



IL-5 (INTERLEUKIN 5)

The Singulex IL-5 assay provides sensitive measurement of IL-5 concentration changes in plasma, enabling efficacy and dosing studies of therapeutic interventions aimed to alleviate allergic inflammation.

BIOLOGY AND DISEASES

Interleukin-5 (IL-5) is a cytokine secreted mainly by T-cells and mast cells upon stimulation with antigens and allergens. It has pleiotropic effects toward B-cells and is involved in the production of immunoglobulins. More importantly, IL-5 acts in synergy with GM-CSF to govern the proliferation and maturation of eosinophils. A pronounced level of eosinophils is commonly associated with the development of allergic conditions such as asthma, eosinophilic esophagitis and hypereosinophilic syndrome. As such, IL-5 is highly regarded as a crucial mediator of the inflammatory pathway concerning allergic reactions.

THERAPIES

Over-production of eosinophils due to the effect of IL-5 prompted pharmaceutical research into anti-IL-5 therapeutics. Bosatria (mepolizumab) is a monoclonal antibody that has been shown to bind and inactivate IL-5. As well, a humanized monoclonal antibody (reslizumab) against IL-5 is under development. The safety and efficacy of mepolizumab and reslizumab are being evaluated in clinical trials with patients suffering from eosinophilic esophagitis and asthma. In other clinical studies, mepolizumab has already demonstrated effective control of over symptoms arising from hypereosinophilic syndrome. Together, these results suggest that IL-5 blockade is a promising intervention for the treatment of allergic diseases.

UNMET NEED

It is known that an elevated level of IL-5 is responsible for allergic inflammation, as IL-5 is a key regulator of eosinophil production and activation. Proper measurement of IL-5 in plasma or sputum is thus important for evaluating the effectiveness of anti-IL-5 therapy. This presents a need to accurately quantify IL-5 during preclinical and early phase drug development. The challenge is to establish a correlation between eosinophil counts and IL-5 concentrations following successful drug administration. A sensitive assay technology will help determine a safe and well-tolerated therapeutic endpoint.

SINGULEX ANSWER

Singulex's IL-5 assay, optimized for use on the Erenna System, is able to measure IL-5 at both low and high plasma concentrations. The Singulex assay has an LLoQ of 1.6 pg/mL and a reading range of 0.94–2000 pg/mL, enabling sensitive detection of significant decreases in IL-5 concentrations in plasma when inhibiting antibodies are used as therapeutic interventions.

This assay will allow investigators to:

1. Measure the efficacy and dosing of IL-5 inhibitors that interfere with allergic inflammation.
2. Design robust clinical and preclinical studies when IL-5 concentration is used as a therapeutic endpoint.
3. Use easy to procure specimens like plasma, instead of more invasive methods to collect sputum samples during clinical trials.
4. Understand how IL-5 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-5 assay.

Lower Limit of Detection (LoD)	0.94 pg/mL
Lower Limit of Quantification (LLoQ)	1.6 pg/mL
Reading Range	0.94-2000 pg/mL



TABLE 2: IL-5 assay low-end standard curve data.

[IL-5] pg/mL	Detected Events	Std Dev	CV
25	1098	37	3%
12.5	555	5	1%
6.25	348	23	7%
3.13	230	10	5%
1.56	155	9	6%
0.78	112	4	3%
0.00	88	19	21%

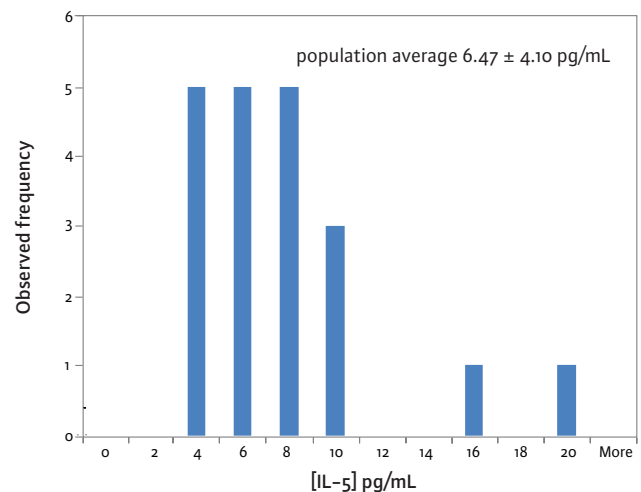


FIGURE 1: Plasma IL-5 concentration in healthy human subjects.

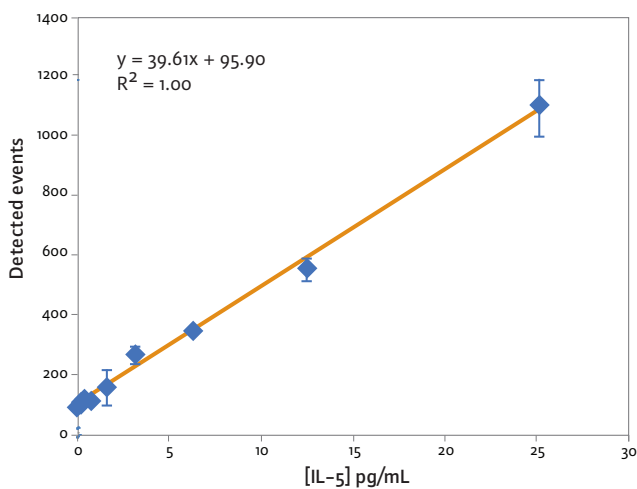


FIGURE 2: IL-5 low-end standard curve signal.

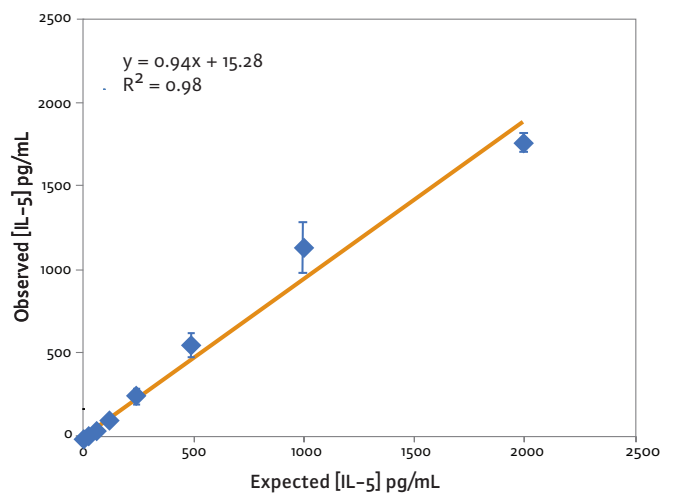


FIGURE 3: IL-5 assay curve fit.

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

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