```
In [1]: using DataFrames
```

```
In [2]: using Distributions
```

```
In [3]: using(Gadfly)
```

CleanCh21

```
In [4]: CleanCh = convert(Array,readtable("/home/nicole/Jupyter/HERdata/data/Clean/cl
```

Out[4]: 1442x18398 Array{Int64,2}:
```
 0  0  0  1  0  0  0  1  1  1  0  1  1  …  1  1  1  0  1  1  0  0  0  1
 1  0
 0  0  1  0  0  0  0  1  1  1  0  1  1     1  1  1  1  0  0  1  0  0  1
 0  0
 0  0  1  0  0  0  0  1  1  1  0  1  1     1  0  0  1  1  0  0  1  1  0
 0  1
 0  0  1  0  0  0  0  1  1  1  0  1  1     0  0  0  0  1  1  0  0  0  1
 1  0
 0  0  1  0  0  0  0  1  1  1  0  1  1     0  0  0  1  1  1  0  1  1  0
 0  1
 0  0  1  0  0  0  0  1  1  1  0  1  1  …  0  0  1  1  1  1  0  0  0  1
 1  0
 0  0  1  0  0  0  0  1  1  1  0  1  1     1  1  1  1  0  0  1  0  0  1
 0  1
 0  0  1  0  0  0  0  1  1  1  0  1  1     1  1  1  0  1  1  0  0  0  1
 1  0
 0  0  0  1  0  0  0  1  1  1  1  0  0     1  1  0  1  0  0  1  1  1  0
 0  1
 0  0  1  0  0  0  0  1  1  1  0  1  1     1  1  1  1  0  0  1  0  1  0
 0  1
 0  0  1  0  0  0  0  1  1  1  0  1  1  …  0  0  1  1  0  0  1  0  0  1
 0  0
 0  0  1  0  0  0  0  1  1  1  0  1  1     0  0  0  0  1  1  0  0  0  1
 1  0
 0  0  1  0  0  0  0  1  1  1  0  1  1     0  0  1  1  0  0  1  0  0  1
 0  0
 ⋮              ⋮              ⋮        ⋱              ⋮              ⋮

 0  0  1  0  0  0  0  1  1  1  0  1  1  …  0  0  0  0  1  1  0  0  0  1
 0  0
 0  0  1  0  0  0  0  1  1  1  0  1  1     0  0  0  0  1  1  0  0  0  1
 1  0
 0  0  1  0  0  0  0  1  1  1  0  1  1     0  0  0  0  1  1  0  0  0  1
 1  0
 1  1  0  1  1  1  1  1  1  1  0  1  1     0  0  1  1  0  0  1  0  0  1
 0  0
 0  0  1  0  0  0  0  1  1  1  0  1  1     0  0  1  1  0  0  1  0  0  1
 0  0
 0  0  1  0  0  0  0  1  1  1  0  1  1  …  1  0  0  1  1  0  0  1  1  0
 0  1
 0  0  1  0  0  0  0  1  1  1  0  1  1     0  0  0  0  1  1  0  0  0  1
 1  0
 0  0  1  0  0  0  0  1  1  1  0  1  1     1  0  0  1  1  0  0  1  1  0
 0  1
 0  0  1  0  0  0  0  1  1  1  0  1  1     0  0  0  0  1  1  0  0  0  1
 1  0
 1  1  0  1  1  1  1  0  0  0  1  0  0     0  0  1  1  0  0  1  0  0  1
 0  0
 0  0  1  0  0  0  0  1  1  1  0  1  1  …  1  1  1  1  0  0  1  1  1  0
 0  1
 0  0  1  0  0  0  0  1  1  1  0  1  1     0  0  0  0  1  1  0  0  0  1
 1  0
```

```
In [5]: corCleanCh = cor(CleanCh)
        nRows     = size(corCleanCh,1)
```

