User Guide

# MILLIPLEX® Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Magnetic Bead Panel

## 96 Well Plate Assay

**PRCYTA-40K**
**PRCYTA-40K-PX38**
**PRCYTA-40K-BK38**
**PRCYTA-40K-PX48**
**PRCYTA-40K-BK48**

# Introduction

"Cytokine" is a general term used for a diverse group of small proteins, peptides or glycoproteins secreted by lymphocytes, monocytes, macrophages and other cells that regulate immune responses, haematopoiesis and lymphocyte development. Cytokines include interleukins, interferons, chemokines and other signaling molecules. Growth factors are extracellular polypeptides that have a positive effect on cell growth and proliferation. They can stimulate growth in a variety of different cell types. Growth factors and cytokines are similar in structure and the way of action. Individual cytokines or growth factors are produced by multiple cell types. This is different from hormones, which tend to be made by specialized glands. Each cytokine or growth factor acts through its own receptor on target cells to generate signaling pathways, and as a consequence to regulate biological processes. Some intracellular signaling components are shared between cytokines and growth factors. Expression of cytokines or growth factors and their receptors is highly regulated. De-regulation may contribute to many diseases such as infectious disease, autoimmune and chronic inflammatory disease, cardiovascular disease, metabolic syndrome, neurological disorders and cancer. Cytokine and growth factor research plays a significant role in achieving a deeper understanding of the immune system and combating related diseases. As the most closely related species to humans, non-human primates are critical models for those studies.

The MILLIPLEX® portfolio offers the broadest selection of analytes across a wide range of disease states and species. Once the analytes of interest have been identified, you can rely on the quality that we build into each kit to produce results you can trust. In addition to the assay characteristics listed in the protocol, other performance criteria evaluated during the verification process include: cross-reactivity, dilution linearity, kit stability, and sample behavior (for example, detectability and stability).

Each MILLIPLEX® panel and kit includes:

- Quality controls (QCs) provided to qualify assay performance.
- Comparison of standard (calibrator) and QC lots to a reference lot to ensure lot-to-lot consistency.
- Optimized serum matrix to mimic native analyte environment.
- Detection antibody cocktails designed to yield consistent analyte profiles within panel.

In addition, each panel and kit meets stringent manufacturing criteria to ensure batch-to-batch reproducibility. The MILLIPLEX® Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Magnetic Bead Panel thus enables you to focus on the therapeutic potential of cytokines and the modulation of cytokine expression. Coupled with the Luminex® xMAP® platform in a magnetic bead format, you receive the advantage of ideal speed and sensitivity, allowing quantitative multiplex detection of dozens of analytes simultaneously, which can dramatically improve productivity.

The MILLIPLEX® Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Magnetic Bead Panel is part of the most versatile system available for cytokine, chemokine and growth factor research. From our single to multiplex biomarker solutions, we partner with you to design, develop, analytically verify and build the most comprehensive library available for protein detection and quantitation.

MILLIPLEX® products offer you:

- The ability to select a 38-plex or 48-plex premixed kit.
  Note: RANTES is provided as a separate bead vial in both premixed bead kits due to different dilution requirements for serum/plasma samples. For more information, please carefully review the "Sample Collection and Storage" section for serum and plasma samples and "Preparation of Reagents for Immunoassay" for preparation of antibody-immobilized beads when assaying RANTES.

  If using tissue/cell culture supernatant samples, the recommended sample dilution is uniform for all analytes. Please review the "Sample Collection and Storage" section for tissue culture supernatant samples.
- The ability to choose any combination of analytes from our panel of 48 analytes to design a custom kit that better meets your needs.
- A convenient "all-in-one" box format that gives you the assurance that you will have all the necessary reagents you need to run your assay.

The MILLIPLEX® Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Magnetic Bead Panel is a 48-plex kit to be used for the simultaneous quantification of any or all of the following analytes in serum or plasma samples and tissue/cell lysate and culture supernatant samples: BCA-1, sCD137, CD40L, Eotaxin, sFASL, FGF-2, Fractalkine, G-CSF, GM-CSF, Granzyme A, Granzyme B, IFNα2, IFNγ, IL-1α, IL-1β, IL-1RA, IL-2, IL-4, IL-5, IL-6, IL-7, IL-8, IL-10, IL-12 (p70), IL-15, IL-16, IL-17A, IL-17E, IL-18, IL-21, IL-22, IL-23, IL-28A, IL-31, IL-33, IP-10, I-TAC, MCP-1, MIG, MIP-1α, MIP-1β, MIP-3α, Perforin, RANTES, TGFα, TNFα, TNFβ, VEGF-A.

**For research use only. Not for use in diagnostic procedures.**
**Please read entire protocol before use.**
**It is important to use same assay incubation conditions throughout your study.**

# Principle

MILLIPLEX® products are based on the Luminex® xMAP® technology — one of the fastest growing and most respected multiplex technologies offering applications throughout the life-sciences and capable of performing a variety of bioassays including immunoassays on the surface of fluorescent-coded magnetic beads known as MagPlex®-C microspheres.

- Luminex® products use proprietary techniques to internally color-code microspheres with two fluorescent dyes. Through precise concentrations of these dyes, distinctly colored bead sets of 500-5.6 µm polystyrene microspheres or 80-6.45 µm magnetic microspheres can be created, each of which is coated with a specific capture antibody.

- After an analyte from a test sample is captured by the bead, a biotinylated detection antibody is introduced.
- The reaction mixture is then incubated with Streptavidin-PE conjugate, the reporter molecule, to complete the reaction on the surface of each microsphere.
- The following Luminex® instruments can be used to acquire and analyze data using two detection methods:
    - The Luminex® analyzers, Luminex® 200™, FLEXMAP 3D®, and xMAP® INTELLIFLEX, are flow cytometry-based instruments that integrate key xMAP® detection components, such as lasers, optics, advanced fluidics and high-speed digital signal processors.
    - The Luminex® analyzer (MAGPIX®), a CCD-based instrument that integrates key xMAP® capture and detection components with the speed and efficiency of magnetic beads.
- Each individual microsphere is identified and the result of its bioassay is quantified based on fluorescent reporter signals. We combine the streamlined data acquisition power of Luminex® xPONENT® acquisition software with sophisticated analysis capabilities of the new MILLIPLEX® Analyst 5.1, integrating data acquisition and analysis seamlessly with all Luminex® instruments.
- xMAP® INTELLIFLEX runs on INTELLIFLEX software for instrument control, run setup and generating high quality data with flexible output options. Data can be exported in xPONENT® style CSV files for compatibility with many existing analytical applications, or in the new, customizable INTELLIFLEX file format. The INTELLIFLEX file format is intended for flexibility and simplicity, allowing the user to freely select which data points to include and to reduce the time to analysis.

The capability of adding multiple conjugated beads to each sample results in the ability to obtain multiple results from each sample. Open-architecture xMAP® technology enables multiplexing of many types of bioassays reducing time, labor and costs over traditional methods.

## Storage Conditions Upon Receipt

- Recommended storage for kit components is 2–8 °C.
- For long-term storage, freeze reconstituted standards and controls at ≤ -20 °C. Avoid multiple (> 2) freeze/thaw cycles.spac
- **DO NOT FREEZE:** Antibody-Immobilized Beads, Detection Antibody, and Streptavidin-Phycoerythrin.

# Reagents Supplied

Store all reagents at 2–8 °C.

| Reagents | Volume | Quantity | Cat. No. |
|---|---|---|---|
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Standard | Lyophilized | 1 vial | PRCYTA-8040-1 (for configurable 31-plex) or<br>PRCYTA-8040-2 (for 38-plex and 48-plex) |
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Quality Controls 1 and 2 | Lyophilized | 1 vial each | PRCYTA-6040-1 (for configurable 31-plex) or<br>PRCYTA-6040-2 (for 38-plex and 48-plex) |
| Serum Matrix* | Lyophilized | 1 vial | MXPRSM-A |
| Set of one 96-Well Plate with 2 sealers | - | 1 set | - |
| Assay Buffer | 30 mL | 1 bottle | L-AB |
| 10X Wash Buffer** | 60 mL | 1 bottle | L-WB |
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Detection Antibodies | 3.2 mL | 1 bottle | PRCYTA-1040-1 (for configurable 31-plex) or<br>PRCYTA-1040-2 (for 38-plex and 48-plex) |
| Streptavidin-Phycoerythrin | 3.2 mL | 1 bottle | L-SAPE4 (Use with Cat. No. PRCYTA-1040-1) or<br>L-SAPE18 (Use with Cat. No. PRCYTA-1040-2) |
| Bead Diluent (not provided with premixed bead) | 3.5 mL | 1 bottle | LBD |
| Mixing Bottle (not provided with premixed panel) | - | 1 bottle | - |

* Contains 0.08% Sodium azide
** Contains 0.05% Proclin™

*** For details on which reagents ship with which analytes, see table in "Replacement Reagents" section.

**Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Antibody-Immobilized Premixed Magnetic Beads**

| | Volume | Quantity | Cat. No. |
|---|---|---|---|
| Premixed 37-plex Beads | 3.5 mL | 1 bottle | PRCYTAPX37-MG |
| Premixed 47-plex Beads | 3.5 mL | 1 bottle | PRCYTAPX47-MG |

**Note:** RANTES is provided as a separate bead vial in both premixed bead kits due to different dilution requirements for serum/plasma samples. RANTES can only be added in the premix for samples other than serum/plasma. If measuring RANTES in serum/plasma, it is recommended to use a singleplex kit including RANTES only. For more information, please carefully review the sample preparation for serum and plasma samples and the preparation of antibody-immobilized beads sections below when assaying RANTES.

Included Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Antibody-Immobilized Beads are dependent on customizable selection of analytes within the panel.

**Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Antibody-Immobilized Magnetic Beads**

| Bead/Analyte Name | Luminex® Magnetic Bead Region | Customizable 48 Analytes (50X concentration, 90 µL) Available | Cat. No. | 37-Plex Magnetic Premixed Beads | 47-Plex Magnetic Premixed Beads |
|---|---|---|---|---|---|
| Anti-Human sCD40L Bead | 12 | ✔ | HCD40L-MG | ✔ | ✔ |
| Anti-Non-Human Primate BCA-1 Bead | 13 | ✔ | PRBCA1-MG | | ✔ |
| Anti-Human Eotaxin Bead | 14 | ✔ | HETXN-MG | | ✔ |
| Anti-Human FGF-2 Bead | 15 | ✔ | HFGF2-MG | | ✔ |
| Anti-Non-Human Primate sCD137 Bead | 18 | ✔ | PRSCD137-MG | ✔ | ✔ |
| Anti-Human Fractalkine Bead | 19 | ✔ | HFRACTALKN-MG | | ✔ |
| Anti-Non-Human Primate IFNγ Bead | 20 | ✔ | PRIFNG-MG | ✔ | ✔ |
| Anti-Non-Human Primate IL-16 Bead | 21 | ✔ | PRIL16-MG | | ✔ |
| Anti-Non-Human Primate sFasL Bead | 22 | ✔ | PRFASL-MG | ✔ | ✔ |
| Anti-Non-Human Primate G-CSF Bead | 25 | ✔ | PRGCSF-MG | ✔ | ✔ |
| Anti-Non-Human Primate GM-CSF Bead | 26 | ✔ | PRGMCSF-MG | ✔ | ✔ |
| Anti-Human IL-1α Bead | 27 | ✔ | HIL1A-MG | | ✔ |
| Anti-Non-Human Primate Granzyme A Bead | 28 | ✔ | PRGZMA-MG | ✔ | ✔ |
| Anti-Non-Human Primate IFNα2 Bead | 29 | ✔ | PRIFNA2-MG | ✔ | ✔ |
| Anti-Non-Human Primate IL-10 Bead | 30 | ✔ | PRIL10-MG | ✔ | ✔ |
| Anti-Non-Human Primate IL-2 Bead | 33 | ✔ | PRIL2-MG | ✔ | ✔ |
| Anti-Non-Human Primate IL-15 Bead | 34 | ✔ | PRIL15-MG | ✔ | ✔ |
| Anti-Non-Human Primate IL-17A Bead | 35 | ✔ | PRIL17A-MG | ✔ | ✔ |
| Anti-Human IL-6 Bead | 36 | ✔ | HIL6-MG | ✔ | ✔ |

For research use only. Not for use in diagnostic procedures.

| Bead/Analyte Name | Luminex® Magnetic Bead Region | Customizable 48 Analytes (50X concentration, 90 µL) Available | Cat. No. | 37-Plex Magnetic Premixed Beads | 47-Plex Magnetic Premixed Beads |
|---|---|---|---|---|---|
| Anti-Non-Human Primate Granzyme B Bead | 37 | ✔ | PRGZMB-MG | ✔ | ✔ |
| Anti-Human IL-8 Bead | 38 | ✔ | HIL8-MG | ✔ | ✔ |
| Anti-Non-Human Primate IL-1RA Bead | 39 | ✔ | PRIL1RA-MG | ✔ | ✔ |
| Anti-Non-Human Primate IL-1β Bead | 42 | ✔ | PRIL1B-MG | ✔ | ✔ |
| Anti-Non-Human Primate IL-23 Bead | 43 | ✔ | PRIL23-MG | ✔ | ✔ |
| Anti-Human IL-12(p70) Bead | 44 | ✔ | HIL12P70-MG | ✔ | ✔ |
| Anti-Non-Human Primate IL-28A Bead | 46 | ✔ | PRIL28A-MG | | ✔ |
| Anti-Non-Human Primate IL-31 Bead | 47 | ✔ | PRIL31-MG | | ✔ |
| Anti-Non-Human Primate IL-33 Bead | 48 | ✔ | PRIL33-MG | ✔ | ✔ |
| Anti-Human IL-17E Bead | 51 | ✔ | HIL17E-MG | | ✔ |
| Anti-Non-Human Primate IL-21 Bead | 52 | ✔ | PRIL21-MG | ✔ | ✔ |
| Anti-Non-Human Primate IL-4 Bead | 53 | ✔ | PRIL4-MG | ✔ | ✔ |
| Anti-Human IL-18 Bead | 54 | ✔ | HIL18-MG | ✔ | ✔ |
| Anti-Human IL-22 Bead | 55 | ✔ | HIL22-MG | ✔ | ✔ |
| Anti-Non-Human Primate IL-5 Bead | 56 | ✔ | PRIL5-MG | ✔ | ✔ |
| Anti-Human IP-10 Bead | 57 | ✔ | HIP10-MG | ✔ | ✔ |
| Anti-Human MCP-1 Bead | 61 | ✔ | HMCP1-MG | ✔ | ✔ |
| Anti-Non-Human Primate IL-7 Bead | 62 | ✔ | PRIL7-MG | ✔ | ✔ |
| Anti-Non-Human Primate I-TAC Bead | 63 | ✔ | PRITAC-MG | ✔ | ✔ |
| Anti-Non-Human Primate MIG Bead | 64 | ✔ | PRMIG-MG | ✔ | ✔ |

| Bead/Analyte Name | Luminex® Magnetic Bead Region | Customizable 48 Analytes (50X concentration, 90 µL) Available | Cat. No. | 37-Plex Magnetic Premixed Beads | 47-Plex Magnetic Premixed Beads |
|---|---|---|---|---|---|
| Anti-Non-Human Primate MIP-1α Bead | 65 | ✔ | PRMIP1A-MG | ✔ | ✔ |
| Anti-Non-Human Primate MIP-3α Bead | 66 | ✔ | PRMIP3A-MG | ✔ | ✔ |
| Anti-Human MIP-1β Bead | 67 | ✔ | HMIP1B-MG | ✔ | ✔ |
| Anti-Non-Human Primate TNFα Bead | 72 | ✔ | PRTNFA-MG | ✔ | ✔ |
| Anti-Human RANTES Bead | 74 | ✔ | HRANTES-MG | * | * |
| Anti-Human TGFα Bead | 75 | ✔ | HTGFA-MG | ✔ | ✔ |
| Anti-Non-Human Primate VEGF-A Bead | 76 | ✔ | PRVEGFA-MG | ✔ | ✔ |
| Anti-Human TNFβ Bead | 77 | ✔ | HTNFB-MG | | ✔ |
| Anti-Non-Human Primate Perforin Bead | 78 | ✔ | PRPRFN-MG | ✔ | ✔ |

**Note:** RANTES is provided as a separate bead vial in both premixed bead kits due to different dilution requirements for serum/plasma samples. For more information, please carefully review the sample preparation for serum and plasma samples and the preparation of antibody-immobilized beads sections below when assaying RANTES.

# Materials Required (not included)

**Reagents**

MAGPIX® Drive Fluid PLUS (Cat. No. 40-50030), xMAP® Sheath Fluid PLUS (Cat. No. 40-50021), or xMAP® Sheath Concentrate PLUS (Cat. No. 40-50023)

**Instrumentation/Materials**

- Adjustable pipettes with tips capable of delivering 25 µL to 1000 µL
- Multichannel pipettes capable of delivering 5 µL to 50 µL, or 25 µL to 200 µL
- Reagent reservoirs
- Polypropylene microfuge tubes
- Rubber bands
- Aluminum foil
- Absorbent pads
- Laboratory vortex mixer
- Sonicator (Branson Ultrasonic Cleaner Model B200 or equivalent)
- Titer plate shaker (VWR® Microplate Shaker Cat. No. 12620-926 or equivalent)
- Luminex® 200™, HTS, FLEXMAP 3D®, MAGPIX® instrument with xPONENT® software, or xMAP® INTELLIFLEX instrument with INTELLIFLEX software by Luminex® Corporation
- Automatic plate washer for magnetic beads (BioTek® 405 LS and 405 TS, Cat. No. 40-094, 40-095, 40-096, 40-097 or equivalent) or Handheld Magnetic Separation Block (Cat. No. 40-285 or equivalent).

**Note:** If a plate washer or handheld magnetic separation block for magnetic beads is not available, one can use a microtiter filter plate (Cat. No. MX-PLATE) to run the assay using a vacuum filtration unit (Vacuum Manifold, Cat. No. MSVMHTS00 or equivalent with Vacuum Pump, Cat. No. WP6111560 or equivalent).

# Safety Precautions

- All blood components and biological materials should be handled as potentially hazardous. Follow universal precautions as established by the Centers for Disease Control and Prevention and by the Occupational Safety and Health Administration when handling and disposing of infectious agents.
- Sodium azide or Proclin™ has been added to some reagents as a preservative. Although the concentrations are low, Sodium azide and Proclin™ may react with lead and copper plumbing to form highly explosive metal azides. Dispose of unused contents and waste in accordance with international, federal, state, and local regulations.

