

CERTIFICATE OF ANALYSIS

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Product Description: V-PLEX® and V-PLEX Plus Cytokine Panel 1 (human) Kit

Kit Catalog Numbers: K15050-Series

Kit Lot Number: K0080995

Expiration Date: 31 Jul 2019

Acceptance Data/ Percent Recovery Specifications:

| Spot | Name | Calibrator | | Cytokine Panel 1 (human) Control 1 | | Cytokine Panel 1 (human) Control 2 | | Cytokine Panel 1 (human) Control 3 | |
|------|----------------|------------|-------|------------------------------------|-------|------------------------------------|-------|------------------------------------|-------|
| | | Recovery | CV | Recovery | CV | Recovery | CV | Recovery | CV |
| 1 | hu GM-CSF | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% |
| 2 | hu IL-1α | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% |
| 3 | hu IL-5 | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% |
| 4 | hu IL-7 | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% |
| 5 | hu IL-12/23p40 | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% |
| 6 | hu IL-15 | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% |
| 7 | hu IL-16 | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% |
| 8 | hu IL-17A | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% |
| 9 | hu TNF-β | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% |
| 10 | hu VEGF | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% | 80% - 120% | < 20% |

| Spot | Name | LLOQ | | | ULOQ | | |
|------|----------------|-------|------------|-------|-------|------------|-------|
| | | Value | Recovery | CV | Value | Recovery | CV |
| 1 | hu GM-CSF | 0.842 | 80% - 120% | < 20% | 750 | 80% - 120% | < 20% |
| 2 | hu IL-1α | 2.85 | 80% - 120% | < 20% | 278 | 80% - 120% | < 20% |
| 3 | hu IL-5 | 4.41 | 80% - 120% | < 20% | 562 | 80% - 120% | < 20% |
| 4 | hu IL-7 | 0.546 | 80% - 120% | < 20% | 563 | 80% - 120% | < 20% |
| 5 | hu IL-12/23p40 | 1.32 | 80% - 120% | < 20% | 2250 | 80% - 120% | < 20% |
| 6 | hu IL-15 | 0.774 | 80% - 120% | < 20% | 525 | 80% - 120% | < 20% |
| 7 | hu IL-16 | 19.1 | 80% - 120% | < 20% | 1870 | 80% - 120% | < 20% |
| 8 | hu IL-17A | 3.19 | 80% - 120% | < 20% | 3650 | 80% - 120% | < 20% |
| 9 | hu TNF-β | 0.465 | 80% - 120% | < 20% | 458 | 80% - 120% | < 20% |
| 10 | hu VEGF | 7.70 | 80% - 120% | < 20% | 562 | 80% - 120% | < 20% |

Acceptance Data/ Non Specific Binding Specifications:

| Spot | Name | NSB Spec |
|------|----------------|----------|
| 1 | hu GM-CSF | < 1.0% |
| 2 | hu IL-1α | < 1.0% |
| 3 | hu IL-5 | < 1.0% |
| 4 | hu IL-7 | < 1.0% |
| 5 | hu IL-12/23p40 | < 1.0% |
| 6 | hu IL-15 | < 1.0% |
| 7 | hu IL-16 | < 1.0% |
| 8 | hu IL-17A | < 1.0% |
| 9 | hu TNF-β | < 1.0% |
| 10 | hu VEGF | < 1.0% |

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Stock Concentration of Material Tested :

