Supporting Health & Longevity Through Protective Immunity.

Offer patients more with the latest immune analsyis solutions.

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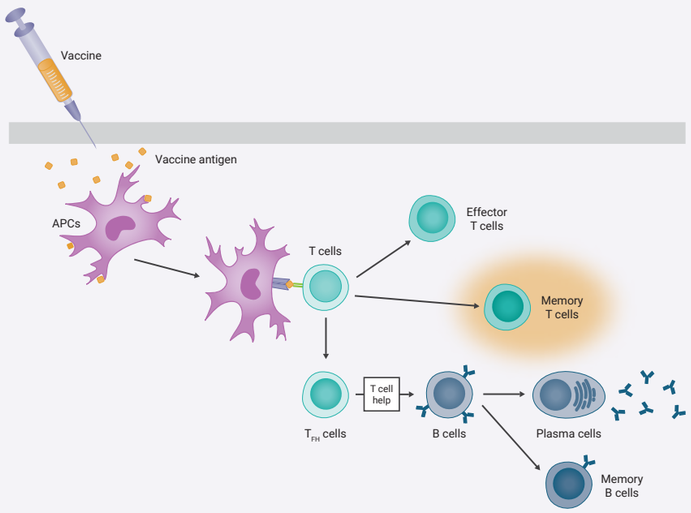
Protective Immunity

Protective immunity is about more than just an initial immune response; in fact, its also about how patients' may respond to an infectious agent over time, stay protected, and fight of re-infection or reactivation of disease.

Here at Virax Biolabs, we specialize in levegraging cutting-edge molecular techniques to help you explore patient immune landscapes. Our carefully designed immune analysis kits and oxidative stress assays can be used provide scientists and clinicians alike with unprecedented insights into immune cell activity. Our test can and provide you with actionable insights that inform patient care.

Investigating Immunity

Understanding protective immunity is essential in supporting the health and longevity of diagnosed and healthy patients. For example, immune cell (T cell) analyses can be used alongside diagnostic tests to provide insights into health status, and, to explore the efficacy of vaccine treatment success.



Vaccines work by stimulating the protective immune responce. Antigens signal to the host's own cells (APCs), initiating the expression of stimulatory immune signals.

In turn, T cells are stimulated to differentiate, to express cytokines, and to recruit other immune components to neutralise pathogen threats.

Helping Scientists and Clinicians Understand Immune Wellbeing

EliSpot and FluoroSpot kits have been central to the development of numerous vaccine types across various disease applications. These assays have been used to assess long-term immunity and T cell cross-reactivity in both infectious disease and cancer immunotherapy contexts. Now, Virax Biolabs kits are available to support scientists and clinicians, for use alongside other routine diagnositc tests.

Our kits utilize isolated cells (PBMCs) instead of whole blood plasma. This innovative approach means that T cell activity can be easily assayed, without confounding factors affecting the results.

Explore Resiliance To Key Conditions

COVID-19

Evaluate vaccine efficacy and T cell responces, inclusing cross-reactivity to new and emerging variants.

Influenza

Monitor the memory immune responce to seasonal flu vaccines with greater sensitivity than serological assays.

Tuberculosis

Measure antigen-specific T cell responces.to new vaccine candidates and BCG doses.

HIV

Map HIV-specific T cell responces and track the efficacy of DNA prime-protein boost vaccines.

Malaria

Evaluate the immune responce against various malaria antigens such as CSP, LSA-1 and MSP-1.

Cancer

Identiy and quantify tumor-specific T cell populations in oncology vaccines (e.g. breast cancer, HPV).

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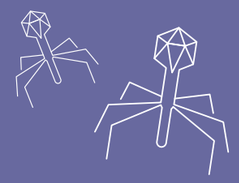
Immune Dysfunction

There are several potential causes of immune dysfunction; these include the post-infection overstimulation of immune activity through viral reactivation, unsuccessful pathogen clearance and chronic, persistent inflammation. These often lead to a collection of symtoms known as Post-Acute Inflammatory Syndrome.