Out[5]: 18398

```
In [6]: LDMat   = zeros(nRows-1,200);
```
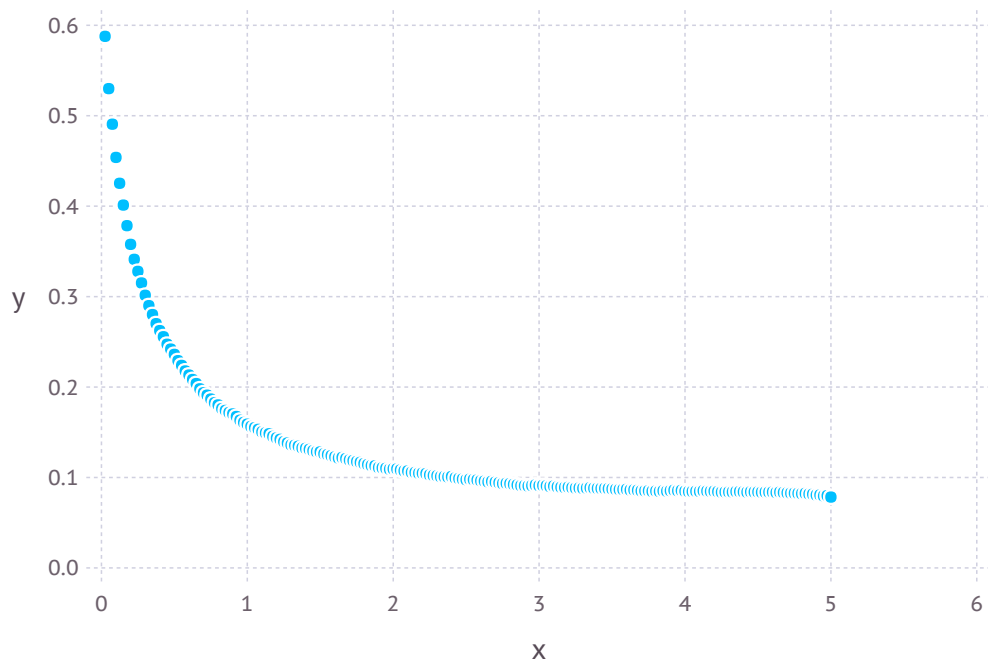
```
In [7]: for i = 1:(nRows-200)
            LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
        end
```

```
In [8]: y = mean(LDMat,1)
        sort(y,2)
```

Out[8]: 1x200 Array{Float64,2}:
         0.0783294 0.0796024 0.0799224 0.0806018 … 0.490647 0.529994 0.587
        755

```
In [9]: plot(x=(1:200)/200*5,y=y)
```

Out[9]:

CleanCh22

```
In [10]: CleanCh = convert(Array,readtable("/home/nicole/Jupyter/HERdata/data/Clean/cl
```

