

# Immunoassay Innovation, Implementation and Industrialisation at TTP

Immunoassay instrumentation has been the workhorse of clinical diagnostics for decades. For much of that, TTP has been innovating in this space to push the boundaries of performance, cost, speed to bring the power and capability of immunoassay to ever greater and distributed markets

## Lateral Flow

TTP have been innovating in the field of approaches to lateral flow over the last decade. This has included – cost reduction, increased communication and novel approaches to measurement and quantification.

## Enhancing Nasal swab extraction

Physical designs to improve elution of biomaterial from swabs; TTP designs have been demonstrated to provide over x10 more material without human interaction.

## Diagnostics Delivered.



## Decentralised, lab-quality immunoassay in a low-plastic format

Ecoflex is the latest embodiment of TTP's microFlex technology, developed in partnership with Prolight Diagnostics, which enables existing central-lab chemiluminescent assays to be translated to a simple, cost-effective fluidic cartridge suitable for use at the point of care. With a focus on sustainability, ecoflex cartridges are targeting reducing plastic use by as much as 95% compared to the equivalent central-lab based test.

## Industrialised deposition: printing cells and antibodies

TTP have worked with Quotient to co-develop a full-scale manufacturing line for their novel micro-array product; including development of a unique print technology for cell- and antibody-deposition, integration with standard manufacturing approaches and innovation in substrate handling to deliver reliable high-volume manufacturing of cell- and antibody-based microarray clinical diagnostics.



## Highly sensitive, highly multiplexed immunoassay at the point of care

FreeFlow couples the power and sensitivity of TIRF, with a novel microfluidic cartridge and miniaturised sandwich microarrays to deliver unprecedented sensitivity at the point of care. The patented microarray deposition enables highly multiplexed readout from only 30uL of input whole blood.

Data shows correlation of > 0.98 against existing central-lab systems with a limit of detection as low as 70fM. No pumps, no wash steps and read-out in as little as 3 minutes makes this platform ideal for a variety of distributed testing markets.

FreeFlow cartridge	Benchmark platform	Pearson Correlation
15 donor internal study	Siemens Atellica	0.97
40 donor Belgian study	Roche Cobas	0.98
	Abbott Architect	0.98

TTP is now searching for interested partners to further develop the platform and rapidly bring it to market. Talk to us about seeing a demonstration of your target assay running on the platform.



## Single-molecule digital assays for unrivalled protein detection sensitivities

The Panacea LDx system has been developed to provide single molecule sensitivity immunoassay and multi-omic read out in a rapid, automated lab platform. Performance has been demonstrated with a range of proteins, small molecules and micro RNA markers with limit of detection as low as 2 femtomolar achieved.

We are now looking for partnerships to move this platform to the next stage of commercialisation.

## Improving throughput at central-lab

Central-lab instrumentation is typically based on decades-old conveyer-belt type architectures but this can ultimately limit throughput, flexibility and speed of STAT samples. TTP have designed a new architecture based on concentric, nested wheels which could dramatically increase the speed and flexibility of central-lab workflows.

Biomarker	Indication	Single molecules @ LOD (Count)	LOD (Molar)	LOD (g/mL)
CRP	Inflammation	13 ± 1.8	7.47 fM	860 fg/mL
TSH	Hypothyroidism & hyperthyroidism	33 ± 6	1.7 fM	47 fg/mL
miR-21	Broad spectrum	120 ± 20	45.1 fM	290 fg/mL
25-OH Vitamin D	Osteoporosis	1,200 ± 90	300 pM	120 pg/mL

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