

# Information (experimental predictions) for PHO5 mutants and wild type strain

April 18, 2021

```
[3]: import math
#define the probability of n number of microstates
def ent(n):
    pr = 0
    sum = 0
    for i in range(n):
        print("The probability of microstate",i+1)
        p =float(input())
        if p == 0:
            p = 0.0001
        else:
            p = p
        pr += p
        sum += p*math.log(p,2)
    s = -(sum)
    print("Entropy for your system =",-sum)
    print("sum of probablity=", pr)
    return s
```

## 1 Information for wild type (PHO4, PHO80, repressed PHO5 state and wild type TATA box)- figure 5E

```
[4]: ent(8)
```

```
The probability of microstate 1
0.595
The probability of microstate 2
0.119
The probability of microstate 3
0.133
The probability of microstate 4
0.043
The probability of microstate 5
```

```
0.033
The probability of microstate 6
0.01
The probability of microstate 7
0.043
The probability of microstate 8
0.024
Entropy for your system = 1.946602465471186
sum of probablity= 1.0
```

[4]: 1.946602465471186

## 2 Information for PHO4, pho80(activated PHO5 state and wild type TATA box) - Figure 4A

[5]: ent(8)

```
The probability of microstate 1
0.074
The probability of microstate 2
0.02
The probability of microstate 3
0.177
The probability of microstate 4
0.064
The probability of microstate 5
0.212
The probability of microstate 6
0.025
The probability of microstate 7
0.182
The probability of microstate 8
0.246
Entropy for your system = 2.639387257401725
sum of probablity= 1.0
```

[5]: 2.639387257401725

## 3 Information for PHO4, PHO80, pho2(repressed PHO5 state and wild type TATA box) - Figure 5D

[6]: ent(8)

```

The probability of microstate 1
0.522
The probability of microstate 2
0.096
The probability of microstate 3
0.196
The probability of microstate 4
0.057
The probability of microstate 5
0.062
The probability of microstate 6
0.024
The probability of microstate 7
0.033
The probability of microstate 8
0.01
Entropy for your system = 2.1172195359804085
sum of probablity= 1.0

```

[6]: 2.1172195359804085

#### 4 Information for pho4, pho80(repressed PHO5 state and mutant type TATA box) - Figure 5C

[7]: ent(8)

```

The probability of microstate 1
0.671
The probability of microstate 2
0.048
The probability of microstate 3
0.138
The probability of microstate 4
0.071
The probability of microstate 5
0.029
The probability of microstate 6
0.005
The probability of microstate 7
0.033
The probability of microstate 8
0.005
Entropy for your system = 1.6487285587505267
sum of probablity= 1.0

```

[7]: 1.6487285587505267

## 5 Information for pho4[85-99], pho80(partially activated PHO5 state and mutant type TATA box) - Figure 5B

[8]: ent(8)

```
The probability of microstate 1
0.3
The probability of microstate 2
0.039
The probability of microstate 3
0.281
The probability of microstate 4
0.079
The probability of microstate 5
0.138
The probability of microstate 6
0.01
The probability of microstate 7
0.094
The probability of microstate 8
0.059
Entropy for your system = 2.5298325679353164
sum of probablity= 1.0
```

[8]: 2.5298325679353164

## 6 Information for PHO4, pho80(activated PHO5 state and mutant type TATA box) - Figure 5A

[9]: ent(8)

```
The probability of microstate 1
0.066
The probability of microstate 2
0.038
The probability of microstate 3
0.183
The probability of microstate 4
0.052
The probability of microstate 5
0.178
The probability of microstate 6
0.075
The probability of microstate 7
0.174
```

```
The probability of microstate 8  
0.235  
Entropy for your system = 2.7617072725892546  
sum of probablity= 1.001
```

```
[9]: 2.7617072725892546
```

```
[ ]:
```