Out[10]: 1442x16850 Array{Int64,2}:
```
 1  1  0  0  1  0  1  1  1  1  1  1  1  …  1  0  1  0  0  1  0  1  0  1
 1  0
 1  1  0  0  1  0  1  1  1  1  1  1  1     1  0  0  0  0  1  0  1  0  1
 1  1
 1  1  0  0  1  1  0  0  0  0  0  1  0     0  1  0  1  1  1  1  0  0  0
 0  0
 1  1  0  1  1  1  0  0  0  0  0  1  0     0  1  0  1  1  1  1  0  0  0
 0  0
 1  1  0  0  1  0  1  1  1  1  1  1  1     0  1  0  0  1  0  0  0  1  0
 1  1
 1  1  0  1  0  0  1  1  1  1  1  1  1  …  1  0  0  0  0  1  0  1  0  1
 1  1
 1  1  0  0  1  1  0  0  0  0  0  1  0     1  1  1  0  1  0  0  0  1  0
 1  1
 1  1  0  1  0  0  1  1  1  1  1  1  1     1  1  1  0  1  0  0  0  1  0
 1  1
 0  0  1  1  1  1  0  0  0  0  0  1  0     0  1  0  0  1  0  0  0  1  0
 1  1
 1  1  0  0  1  1  0  0  0  0  0  1  0     1  0  0  0  1  1  1  1  0  1
 0  0
 0  0  1  1  0  0  1  1  1  1  0  0  1  …  1  0  1  0  0  1  0  1  0  1
 1  0
 1  1  0  1  1  1  0  1  1  1  0  0  1     0  1  0  1  1  1  1  0  0  0
 0  0
 0  0  1  1  0  0  1  1  1  1  0  0  1     1  0  1  0  0  1  0  1  0  1
 1  0
 ⋮              ⋮              ⋮        ⋱        ⋮                ⋮
 1  1  0  0  1  0  1  1  1  1  1  1  1  …  1  0  1  0  1  0  0  0  1  0
 1  1
 1  1  0  0  1  0  1  1  1  1  1  1  1     1  0  1  0  1  0  0  0  1  0
 1  1
 1  1  0  0  1  1  0  0  0  0  0  1  0     1  0  1  0  1  0  0  0  1  0
 1  1
 1  1  0  1  1  1  0  1  1  1  0  0  1     0  1  0  0  1  0  0  0  1  0
 1  1
 0  0  1  1  1  1  0  0  0  0  0  1  0     1  1  0  0  1  0  0  0  1  0
 1  1
 1  1  0  0  1  0  1  1  1  1  1  1  1  …  0  1  0  0  1  0  0  0  1  0
 1  1
 1  1  0  0  1  0  1  1  1  1  1  1  1     1  0  1  0  1  0  0  0  1  0
 1  1
 1  1  0  1  1  1  0  1  1  1  0  0  1     1  0  0  0  0  1  0  1  0  1
 1  1
 1  1  0  0  1  0  1  1  1  1  1  1  1     1  0  0  0  0  1  0  1  0  1
 1  1
 1  1  0  0  1  1  0  0  0  0  0  1  0     1  0  0  0  0  1  0  1  0  1
 1  1
 1  1  0  0  1  1  0  0  0  0  0  1  0  …  0  1  0  0  1  0  0  0  1  0
 1  1
 1  1  0  0  1  1  0  0  0  0  0  1  0     1  0  1  0  1  0  0  0  1  0
 1  1
```

```
In [11]:  corCleanCh = cor(CleanCh)
          nRows     = size(corCleanCh,1)
```

Out[11]: 16850

```
In [12]:  LDMat    = zeros(nRows-1,200);
```
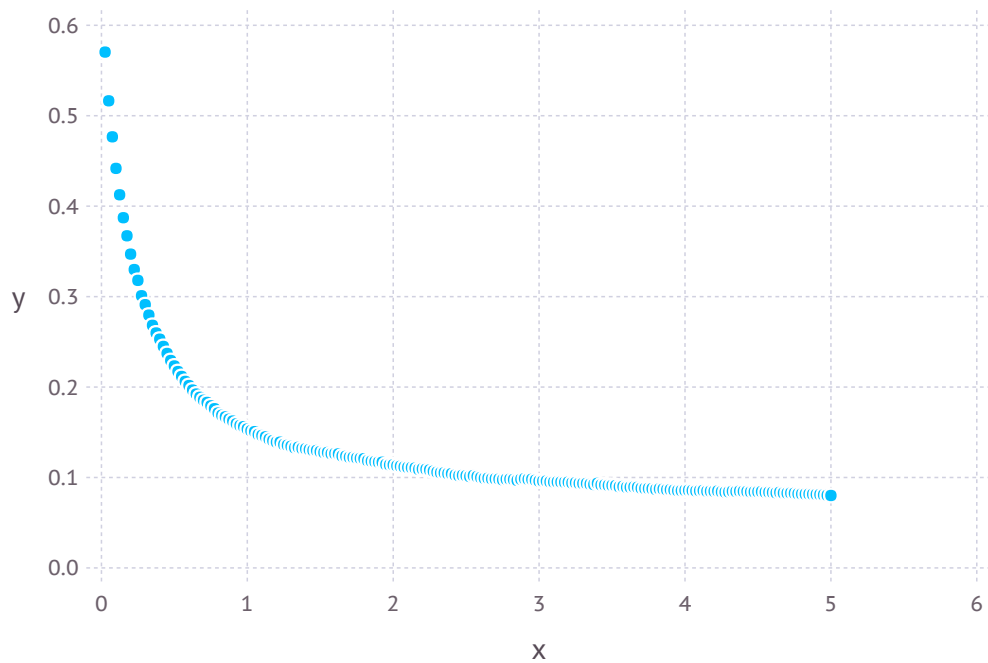
```
In [13]:  for i = 1:(nRows-200)
              LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
          end
```

```
In [14]:  y = mean(LDMat,1)
          sort(y,2)
```

