

# 1 Supplementary Material

## 1.1 Model parameters

**Table 1.** Summary of key parameters and methods used in the burn wound immune response simulations [3]. **Most significant parameters for our optimization process.**

Parameter/Method	Description	Details/Values
cc3d processors	Number of processors used for the simulation	<b>4</b>
Simulation Domain	Squared 2D grid	$2.5 \times 10^5$ grids
Cell Type	Number of different cells	9, where 1 (endothelial cells) is static
Cytokines	Number of different cytokines	6
Modeling Framework	Glazier-Graner-Hogeweg (GGH)	Implemented using CompuCell3D
Numerical Solver	Finite volume solver (FiPy) for Partial differential Equations	LinearGMRESSolver
Simulation Timeframe	Inflammatory phase	$10^6$ Monte Carlo steps
Chemotaxis Plugin	Movement based on cytokine gradients	Parameter $\lambda$ controls chemotaxis strength
Key Parameter Explored	Endothelial cell number	<b>10, 100, 500, 1000, 2000, 3000, 4000, 5000</b>
Key Findings	Role of endothelial cells in inflammation	Higher counts lead to faster inflammation resolution