## Symbol Definitions

| Ingredient | Cat. No. | Label | |
|---|---|---|---|
| 10X Wash Buffer | L-WB |  | **Warning.** May cause an allergic skin reaction. Wear protective gloves. IF ON SKIN: Wash with plenty of soap and water. |
| NHP Cytokine Panel A Std 1 & NHP Cytokine Panel A QC1 & 2 for Std 1, NHP Cytokine Panel A Std 2 & NHP Cytokine Panel A QC1 & 2 for Std 2 | PRCYTA-8040-1 & PRCYTA-6040-1, PRCYTA-8040-2 & PRCYTA-6040-2 |  | **Danger**. Harmful if swallowed or if inhaled. Toxic in contact with skin. Causes serious eye damage. May cause damage to Respiratory Tract through prolonged or repeated exposure. May cause damage to Brain through prolonged or repeated exposure if swallowed. Harmful to aquatic life with long lasting effects. Do not breathe dust/fume/gas/mist/vapours/spray. Wash skin thoroughly after handling. Do not eat, drink or smoke when using this product. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth. IF ON SKIN: Wash with plenty of water. Call a POISON CENTER/doctor if you feel unwell. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention if you feel unwell. Take off contaminated clothing and wash before reuse. Store locked up. Dispose of contents/container to an approved waste disposal plant. |

| Ingredient, | Cat. No. | Label | |
|---|---|---|---|
| NHP Cytokine Panel A Det Abs 1, NHP Cytokine Panel A Det Abs 2 | PRCYTA-1040-1, PRCYTA-1040-2 |  | **Warning.** Causes serious eye irritation. May cause damage to organs Respiratory Tract through prolonged or repeated exposure. Do not breathe dust/fume/gas/mist/vapours/spray. Wash skin thoroughly after handling. Wear eye protection/face protection. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention if you feel unwell. If eye irritation persists: Get medical advice/attention. Dispose of contents/container to an approved waste disposal plant. |
| Serum Matrix | MXPRSM-A | no symbol required | Harmful to aquatic life with long lasting effects. Avoid release to the environment. |
| Streptavidin-Phycoerythrin | L-SAPE4 |  | **Warning.** Causes serious eye irritation. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. |
| Streptavidin-Phycoerythrin | L-SAPE18 |  | **Warning.** Causes serious eye irritation. May cause damage to organs Respiratory Tract through prolonged or repeated exposure. Do not breathe dust/fume/gas/mist/vapours/spray. Wash skin thoroughly after handling. Wear eye protection/face protection. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention if you feel unwell. If eye irritation persists: Get medical advice/ attention. Dispose of contents/ container to an approved waste disposal plant. |

# Technical Guidelines

To obtain reliable and reproducible results, the operator should carefully read this entire manual and fully understand all aspects of each assay step before running the assay. The following notes should be reviewed and understood before the assay is set up.

- FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.
- Do not use beyond the expiration date on the label.
- Do not mix or substitute reagents with those from other lots or sources.
- The Antibody-Immobilized Beads are light sensitive and must be protected from light at all times. Cover the assay plate containing beads with opaque plate lid or aluminum foil during all incubation steps.
- It is important to allow all reagents to warm to room temperature (20-25 °C) before use in the assay.
- Incomplete washing can adversely affect the assay outcome. All washing must be performed with the Wash Buffer provided.
- The standards prepared by serial dilution must be used within 1 hour of preparation. Discard any unused standards except the standard stock which may be stored at ≤ -20 °C for 1 month and at ≤ -80 °C for greater than one month.
- If samples fall outside the dynamic range of the assay, further dilute the samples with the appropriate diluent and repeat the assay.
- Any unused mixed Antibody-Immobilized Beads may be stored in the Mixing Bottle at 2-8 °C for up to one month**.**
- During the preparation of the standard curve, make certain to mix the higher concentration well before making the next dilution. Use a new tip with each dilution.
- The plate should be read immediately after the assay is finished. If, however, the plate cannot be read immediately, seal the plate, cover with aluminum foil or an opaque lid, and store the plate at 2-8 °C for up to 24 hours. Prior to reading, agitate the plate on the plate shaker at room temperature for 10 minutes. Delay in reading a plate may result in decreased sensitivity for some analytes.
- The titer plate shaker should be set at a speed to provide maximum orbital mixing without splashing of liquid outside the wells. For the recommended plate shaker, this would be a setting of 5-7 which is approximately 500-800 rpm.
- Ensure that the needle probe is clean. This may be achieved by sonication and/or alcohol flushes.

- When reading the assay on the Luminex® 200™ instrument, adjust probe height according to the protocols recommended by Luminex® to the kit solid plate or to the recommended filter plates using 3 alignment discs. When reading the assay on the MAGPIX® instrument, adjust probe height according to the protocols recommended by Luminex® to the kit solid plate or to the recommended filter plates using 2 alignment discs. When reading the assay on the FLEXMAP 3D® instrument, adjust probe height according to the protocols recommended by Luminex® to the kit solid plate using 1 alignment disc.
- For the FLEXMAP 3D® instrument, when using the solid plate in the kit, the final resuspension should be with 150 µL Sheath Fluid PLUS in each well and 75 µL should be aspirated.
- For the xMAP® INTELLIFLEX instrument, adjust probe height based on the type of plate you are using, place an alignment disk or an alignment sphere in the well according to the protocol recommended by Luminex®.
- For cell culture supernatants or tissue extraction, use the culture or extraction medium as the matrix solution in background, standard curve and control wells. If samples are diluted in Assay Buffer, use the Assay Buffer as matrix.
- For serum/plasma samples that require further dilution beyond "Neat", use the Serum Matrix provided in the kit.
- For cell/tissue homogenate, the final cell or tissue homogenate should be prepared in a buffer that has a neutral pH, contains minimal detergents or strong denaturing detergents, and has an ionic strength close to physiological concentration. Avoid debris, lipids, and cell/tissue aggregates. Centrifuge samples before use.
- Vortex all reagents well before adding to plate.
- Some analytes are temperature sensitive. Please use freshly thawed samples.

  **Note:** RANTES is provided as a separate bead vial in both premixed bead kits due to different dilution requirements for serum/plasma samples. RANTES can only be added in the premix for samples other than serum/plasma. If measuring RANTES in serum/plasma, it is recommended to use a singleplex kit including RANTES only. For more information, please carefully review the sample preparation for serum and plasma samples and the preparation of antibody-immobilized beads sections below when assaying RANTES.

  **Note:** The serum/plasma samples of some non-human primate species may require up to 1:100 dilution in Assay Buffer for IL-8.

# Sample Collection and Storage

**Preparation of Serum Samples**

- Allow the blood to clot for at least 30 minutes before centrifugation for 10 minutes at 1000 *x g*. Remove serum and assay immediately or aliquot and store samples at ≤ -20 °C.
- Avoid multiple (> 2) freeze/thaw cycles.
- When using frozen samples, it is recommended to thaw the samples completely, mix well by vortexing and centrifuge prior to use in the assay to remove particulates.
- Neat Serum samples (for measuring 47 analytes, not including RANTES) are used. When further dilution is required, use Serum Matrix as the diluent.
- The serum of some non-human primate species may require up to 1:100 dilution in Assay Buffer for IL-8.
- When measuring RANTES in serum, samples should be diluted 1:100 in the Assay Buffer and a standard curve with Assay Buffer should be used accordingly. When further dilution beyond 1:100 is required, use Assay Buffer as the diluent.

**Preparation of Plasma Samples**

- Plasma collection using EDTA as an anti-coagulant is recommended. Centrifuge for 10 minutes at 1000 *x g* within 30 minutes of blood collection. Remove plasma and assay immediately or aliquot and store samples at ≤ -20 °C.
- Avoid multiple (> 2) freeze/thaw cycles.
- When using frozen samples, it is recommended to thaw the samples completely, mix well by vortexing and centrifuge prior to use in the assay to remove particulates.
- Neat Plasma samples (for measuring 47 analytes, not including RANTES) are used. When further dilution is required, use Serum Matrix as the diluent.
- The plasma of some non-human primate species may require up to 1:100 dilution in Assay Buffer for IL-8.
- When measuring RANTES in plasma, samples should be diluted 1:100 in the Assay Buffer and a standard curve with Assay Buffer should be used accordingly. When further dilution beyond 1:100 is required, use Assay Buffer as the diluent.

**Preparation of Tissue Culture Supernatant**

- Centrifuge the sample to remove debris and assay immediately or aliquot and store samples at ≤ -20 °C.
- Avoid multiple (> 2) freeze/thaw cycles.

- Tissue culture supernatant may require a dilution with an appropriate control medium prior to assay. Tissue/cell extracts should be done in neutral buffers containing reagents and conditions that do not interfere with assay performance. Excess concentrations of detergent, salt, denaturants, high or low pH, etc. will negatively affect the assay. Organic solvents should be avoided. The tissue/cell extract samples should be free of particles such as cells or tissue debris.

**Note:**

- A maximum of 25 µL per well of diluted or neat sample can be used.
- All samples must be stored in polypropylene tubes. **DO NOT STORE SAMPLES IN GLASS.**
- Avoid debris, lipids and cells when using samples with gross hemolysis or lipemia.
- Care must be taken when using heparin as an anti-coagulant since an excess of heparin will provide falsely high values. Use no more than 10 IU heparin per mL of blood collected.

# Preparation of Reagents for Immunoassay

**Preparation of Antibody-Immobilized Beads**

- If premixed beads are used, sonicate the premixed bead bottle 30 seconds and then vortex for 1 minute before use.

  To prepare a 38-Plex premixed beads or a 48-Plex premixed beads, which includes RANTES, add 70 µL of RANTES beads to the 37-Plex premixed bead bottle or the 47-Plex premixed bead bottle, respectively.

  **Note**: Due to high concentration of RANTES in serum/plasma, it has to be measured separately with 1:100 diluted serum/plasma. The 37-Plex premixed beads and the 47-Plex premixed beads are used for measuring all other 37 or 47 analytes, respectively, in serum/plasma with **Neat** serum/plasma. RANTES should only be added to the premix if running samples other than serum/plasma.

- For individual vials of beads, sonicate each antibody-bead vial for 30 seconds; vortex for 1 minute. Add 60 µL from each antibody-bead vial to the Mixing Bottle and bring final volume to 3.0 mL with Bead Diluent. Vortex the mixed beads well. Unused portion may be stored at 2-8 °C for up to one month.
  **Note:** Due to the composition of magnetic beads, you may notice a slight color in the bead solution. This does not affect the performance of the beads or the kit.