Out[14]: 1x200 Array{Float64,2}:
           0.0801285 0.0803755 0.0807701 0.0812201 … 0.476704 0.516524 0.570
          365

```
In [15]:  plot(x=(1:200)/200*5,y=y)
```

Out[15]:

CleanCh23

```
In [16]: CleanCh = convert(Array,readtable("/home/nicole/Jupyter/HERdata/data/Clean/cl
```

Out[16]: 1442x14057 Array{Int64,2}:
```
 0  1  0  0  1  0  1  0  0  0  1  1  0  …  0  0  0  1  1  0  0  0  0  1
 0  1
 1  0  1  1  0  1  0  1  1  1  0  1  1     1  1  1  1  0  1  1  1  1  0
 1  0
 1  0  1  0  0  1  0  1  1  1  0  1  1     1  1  1  1  0  1  1  1  1  0
 1  1
 1  0  1  1  0  1  0  1  1  1  0  1  1     1  1  1  1  0  1  1  1  1  0
 1  1
 1  0  1  0  0  1  0  1  1  1  0  1  1     1  1  1  0  0  1  1  1  1  0
 1  1
 1  0  1  1  0  1  0  1  1  1  0  1  1  …  1  1  1  0  0  1  1  1  1  0
 1  1
 1  0  0  1  0  1  0  1  1  1  1  0  1     1  1  1  0  0  1  1  1  1  0
 1  1
 1  0  1  0  0  1  0  1  1  1  0  1  1     1  1  1  1  0  1  1  1  1  0
 1  1
 1  0  0  0  0  1  0  1  1  1  1  0  1     1  1  1  1  0  1  1  1  1  0
 1  1
 1  0  0  1  0  1  0  1  1  1  1  0  1     1  1  1  1  0  1  1  1  1  0
 1  1
 1  0  1  1  0  1  0  1  1  1  0  1  1  …  1  1  1  0  0  1  1  1  1  0
 1  1
 1  0  1  1  0  1  0  1  1  1  0  1  1     1  1  1  1  0  1  1  1  1  0
 1  1
 1  0  1  0  0  1  0  1  1  1  0  1  1     1  1  1  0  0  1  1  1  1  0
 1  1
 ⋮              ⋮              ⋮     ⋱  ⋮              ⋮              ⋮
 1  0  1  0  0  1  0  1  1  1  0  1  1  …  1  1  1  0  0  1  1  1  1  0
 1  1
 1  0  1  1  0  1  0  1  1  1  0  1  1     1  1  1  1  0  1  1  1  1  0
 1  1
 1  0  1  0  0  1  0  1  1  1  0  1  1     1  1  1  1  0  1  1  1  1  0
 1  1
 1  0  1  1  0  1  0  1  1  1  0  1  1     1  1  1  1  0  1  1  1  1  0
 1  1
 1  0  1  0  0  1  0  1  1  1  0  1  1     0  0  0  1  1  0  0  0  0  1
 0  1
 1  0  1  1  0  1  0  1  1  1  0  1  1  …  1  1  1  1  0  1  1  1  1  0
 1  1
 1  0  1  0  0  1  0  1  1  1  0  1  1     1  1  1  0  0  1  1  1  1  0
 1  1
 1  0  1  1  0  1  0  1  1  1  0  1  1     1  1  1  0  0  1  1  1  1  0
 1  1
 1  0  1  0  0  1  0  1  1  1  0  1  1     1  1  1  1  0  1  1  1  1  0
 1  1
 1  0  1  1  0  1  0  1  1  1  0  1  1     1  1  1  1  0  1  1  1  1  0
 1  1
 1  0  1  0  0  1  0  1  1  1  0  1  1  …  1  1  1  1  0  1  1  1  1  0
 1  1
 1  0  1  1  0  1  0  1  1  1  0  1  1     1  1  1  0  0  1  1  1  1  0
 1  1
```

```
In [17]: corCleanCh = cor(CleanCh)
         nRows    = size(corCleanCh,1)
```

