

## How to Run the Leukemia Control Simulations

### Step-by-Step Instructions

#### 1 Open the Simulink Model

Open the file named:

- SMC\_Leukemia\_nonmono.slx, or
- SMC\_ISTSMC\_ATSMC\_IASMC\_Leukemia\_nonmono.slx  
in **MATLAB R2024b or later.**

#### 2 Set Simulation Stop Time

At the top of the Simulink window:

- Find **Stop Time**
- Set it to: 50

#### 3 Run the Simulation

Click **Run ▶**

Observe the system responses in the Scope blocks:

- $N(t)$ : Healthy cells
- $L(t)$ : Leukemic cells
- $h(t)$ : Drug level / control input

#### 4 Controllers Already Included

All controllers are implemented using **MATLAB Function blocks**, so:

- ✓ No extra setup required
- ✓ Only click **Run** to simulate
- ✓ All model parameters are pre-loaded inside the model

### Output Interpretation

- Goal:  $L(t) \rightarrow$  decreases to near zero
- Goal:  $N(t) \rightarrow$  stays above safe minimum
- Controller ensures drug use remains within allowable limits

### Contact

If any issues arise during execution, please contact:

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