



## IL-21 (INTERLEUKIN 21)

The Singulex IL-21 assay allows sensitive detection of baseline and elevated concentrations of plasma IL-21 in healthy and diseased individuals, advancing development of IL-21 immunotherapy for the treatment of skin and kidney cancer.

### BIOLOGY AND DISEASES

Interleukin-21 (IL-21) is a cytokine with a potent regulatory effect on the immune system. Mainly produced by activated T-cells, IL-21 is responsible for the hematopoiesis of T-, B-, natural killer and dendritic cells. The production and differentiation of these effector cells may lead to an increased immunity against cancerous or virally infected cells. Thus, the role of IL-21 in the regulation of immuno-inflammatory responses has important implications for diseases such as multiple sclerosis, metastatic melanoma and metastatic renal cell carcinoma.

### THERAPIES

The effect of IL-21 on the growth and maturation of myeloid and lymphoid cells has sparked immense therapeutic interest. IL-21 is being developed as an anti-tumor treatment for metastatic melanoma and metastatic renal cell carcinoma. Another phase II clinical trial examines the therapeutic potential of IL-21 in the treatment of ovarian cancer. Successful outcome from these studies will further establish IL-21 immunotherapy as an effective treatment for various cancers, in addition to standard methods such as surgery, chemotherapy and radiotherapy. Moreover, preclinical studies suggest that IL-21's role in T-cell regulation might increase cytotoxic potential and boost antiviral immunity in HIV infected patients.

### UNMET NEED

The precise function of IL-21 in the modulation of the immune system is not well understood due to the complexity of the regulatory pathway. Detecting diminutive changes in IL-21 concentrations will help researchers understand the processes that occur during disease progression of cancers where IL-21 is implicated. Currently available immunoassays still lack the sensitivity required to quantify baseline concentrations of IL-21 in healthy subjects. A superior assay with a broad range of detection will aid in efficacy and toxicity studies of IL-21 targeted therapies.

### SINGULEX ANSWER

The Singulex IL-21 assay, optimized for use on the Erenna System, has an LLoQ of 0.8 pg/mL and a reading range of 0.07–100 pg/mL. The excellent assay sensitivity and precision enable early detection of diseases, where significant changes in IL-21 concentration are easily overlooked by less sensitive immunoassays. The Singulex IL-21 Assay has also been validated for use in serum.

This assay will allow investigators to:

1. Measure the efficacy and dosing of therapies designed to interfere with immuno-inflammatory responses.
2. Design robust clinical and preclinical studies when IL-21 concentration is used as a therapeutic endpoint.
3. Understand how IL-21 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.

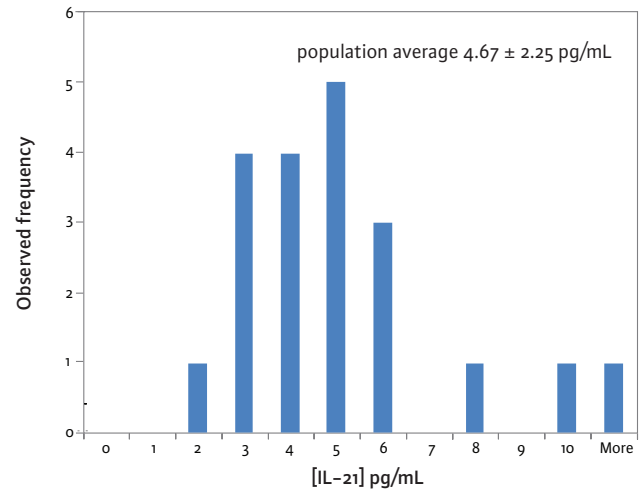
**TABLE 1:** Analytical sensitivity of the Singulex IL-21 assay.

Lower Limit of Detection (LoD)	0.07 pg/mL
Lower Limit of Quantification (LLoQ)	0.8 pg/mL
Reading Range	0.07-100 pg/mL

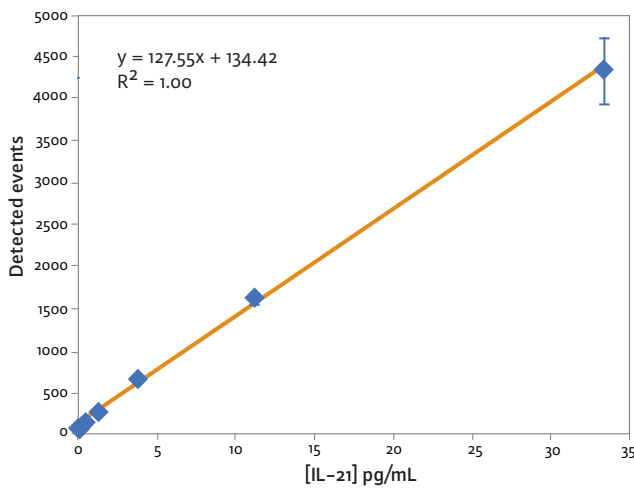
**TABLE 2:** IL-21 assay low-end standard curve data.

[IL-21] pg/mL	Detected Events	Std Dev	CV
33.3	4345	403	9%
11.1	1642	62	4%
3.70	671	22	3%
1.23	280	9	3%
0.41	149	17	12%
0.14	116	13	11%
0.00	100	5	5%

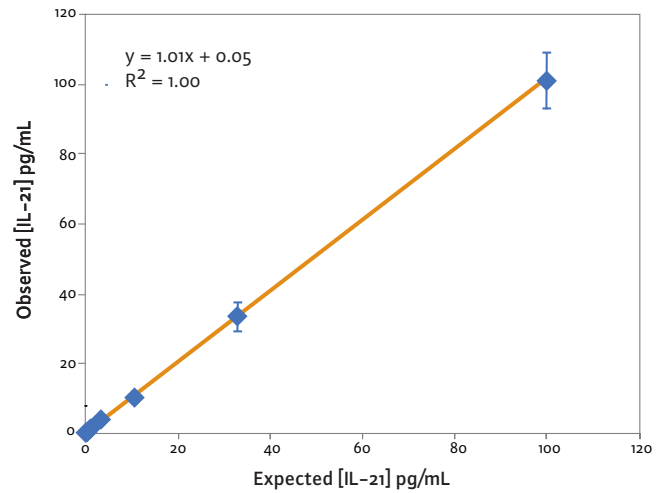
**Erenna® System**



**FIGURE 1:** Plasma IL-21 concentration in healthy human subjects.



**FIGURE 2:** IL-21 low-end standard curve signal.



**FIGURE 3:** IL-21 assay curve fit.

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

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