Out[17]: 14057

```
In [18]: LDMat    = zeros(nRows-1,200);
```
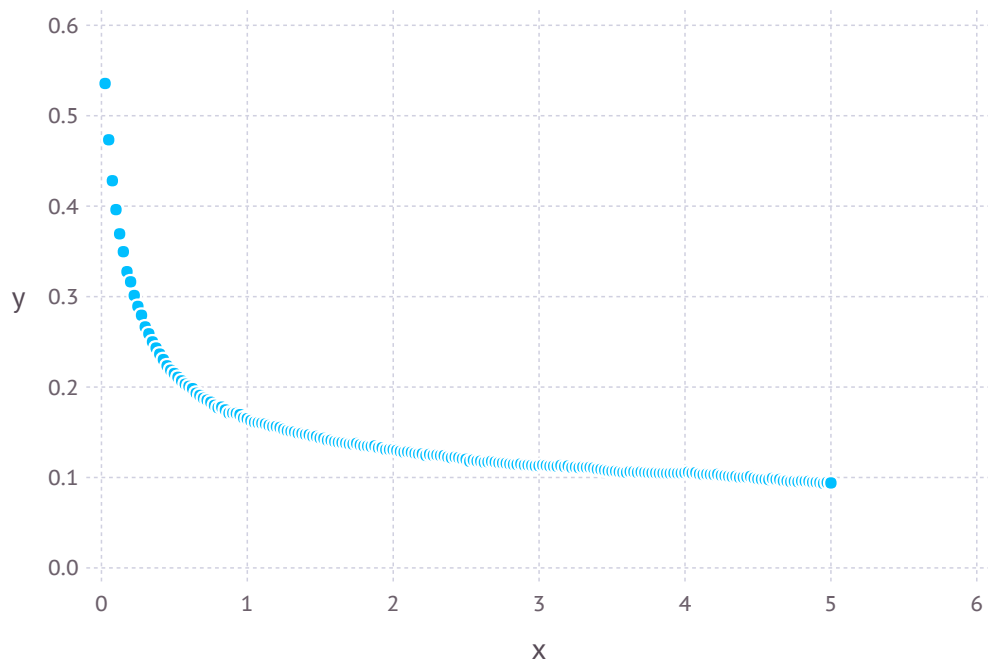
```
In [19]: for i = 1:(nRows-200)
             LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
         end
```

```
In [20]: y = mean(LDMat,1)
         sort(y,2)
```

Out[20]: 1x200 Array{Float64,2}:
          0.0935184 0.0939804 0.0944343 0.094487 … 0.42814 0.473387 0.53568
         2

```
In [21]: plot(x=(1:200)/200*5,y=y)
```

Out[21]:

CleanCh24

```
In [22]: CleanCh = convert(Array,readtable("/home/nicole/Jupyter/HERdata/data/Clean/cl
```

Out[22]: 1442x16178 Array{Int64,2}:
```
         1  1  1  0  1  0  1  1  1  1  1  1  1  …  0  0  0  0  0  1  1  0  0  0
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  0  1  0  0  1  1  1  0  0
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  1  0  1  1  1  0  0  1  1
         0  0
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  1  0  1  1  1  0  0  1  1
         0  0
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  0  1  0  0  1  1  1  0  0
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1  …  0  1  0  1  1  1  0  0  1  1
         0  0
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  1  0  1  1  1  0  0  1  1
         0  0
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  0  1  0  0  1  1  1  0  0
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1     1  1  0  0  0  1  1  0  0  0
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  0  1  0  0  1  1  1  0  0
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1  …  0  0  1  0  0  1  1  1  0  0
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  0  1  0  0  1  1  1  0  0
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  0  1  0  0  1  1  1  0  0
         1  1
         ⋮              ⋮              ⋮        ⋱              ⋮              ⋮

         1  1  1  0  1  0  1  1  1  1  1  1  1  …  1  1  0  1  1  0  1  0  1  1
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  1  0  1  1  1  0  0  1  1
         0  0
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  1  0  1  1  1  0  0  1  1
         0  0
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  1  0  1  1  1  0  0  1  1
         0  0
         1  1  1  0  1  0  1  1  1  1  1  1  1     1  1  0  1  1  0  1  0  1  1
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1  …  0  0  1  0  0  1  1  1  0  0
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  0  1  0  0  1  1  1  0  0
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  0  1  0  0  1  1  1  0  0
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  1  0  1  1  1  0  0  1  1
         0  0
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  0  1  0  0  1  1  1  0  0
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1  …  1  1  0  1  1  0  1  0  1  1
         1  1
         1  1  1  0  1  0  1  1  1  1  1  1  1     0  0  1  0  0  1  1  1  0  0
         1  1
```

```
In [23]: corCleanCh = cor(CleanCh)
         nRows     = size(corCleanCh,1)
```

