PhD Diary

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Contents

1 **TODO** Tasks [5/8]

1.1 **DONE** Test D_{eff} and show that length is a significant variable

$$D'_{S,eff} = \frac{Dql}{D + ql} \tag{1}$$

```python
from SALib.sample import saltelli
from SALib.analyze import sobol
import numpy as np

sa = stokes_einstein(3.5e-10) * 1e12
auxin = 300  # from Dienum

problem = {
    'num_vars': 3,
    'names': ['D', 'q', 'l'],
    'bounds': [[auxin, sa],
               [1, 100],
               [50, 100]]
}

def D_eff(d, q, l):
    return (D*q*l)/(d+q*l)


param_values = saltelli.sample(problem, 1000)

Y = np.array([D_eff(*pv) for pv in param_values])

Si = sobol.analyze(problem, Y)
```
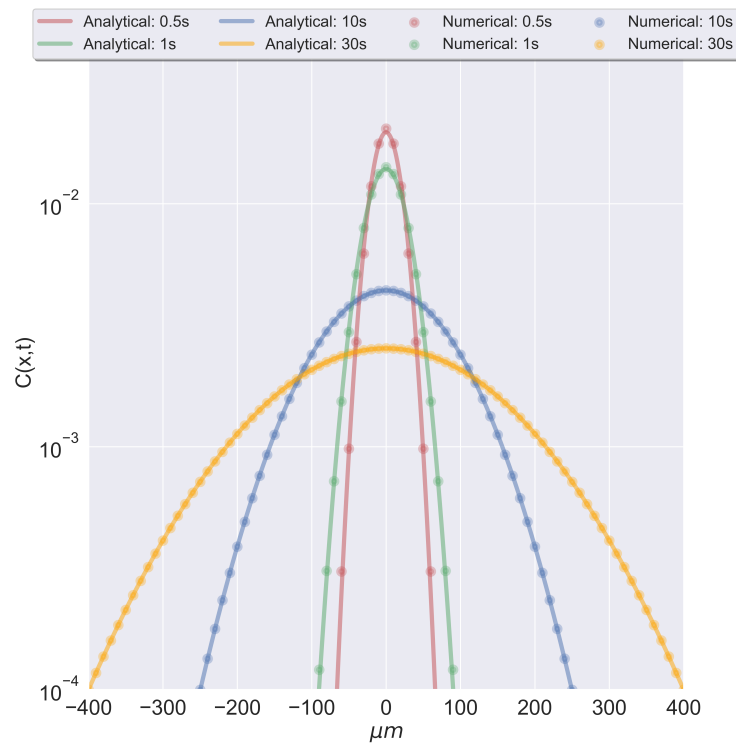
1.1.1 Results

Table 1: Sensitivity Analysis for D_{eff}

Parameter	S1	S1_conf	ST	ST_conf
D	0.035749	0.016874	0.043222	0.006289
q	0.920810	0.125206	0.942366	0.065333
l	0.025096	0.016028	0.030981	0.004830

1.2   **DONE** Statistically test analytical and numerical solutions to diffusion eq

1.3   **TODO** Questions for Friday meeting

- What is the short term plans (3 months)
- What is the longer term plan (3-6 months)
- What side projects could be of use?

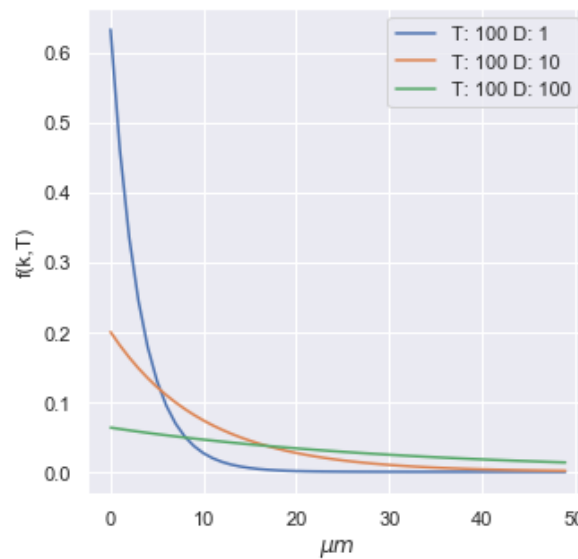## 1.4   **DONE** Implement Eq. A.70 with full actual parameters

Figure 1: Time resolved solution for purely diffusive symplastic transport (approximation)

1.5   **DONE** Read up on ROS bursts

1.6   **TODO** Read up on Calcium signalling

1.7   **IDEA** Entropy and information theory?

1.8   **DONE** Finish draft of Chapter 1 of probation report

References