  Example 1: When using 20 antibody-immobilized beads, add 60 µL from each of the 20 bead vials to the Mixing Bottle. Then add 1.8 mL Bead Diluent.

  Example 2: When using 9 antibody-immobilized beads, add 60 µL from each of the 9 bead vials to the Mixing Bottle. Then add 2.46 mL Bead Diluent.

**Preparation of Quality Controls**

Before use, reconstitute Quality Control 1 and Quality Control 2 with 250 µL deionized water. Invert the vial several times to mix and vortex. Allow the vial to sit for 5-10 minutes. Transfer the reconstituted Quality Control 1 and Quality Control 2 into two polypropylene microfuge tubes and set in an ice bath. These should be added to the plate within 1 hour of reconstitution. Unused portion may be stored at ≤ -20 °C for up to one month.

**Preparation of Wash Buffer**

Bring the 10X Wash Buffer to room temperature and mix to bring all salts into solution. Dilute 60 mL of 10X Wash Buffer with 540 mL deionized water. Store the unused portion at 2-8 °C for up to one month.

**Preparation of Serum Matrix**

**This step is required for serum or plasma samples only.**

Add 1 mL deionized water to the bottle containing lyophilized Serum Matrix. Mix well. Allow at least 10 minutes for complete reconstitution. Leftover reconstituted Serum Matrix should be stored at ≤ -20 °C for up to one month.

**Preparation of Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Standard**

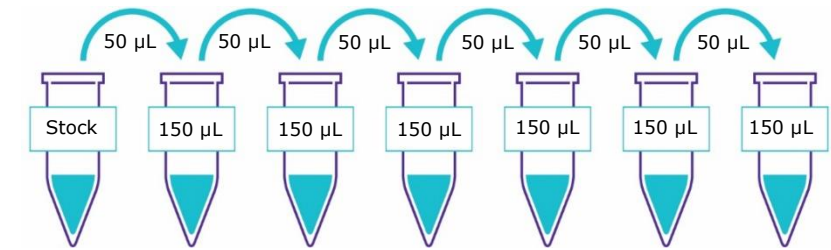
1. Prior to use, reconstitute the Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Standard with 250 µL deionized water. Refer to table below for analyte concentrations. Invert the vial several times to mix. Vortex the vial for 10 seconds. Allow the vial to sit for 5-10 minutes. Transfer the reconstituted standard to a polypropylene microfuge tube. This will be used as Standard 7; This reconstituted standard and the serially diluted standards in the following steps should be set in an ice bath, during the assay procedure. These need to be added to the plate within 1 hour of preparation. The unused portion of the "standard 7" may be stored at ≤ -20 °C for up to one month.

2. Preparation of Working Standards
   Label 6 polypropylene microfuge tubes Standard 1 through Standard 6. Add 150 µL of Assay Buffer to each of the 6 tubes. Prepare serial dilutions by adding 50 µL of the reconstituted standard to the Standard 6 tube, mix well and transfer 50 µL of Standard 6 to the Standard 5 tube, mix well and transfer 50 µL of Standard 5 to the Standard 4 tube, mix well and transfer 50 µL of Standard 4 to the Standard 3 tube, mix well and transfer 50 µL of Standard 3 to the Standard 2 tube, mix well and transfer 50 µL of Standard 2 to the Standard 1 tube and mix well. The 0 pg/mL standard (Background) will be Assay Buffer.

| Standard No. | Add Deionized Water (µL) | Add Standard (volume) |
|---|---|---|
| Standard 7 | 250 | 0 |

| Standard No. | Add Assay Buffer (µL) | Add Standard (volume) |
|---|---|---|
| Standard 6 | 150 | 50 µL of Standard 7 |
| Standard 5 | 150 | 50 µL of Standard 6 |
| Standard 4 | 150 | 50 µL of Standard 5 |
| Standard 3 | 150 | 50 µL of Standard 4 |
| Standard 2 | 150 | 50 µL of Standard 3 |
| Standard 1 | 150 | 50 µL of Standard 2 |

**Preparation of Standards**




Reconstituted Standard 7 | Standard 6 | Standard 5 | Standard 4 | Standard 3 | Standard 2 | Standard 1

| Standard | sCD40L (pg/mL) | BCA-1, Eotaxin, GM-CSF, IL-1α, IL-2, IL-17A, IL-6, IP-10, I-TAC, MIP-3α, TNFβ (pg/mL) | FGF-2 (pg/mL) | sCD137, Granzyme B, IL-1β (pg/mL) |
|---|---|---|---|---|
| Standard 1 | 48.83 | 1.22 | 61.04 | 0.98 |
| Standard 2 | 195 | 4.88 | 244 | 3.91 |
| Standard 3 | 781 | 20 | 977 | 16 |
| Standard 4 | 3,125 | 78 | 3,906 | 63 |
| Standard 5 | 12,500 | 313 | 15,625 | 250 |
| Standard 6 | 50,000 | 1,250 | 62,500 | 1000 |
| Standard 7 | 200,000 | 5,000 | 250,000 | 4,000 |

| Standard | Fractalkine, IL-17E (pg/mL) | IFNγ, IFNα2, IL-10, IL-22, VEGF-A (pg/mL) | IL-16 (pg/mL) | sFASL, G-CSF, IL-1RA, IL-21, IL-7, MIG, TNFα (pg/mL) |
|---|---|---|---|---|
| Standard 1 | 24.41 | 2.44 | 36.62 | 4.88 |
| Standard 2 | 98 | 9.77 | 146 | 20 |
| Standard 3 | 391 | 39 | 586 | 78 |
| Standard 4 | 1,563 | 156 | 2,344 | 313 |
| Standard 5 | 6,250 | 625 | 9,375 | 1,250 |
| Standard 6 | 25,000 | 2,500 | 37,500 | 5,000 |
| Standard 7 | 100,000 | 10,000 | 150,000 | 20,000 |

| Standard | Granzyme A (pg/mL) | IL-15, MIP-1β (pg/mL) | IL-8 (pg/mL) | IL-23, IL-18 (pg/mL) |
|---|---|---|---|---|
| Standard 1 | 0.61 | 6.10 | 0.05 | 19.53 |
| Standard 2 | 2.44 | 24 | 0.20 | 78 |
| Standard 3 | 9.77 | 98 | 0.78 | 313 |
| Standard 4 | 39 | 391 | 3.13 | 1,250 |
| Standard 5 | 156 | 1,563 | 13 | 5,000 |
| Standard 6 | 625 | 6,250 | 50 | 20,000 |
| Standard 7 | 2,500 | 25,000 | 200 | 80,000 |

| Standard | IL-12(p70), IL-28A, IL-31, IL-4 (pg/mL) | IL-33 (pg/mL) | IL-5 (pg/mL) | MCP-1 (pg/mL) |
|---|---|---|---|---|
| Standard 1 | 12.21 | 14.65 | 2.93 | 3.05 |
| Standard 2 | 49 | 59 | 12 | 12 |
| Standard 3 | 195 | 234 | 47 | 49 |
| Standard 4 | 781 | 938 | 188 | 195 |
| Standard 5 | 3,125 | 3,750 | 750 | 781 |
| Standard 6 | 12,500 | 15,000 | 3,000 | 3,125 |
| Standard 7 | 50,000 | 60,000 | 12,000 | 12,500 |

| Standard | MIP-1α (pg/mL) | RANTES (pg/mL) | TGF-α (pg/mL) | Perforin pg/mL) |
|---|---|---|---|---|
| Standard 1 | 0.73 | 0.10 | 0.49 | 97.66 |
| Standard 2 | 2.93 | 0.39 | 1.95 | 391 |
| Standard 3 | 12 | 1.56 | 7.81 | 1,563 |
| Standard 4 | 47 | 6.25 | 31 | 6,250 |
| Standard 5 | 188 | 25 | 125 | 25,000 |
| Standard 6 | 750 | 100 | 500 | 100,000 |
| Standard 7 | 3,000 | 400 | 2,000 | 400,000 |

# Immunoassay Procedure

- Prior to beginning this assay, it is imperative to read this protocol completely and to thoroughly understand the Technical Guidelines.
- Allow all reagents to warm to room temperature (20-25 °C) before use in the assay.
- Diagram the placement of Standards 0 (Background), Standard 1 through 7, Controls 1 and 2, and Samples on Well Map Worksheet in a vertical configuration.
  (**Note:** Most instruments will only read the 96-well plate vertically by default.)
  It is recommended to run the assay in duplicate.

