Biochip Array Technology

Exquisite precision in multiplex testing

Many years of development and the expertise of highly qualified scientists have gone into the creation of Biochip Array Technology (BAT) - a multi-analyte testing platform facilitating the simultaneous quantitative or qualitative detection of a wide range of analytes from a single sample. Biochip Array Technology provides a unique platform for assessment of biological samples in a rapid, accurate and easy to use format and users can have the utmost confidence in this proven technology.

A chemically activated 9x9mm ceramic biochip acts as a solid phase reaction vessel. Biochips are pre-fabricated with discrete test regions (DTR's); a different antibody/oligonucleotide is immobilised at each spatially distinct DTR. Up to 49 individual DTR's can be arrayed on to a single biochip with one biochip per sample used to generate multiple results simultaneously. This eliminates the need to run costly, time consuming and sample intensive singleplex Elisas.

The biochip detection is based on a chemiluminescent signal emitting light, without heat, as a result of a chemical reaction. The light emitted is simultaneously detected and quantified using a CCD camera.

Applications:

- Academic Research
- Drug Development (CRO's and Pharma)
- Molecular Research and Diagnostics
- Forensic and Clinical Toxicology

Key Features & Benefits

Highly accurate testing

- Fully validated arrays offering reproducible testing with CV's <10%
- Multiplex analysis minimises analytical variation between tests

Consolidated testing

- One platform/system for immunoassays and nucleic acid testing
- Custom biochip arrays eliminates requirement for multiple Elisas

Cost consolidation

- Multiplex testing reduces the amount of time spent on individual tests and associated lab costs

Reduced sample volume

- Multiple biomarker results from as little as 7µl conserves valuable sample

Wide test menu

- Expanding menu of routine and novel biomarkers plus custom array development

Multiple sample matrices

- Multiple matrices can be used with BAT including serum, plasma, whole blood, urine, oral fluid, extracted DNA and alternative matrices

Extensive quality control features

- Internal controls on each biochip ensure optimum assay performance
- Multi-analyte QC sera standardised to WHO/NIBSC reference material where available

Result traceability

- Bar-coded biochips and scanner for patient samples ensures complete traceability of results

Retrospective Reporting

- Retrieve previously unreported results without additional testing, saving time

Biochip Array Technology workflow

Biochip Array technology operates via the Evidence series of analysers designed to deliver efficient high-quality testing and significant time and cost savings.

The following workflow represents that of the semi-automated Evidence Investigator analyser, however Biochip Array Technology also operates on fully automated instruments such as the Evidence which is CE marked and FDA 510K cleared.

1

Addition of assay reagents and sample to the biochips

2

Place in thermoshaker and incubate

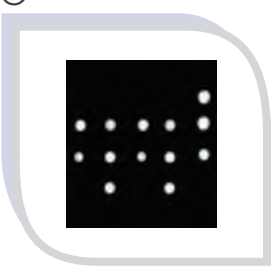
3

Wash biochips

4

Biochip carrier loaded into Evidence Investigator

5



Automatic biochip imaging and result processing

Biochip Array Technology

Multiplex Platforms

Investigator

The bench-top semi-automated Evidence Investigator is the world's first platform with the unique ability to consolidate immunoassay and nucleic acid testing. In addition, the Investigator boasts the most comprehensive test menu on the market with a full custom panel service available.

Evidence

The Evidence analyser is the world's first protein Biochip Array Technology system and has transformed laboratory screening worldwide. This fully automated platform, which is CE marked and FDA 510K cleared, is suited to the larger laboratory. The Evidence offers a throughput of >1500 tests per hour.

Evolution

The Evidence Evolution is the world's first fully automated random access biochip testing platform with the ability to process up to 2,640 tests per hour and comes equipped with intuitive software, highly innovative robotics and sample processing technology.

Multiplex Arrays

PROTEINS

Adhesion Molecules (serum & plasma)
E Selectin
L Selectin
P Selectin
Vascular Cell Adhesion Molecule 1(VCAM 1)
Intercellular Adhesion Molecule 1 (ICAM 1)

Cardiac Array (serum & plasma)
Creatine Kinase MB (CK MB)
Heart type Fatty Acid Binding Protein (H-FABP)
Myoglobin (MYO)
Troponin I (cTnI)

Cerebral Array I (serum, plasma & CSF)
Brain-Derived Neurotrophic Factor (BDNF)
Glial Fibrillary Acidic Protein (GFAP)
Heart Type Fatty Acid Binding Protein (H-FABP)
Interleukin-6 (IL-6)

Cerebral Array II (serum, plasma & CSF)
C-Reactive Protein (CRP)
D-dimer
Neuron Specific Enolase (NSE)
Soluble Tumour Necrosis Factor Receptor I (sTNFRI)
Neutrophil Gelatinase-Associated Lipocalin (NGAL)

