Singulex®

IL-7 (Interleukin 7)

The superior sensitivity and precision of the Singulex IL-7 assay allows accurate differentiation of IL-7 concentrations between healthy and diseased patients, advancing critical research and drug efficacy studies in the area of immunodeficiency.

Biology and Diseases

Interleukin-7 (IL-7) is an endogenous cytokine responsible for the proliferation of B- and T-lymphocytes. The active human form of IL-7 has 152aa and is expressed by fibroblasts, stromal, dendritic and endothelial cells. IL-7 often acts in synergy with other cytokines. For example, IL-7 is found to have an additive effect on T-cell activation in combination with IL-12. However, IL-7 is not redundant, as abnormal function of IL-7 has been implicated in immune disorders such as common variable immunodeficiency, HIV and rheumatoid arthritis (RA).

Therapies

IL-7 is an excellent candidate for therapeutic development because of its crucial role in the modulation of innate immunity. IL-7 is capable of rescuing lymphocyte depletion resulting from either auto-immunodeficiency disorder or chemotherapy. The efficacy and safety of recombinant IL-7 as a vaccine adjuvant has been investigated for treatments targeting HIV, melanoma and prostate cancer. Reports reveal that in addition to boosting primary immune responses, IL-7 is also capable of enhancing the effectiveness of other adjuvant therapies. Conversely, IL-7 can also be considered a disease target, as in the case of RA, where IL-7 is said to be responsible for chronic inflammation in the joints. Thus, both amplification and impediment of IL-7 activity may be of value in future therapeutic interventions.

Unmet Need

The plasma concentration of IL-7 has been a source of debate in several rheumatology studies. Reported values range from 1.5 to 300 pg/mL in individuals with RA, making it problematic to establish diagnostic criteria. Furthermore, consensus has not been reached with respect to IL-7 concentrations in healthy subjects. Thus, a standardized IL-7 assay with exceptional accuracy and precision is critical to establish IL-7 concentrations in healthy subjects, and measure discreet changes in IL-7 during disease progression.

Singulex Answer

Singulex's IL-7 assay, optimized for use on the Erenna System, improves the therapeutic potential of IL-7 by enabling researchers to measure baseline concentrations in healthy subjects. The Singulex assay has an LLoQ of 0.08 pg/mL and a reading range of 0.01-500 pg/mL, providing superior assay linearity and precision to researchers investigating variations in IL-7 concentration.

This assay will allow investigators to:

1. Measure the efficacy and dosing of therapeutics designed to interfere with IL-7 induced inflammatory responses.
2. Quantify IL-7 concentrations in RA patients with values non-quantifiable with other less sensitive technologies.
3. Design robust clinical and preclinical studies when IL-7 concentration is used as a therapeutic endpoint.
4. Understand how IL-7 concentrations change in patients as they transition from a healthy to diseased state.

ERENNA TECHNOLOGY ACCESS PROGRAM.

Through the Erenna Technology Access Program (ETAP), Singulex offers an interactive, results-driven solution to biomarker challenges faced by the pharmaceutical industry during product development. Singulex assists the development programs of our ETAP collaborators by developing customer-driven assays and access to a menu of fully-validated assays. Participants in ETAP gain access to the Singulex Erenna Immunoassay System, our proven expertise developing high-value immunoassays and our world-class customer support. Together with Singulex, our ETAP collaborators are expanding the utility of protein biomarkers and using them as tools to measure disease progression, drug efficacy and toxicity.

TABLE 1: Analytical sensitivity of the Singulex IL-7 assay.

Lower Limit of Detection (LoD)	0.01 pg/mL
Lower Limit of Quantification (LLoQ)	0.08 pg/mL
Reading Range	0.01-500 pg/mL

Erenna® System

TABLE 2: IL-7 assay low-end standard curve data.

[IL-7] pg/mL	Detected Events	Std Dev	CV
1.23	2555	112	4%
0.41	998	20	2%
0.14	452	31	7%
0.02	126	8	6%
0.01	75	9	12%
0.00	46	14	31%

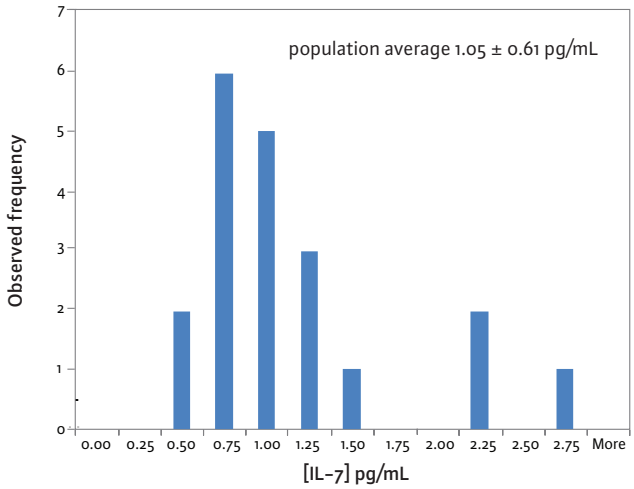

FIGURE 1: Plasma IL-7 concentration in healthy human subjects.

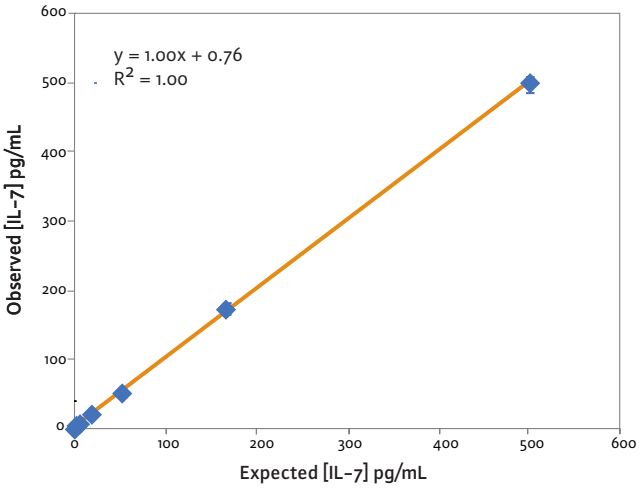

FIGURE 2: IL-7 low-end standard curve signal.

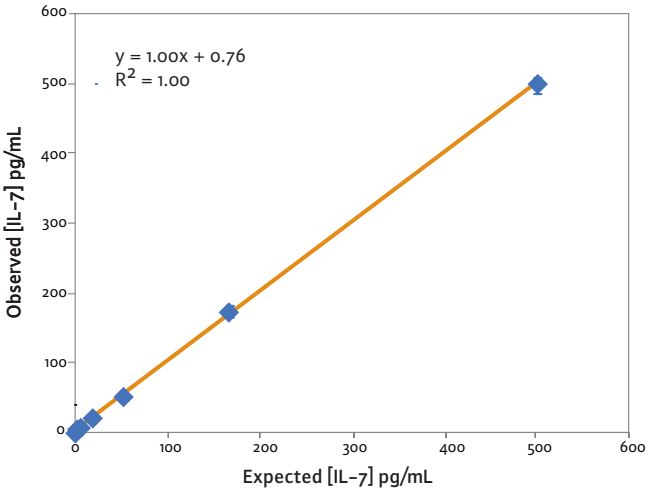

FIGURE 3: IL-7 assay curve fit.

These standard curves are for representational purposes only. A standard curve must be run with each assay.

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