PAIS is thought to be caused when T cells, confronted with an invading pathogen or stimulatory substance, become fatigued by overstimulation. This causes them to express lower cytokine levels, meaning that protective immunity cannot be conferred.

Causes Of Immune Dysfunction

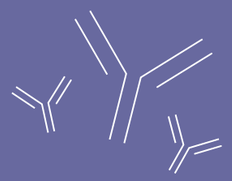


Viral Reactivation

Dormant viral particles begin to replicate in the body, after a period of quiescence.

Chronic Infection

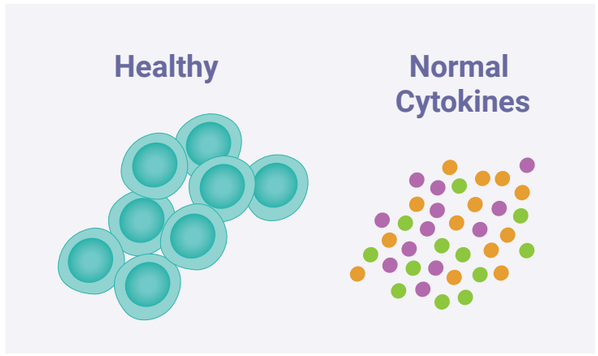
Chronic stimulation occurs when an infection cannot be cleared.



Chronic Inflammation

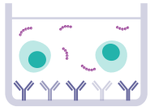
Immune system components respond to an infection more aggressively than they should.

While immune dysfunction may stem from multiple causative factors, the effect in all cases is typically the same. Whether caused by viral reactivation, chronic infection or chronic inflammation, T cell activity is typically reduced and cytokine production is compromised. This can be measured using Virax Biolabs' Fluorospot assay kits.



How Virax's Immune Analysis Kits Work

PBMCs are eaily isolated from patient blood by density-gradient centrifugation. A known number of cells are then placed into the wells of each test strip. The cells are stimulated with infection-specific peptides and cytokine secretion is detected by means of a fluorescent signal.

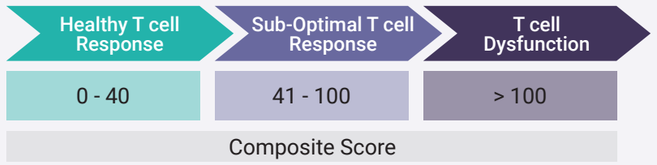


Cell Stimulation: PBMCs are added to the wells and stimulated with infection-specific peptides to induce cytokine secretion by T cells.

Analyte Capture: As the T cells secrete cytokines in response to the stimulation, the cytokines are captured by antibodies around the cell on the surface of the well.

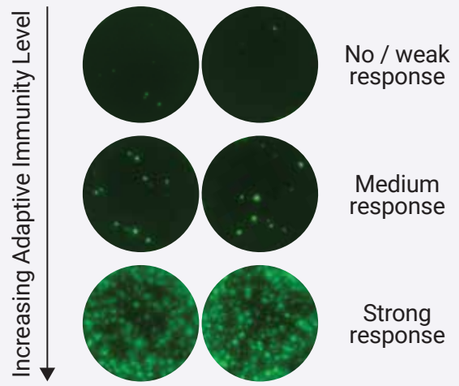
Detection & Development: Fluorophore-labelled detection antibodies are added to bind to the captured cytokines. A different fluorophore is used for each cytokine of interest, allowing the detection of multiple cytokines per well.

Analysis: Each cytokine-secreting cell forms a distinct fluorescent "spot" at the site of secretion. The spots are counted and analysed using fluorescent detection.



Composite scores are calculated for each patient, in accordance with the cytokine analyses undertaken.

This provides a single, easy-to-interpret assay result.



