系统生物学作业

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使用 MATLAB 求解：

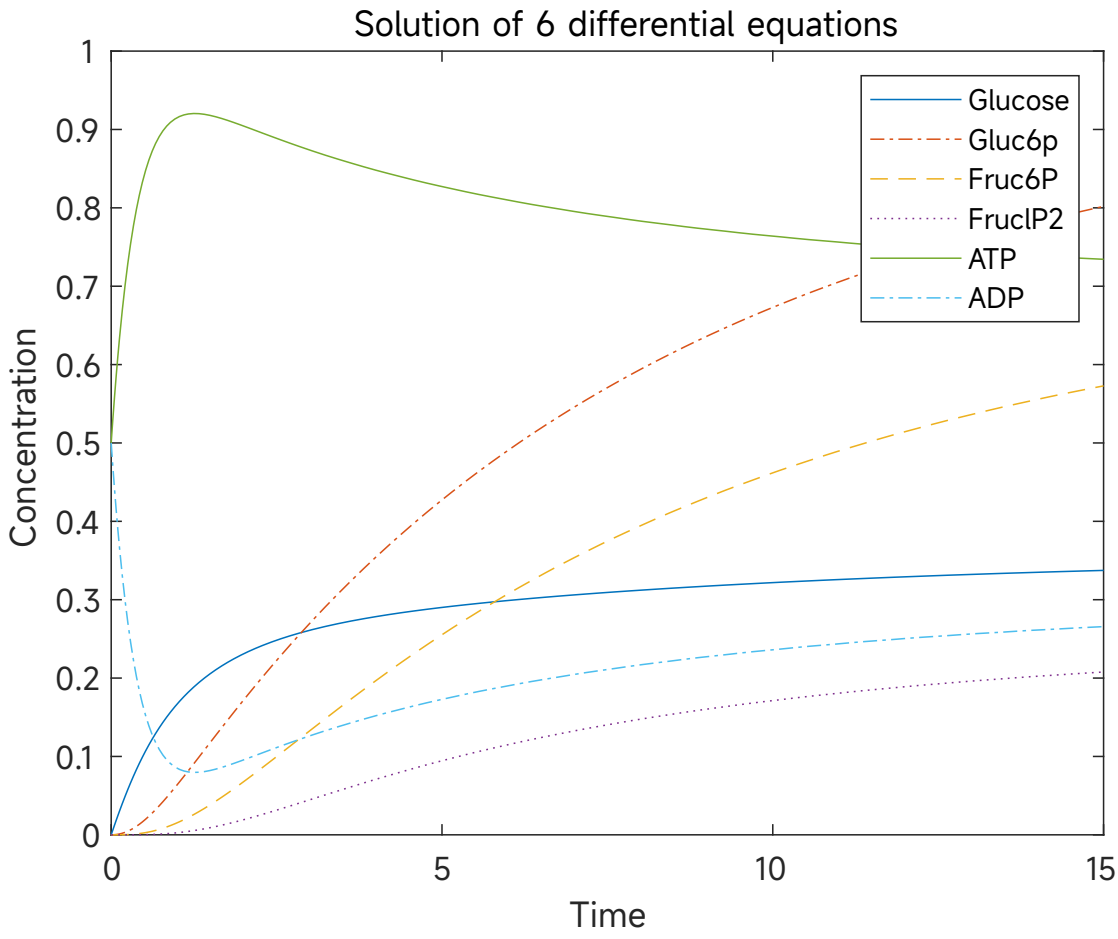
定义函数文件：

```
function dxdt = myfun(t,x)
k1 = 0.25; k2 = 1; k3 = 1; k4 = 1; k5 = 1; k6 = 1; k7 = 2.5;
dxdt = [k1 - x(1) * k2 * x(5);
        x(1) * k2 * x(5) - k3 * x(2) + k3 * x(3);
        k3 * x(2) - k3 * x(3) - k4 * x(5) * x(3) + k5 * x(4);
        k4 * x(5) * x(3) - k5 * x(4) - k6 * x(4);
        k7 * x(6) - k2 * x(1) * x(5) - k4 * x(5) * x(3);
        k4 * x(5) * x(3) + k2 * x(1) * x(5) - k7 * x(6)];
end

