

Table S1. Attractors Found for All Models

Model ID	Error $\frac{O_d}{P}$	Structural Complexity O_c	Minimum Distance			Number of Attractors					
			Immune Quiescence	Cytokine Storm	O_r	$n = 1$	$n = 2$	$n = 3$	$n = 4$	Total	O_p
18	0	0.7	1	0	1	4	2	1	0	7	5.3
17	0	0.7	1	0	1	5	0	0	0	5	5
15	0	0.7	1	0	1	3	0	1	2	6	3.8
19	0	0.7	6	0	6	6	4	1	0	11	8.3
14	0	0.7	6	0	6	5	2	0	0	7	6
13	0	0.7	6	0	6	3	2	1	0	6	4.3
12	0	0.7	8	0	8	6	2	1	0	9	7.3
16	0	0.7	14	0	14	3	2	0	0	5	4
11	0	0.8	3	0	3	6	6	2	0	14	9.7
10	0	0.8	3	0	3	4	0	0	0	4	4
9	0	0.8	4	0	4	4	0	0	0	4	4
7	0.01	0.8	2	0	2	4	0	0	0	4	4
8	0.01	0.8	3	0	3	4	0	0	0	4	4
6	0.02	0.8	5	0	5	3	2	0	0	5	4
5	0.02	0.8	17	0	17	3	0	0	0	3	3
4	0.03	0.8	3	0	3	3	1	0	0	4	3.5
3	0.03	0.8	16	4	20	4	3	0	0	7	5.5
1	0.04	0.8	2	0	2	6	5	0	0	11	8.5
2	0.04	0.8	2	0	2	6	3	0	0	9	7.5

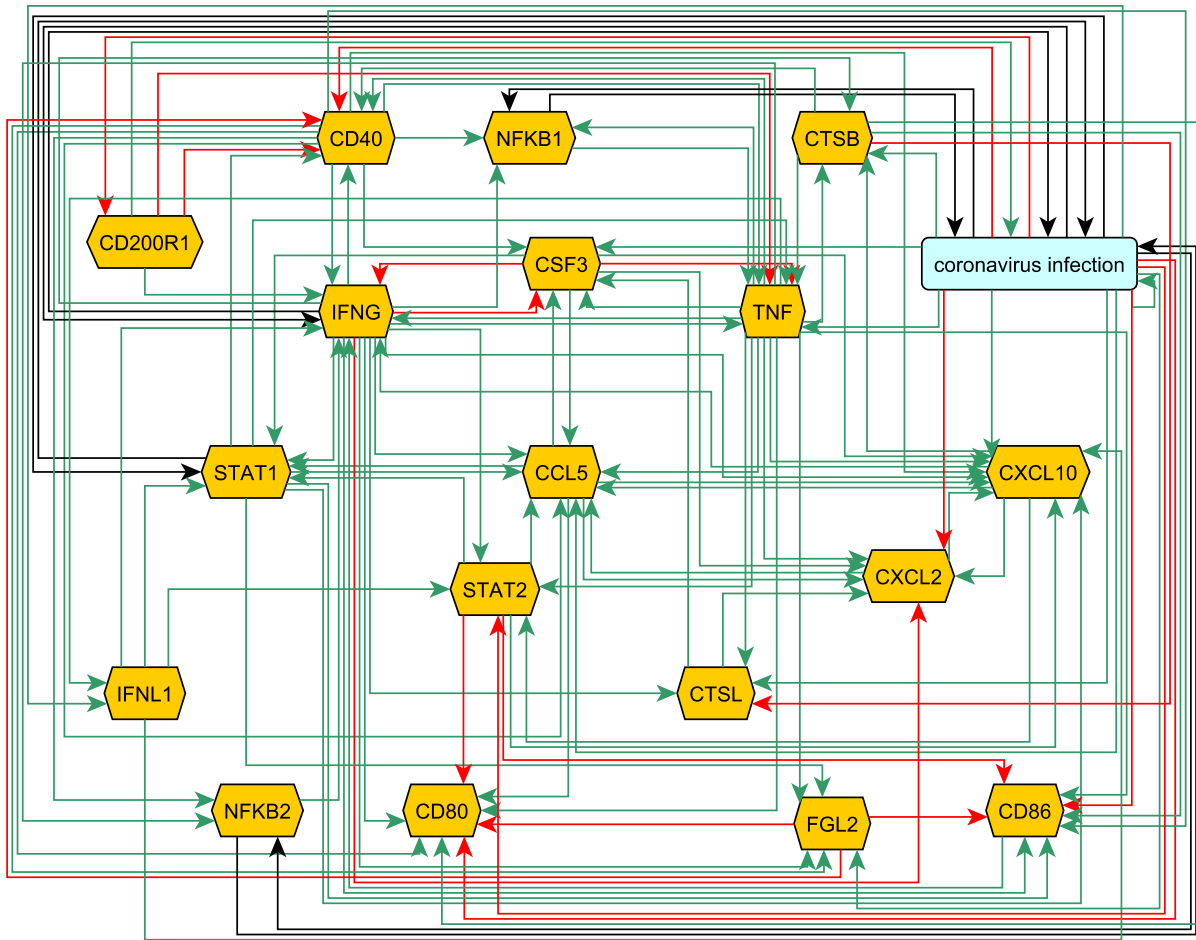


Fig. S1. Network structure of the SARS-CoV immune regulatory model [?]. The model contains 19 entites (nodes) and 112 regulatory actions (edges) which were obtained from biomedical literature using Pathway Studio*. The color of the edges indicates the mode-of-action for the regulation, where green is an activating mode-of-action, red is an inactivating mode-of-action, and black is an unknown mode-of-action. Generated using yEd [?].

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Algorithm S1 Attractor Search as a Constraint Satisfaction Problem

Require: n is the period of the attractor

Ensure: X is an attractor

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1: function ATTRACTORSEARCH( $n$ )
2:    $X \leftarrow (n + 1) \times |V|$  matrix ▷  $|V|$  is the number of entities in the model
3:    $I \leftarrow (n + 1) \times |V|$  matrix
4:   for  $i \leftarrow 1$  to  $n$  do ▷ combine the constraints in this block by logical conjunction (i.e.  $\wedge$ )
5:      $I[i, :] = \text{COMPUTEIMAGE}(X[i, :])$ 
6:      $X[i + 1, :] = H^s(X[i, :])$  ▷  $H^s$  is the synchronous update function using  $I$ 
7:     if  $n > 1$  then
8:        $X[i + 1, :] \neq X[i, :]$ 
9:     end if
10:  end for
11:   $X[1, :] = X[n + 1, :]$  ▷ constrain the first and last row of  $X$  to be equal
12:   $X = \text{INCREASING}(X)$  ▷ constrain the sum of each row in  $X$  to be increasing
13:  return  $X$ 
14: end function
```