1. Add 200 µL of Wash Buffer into each well of the plate. Seal and mix on a plate shaker for 10 minutes at room temperature (20-25 °C).
. Decant Wash Buffer and remove the residual amount from all wells by inverting the plate and tapping it smartly onto absorbent towels several times.
. Add 25 µL of each Standard or Control into the appropriate wells. Assay Buffer should be used for 0 pg/mL standard (Background).
. Add 25 µL of Assay Buffer to the sample wells.
. Add 25 µL of appropriate matrix solution to the background, standards, and control wells. When assaying serum or plasma, use the Serum Matrix provided in the kit. When assaying tissue culture or other supernatant, use proper control culture medium as the matrix solution. When measuring RANTES in serum or plasma use Assay Buffer as the matrix solution.
. Add 25 µL of Sample (1:100 dilution for RANTES if using serum or plasma samples, neat for all other analytes) into the appropriate wells.
. Vortex Mixing Bottle and add 25 µL of the Mixed or Premixed Beads to each well. **Note:** During addition of Beads, shake bead bottle intermittently to avoid settling.
. Seal the plate with a plate sealer. Wrap the plate with foil and incubate with agitation on a plate shaker overnight (16-18 hours) at 2-8 °C. Alternatively, incubate for 2 hours at room temperature (20-25 °C). *An overnight incubation may improve assay sensitivity for some analytes.*

Add 200 µL Wash Buffer per well

Shake 10 min, RT

Decant

- Add 25 µL Standard or Control to appropriate wells
- Add 25 µL Assay Buffer to background and sample wells
- Add 25 µL appropriate matrix solution to background, standards, and control wells
- Add 25 µL neat or diluted Samples to sample wells
- Add 25 µL Beads to each well

Incubate overnight (16-18 hours) at 2-8 °C or 2 hours at RT with shaking

10. Gently remove well contents and wash plate 3 times following instructions listed in the Plate Washing section.
11. Add 25 µL of Detection Antibodies into each well.
    **Note:** Allow the Detection Antibodies to warm to room temperature prior to addition.
12. Seal, cover with foil and incubate with agitation on a plate shaker for 1 hour at room temperature (20-25 °C). **DO NOT ASPIRATE AFTER INCUBATION.**
13. Add 25 µL Streptavidin-Phycoerythrin to each well containing the 25 µL of Detection Antibodies.
14. Seal, cover with foil and incubate with agitation on a plate shaker for 30 minutes at room temperature (20-25 °C).
15. Gently remove well contents and wash plate 3 times following instructions listed in the Plate Washing section.
16. Add 100 µL of Sheath Fluid PLUS (or Drive Fluid PLUS if using MAGPIX®) to all wells. Resuspend the beads on a plate shaker for 5 minutes.
17. Run plate on Luminex® 200™, HTS, FLEXMAP 3D®, MAGPIX® instrument with xPONENT® software or xMAP® INTELLIFLEX instrument with INTELLIFLEX software.
18. Save and analyze the Median Fluorescent Intensity (MFI) data using a 5-parameter logistic or spline curve-fitting method for calculating analyte concentrations in samples.

    **Note:** For diluted samples, final sample concentrations should be multiplied by the dilution factor.

re

Remove well contents and wash 3X with 200 µL Wash Buffer

Add 25 µL Detection Antibodies per well

Incubate 1 hour at RT

Do Not Aspirate

Add 25 µL Streptavidin-Phycoerythrin per well

Incubate for 30 minutes at RT

Remove well contents and wash 3X with 200 µL Wash Buffer

Add 100 µL Sheath Fluid PLUS or Drive Fluid PLUS per well

Read on Luminex® (50 µL, 50 beads per bead set)

# Plate Washing

If using a solid plate, use either a handheld magnet or magnetic plate washer.

- Handheld magnet (Cat. No. 40-285)
  Rest plate on magnet for 60 seconds to allow complete settling of magnetic beads. Remove well contents by gently decanting the plate in an appropriate waste receptacle and gently tapping on absorbent pads to remove residual liquid. Wash plate with 200 µL of Wash Buffer by removing plate from magnet, adding Wash Buffer, shaking for 30 seconds, reattaching to magnet, letting beads settle for 60 seconds and removing well contents as previously described after each wash. Repeat wash steps as recommended in Assay Procedure.
- Magnetic plate washer (Cat. No. 40-094, 40-095, 40-096 and 40-097)
  Please refer to specific automatic plate washer manual for appropriate equipment settings. Please note that after the final aspiration, there will be approximately 25 µL of residual wash buffer in each well. This is expected when using the BioTek® plate washer and this volume does not need to be aspirated from the plate.

If using an automatic plate washer other than BioTek® 405 LS or 405 TS, please refer to the manufacturer's recommendations for programming instructions.

# Equipment Settings

Luminex® 200™, HTS, FLEXMAP 3D®, MAGPIX® instruments with xPONENT® software and xMAP® INTELLIFLEX instrument with INTELLIFLEX software:

These specifications are for the above listed instruments and software. Luminex® instruments with other software (for example, MasterPlex®, StarStation, LiquiChip, Bio-Plex® Manager™, LABScan™100) would need to follow instrument instructions for gate settings and additional specifications from the vendors for reading Luminex® magnetic beads.

For magnetic bead assays, each instrument must be calibrated and performance verified with the indicated calibration and verification kits.

| Instrument | Calibration Kit | Verification Kit |
|---|---|---|
| Luminex® 200™ and HTS | xPONENT® 3.1 compatible Calibration Kit (Cat. No. LX2R-CAL-K25) | Performance Verification Kit (Cat. No. LX2R-PVER-K25) |
| FLEXMAP 3D® | FLEXMAP 3D® Calibrator Kit (Cat. No. F3D-CAL-K25) | FLEXMAP 3D® Performance Verification Kit (Cat. No. F3D-PVER-K25) |
| xMAP® INTELLIFLEX | xMAP® INTELLIFLEX Calibration Kit (Cat. No. IFX-CAL-K20) | xMAP® INTELLIFLEX Performance Verification Kit (Cat. No. IFX-PVER-K20) |
| MAGPIX® | MAGPIX® Calibration Kit (Cat. No. MPX-CAL-K25) | MAGPIX® Performance Verification Kit (Cat. No. MPX-PVER-K25) |

**Note:** When setting up a Protocol using the xPONENT® software, you must select MagPlex® as the Bead Type in the Acquisition settings.

**Note:** These assays cannot be run on any instruments using Luminex® IS 2.3 or Luminex® 1.7 software.

The Luminex® probe height must be adjusted to the plate provided in the kit. Please use Cat. No. MAG-PLATE, if additional plates are required for this purpose.

| | |
|---|---|
| Events | 50, per bead |
| Sample Size | 50 µL |
| Gate Settings | 8,000 to 15,000 |
| Reporter Gain | Default (low PMT) |
| Time Out | 60 seconds |
| Bead Set | Customizable 48-plex Beads |

| | | | |
|---|---|---|---|
| sCD40L | 12 | IL-12(p70) | 44 |
| BCA-1 | 13 | IL-28A | 46 |
| Eotaxin | 14 | IL-31 | 47 |
| FGF-2 | 15 | IL-33 | 48 |
| sCD137 | 18 | IL-17E | 51 |
| Fractalkine | 19 | IL-21 | 52 |
| IFNγ | 20 | IL-4 | 53 |
| IL-16 | 21 | IL-18 | 54 |
| sFasL | 22 | IL-22 | 55 |
| G-CSF | 25 | IL-5 | 56 |
| GM-CSF | 26 | IP-10 | 57 |
| IL-1α | 27 | MCP-1 | 61 |
| Granzyme A | 28 | IL-7 | 62 |
| IFNα2 | 29 | I-TAC | 63 |
| IL-10 | 30 | MIG | 64 |
| IL-2 | 33 | MIP-1α | 65 |
| IL-15 | 34 | MIP-3α | 66 |
| IL-17A | 35 | MIP-1β | 67 |
| IL-6 | 36 | TNFα | 72 |
| Granzyme B | 37 | RANTES | 74 |
| IL-8 | 38 | TGFα | 75 |
| IL-1RA | 39 | VEGF-A | 76 |
| IL-1β | 42 | TNFβ | 77 |
| IL-23 | 43 | Perforin | 78 |

# Quality Controls

The ranges for each analyte in Quality Control 1 and 2 are provided on the card insert or can be located at our website SigmaAldrich.com using the catalogue number as the keyword.

# Assay Characteristics

## Cross-Reactivity

There was no or negligible cross-reactivity between the antibodies for an analyte and any of the other analytes in this panel, except G-CSF had ~5% cross-reactivity with IL-1β.

**Detection of Normal Blood Samples from Multiple Non-Human Primate Species[1,2]**

| | Rhesus | | Cynomolgus | | Chimpanzee | | Baboon | African Green | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte** | S (n=10) | P (n=4) | S (n=8) | P (n=4) | S (n=5) | P (n=4) | S (n=5) | P (n=4) | S (n=5) | P (n=4) |
| sCD40L | +++ | +++ | +++ | +++ | +++ | ++ | +++ | +++ | +++ | +++ |
| BCA-1 | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ |
| Eotaxin | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ |
| FGF-2 | ++ | - | ++ | + | - | - | + | - | - | - |
| sCD137 | ++ | + | ++ | ++ | +++ | +++ | ++ | ++ | ++ | ++ |
| Fractalkine | +++ | +++ | ++ | ++ | +++ | ++ | ++ | ++ | +++ | +++ |
| IFNγ | ++ | + | ++ | - | - | - | ++ | - | + | ++ |
| IL-16 | ++ | - | + | + | +++ | ++ | ++ | - | + | ++ |
| sFasL | ++ | ++ | ++ | ++ | - | ++ | +++ | +++ | ++ | +++ |
| G-CSF | ++ | ++ | ++ | ++ | +++ | ++ | ++ | ++ | ++ | ++ |
| GM-CSF | ++ | ++ | ++ | ++ | ++ | +++ | +++ | +++ | ++ | ++ |
| IL-1α | ++ | ++ | ++ | - | ++ | ++ | ++ | ++ | ++ | - |
| Granzyme A | ++ | ++ | ++ | ++ | +++ | +++ | ++ | + | + | - |
| IFNα2 | ++ | ++ | ++ | + | ++ | ++ | ++ | ++ | ++ | + |
| IL-10 | ++ | ++ | ++ | ++ | + | ++ | +++ | +++ | + | - |
| IL-2 | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ |
| IL-15 | ++ | - | + | ++ | + | ++ | - | + | + | + |
| IL-17A | ++ | - | ++ | ++ | - | + | +++ | +++ | + | ++ |
| IL-6 | +++ | +++ | +++ | ++ | +++ | ++ | +++ | +++ | +++ | ++ |
| Granzyme B | ++ | - | + | - | ++ | +++ | ++ | + | - | - |
| IL-8 | +++ | +++ | +++ | +++ | +++ | ++ | +++ | +++ | +++ | +++ |
| IL-1RA | ++ | ++ | ++ | +++ | + | +++ | +++ | +++ | + | +++ |