Out[23]: 16178

```
In [24]: LDMat    = zeros(nRows-1,200);
```

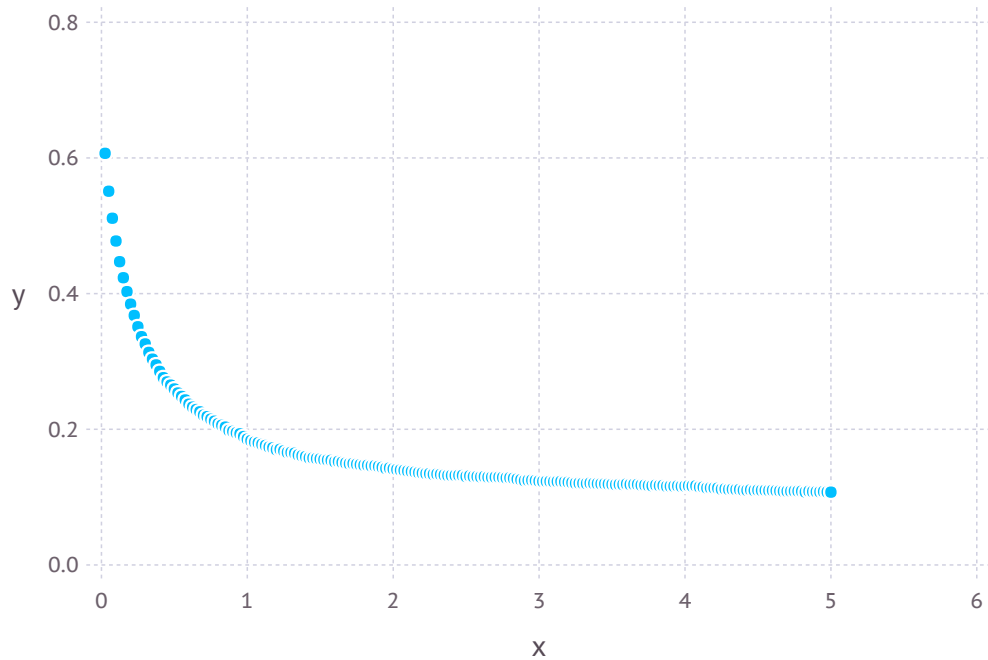```
In [25]: for i = 1:(nRows-200)
             LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
         end
```

```
In [26]: y = mean(LDMat,1)
         sort(y,2)
```

Out[26]: 1x200 Array{Float64,2}:
          0.107311 0.107447 0.107527 0.107735 … 0.511099 0.550888 0.606807

```
In [27]: plot(x=(1:200)/200*5,y=y)
```

Out[27]:

CleanCh25

```
In [64]: CleanCh = convert(Array,readtable("/home/nicole/Jupyter/HERdata/data/Clean/cl

