

rate of change of  
cell density,  $n$

=

diffusion of  $n$

+

chemotaxis  
of  $n$  to  $c$

+

proliferation of  $n$

rate of change of  
chemoattractant  
concentration,  $c$

=

diffusion of  $c$

+

production  
of  $c$  by  $n$

-

uptake of  $c$  by  $n$

rate of change of  
stimulant  
concentration,  $s$

=

diffusion of  $s$

-

uptake of  $s$  by  $n$