For research use only. Not for use in diagnostic procedures.

| | Rhesus | | Cynomolgus | | Chimpanzee | | Baboon | African Green | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Analyte** | S (n=10) | P (n=4) | S (n=8) | P (n=4) | S (n=5) | P (n=4) | S (n=5) | P (n=4) | S (n=5) | P (n=4) |
| IL-1β | +++ | +++ | +++ | ++ | +++ | +++ | +++ | +++ | +++ | +++ |
| IL-23 | ++ | ++ | ++ | ++ | - | ++ | ++ | ++ | ++ | + |
| IL-12(p70) | + | - | + | - | - | + | + | - | - | - |
| IL-28A | ++ | +++ | ++ | ++ | ++ | +++ | ++ | +++ | ++ | ++ |
| IL-31 | + | - | + | ++ | + | + | +++ | ++ | + | + |
| IL-33 | + | - | - | ++ | - | + | ++ | ++ | - | - |
| IL-17E | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ |
| IL-21 | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | ++ |
| IL-4 | ++ | + | + | + | + | + | +++ | ++ | + | - |
| IL-18 | ++ | + | - | + | ++ | +++ | - | - | - | - |
| IL-22 | ++ | +++ | ++ | ++ | ++ | ++ | +++ | ++ | ++ | ++ |
| IL-5 | ++ | + | ++ | ++ | - | - | + | ++ | + | ++ |
| IP-10 | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ |
| MCP-1 | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ |
| IL-7 | ++ | - | ++ | + | +++ | +++ | ++ | + | - | - |
| I-TAC | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ |
| MIG | ++ | - | + | + | +++ | +++ | +++ | +++ | + | - |
| MIP-1α | ++ | +++ | +++ | ++ | ++ | ++ | +++ | +++ | ++ | - |
| MIP-3α | ++ | ++ | ++ | ++ | +++ | +++ | +++ | ++ | ++ | +++ |
| MIP-1β | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ |
| TNFα | ++ | ++ | ++ | ++ | +++ | ++ | ++ | + | ++ | ++ |
| RANTES | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ |
| TGFα | +++ | + | +++ | ++ | +++ | +++ | +++ | +++ | +++ | +++ |
| VEGF-A | ++ | + | + | + | + | + | ++ | ++ | ++ | + |
| TNFβ | +++ | +++ | ++ | +++ | ++ | +++ | +++ | +++ | ++ | +++ |
| Perforin | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ | +++ |

1. S=Serum; P=EDTA Plasma.

2. The "+++", "++", "+" and "-" indicate degree of reactivity: "+++" detected all test samples; "++" detected more than one samples but not all; "+" detected one sample; "-" no samples detected.

## Assay Sensitivities (minimum detectable concentrations, pg/mL)

Minimum Detectable Concentration (MinDC) is calculated using MILLIPLEX® Analyst 5.1. It measures the true limits of detection for an assay by mathematically determining what the empirical MinDC would be if an infinite number of standard concentrations were run for the assay under the same conditions.

| | Overnight Protocol (n = 11 Assays) | | 2 Hour Protocol (n = 4 Assays) | |
|---|---|---|---|---|
| **Analyte** | **MinDC (pg/mL)** | **MinDC+2SD (pg/mL)** | **MinDC (pg/mL)** | **MinDC+2SD (pg/mL)** |
| sCD40L | 16.53 | 49.95 | 9.06 | 19.17 |
| BCA-1 | 0.37 | 1.06 | 0.70 | 1.75 |
| Eotaxin | 1.45 | 3.21 | 0.87 | 1.49 |
| FGF-2 | 44.87 | 88.34 | 39.98 | 84.88 |
| sCD137 | 0.31 | 1.03 | 0.86 | 2.53 |
| Fractalkine | 7.99 | 13.42 | 7.13 | 12.31 |
| IFNγ | 1.37 | 2.42 | 1.76 | 3.76 |
| IL-16 | 12.31 | 23.42 | 10.86 | 24.43 |
| sFasL | 2.51 | 5.39 | 2.31 | 4.72 |
| G-CSF | 4.43 | 8.62 | 3.82 | 8.52 |
| GM-CSF | 0.23 | 0.62 | 0.73 | 2.72 |
| IL-1α | 0.79 | 2.94 | 1.73 | 7.61 |
| Granzyme A | 0.27 | 1.01 | 0.17 | 0.59 |
| IFNα2 | 1.24 | 2.62 | 1.39 | 2.59 |
| IL-10 | 0.37 | 0.99 | 0.39 | 0.98 |
| IL-2 | 0.59 | 1.96 | 0.31 | 0.58 |
| IL-15 | 1.76 | 4.43 | 1.41 | 5.35 |
| IL-17A | 0.42 | 0.88 | 0.72 | 1.45 |
| IL-6 | 0.41 | 1.03 | 1.09 | 2.88 |
| Granzyme B | 0.18 | 0.36 | 0.46 | 1.70 |
| IL-8 | 0.02 | 0.07 | 0.15 | 0.70 |
| IL-1Ra | 1.04 | 2.23 | 1.22 | 2.18 |
| IL-1β | 0.18 | 0.37 | 0.29 | 0.53 |
| IL-23 | 4.45 | 9.78 | 0.49 | 1.90 |
| IL-12 (p70) | 2.30 | 4.57 | 2.57 | 5.56 |

| | Overnight Protocol (n = 11 Assays) | | 2 Hour Protocol (n = 4 Assays) | |
|---|---|---|---|---|
| **Analyte** | **MinDC (pg/mL)** | **MinDC+2SD (pg/mL)** | **MinDC (pg/mL)** | **MinDC+2SD (pg/mL)** |
| IL-28A | 10.69 | 17.72 | 8.88 | 17.77 |
| IL-31 | 2.63 | 5.63 | 2.21 | 6.08 |
| IL-33 | 5.45 | 13.09 | 2.35 | 4.26 |
| IL-17E | 7.26 | 17.34 | 5.40 | 7.75 |
| IL-21 | 1.33 | 2.67 | 0.70 | 1.78 |
| IL-4 | 3.27 | 6.09 | 3.54 | 6.83 |
| IL-18 | 5.20 | 10.98 | 8.43 | 24.14 |
| IL-22 | 2.09 | 4.88 | 1.09 | 2.81 |
| IL-5 | 0.75 | 1.62 | 0.16 | 0.54 |
| IP-10 | 0.60 | 1.13 | 0.94 | 2.31 |
| MCP-1 | 2.71 | 4.53 | 2.43 | 5.18 |
| IL-7 | 1.10 | 3.55 | 3.27 | 5.98 |
| I-TAC | 0.35 | 0.81 | 1.08 | 2.67 |
| MIG | 2.39 | 5.51 | 1.57 | 2.44 |
| MIP-1α | 0.93 | 2.09 | 0.66 | 1.95 |
| MIP-3α | 0.27 | 0.63 | 0.39 | 1.14 |
| MIP-1β | 4.28 | 8.60 | 3.33 | 7.96 |
| TNFα | 4.19 | 5.91 | 2.67 | 5.29 |
| *RANTES | 0.04 | 0.12 | 0.14 | 0.57 |
| TGFα | 0.32 | 1.19 | 0.08 | 0.21 |
| VEGF-A | 0.50 | 1.08 | 0.43 | 1.62 |
| TNFβ | 0.20 | 0.45 | 0.29 | 1.02 |
| Perforin | 46.92 | 73.95 | 29.22 | 60.21 |

*RANTES standard curve with Assay Buffer

## Precision

Intra-assay precision is generated from the mean of the %CV's from 16 reportable results across two different concentrations of analytes in a single assay. Inter-assay precision is generated from the mean of the %CV's across two different concentrations of analytes across 10 different assays.

| | Overnight Protocol | | 2 Hour Protocol |
|---|---|---|---|
| **Analyte** | **Intra-assay %CV** | **Inter-assay %CV** | **Intra-assay %CV** |
| sCD40L | < 10 | < 20 | < 10 |
| BCA-1 | < 10 | < 20 | < 10 |
| Eotaxin | < 10 | < 20 | < 10 |
| FGF-2 | < 10 | < 20 | < 10 |
| sCD137 | < 10 | < 20 | < 10 |
| Fractalkine | < 10 | < 20 | < 10 |
| IFNγ | < 10 | < 20 | < 10 |
| IL-16 | < 10 | < 20 | < 10 |
| sFasL | < 10 | < 20 | < 10 |
| G-CSF | < 10 | < 20 | < 10 |
| GM-CSF | < 10 | < 20 | < 10 |
| IL-1α | < 10 | < 20 | < 10 |
| Granzyme A | < 10 | < 20 | < 10 |
| IFNα2 | < 10 | < 20 | < 10 |
| IL-10 | < 10 | < 20 | < 10 |
| IL-2 | < 10 | < 20 | < 10 |
| IL-15 | < 10 | < 20 | < 10 |
| IL-17A | < 10 | < 20 | < 10 |
| IL-6 | < 10 | < 20 | < 10 |
| Granzyme B | < 10 | < 20 | < 10 |
| IL-8 | < 10 | < 20 | < 10 |
| IL-1Ra | < 10 | < 20 | < 10 |
| IL-1β | < 10 | < 20 | < 10 |
| IL-23 | < 10 | < 20 | < 10 |
| IL-12 (p70) | < 10 | < 20 | < 10 |
| IL-28A | < 10 | < 20 | < 10 |
| IL-31 | < 10 | < 20 | < 10 |

| | Overnight Protocol | | 2 Hour Protocol |
|---|---|---|---|
| **Analyte** | **Intra-assay %CV** | **Inter-assay %CV** | **Intra-assay %CV** |
| IL-33 | < 10 | < 20 | < 10 |
| IL-17E | < 10 | < 20 | < 10 |
| IL-21 | < 10 | < 20 | < 10 |
| IL-4 | < 10 | < 20 | < 10 |
| IL-18 | < 10 | < 20 | < 10 |
| IL-22 | < 10 | < 20 | < 10 |
| IL-5 | < 10 | < 20 | < 10 |
| IP-10 | < 10 | < 20 | < 10 |
| MCP-1 | < 10 | < 20 | < 10 |
| IL-7 | < 10 | <20 | <10 |
| I-TAC | < 10 | <20 | <10 |
| MIG | < 10 | <20 | <10 |
| MIP-1α | < 10 | <20 | <10 |
| MIP-3α | < 10 | <20 | <10 |
| MIP-1β | < 10 | < 20 | <10 |
| TNFα | < 10 | < 30 | <10 |
| *RANTES | < 10 | < 20 | <10 |
| TGFα | < 10 | < 20 | <10 |
| VEGF-A | < 10 | < 20 | <10 |
| TNFβ | < 10 | < 20 | <10 |
| Perforin | < 10 | < 20 | <10 |

