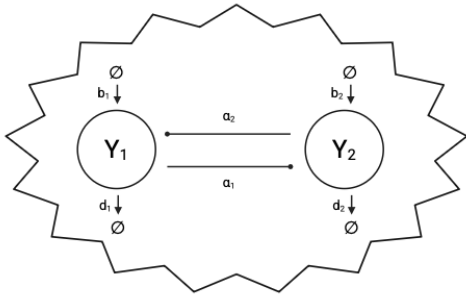# Simulating alternative feedback topologies for the R-regulator system
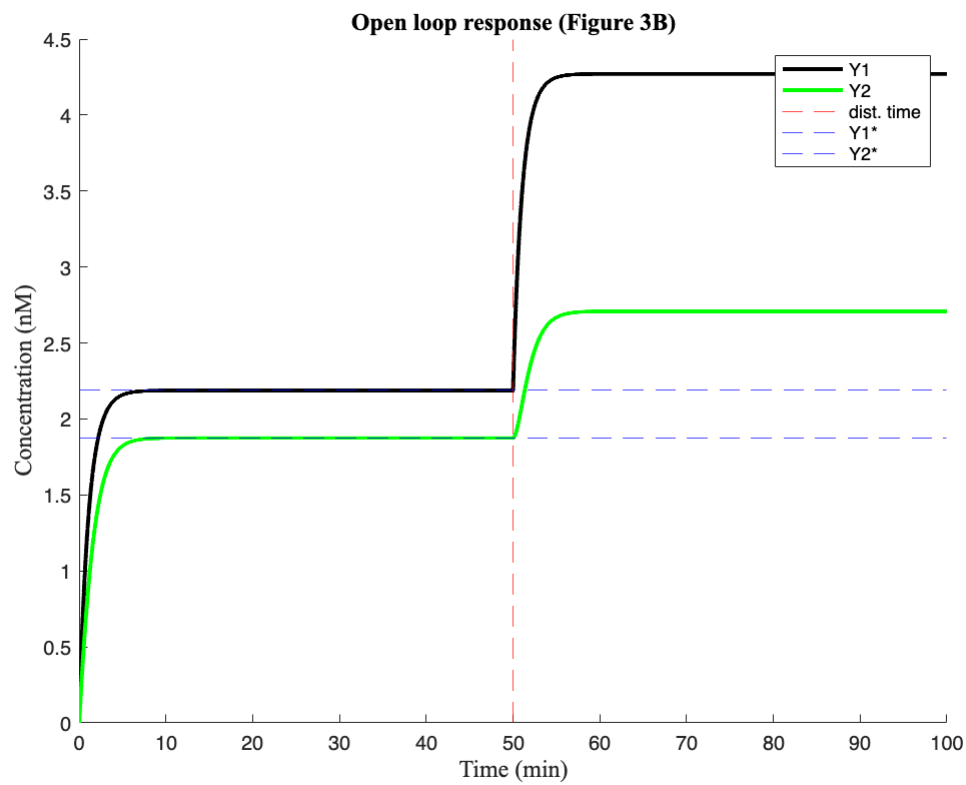