Out[64]: 1442x11890 Array{Int64,2}:
         1  1  1  1  1  0  0  0  0  1  0  0  0  …  1  1  1  0  0  0  1  0  0  1
         1  1
         1  1  1  1  1  0  0  0  0  1  0  0  0     1  1  1  0  1  0  1  0  0  1
         1  1
         1  0  1  1  1  0  0  0  0  1  0  0  0     0  0  0  1  1  1  0  1  1  0
         0  0
         1  1  1  1  1  0  0  0  0  1  0  0  0     1  1  1  0  1  0  1  0  0  1
         1  1
         1  1  0  0  1  1  1  1  1  0  1  1  1     1  1  1  0  1  0  1  0  0  1
         1  1
         1  1  1  1  1  0  0  0  0  1  0  0  0  …  0  0  0  1  1  1  0  1  1  0
         0  0
         0  1  0  0  0  1  1  1  1  0  1  1  1     0  0  0  0  1  1  0  1  1  0
         0  0
         0  1  0  0  0  1  1  1  1  0  1  1  1     0  0  0  0  1  1  0  1  1  0
         0  0
         0  1  0  0  0  1  1  1  1  0  1  1  1     0  0  0  1  1  1  0  1  0  1
         1  1
         1  1  1  1  1  0  0  0  0  1  0  0  0     1  1  1  0  1  0  1  0  0  1
         1  1
         1  0  1  1  1  0  0  0  0  1  0  0  0  …  1  1  1  0  1  0  1  0  0  1
         1  1
         1  1  1  0  1  1  1  1  1  0  1  0  1     1  1  1  0  0  0  1  0  0  1
         1  1
         1  1  1  0  1  1  1  1  1  0  1  0  1     1  1  1  0  0  0  1  0  0  1
         1  1
         ⋮                 ⋮                 ⋮              ⋱              ⋮                 ⋮
         1  1  1  1  1  0  0  0  0  1  0  0  0  …  0  0  0  1  1  1  1  0  1  0
         0  0
         1  1  1  1  1  0  0  0  0  1  0  0  0     1  1  1  0  1  0  1  0  0  1
         1  1
         1  1  1  1  1  0  0  0  0  1  0  0  0     0  0  0  1  1  1  1  0  1  0
         0  0
         1  1  1  1  1  0  0  0  0  1  0  0  0     0  0  0  1  1  1  1  0  0  1
         1  1
         1  1  1  1  1  0  0  0  0  1  0  0  0     0  0  0  1  1  1  0  1  1  0
         0  0
         1  1  1  1  1  0  0  0  0  1  0  0  0  …  1  1  1  0  0  0  1  0  0  1
         1  1
         1  1  1  1  1  0  0  0  0  1  0  0  0     0  0  0  1  1  1  0  1  1  0
         0  0
         1  1  1  1  1  0  0  0  0  1  0  0  0     1  1  1  0  0  0  1  0  0  1
         0  0
         1  0  1  1  1  0  0  0  0  1  0  0  0     0  0  0  1  1  0  1  0  0  1
         1  1
         1  1  1  1  1  0  0  0  0  1  0  0  0     1  1  1  0  1  0  1  0  0  1
         1  1
         1  1  1  1  1  0  0  0  0  1  0  0  0  …  1  1  1  1  1  0  1  0  0  1
         1  1
         1  1  1  1  1  0  0  0  0  1  0  0  0     0  0  0  1  1  1  0  1  1  0
         0  0
```

```
In [65]: corCleanCh = cor(CleanCh)
         nRows     = size(corCleanCh,1)
```

Out[65]: 11890

```
In [66]: LDMat    = zeros(nRows-1,200);
```
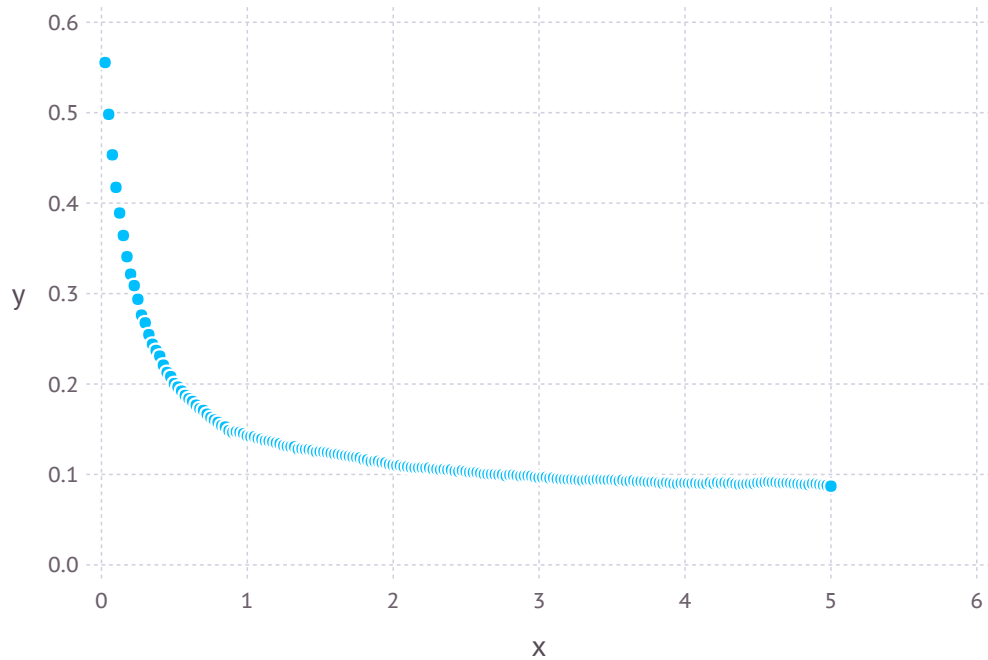
```
In [67]: for i = 1:(nRows-200)
             LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
         end
```