| Spot | Name | Item | Conc | Units |
|------|------------------|------------------------------------|------|-------|
| 1 | hu GM-CSF | Calibrator | 1100 | pg/mL |
| | | Cytokine Panel 1 (human) Control 1 | 370 | pg/mL |
| | | Cytokine Panel 1 (human) Control 2 | 70 | pg/mL |
| | | Cytokine Panel 1 (human) Control 3 | 10 | pg/mL |
| 2 | hu IL-1 α | Calibrator | 459 | pg/mL |
| | | Cytokine Panel 1 (human) Control 1 | 170 | pg/mL |
| | | Cytokine Panel 1 (human) Control 2 | 60 | pg/mL |
| | | Cytokine Panel 1 (human) Control 3 | 20 | pg/mL |
| 3 | hu IL-5 | Calibrator | 877 | pg/mL |
| | | Cytokine Panel 1 (human) Control 1 | 310 | pg/mL |
| | | Cytokine Panel 1 (human) Control 2 | 110 | pg/mL |
| | | Cytokine Panel 1 (human) Control 3 | 34 | pg/mL |
| 4 | hu IL-7 | Calibrator | 881 | pg/mL |
| | | Cytokine Panel 1 (human) Control 1 | 330 | pg/mL |
| | | Cytokine Panel 1 (human) Control 2 | 60 | pg/mL |
| | | Cytokine Panel 1 (human) Control 3 | 10 | pg/mL |
| 5 | hu IL-12/23p40 | Calibrator | 3690 | pg/mL |
| | | Cytokine Panel 1 (human) Control 1 | 1360 | pg/mL |
| | | Cytokine Panel 1 (human) Control 2 | 235 | pg/mL |
| | | Cytokine Panel 1 (human) Control 3 | 40 | pg/mL |
| 6 | hu IL-15 | Calibrator | 842 | pg/mL |
| | | Cytokine Panel 1 (human) Control 1 | 280 | pg/mL |
| | | Cytokine Panel 1 (human) Control 2 | 50 | pg/mL |
| | | Cytokine Panel 1 (human) Control 3 | 10 | pg/mL |
| 7 | hu IL-16 | Calibrator | 2800 | pg/mL |
| | | Cytokine Panel 1 (human) Control 1 | 1180 | pg/mL |
| | | Cytokine Panel 1 (human) Control 2 | 335 | pg/mL |
| | | Cytokine Panel 1 (human) Control 3 | 110 | pg/mL |
| 8 | hu IL-17A | Calibrator | 6480 | pg/mL |
| | | Cytokine Panel 1 (human) Control 1 | 2210 | pg/mL |
| | | Cytokine Panel 1 (human) Control 2 | 310 | pg/mL |
| | | Cytokine Panel 1 (human) Control 3 | 50 | pg/mL |
| 9 | hu TNF- β | Calibrator | 733 | pg/mL |
| | | Cytokine Panel 1 (human) Control 1 | 230 | pg/mL |
| | | Cytokine Panel 1 (human) Control 2 | 42 | pg/mL |
| | | Cytokine Panel 1 (human) Control 3 | 6.4 | pg/mL |
| 10 | hu VEGF | Calibrator | 1490 | pg/mL |
| | | Cytokine Panel 1 (human) Control 1 | 410 | pg/mL |
| | | Cytokine Panel 1 (human) Control 2 | 140 | pg/mL |
| | | Cytokine Panel 1 (human) Control 3 | 50 | pg/mL |

Controls tested may not be the same lot as shipped.

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Standard Curve Data:

| hu GM-CSF - Spot 1 | | |
|--------------------|------------|-----|
| Conc. pg/mL | ECL Signal | %CV |
| 1100 | 396,000 | 2.8 |
| 275 | 116,000 | 2.9 |
| 68.8 | 29,900 | 2.5 |
| 17.2 | 7,680 | 2.1 |
| 4.30 | 2,030 | 3.8 |
| 1.07 | 660 | 5.9 |
| 0.269 | 275 | 9.2 |
| 0.00 | 154 | 7.1 |

| hu IL-1 α - Spot 2 | | |
|---------------------------|------------|-----|
| Conc. pg/mL | ECL Signal | %CV |
| 459 | 257,000 | 5.6 |
| 115 | 75,400 | 6.0 |
| 28.7 | 20,300 | 4.6 |
| 7.17 | 5,330 | 3.3 |
| 1.79 | 1,640 | 6.5 |
| 0.448 | 694 | 5.4 |
| 0.112 | 442 | 7.3 |
| 0.00 | 358 | 5.4 |

| hu IL-5 - Spot 3 | | |
|------------------|------------|-----|
| Conc. pg/mL | ECL Signal | %CV |
| 877 | 604,000 | 3.2 |
| 219 | 169,000 | 3.5 |
| 54.8 | 42,900 | 4.3 |
| 13.7 | 11,300 | 3.8 |
| 3.43 | 2,990 | 4.9 |
| 0.856 | 988 | 4.1 |
| 0.214 | 454 | 6.3 |
| 0.00 | 282 | 6.2 |

| hu IL-7 - Spot 4 | | |
|------------------|------------|------|
| Conc. pg/mL | ECL Signal | %CV |
| 881 | 559,000 | 3.0 |
| 220 | 137,000 | 2.6 |
| 55.1 | 33,300 | 1.5 |
| 13.8 | 8,430 | 2.1 |
| 3.44 | 2,170 | 1.8 |
| 0.860 | 675 | 5.6 |
| 0.215 | 267 | 14.0 |
| 0.00 | 156 | 18.0 |

| hu IL-12/23p40 - Spot 5 | | |
|-------------------------|------------|------|
| Conc. pg/mL | ECL Signal | %CV |
| 3690 | 611,000 | 1.8 |
| 923 | 175,000 | 1.3 |
| 231 | 45,100 | 1.8 |
| 57.7 | 11,500 | 2.7 |
| 14.4 | 3,010 | 2.2 |
| 3.60 | 881 | 3.3 |
| 0.901 | 345 | 6.4 |
| 0.00 | 155 | 10.0 |

