

**Supplementary Table 1.** Cluster 1 vs. 2A parameter value comparisons.

| Parameter      | Cluster 1    |                | Cluster 2A   |                |
|----------------|--------------|----------------|--------------|----------------|
|                | <i>Range</i> | <i>Average</i> | <i>Range</i> | <i>Average</i> |
| $k_{pn1}$      | 0.07 – 29.90 | 15.51          | 0.05 – 0.93  | 0.25           |
| $k_{pn12}$     | 8.10 – 49.88 | 32.31          | 0.05 – 1.25  | 0.42           |
| $\mu_{M1}$     | 0.05 – 0.46  | 0.14           | 2.41 – 22.92 | 6.88           |
| $\mu_{n10}$    | 0.30 – 0.72  | 0.50           | 0.82 – 1.70  | 1.29           |
| $a_{\infty 2}$ | 25.0 – 38.51 | 26.42          | 1.31 – 16.21 | 8.78           |

Distributions of model parameters representing the release rates of IL-1 ( $k_{pn1}$ ) and IL-12 ( $k_{pn12}$ ), decay rates of M1 ( $\mu_{M1}$ ) and IL-10 ( $\mu_{n10}$ ), and a threshold-like term for the effectiveness of IL-10 inhibition on further cytokine release ( $a_{\infty 2}$ ), differed significantly between Clusters 1 and 2A.

**Supplementary Table 2.** Cluster 1 vs. 2B parameter value comparisons.

| Parameter   | Cluster 1    |                | Cluster 2B    |                |
|-------------|--------------|----------------|---------------|----------------|
|             | <i>Range</i> | <i>Average</i> | <i>Range</i>  | <i>Average</i> |
| $k_{pn1}$   | 0.07 – 29.90 | 15.51          | 0.11 – 2.86   | 0.91           |
| $k_{pn12}$  | 8.10 – 49.88 | 32.31          | 0.59 – 8.06   | 1.83           |
| $\mu_{M1}$  | 0.05 – 0.46  | 0.14           | 4.73 – 37.32  | 10.77          |
| $\mu_{M2}$  | 2.87 – 11.89 | 5.43           | 7.33 – 32.05  | 17.70          |
| $\mu_{n12}$ | 0.06 – 0.63  | 0.26           | 0.050 – 0.076 | 0.052          |
| $\mu_{n10}$ | 0.30 – 0.72  | 0.50           | 1.18 – 1.40   | 1.30           |
| $h_n$       | 1.03 – 6.00  | 5.14           | 1.00 – 2.23   | 1.27           |

Distributions of model parameters representing the release rates of IL-1 ( $k_{pn1}$ ) and IL-12 ( $k_{pn12}$ ), decay rates of M1 ( $\mu_{M1}$ ), M2 ( $\mu_{M2}$ ), IL-12 ( $\mu_{n12}$ ) and IL-10 ( $\mu_{n10}$ ), and Hill coefficient ( $h_n$ ), differed significantly between Clusters 1 and 2B.

**Supplementary Table 3.** Cluster 2A vs. 2B parameter value comparisons.

| Parameter      | Cluster 2A   |                | Cluster 2B    |                |
|----------------|--------------|----------------|---------------|----------------|
|                | <i>Range</i> | <i>Average</i> | <i>Range</i>  | <i>Average</i> |
| $k_{pn12}$     | 0.05 – 1.25  | 0.42           | 0.59 – 8.06   | 1.83           |
| $\mu_{M2}$     | 1.23 – 6.39  | 3.45           | 7.33 – 32.05  | 17.70          |
| $a_{\infty 2}$ | 1.31 – 16.21 | 8.78           | 25.00 – 44.30 | 27.97          |
| $v_n$          | 0.20 – 1.21  | 0.85           | 0.87 – 25.85  | 7.17           |

Distributions of model parameters representing the release rate of IL-12 ( $k_{pn12}$ ), decay rate of M2 ( $\mu_{M2}$ ), a threshold-like term for the effectiveness of IL-10 inhibition on further cytokine release ( $a_{\infty 2}$ ), and half-activation constant ( $v_n$ ) differed significantly between Clusters 2A and 2B.