Cytokine Array I (serum & plasma)
Epidermal Growth Factor (EGF)
Interleukin 1 alpha (IL 1α)
Interleukin 1 beta (IL 1β)
Interleukin 2 (IL 2)
Interleukin 4 (IL 4)
Interleukin 6 (IL 6)
Interleukin 8 (IL 8)
Interleukin 10 (IL 10)
Interferon gamma (IFN γ)
Monocyte Chemotactic Protein 1 (MCP 1)
Tumour Necrosis Factor alpha (TNF α)
Vascular Endothelial Growth Factor (VEGF)

Cytokine Array II (serum & plasma)
Eotaxin
Insulin Like Growth Factor I (IGF-1)
Interleukin 12p40 Subunit (IL12-p40)
Interferon-γ Inducible Protein 10 (IP-10)
Platelet Dervied Growth Factor BB (PDGF-BB)
Regulated on Activation, Normal T Expressed and Secreted (RANTES)

Cytokine Array III (serum & plasma)
Interleukin 5 (IL 5)
Interleukin 15 (IL 15)
Granulocyte Macrophage Colony Simulating Factor (GM-CSF)
Macrophage Inflammatory Protein - 1 alpha (MIP-1α)

Cytokine Array IV (serum & plasma)
Matrix Metalloproteinase 9 (MMP 9)
Soluble IL 2 Receptor Alpha (sIL 2Rα)
Soluble IL 6 Receptor (sIL 6R)
Soluble Tumour Necrosis Factor Receptor I (sTNFRI)
Soluble Tumour Necrosis Factor Receptor II (sTNFRII)

Cytokine Array V (serum & plasma)
Interleukin 3 (IL 3)
Interleukin 7 (IL 7)
Interleukin 13 (IL 13)
Interleukin 12p70 (IL-12 p70)
Interleukin 23 (IL 23)

Endocrine (serum & plasma)
Cortisol
Dehydroepiandrosterone Sulphate (DHEA's)
Leptin
17α Hydroxyprogesterone

Metabolic Syndrome Array I (serum & plasma)
Ferritin
Insulin
Interleukin-6 (IL-6)
Leptin
Plasminogen Activator Inhibitor-I (PAI-I)
Resistin
Tumour Necrosis Factor-α (TNF-α)

Metabolic Syndrome Array II (serum & plasma)
Adiponectin
C-Reactive Protein (CRP)
Cystatin C

Thyroid Free Array (serum & plasma)
Free Thyroxine (FT4)
Free Tri-iodothyronine (FT3)
Thyroid Stimulating Hormone (TSH)

Thyroid Total Array (serum & plasma)
Thyroid Stimulating Hormone (TSH)
Total Thyroxine (TT4)
Total Tri-iodothyronine (TT3)

Tumour PSA Array (serum & plasma)
Carcinoembryonic Antigen (CEA)
Free Prostate Specific Antigen (fPSA)
Total Prostate Specific Antigen (tPSA)

Other biological matrices are feasible following end user assay optimisation/validation.

TOXICOLOGY

Drugs of Abuse I Plus (urine, whole blood and oral fluid)
Amphetamine
Barbiturates
Benzodiazepine I
Benzodiazepine II
Buprenorphine
Cannabinoids
Cocaine metabolite (Benzoylecgonine)
Methamphetamine
Methadone
3,4 Methylenedioxymethamphetamine (MDMA)
Opiates
Phencyclidine
Tricyclic Antidepressants (TCA's generic)
Creatinine (Dilution for urine)

Drugs of Abuse II (urine and whole blood)
Buprenorphine
Fentanyl
Generic Opioids
Ketamine
Lysergic Acid Diethylamide (LSD)
3,4 Methylenedioxymethamphetamine (MDMA)
Methaqualone
Oxycodone I
Oxycodone II
Propoxyphene
Creatinine (Dilution for urine)

Drugs of Abuse III (urine and blood)
Choral Hydrate Metabolite
Ethyl Glucuronide
Fentanyl
Flunitrazepam
Ketamine Metabolite
Meperidine
Meprobamate
Zaleplon
Zolpidem
Zopiclone
Creatinine (Dilution for urine)

Drugs of Abuse IV (urine and blood)
Acetaminophen
Dextromethorphan
Ethyl Glucuronide
Escitalopram
Fluoxetine
Haloperidol
Ibuprofen
Methylphenidate/Ritalinic Acid
Salicylate
Sertraline
Tramadol
Trazodone
Tricyclic Antidepressants (TCAs Generic)
Creatinine (Dilution for urine)

Drugs of Abuse Array V (urine & blood)
Bath Salts I (Methcathinone and Mephedrone)
Bath Salts II (MDPV)
Benzylpiperazines
Mescaline
Phenylpiperazines I
Phenylpiperazines II
Salvinorin
Synthetic Cannabinoids I
Synthetic Cannabinoids II
Synthetic Cannabinoids III
Synthetic Cannabinoids IV
Creatinine (Dilution for urine)