Taqman chemistry
- 50 on farm tests
- Tests confirmed
 - AI
 - QPCR (MagNApure and MX3000)
- Results concordant











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Faster results – in the field

Enigma Diagnostics' rapid biological ag detection system combines the speed, sensitivity of PCR, with the simplicity and ruggedness needed for frontline operations. Completely self-contained, every aspect of operation has been fully automated to provide an ultra-rapid laboratory standard results used by military personnel in the field. The process from collection of the raw sample to delivery of the end result can take less than 20 minutes.

Portable and rapidly deployable, it operates with ambient-stored reagents to eliminate the logistics and training burden of traditional PCR instruments.

For faster secure results in the field, the answer is Enigma Diagnostics.



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securing rapid results



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securing rapid results

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