Supplementary Material

Mathematical modeling of proliferative immune response initiated by interactions between classical antigen presenting cells under joint antagonistic IL-2 and IL-4 signaling

FIGURE S1. Proliferation in terms of changes in number of T cells over time. C1: Initial concentration of IL-4 ([IL4]₀ = 0.75pM); C2: Second concentration of IL-4 ([IL4]₁ = 2[IL4]₀); C3: Third concentration of IL-4 ([IL4]₂ = 3[IL4]₀). a) Initial concentration of IL-2 ([IL2]₀ = 0.75pM); b) Second concentration of IL-2 ([IL2]₁ = 2[IL2]₀); c) Third concentration of IL-2 ([IL2]₂ = 3[IL2]₀). 1) DC activation by APC 2) B cells activation by APC 3) Joint DC and B cells APC activations. The proliferation of T cell lymphocytes growth with the increase of the concentration of the cytokine IL-2 (c > b > a) and the decrease of the concentration of the cytokine IL-4 (C1 < C2 <C3).
FIGURE S2. Proliferation profile of B cell Lymphocytes over time. C1: Initial concentration of IL-4 ([IL4]₀ = 0.75pM); C2: Second concentration of IL-4 ([IL4]₁ = 2[IL4]₀); C3: Third concentration of IL-4 ([IL4]₂ = 3[IL4]₀). a) Initial concentration of IL-2 ([IL2]₀ = 0.75pM); b) Second concentration of IL-2 ([IL2]₁ = 2[IL2]₀); c) Third concentration of IL-2 ([IL2]₂ = 3[IL2]₀). 1) DC activation by APC, 2) B cells APC activations, 3) Joint DC and B cells APC activations. The proliferation of B cell lymphocytes growth with the increase of the concentration of the cytokine IL-2 (c > b > a) and the decrease of the concentration of the cytokine IL-4 (C1 < C2 <C3).
**FIGURE S3. Proliferation dynamics of Plasma B cells.**

- **C1**: Initial concentration of IL-4 ([IL4]₀ = 0.75pM);
- **C2**: Second concentration of IL-4 ([IL4]₁ = 2[IL4]₀);
- **C3**: Third concentration of IL-4 ([IL4]₂ = 3[IL4]₀).

- **a)** Initial concentration of IL-2 ([IL2]₀ = 0.75pM);
- **b)** Second concentration of IL-2 ([IL2]₁ = 2[IL2]₀);
- **c)** Third concentration of IL-2 ([IL2]₂ = 3[IL2]₀).

1) DC APC activation, 2) B cells APC activations, 3) Joint DC and B cells APC activations. The proliferation of Plasma B cell lymphocytes growth with the increase of the concentration of the cytokine IL-2 (c > b > a) and the decrease of the concentration of the cytokine IL-4 (C1 < C2 < C3).