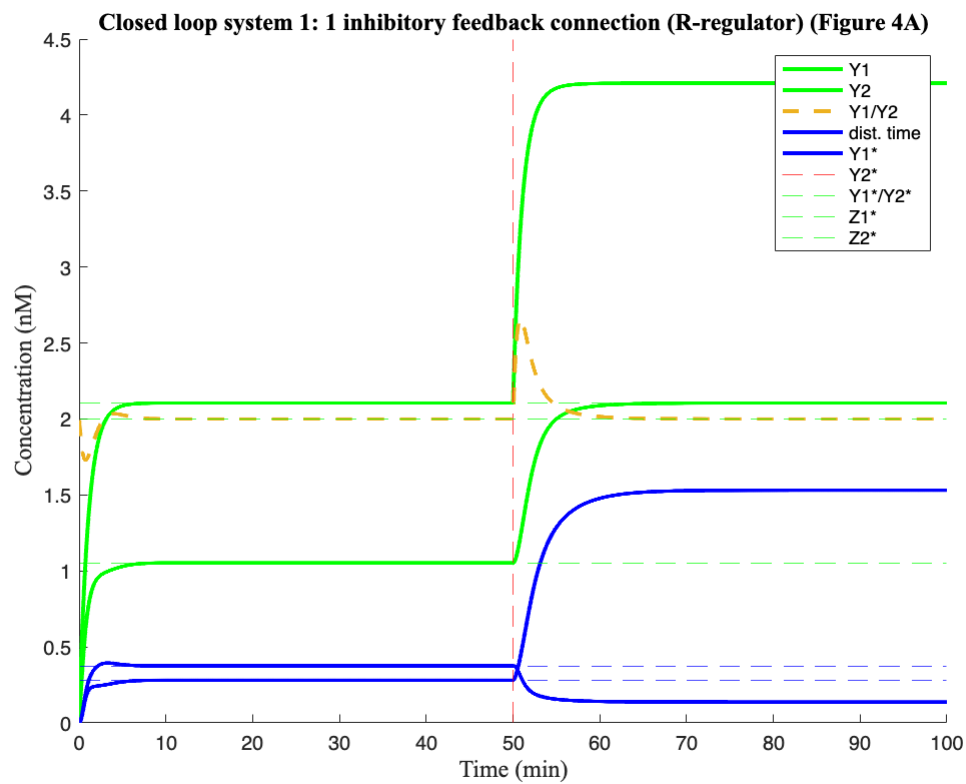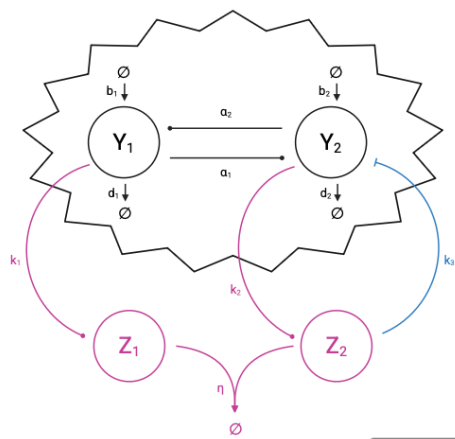
0. Open-loop system
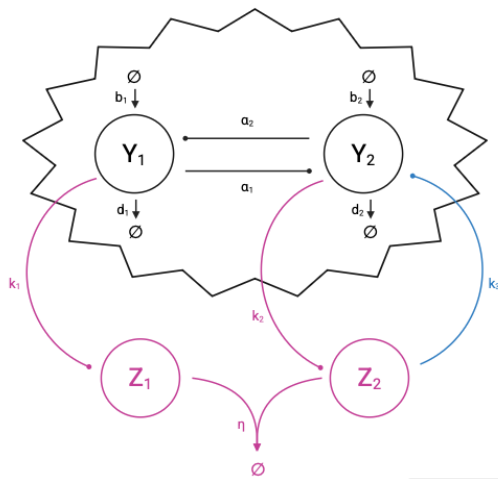
1. 1 inhibitory feedback connection