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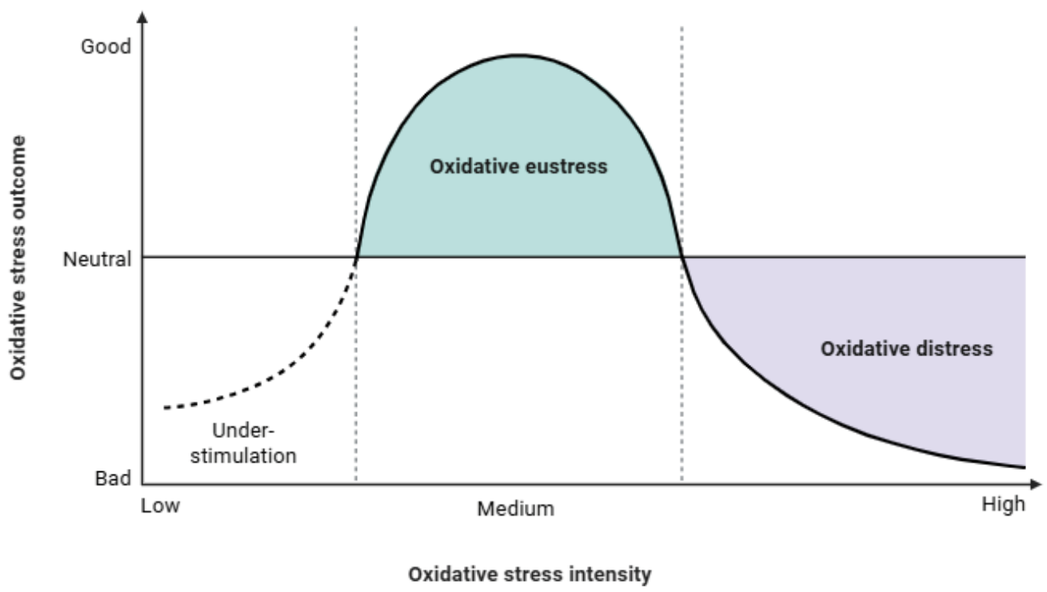
Measuring Oxidative Stress

Oxidative stress is thought to be involved in a range of disease mechanisms. It also plays an important role in promoting health and longevity. While oxidative stress can be harnessed by immune cells in the fight against pathogens, it chronic exposure can lead to poor patient health.

Virax Biolabs, offers an impressive range of high-quality oxidative stress assays designed to help you explore patient health. Each assay, including high-performance liquid chromatography (HPLC) and immunostaining approaches, has been expertly crafted to support your routine blood sample monitoring, offering additional insights into baseline, risk and intervention monitoring.



Detect REDOX Biomarkers That Matter

There are several potential causes of T cell exhaustion; these include the post-infection overstimulation of immune activity through viral reactivation, unsuccessful pathogen clearance and chronic, persistent inflammation. These often lead to a collection of symtoms known as Post-Acute Inflammatory Syndrome.

Glutatione (GSH)

A major intracellular antioxidant that plays a critical role in REDOX homeostasis, supporting immune and mitochondiral function.

Malondialdehyde (MDA)

An end-product of lipid peroxidation that indicates chronic cell damage. It can be linked to various age-related conditions like diabetes and heart disease.

8-OHdG

A marker of oxidative DNA damage that is associated with genomic instability, ageing and cancer risk.

F2-isoprostanes

A lipid peroxidation marker that correlates with biological aging, mitochondiral dysfunction and various age-related diseases.

Superoxide Dismutase (SOD)

The first-line enzymatic defence against ROS. It declines with age and is impaired in oxidative stress pathologies.

Total Antioxidant Capacity (TAC)

An aggregate marker of systemic antioxidant defences that indicates both enzymatic and non-enzymatic antioxidant capacity.

Baseline Assessment

Use our full panel prior to the beginning of treatment.

Risk Stratification

Predict age-related changes through 8-OHdG and MDA.

Intervention Monitoring

Analyze change using GSH, TAC, and 8-OHdG levels.