*RANTES standard curve with Assay Buffer

## Accuracy

Spike Recovery: The data represent mean percent recovery of spiked standards ranging from low, medium, and high concentration in serum matrices (n=6).

| | Overnight Protocol | 2 Hour Protocol |
|---|---|---|
| **Analyte** | **% Recovery in Serum Matrix** | **% Recovery in Serum Matrix** |
| sCD40L | 84 | 83 |
| BCA-1 | 88 | 92 |
| Eotaxin | 86 | 86 |
| FGF-2 | 88 | 88 |
| sCD137 | 87 | 90 |
| Fractalkine | 83 | 85 |
| IFNγ | 89 | 86 |
| IL-16 | 87 | 85 |
| sFasL | 82 | 85 |
| G-CSF | 89 | 89 |
| GM-CSF | 89 | 91 |
| IL-1α | 86 | 89 |
| Granzyme A | 85 | 85 |
| IFNα2 | 84 | 83 |
| IL-10 | 91 | 94 |
| IL-2 | 83 | 86 |
| IL-15 | 84 | 84 |
| IL-17A | 85 | 86 |
| IL-6 | 83 | 86 |
| Granzyme B | 88 | 85 |
| IL-8 | 85 | 83 |
| IL-1Ra | 86 | 90 |
| IL-1β | 80 | 87 |
| IL-23 | 93 | 84 |
| IL-12 (p70) | 84 | 91 |
| IL-28A | 83 | 84 |
| IL-31 | 92 | 93 |
| IL-33 | 88 | 94 |
| IL-17E | 87 | 84 |

| | Overnight Protocol | 2 Hour Protocol |
|---|---|---|
| **Analyte** | **% Recovery in Serum Matrix** | **% Recovery in Serum Matrix** |
| IL-21 | 82 | 87 |
| IL-4 | 83 | 86 |
| IL-18 | 88 | 90 |
| IL-22 | 87 | 88 |
| IL-5 | 88 | 84 |
| IP-10 | 87 | 83 |
| MCP-1 | 85 | 86 |
| IL-7 | 86 | 91 |
| I-TAC | 87 | 87 |
| MIG | 86 | 85 |
| MIP-1α | 102 | 91 |
| MIP-3α | 87 | 84 |
| MIP-1β | 85 | 95 |
| TNFα | 86 | 92 |
| *RANTES | 91 | 90 |
| TGFα | 85 | 88 |
| VEGF-A | 85 | 88 |
| TNFβ | 87 | 84 |
| Perforin | 85 | 86 |

*RANTES recovery with Assay Buffer

# Troubleshooting

| Problem | Probable Cause | Solution |
|---|---|---|
| Insufficient bead count | Plate washer aspirate height set too low | Adjust aspiration height according to manufacturers' instructions. |
| | Bead mix prepared inappropriately | Sonicate bead vials and vortex just prior to adding to bead mix bottle according to protocol. Agitate bead mix intermittently in reservoir while pipetting this into the plate. |
| | Samples cause interference due to particulate matter or viscosity | See above. Also sample probe may need to be cleaned with alcohol flushes, back flushes and washes; or if needed, probe should be removed and sonicated. |
| | Probe height not adjusted correctly | When reading the assay on the Luminex® 200™ instrument, adjust probe height to the kit solid plate using 3 alignment discs. When reading the assay on the MAGPIX® instrument, adjust probe height to the kit solid plate using 2 alignment discs. When reading the assay on the FLEXMAP 3D® instrument, adjust probe height to the kit solid plate using 1 alignment disc. When reading the assay on the xMAP® INTELLIFLEX instrument, adjust probe height based on the type of plate you are using, place an alignment disk or an alignment sphere in the well according to the protocol recommended by Luminex®. |
| Background is too high | Background wells were contaminated | Avoid cross-well contamination by using sealer appropriately and pipetting with multichannel pipettes without touching reagent in plate. |
| | Matrix used has endogenous analyte or interference | Check matrix ingredients for cross-reacting components (for example, interleukin modified tissue culture medium). |
| | Insufficient washes | Increase number of washes. |

| Problem | Probable Cause | Solution |
|---|---|---|
| Beads not in region or gate | Luminex® instrument not calibrated correctly or recently | Calibrate Luminex® instrument based on manufacturer's instructions, at least once a week or if temperature has changed by > 3 °C. |
| | Gate settings not adjusted correctly | Some Luminex® instruments (for example, Bio-Plex®) require different gate settings than those described in the kit protocol. Use instrument default settings. |
| | Wrong bead regions in protocol template | Check kit protocol for correct bead regions or analyte selection. |
| | Incorrect sample type used | Samples containing organic solvents or if highly viscous should be diluted or dialyzed as required. |
| | Instrument not washed or primed | Prime the Luminex® instrument 4 times to rid it of air bubbles, wash 4 times with sheath fluid or water if there is any remnant alcohol or sanitizing liquid. |
| | Beads were exposed to light | Keep plate and bead mix covered with dark lid or aluminum foil during all incubation steps. |
| Signal for whole plate is same as background | Incorrect or no Detection Antibody was added | Add appropriate Detection Antibody and continue. |
| | Streptavidin-Phycoerythrin was not added | Add Streptavidin-Phycoerythrin according to protocol. If Detection Antibody has already been removed, sensitivity may be low. |
| Low signal for standard curve | Detection Antibody may have been removed prior to adding Streptavidin-Phycoerythrin | May need to repeat assay if desired sensitivity not achieved. |
| | Incubations done at inappropriate temperatures, timings or agitation | Assay conditions need to be checked. |

| Problem | Probable Cause | Solution |
|---|---|---|
| Signals too high, standard curves are saturated | Calibration target value set too high | With some Luminex® instruments (for example, Bio-Plex®) default target setting for RP1 calibrator is set at high PMT. Use low target value for calibration and reanalyze plate. |
| | Plate incubation was too long with standard curve and samples | Use shorter incubation time. |
| Sample readings are out of range | Samples contain no or below detectable levels of analyte | If below detectable levels, it may be possible to use higher sample volume. Check with technical support for appropriate protocol modifications. |
| | Samples contain analyte concentrations higher than highest standard point | Samples may require dilution and reanalysis for just that particular analyte. |
| | Standard curve was saturated at higher end of curve | See above. |
| High variation in samples and/or standards | Multichannel pipette may not be calibrated | Calibrate pipettes. |
| | Plate washing was not uniform | Confirm all reagents are removed completely in all wash steps. |
| | Samples may have high particulate matter or other interfering substances | See above. |
| | Plate agitation was insufficient | Plate should be agitated during all incubation steps using an orbital plate shaker at a speed where beads are in constant motion without causing splashing. |
| | Cross-well contamination | Check when reusing plate sealer that no reagent has touched sealer. Care should be taken when using same pipette tips that are used for reagent additions and that pipette tip does not touch reagent in plate. |

# Product Ordering

| Reagent | Note | Cat. No. |
|---|---|---|
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Standard | For configurable kit | PRCYTA-8040-1 |
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Standard | For 38- or 48-plex or configurable kit | PRCYTA-8040-2 |
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Quality Controls 1 and 2 | For configurable kit | PRCYTA-6040-1 |
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Quality Controls 1 and 2 | For 38- or 48-plex or configurable kit | PRCYTA-6040-2 |
| Serum Matrix | - | MXPRSM-A |
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Detection Antibodies | For configurable kit | PRCYTA-1040-1 |
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A Detection Antibodies | For 38- or 48-plex or configurable kit | PRCYTA-1040-2 |
| Streptavidin-Phycoerythrin | For configurable kit | L-SAPE4 |
| Streptavidin-Phycoerythrin | For 38- or 48-plex or configurable kit | L-SAPE18 |
| Assay Buffer | - | L-AB |
| Set of two 96-Well plates with sealers | - | MAG-PLATE |
| 10X Wash Buffer | - | L-WB |

| Reagent | Note | Cat. No. |
|---|---|---|
| Bead Diluent | - | LBD |
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A 37-Plex Premixed Beads* | - | PRCYTAPX37-MG |
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A 47-Plex Premixed Beads* | - | PRCYTAPX47-MG |
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A 38 Plex Premixed Magnetic Bead Panel | - | PRCYTA-40K-PX38 |
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A 48 Plex Premixed Magnetic Bead Panel | - | PRCYTA-40K-PX48 |
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A 38 Plex Premixed Magnetic Bead Panel | BULK PACKAGING | PRCYTA-40K-BK38 |
| Non-Human Primate Cytokine/Chemokine/Growth Factor Panel A 48 Plex Premixed Magnetic Bead Panel | BULK PACKAGING | PRCYTA-40K-BK48 |

* For individual beads, see below.