Closed loop system 1: 1 inhibitory feedback connection (R-regulator) (Figure 4A)

2. 1 excitatory feedback connection

Question: Why do we apply the disturbance specifically to the Y1_dot term?

Closed loop system 2: 1 excitatory feedback connection
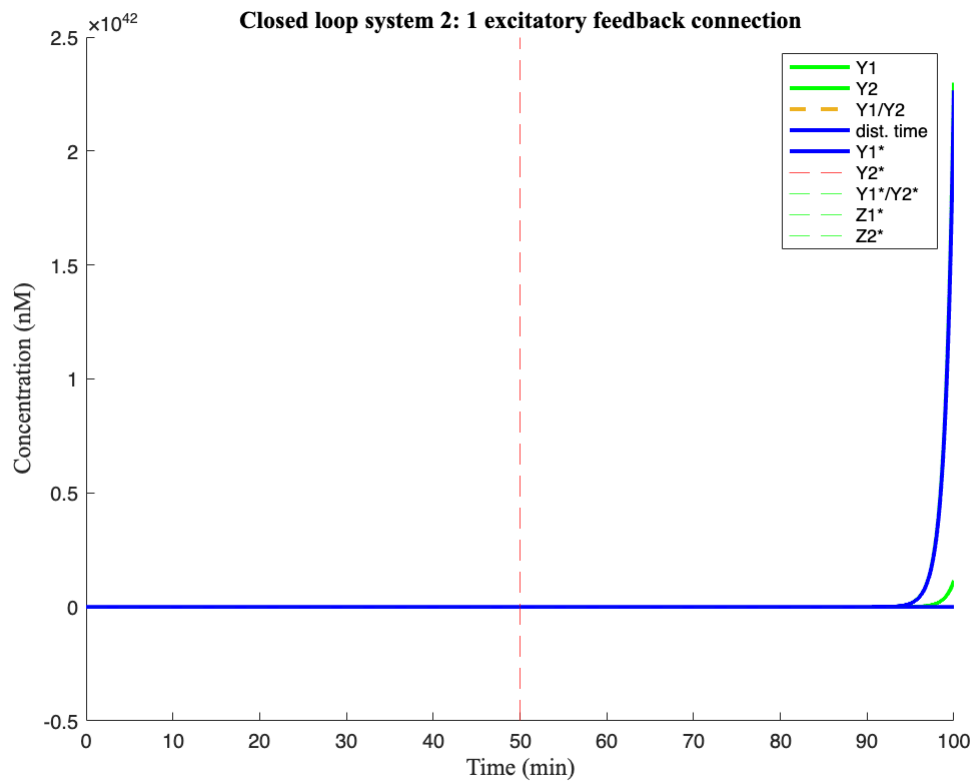
```
J = 4×4
   -1.0000    0.1000         0         0
    0.4000   -1.0000         0    2.0000
    0.5000         0    3.9474    2.6667
         0    1.0000    3.9474    2.6667
ans = 4×1
    6.7220
   -1.8278