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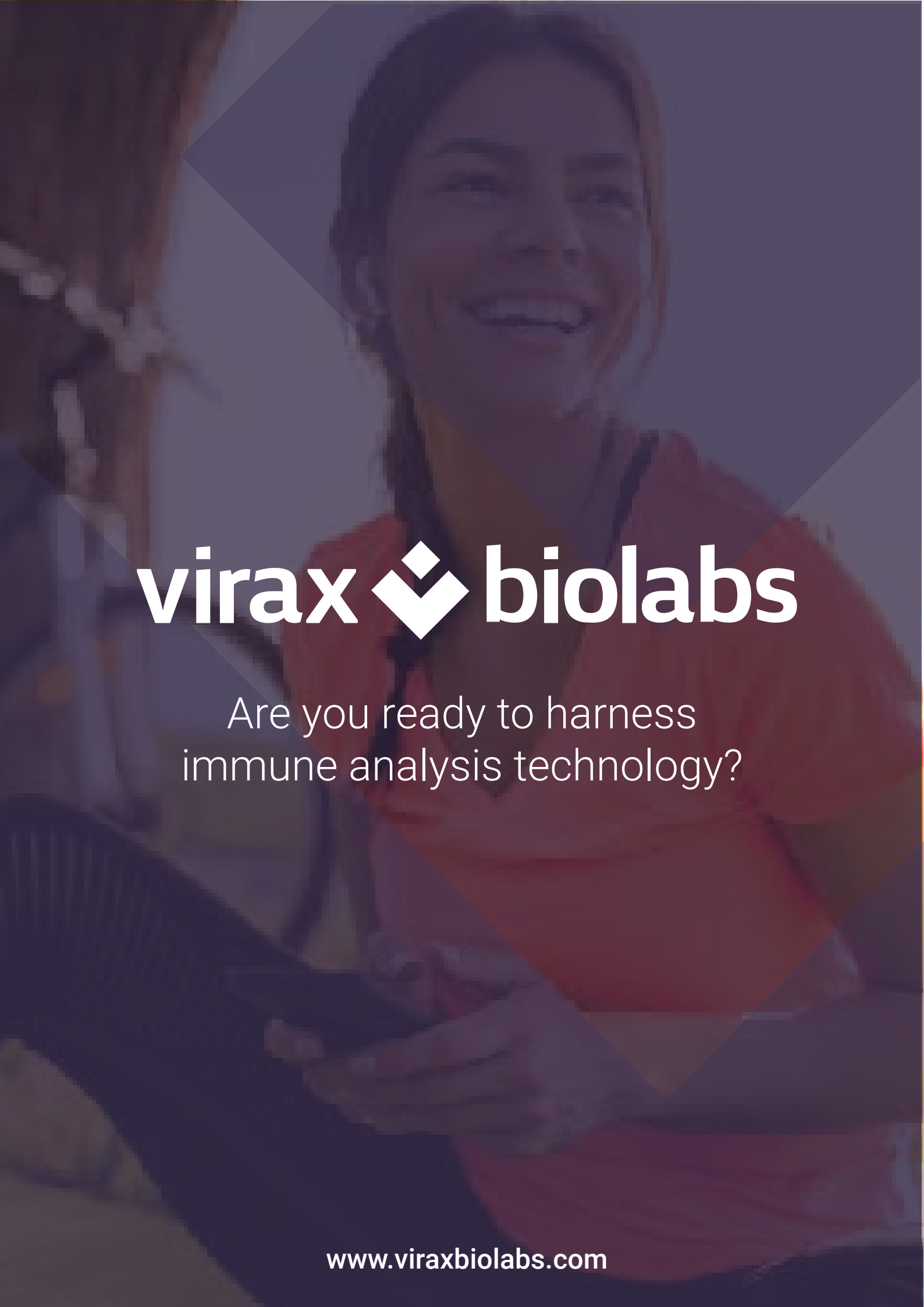
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