```
%% Protein Production
% Solve the ODE numerically
m =[1,2,5,10,50,100,200,500,1000,5000];
ss=zeros(1,length(m));
for ii=1:length(m)
   [t1, specs]=ode45(@Ecoli,[0 3500000],[0.00077042*m(ii),0,0])
   ss(ii)=mean(specs(end-5:end,3))
end
plot(0.00077042*m,ss)
title('Effects of Altering DNA Concentration on Protein Production in E.coli');
xlabel('DNA Concentration (mM)'); ylabel('Protein Level (mM)');
grid on;
m2=[1,2,5,10,50,100,200,500,1000,5000];
ss=zeros(1,length(m2));
for ii=1:length(m2)
   [t2, specs2]=ode45(@SF9,[0 3500000],[0.00077042*m2(ii),0,0])
   ss(ii)=mean(specs2(end-5:end,3))
end
figure;
plot(0.00077042*m2,ss)
title('Effects of Altering DNA Concentration on Protein Production in Sf9');
xlabel('DNA Concentration (mM)'); ylabel('Protein Level (mM)');
grid on;
[t1, specs] = ode45(@Ecoli,[0 3500000],[0.00077042,0,0]);
[t2, specs2] = ode45(@SF9,[0 3500000],[0.00077042,0,0]);
%% User Defined Functions
% Ecoli
function dx = Ecoli(t1,vec)
% Initial conditions
D = vec(1); M = vec(2); P = vec(3);
% Rate constants
k1 = 0.038532; k2 = 0.00000030243597; k3 = 0.00288811325; k4 = 0.00000275058;
% ODEs
dD = 0; dM = (k1*D)-(k3*M); dP = (k2*M)-(k4*P);
dx = [dD; dM; dP];
end
%% User Defined Functions
% SF9
function dx = SF9(t2,vec)
% Initial conditions
D = vec(1); M = vec(2); P = vec(3);
```

```
% Rate constants
k1 = 0.06613; k2 = 0.0000000000076790383; k3 = 0.00033007008; k4 =
0.000019254088;
% ODEs
dD = 0; dM = (k1*D)-(k3*M); dP = (k2*M)-(k4*P);
dx = [dD; dM; dP];
end
```