   -0.9338
    0.6537
```
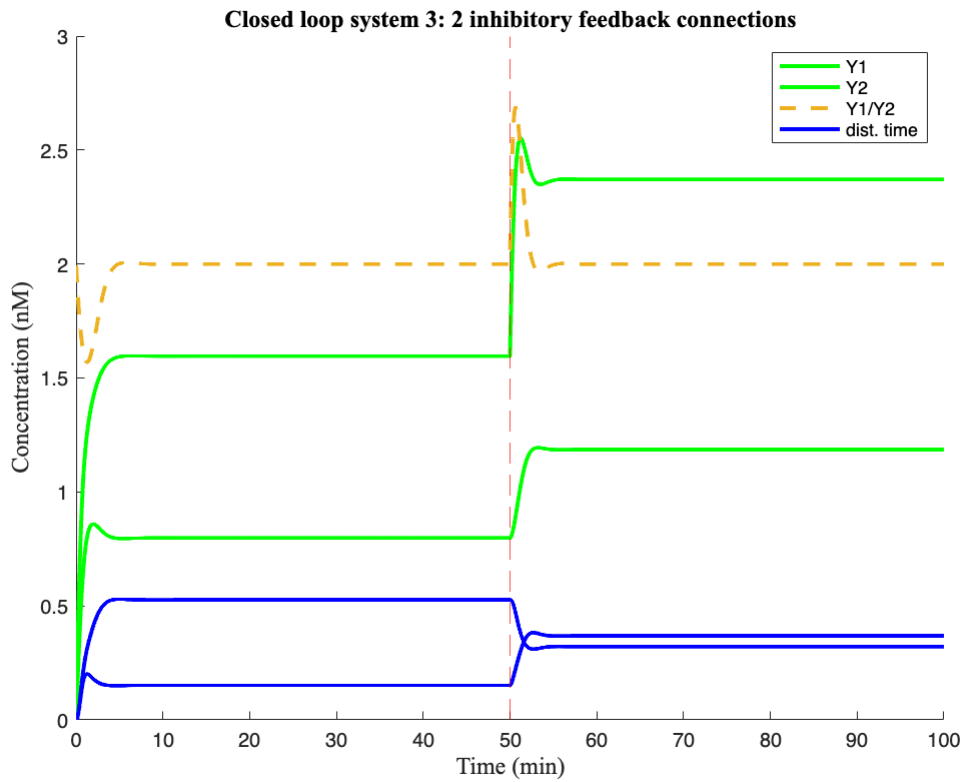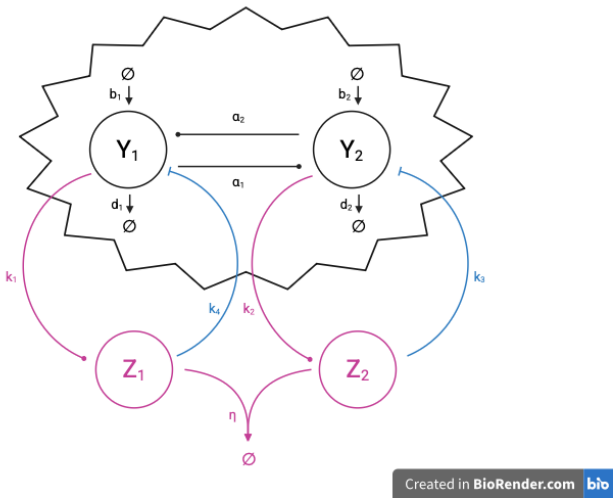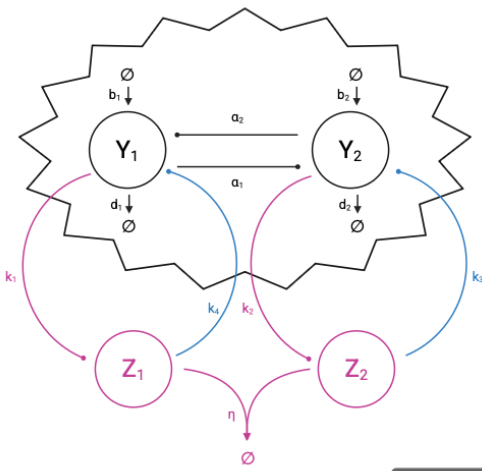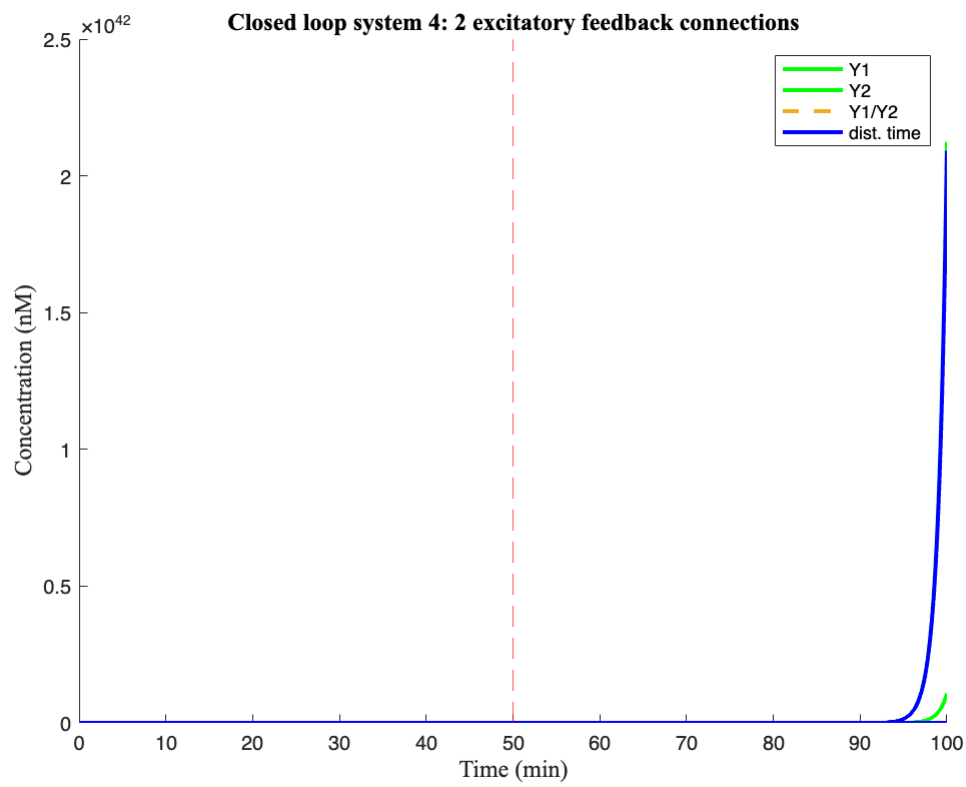
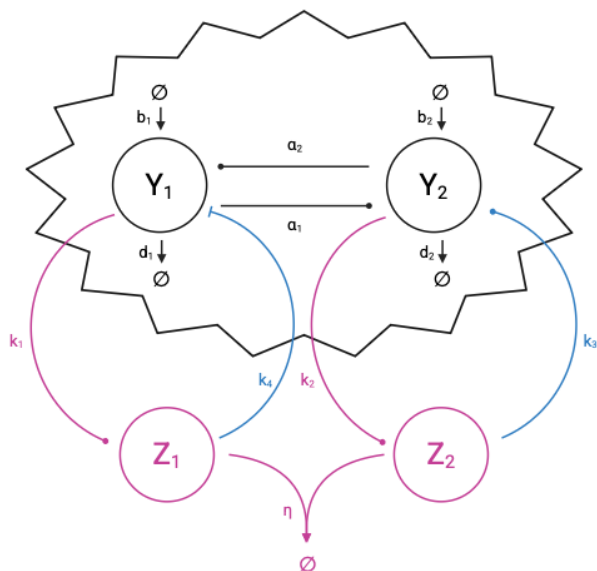This system is unstable.

3. 2 inhibitory feedback connections

4. 2 excitatory feedback connections

Closed loop system 4: 2 excitatory feedback connections

5. 1 excitatory, 1 inhibitory feedback connection

Closed loop system 5: 1 excitatory and 1 inhibitory feedback connection