**Antibody-Immobilized Magnetic Beads**

| Analyte | Bead No. | Cat. No. | Analyte | Bead No. | Cat. No. |
|---|---|---|---|---|---|
| sCD40L | 12 | HCD40L-MG | IL-12(p70) | 44 | HIL12P70-MG |
| BCA-1 | 13 | PRBCA1-MG | IL-28A | 46 | PRIL28A-MG |
| Eotaxin | 14 | HETXN-MG | IL-31 | 47 | PRIL31-MG |
| FGF-2 | 15 | HFGF2-MG | IL-33 | 48 | PRIL33-MG |
| sCD137 | 18 | PRSCD137-MG | IL-17E | 51 | HIL17E-MG |
| Fractalkine | 19 | HFRACTALKN-MG | IL-21 | 52 | PRIL21-MG |
| IFNγ | 20 | PRIFNG-MG | IL-4 | 53 | PRIL4-MG |
| IL-16 | 21 | PRIL16-MG | IL-18 | 54 | HIL18-MG |
| sFasL | 22 | PRFASL-MG | IL-22 | 55 | HIL22-MG |
| G-CSF | 25 | PRGCSF-MG | IL-5 | 56 | PRIL5-MG |
| GM-CSF | 26 | PRGMCSF-MG | IP-10 | 57 | HIP10-MG |
| IL-1α | 27 | HIL1A-MG | MCP-1 | 61 | HMCP1-MG |
| Granzyme A | 28 | PRGZMA-MG | IL-7 | 62 | PRIL7-MG |
| IFNα2 | 29 | PRIFNA2-MG | I-TAC | 63 | PRITAC-MG |
| IL-10 | 30 | PRIL10-MG | MIG | 64 | PRMIG-MG |
| IL-2 | 33 | PRIL2-MG | MIP-1α | 65 | PRMIP1A-MG |
| IL-15 | 34 | PRIL15-MG | MIP-3α | 66 | PRMIP3A-MG |
| IL-17A | 35 | PRIL17A-MG | MIP-1β | 67 | HMIP1B-MG |
| IL-6 | 36 | HIL6-MG | TNFα | 72 | PRTNFA-MG |
| Granzyme B | 37 | PRGZMB-MG | RANTES | 74 | HRANTES-MG |
| IL-8 | 38 | HIL8-MG | TGFα | 75 | HTGFA-MG |
| IL-1RA | 39 | PRIL1RA-MG | VEGF-A | 76 | PRVEGFA-MG |
| IL-1β | 42 | PRIL1B-MG | TNFβ | 77 | HTNFB-MG |
| IL-23 | 43 | PRIL23-MG | Perforin | 78 | PRPRFN-MG |

# Analyte Contents of Select Reagents

| Analyte/ Bead Name | Luminex® Magnetic Bead Region | Customizable 48 Analytes (50X concentration, 90 µL) | | PRCYTAPX37-MG (37-Plex Premixed Beads) | PRCYTAPX47-MG (47-Plex Premixed Beads) | PRCYTA-8040-1 (31-plex Standard Mix) | PRCYTA-8040-2 (48-plex Standard Mix) | PRCYTA-1040-1 (31-plex Detection Mix) with L-SAPE4 | PRCYTA-1040-2 (48-plex Detection Mix) with L-SAPE-18 |
|---|---|---|---|---|---|---|---|---|---|
| | | Available | Catalog Number | | | | | | |
| Anti-H sCD40L | 12 | ✔ | HCD40L-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP BCA-1 | 13 | ✔ | PRBCA1-MG | | ✔ | | ✔ | | ✔ |
| Anti-H Eotaxin | 14 | ✔ | HETXN-MG | | ✔ | | ✔ | | ✔ |
| Anti-H FGF-2 | 15 | ✔ | HFGF2-MG | | ✔ | | ✔ | | ✔ |
| Anti-NHP sCD137 | 18 | ✔ | PRSCD137-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-H Fractalkine | 19 | ✔ | HFRACTALKN-MG | | ✔ | | ✔ | | ✔ |
| Anti-NHP IFNγ | 20 | ✔ | PRIFNG-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP IL-16 | 21 | ✔ | PRIL16-MG | | ✔ | | ✔ | | ✔ |
| Anti-NHP sFasL | 22 | ✔ | PRFASL-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP G-CSF | 25 | ✔ | PRGCSF-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP GM-CSF | 26 | ✔ | PRGMCSF-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-Human IL-1α | 27 | ✔ | HIL1A-MG | | ✔ | | ✔ | | ✔ |
| Anti-NHP Granzyme A | 28 | ✔ | PRGZMA-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP IFNα2 | 29 | ✔ | PRIFNA2-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP IL-10 | 30 | ✔ | PRIL10-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP IL-2 | 33 | ✔ | PRIL2-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP IL-15 | 34 | ✔ | PRIL15-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |

| Analyte/ Bead Name | Luminex® Magnetic Bead Region | Customizable 48 Analytes (50X concentration, 90 µL) | | PRCYTAPX37-MG (37-Plex Premixed Beads) | PRCYTAPX47-MG (47-Plex Premixed Beads) | PRCYTA-8040-1 (31-plex Standard Mix) | PRCYTA-8040-2 (48-plex Standard Mix) | PRCYTA-1040-1 (31-plex Detection Mix) with L-SAPE4 | PRCYTA-1040-2 (48-plex Detection Mix) with L-SAPE-18 |
|---|---|---|---|---|---|---|---|---|---|
| | | Available | Catalog Number | | | | | | |
| Anti-NHP IL-17A | 35 | ✔ | PRIL17A-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-H IL-6 | 36 | ✔ | HIL6-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP Granzyme B | 37 | ✔ | PRGZMB-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-H IL-8 | 38 | ✔ | HIL8-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP IL-1RA | 39 | ✔ | PRIL1RA-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP IL-1β | 42 | ✔ | PRIL1B-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP IL-23 | 43 | ✔ | PRIL23-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-H IL-12(p70) | 44 | ✔ | HIL12P70-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP IL-28A | 46 | ✔ | PRIL28A-MG | | ✔ | | ✔ | | ✔ |
| Anti-NHP IL-31 | 47 | ✔ | PRIL31-MG | | ✔ | | ✔ | | ✔ |
| Anti-NHP IL-33 | 48 | ✔ | PRIL33-MG | ✔ | ✔ | | ✔ | | ✔ |
| Anti-H IL-17E | 51 | ✔ | HIL17E-MG | | ✔ | | ✔ | | ✔ |
| Anti-NHP IL-21 | 52 | ✔ | PRIL21-MG | ✔ | ✔ | | ✔ | | ✔ |
| Anti-NHP IL-4 | 53 | ✔ | PRIL4-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-H IL-18 | 54 | ✔ | HIL18-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-H IL-22 | 55 | ✔ | HIL22-MG | ✔ | ✔ | | ✔ | | ✔ |
| Anti-NHP IL-5 | 56 | ✔ | PRIL5-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-H IP-10 | 57 | ✔ | HIP10-MG | ✔ | ✔ | | ✔ | | ✔ |

| Analyte/ Bead Name | Luminex® Magnetic Bead Region | Customizable 48 Analytes (50X concentration, 90 µL) | | PRCYTAPX37-MG (37-Plex Premixed Beads) | PRCYTAPX47-MG (47-Plex Premixed Beads) | PRCYTA-8040-1 (31-plex Standard Mix) | PRCYTA-8040-2 (48-plex Standard Mix) | PRCYTA-1040-1 (31-plex Detection Mix) with L-SAPE4 | PRCYTA-1040-2 (48-plex Detection Mix) with L-SAPE-18 |
|---|---|---|---|---|---|---|---|---|---|
| | | Available | Catalog Number | | | | | | |
| Anti-H MCP-1 | 61 | ✔ | HMCP1-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP IL-7 | 62 | ✔ | PRIL7-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP I-TAC | 63 | ✔ | PRITAC-MG | ✔ | ✔ | | ✔ | | ✔ |
| Anti-NHP MIG | 64 | ✔ | PRMIG-MG | ✔ | ✔ | | ✔ | | ✔ |
| Anti-NHP MIP-1α | 65 | ✔ | PRMIP1A-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP MIP-3α | 66 | ✔ | PRMIP3A-MG | ✔ | ✔ | | ✔ | | ✔ |
| Anti-H MIP-1β | 67 | ✔ | HMIP1B-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP TNFα | 72 | ✔ | PRTNFA-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-H RANTES | 74 | ✔ | HRANTES-MG | | | ✔ | ✔ | ✔ | ✔ |
| Anti-H TGFα | 75 | ✔ | HTGFA-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-NHP VEGF-A | 76 | ✔ | PRVEGFA-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |
| Anti-H TNFβ | 77 | ✔ | HTNFB-MG | | ✔ | | ✔ | | ✔ |
| Anti-NHP Perforin | 78 | ✔ | PRPRFN-MG | ✔ | ✔ | ✔ | ✔ | ✔ | ✔ |

# Well Map

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | Standard 0 (Background) | Standard 4 | QC-1 Control | Etc. | | | | | | | | |
| B | Standard 0 (Background) | Standard 4 | QC-1 Control | | | | | | | | | |
| C | Standard 1 | Standard 5 | QC-2 Control | | | | | | | | | |
| D | Standard 1 | Standard 5 | QC-2 Control | | | | | | | | | |
| E | Standard 2 | Standard 6 | Sample 1 | | | | | | | | | |
| F | Standard 2 | Standard 6 | Sample 1 | | | | | | | | | |
| G | Standard 3 | Standard 7 | Sample 2 | | | | | | | | | |
| H | Standard 3 | Standard 7 | Sample 2 | | | | | | | | | |

# Notice

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