COMPLETE CELL SIMULATION

This is the first time the entire lifecycle of an organism has been simulated at the molecular level.

Today

- Functions as Data
- Higher-Order Functions
- Useful HOFs (build them all!)
- Demo
map **Reporter** over **List**

- Report a new list, every element of becoming Reporter(E)
- Lists are immutable (you get a new list back)

```
(□ □ □ □ □ □ □)
↓ ↓ ↓ ↓ ↓ ↓
(▲ ▲ ▲ ▲ ▲ ▲ ▲)
```
keep items such that **Predicate from List**

- Report a new list, keeping only elements $E$ of List if $\text{Predicate}(E)$
- This is also known as “filter”

```
[] [] [] [] [] []
```

```
[]    []    []
```
**combine with ** **Reporter** over **List**

- Return the result of combining all the elements of **List** with **Reporter(E)**
- This is also known as “reduce”

\[
\text{(□ □ □ □ □ □)}
\]

○
combine with Reporter over List
I understand higher-order functions.

a) Strongly disagree  
b) Disagree  
c) Neutral  
d) Agree  
e) Strongly agree
Summary

- Functions as data is one of the three big ideas in this course
- It can give a beautiful abstraction of list iteration details
- Now widely used in industry
  - Google’s map-reduce
  - JavaScript idioms

(Image Credit: *Simply Scheme* by Brian Harvey & Matt Wright)