```

在主程序中运行：

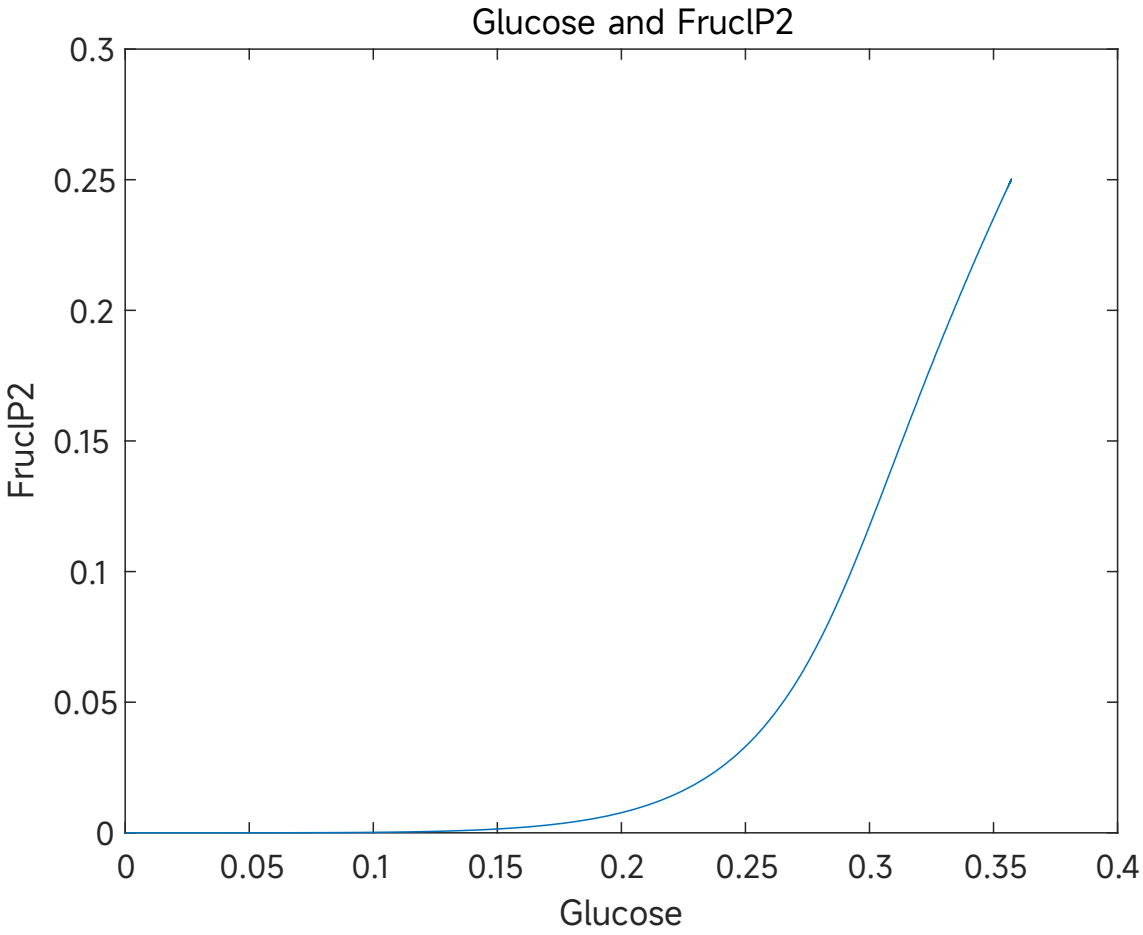
```
[t,x] = ode45(@myfun,[0 15],[0 0 0 0 0.5 0.5]);
plot(t,x(:,1),'-',t,x(:,2),'-.',t,x(:,3),'--',t,x(:,4),':',t,x(:,5),'-
',t,x(:,6),'-.')
xlabel('Time')
ylabel('Concentration')
title('Solution of 6 differential equations')
legend('Glucose','Gluc6p','Fruc6P','FruclP2','ATP','ADP')
```



继续运行：

```
[t,x] = ode45(@myfun,[0 100],[0 0 0 0 0.5 0.5]);
plot(x(:,1),x(:,4))
xlabel('Glucose')
ylabel('FruclP2')
title(' Glucose and FruclP2')

```


Glucose and FruclP2
FruclP2
Glucose
0.3
0.25
0.2
0.15
0.1
0.05
0
0
0.05
0.1
0.15
0.2
0.25
0.3
0.35
0.4