| hu IL-15 - Spot 6 | | |
|-------------------|------------|------|
| Conc. pg/mL | ECL Signal | %CV |
| 842 | 582,000 | 2.5 |
| 211 | 106,000 | 2.4 |
| 52.6 | 24,400 | 2.9 |
| 13.2 | 6,130 | 2.7 |
| 3.29 | 1,630 | 3.1 |
| 0.822 | 471 | 5.0 |
| 0.206 | 208 | 11.0 |
| 0.00 | 101 | 18.0 |

| hu IL-16 - Spot 7 | | |
|-------------------|------------|------|
| Conc. pg/mL | ECL Signal | %CV |
| 2800 | 505,000 | 3.9 |
| 700 | 95,400 | 4.0 |
| 175 | 16,800 | 3.6 |
| 43.8 | 3,450 | 4.5 |
| 10.9 | 975 | 3.1 |
| 2.73 | 312 | 5.7 |
| 0.684 | 173 | 13.0 |
| 0.00 | 129 | 14.0 |

| hu IL-17A - Spot 8 | | |
|--------------------|------------|------|
| Conc. pg/mL | ECL Signal | %CV |
| 6480 | 1,550,000 | 2.9 |
| 1620 | 434,000 | 1.8 |
| 405 | 110,000 | 2.4 |
| 101 | 27,800 | 2.8 |
| 25.3 | 6,890 | 3.4 |
| 6.33 | 1,900 | 3.7 |
| 1.58 | 660 | 10.0 |
| 0.00 | 247 | 24.0 |

| hu TNF- β - Spot 9 | | |
|--------------------------|------------|------|
| Conc. pg/mL | ECL Signal | %CV |
| 733 | 1,210,000 | 1.7 |
| 183 | 279,000 | 2.7 |
| 45.8 | 65,000 | 2.3 |
| 11.5 | 16,100 | 1.7 |
| 2.86 | 4,600 | 2.7 |
| 0.716 | 1,300 | 2.9 |
| 0.179 | 468 | 5.7 |
| 0.00 | 205 | 13.0 |

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| hu VEGF - Spot 10 | | |
|-------------------|------------|------|
| Conc. pg/mL | ECL Signal | %CV |
| 1490 | 1,170,000 | 2.3 |
| 373 | 248,000 | 2.7 |
| 93.1 | 47,300 | 2.8 |
| 23.3 | 10,100 | 2.7 |
| 5.82 | 2,660 | 2.2 |
| 1.46 | 770 | 4.1 |
| 0.364 | 303 | 8.5 |
| 0.00 | 149 | 13.0 |

Components:

| Description | Lot Number | Storage Temperature | Expiration Date |
|---|------------------|---------------------|-----------------|
| Cytokine Panel 1 (human) Plate | Z0046806 | 2-8°C | 30 Sep 2020 |
| Anti-hu GM-CSF Antibody | D0080885 | 2-8°C | 31 Jul 2019 |
| Anti-hu IL-1 α Antibody | D0081053 | 2-8°C | 30 Apr 2020 |
| Anti-hu IL-5 Antibody | D0081054 | 2-8°C | 30 Apr 2020 |
| Anti-hu IL-7 Antibody | D0081055 | 2-8°C | 30 Apr 2020 |
| Anti-hu IL-12/23p40 Antibody | D0081040 | 2-8°C | 31 Mar 2020 |
| Anti-hu IL-15 Antibody | D0080983 | 2-8°C | 31 Oct 2019 |
| Anti-hu IL-16 Antibody | D0081056 | 2-8°C | 30 Apr 2020 |
| Anti-hu IL-17A Antibody | D0080892 | 2-8°C | 31 Jul 2019 |
| Anti-hu TNF- β Antibody | D0081057 | 2-8°C | 30 Apr 2020 |
| Anti-hu VEGF Antibody | D0081058 | 2-8°C | 31 May 2020 |
| Cytokine Panel 1 (human) Calibrator Blend | A0080144 | 2-8°C | 31 Aug 2022 |
| Diluent 43 | M0430024 | \leq -10°C | 31 Jan 2020 |
| Diluent 3 | M0030081 | \leq -10°C | 30 Sep 2020 |
| MSD Read Buffer T | Not Kit Specific | Not Kit Specific | N/A |

| Additional Components Included in V-PLEX Plus | |
|---|------------------|
| Plate Seals | Not Kit Specific |
| Wash Buffer (20x), 100 mL | Not Kit Specific |
| Cytokine Panel 1 (human) Control 1 | Not Kit Specific |
| Cytokine Panel 1 (human) Control 2 | Not Kit Specific |
| Cytokine Panel 1 (human) Control 3 | Not Kit Specific |

Statement:

The above product is intended for Research Use Only. Not for use in Diagnostic Procedures.

| | Name | Function | Signature | Date |
|------------------------|--------------|-------------------|---------------------|-------------|
| Review/Approval | Dawn Stollar | Quality Assurance | <i>Dawn Stollar</i> | 29 MAY 2018 |