Supplementary Material

**Table S1:** Calibration data set. Rats were injected with different bacterial loads (*Bsource*). Measurements of the number of bacteria in the peritoneal cavity in an individual animal euthanized at one of the time points indicated in bold font are provided in the table.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Bsource*** | **Bacterial levels at various time points (bacteria)** | | | | | | | | |
|  | **24 h** | **48 h** | **72 h** | **96 h** |  |  |  |  |  |
| 128×106 | 5.48×107 | 2.20×106 | 7.40×105 | 7.40×105 |  |  |  |  |  |
| 128×106 | 6.60×106 | 4.60×106 | 3.20×106 | 1.20×106 |  |  |  |  |  |
| 128×106 | 2.10×107 | 1.60×108 |  | 4.00×105 |  |  |  |  |  |
| 128×106 | 5.90×107 | 4.18×107 |  | 4.00×105 |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | **4 h** | **8 h** | **24 h** | **48 h** | **72 h** |  |  |  |  |
| 248×106 | 1.50×108 | 1.44×108 | 1.90×108 | 8.00×106 | 2.40×106 |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  | **0 h** | **2 h** | **2.5 h** | **3 h** | **4 h** | **6 h** | **8 h** | **18 h** | **28 h** |
| 505×106 | 1.50×108 | 1.50×108 | 1.44×108 | 5.00×107 | 1.90×108 | 1.50×108 | 1.90×108 | 5.00×107 | 5.00×107 |
| 505×106 | 1.90×108 | 1.90×108 |  |  | 8.00×108 |  |  |  |  |

**Table S2**: Validation data set. Rats were injected with differing bacterial loads (Initial Bacteria: number of injected bacteria). Rats that were dead or near death at the 24, 48, or 72 h time points were assigned observed mortality times (OMT) of 24, 48, and 72 h, respectively. Rats assigned OMT 96 h survived past 72 h.

|  |  |  |
| --- | --- | --- |
| **Rat** | **Initial Bacteria** | **OMT** |
| 1 | 459 × 106 | 24 h |
| 2 | 480 × 106 | 24 h |
| 3 | 411 × 106 | 24 h |
| 4 | 449 × 106 | 24 h |
| 5 | 289 × 106 | 48 h |
| 6 | 450 × 106 | 24 h |
| 7 | 307 × 106 | 24 h |
| 8 | 427 × 106 | 24 h |
| 9 | 188 × 106 | 48 h |
| 10 | 144 × 106 | 48 h |
| 11 | 163 × 106 | 48 h |
| 12 | 207 × 106 | 48 h |
| 13 | 205 × 106 | 72 h |
| 14 | 245 × 106 | 48 h |
| 15 | 285 × 106 | 72 h |
| 16 | 282 × 106 | 72 h |
| 17 | 260 × 106 | 72 h |
| 18 | 413 × 106 | 72 h |
| 19 | 361 × 106 | 24 h |
| 20 | 172 × 106 | 96 h |
| 21 | 226 × 106 | 96 h |
| 22 | 291 × 106 | 48 h |
| 23 | 291 × 106 | 48 h |
| 24 | 291 × 106 | 48 h |
| 25 | 291 × 106 | 48 h |
| 26 | 251 × 106 | 96 h |
| 27 | 251 × 106 | 96 h |

**Table S3:** Sensitivity analysis. Root mean square sensitivities (Relative sensitivity) for parameters in the model. Higher values (bottom) corresponded to higher influence on model outcomes.

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Relative sensitivity** | **Description of influence** |
| *τ* | 0.0198 | time scale for epithelium repair; unit h |
| *kM* | 0.0314 | activation of pro-inf by pro-inf |
| *k4* | 0.062 | Activation of anti-inf by damage |
| *kε* | 0.417 | activation of inf by damage |
| *Bc* | 0.453 | number of bacteria clot can hold |
| *ν4* | 0.504 | half-saturation of anti-inf response |
| *ν3* | 0.553 | maximum production rate of anti-inf |
| *μM* | 0.801 | decay rate of pro-inf |
| *f* | 1.19 | maximum rate of damage production by pro-inf |
| *T* | 1.27 | Threshold value for damage |
| *kB* | 1.39 | activation of pro-inf by bacteria |
| *k5* | 1.46 | rate at which pro-inf kills bacteria |
| *ν2* | 1.82 | half-saturation of pro-inf production |
| *sA* | 2.29 | source of anti-inf |
| *μA* | 2.32 | decay rate of the anti-inf |
| *kA* | 2.39 | anti-inf inhibition rate |
| *ν1* | 2.75 | maximal rate of pro-inf activation |
| *B∞* | 3.36 | bacteria carrying capacity |
| *Bs* | 4.47 | rescaling factor for bacteria |
| *kD* | 6.61 | rate at which bacteria leave the clot and enter the body |
| *k3* | 8.61 | rate at which the non-specific local response is exhausted by pathogen |
| *μl* | 36 | decay rate for the non-specific local response |
| *k1* | 43.5 | growth rate for bacteria |
| *k2* | 44.3 | rate at which the non-specific local response eliminates pathogen |
| *sl* | 44.3 | source of non-specific local response |