```
In [68]: y = mean(LDMat,1)
         sort(y,2)
```

Out[68]: 1x200 Array{Float64,2}:
          0.0870804 0.087992 0.0882749 … 0.417407 0.45345 0.4982 0.555478

```
In [69]: plot(x=(1:200)/200*5,y=y)
```

Out[69]:

CleanCh26

```
In [34]: CleanCh = convert(Array,readtable("/home/nicole/Jupyter/HERdata/data/Clean/cl
```

Out[34]: 1442x14127 Array{Int64,2}:
```
 0  1  0  0  1  1  0  1  1  0  0  1  0  …  1  1  1  0  0  0  0  1  0  1
 1  0
 0  1  0  0  1  1  1  0  0  1  1  0  1     1  0  1  0  0  0  0  1  0  1
 1  1
 0  1  0  0  1  0  1  0  0  1  1  0  1     1  0  1  0  0  0  0  1  0  1
 1  1
 1  0  0  1  0  1  0  1  1  0  0  1  0     1  1  1  0  0  0  0  1  1  1
 1  0
 0  1  0  0  1  0  1  0  0  1  1  0  1     1  1  1  0  0  0  0  1  0  1
 1  0
 0  1  0  0  1  1  0  1  1  0  0  1  0  …  0  1  0  1  1  0  0  1  0  1
 0  0
 0  1  0  0  1  1  1  0  0  1  0  1  0     1  1  1  0  0  0  0  1  0  1
 0  0
 0  1  0  0  1  1  1  0  0  1  1  0  1     1  1  1  0  0  0  0  1  0  1
 1  0
 0  1  0  0  1  1  1  0  0  1  1  0  1     1  1  1  0  0  0  0  1  0  1
 0  0
 0  1  0  0  1  1  1  0  0  1  1  0  1     1  1  1  0  0  1  0  0  1  1
 1  0
 0  1  0  0  1  1  1  0  0  1  1  0  1  …  1  1  1  0  0  1  0  0  1  1
 1  1
 1  0  0  1  0  1  0  1  1  0  0  1  0     1  1  1  0  0  0  0  1  1  1
 1  0
 0  1  0  0  1  0  1  0  0  1  1  0  1     1  1  1  0  0  0  0  1  0  1
 0  0
 ⋮              ⋮                 ⋮         ⋱  ⋮              ⋮                 ⋮

 0  1  0  0  1  0  1  0  0  1  1  0  1  …  0  1  0  1  1  0  0  1  0  1
 0  0
 0  1  0  0  1  1  1  0  0  1  1  1  1     0  1  0  1  1  0  0  1  0  1
 0  0
 0  0  0  1  1  1  0  1  1  0  0  1  0     1  0  1  0  0  0  0  1  0  1
 1  1
 0  1  0  0  1  1  1  0  0  1  1  1  1     0  1  0  1  1  0  0  1  0  1
 0  0
 0  1  0  0  1  1  1  0  0  1  1  0  1     0  1  0  1  1  0  0  1  0  1
 0  0
 0  1  0  0  1  1  1  0  0  1  1  0  1  …  0  1  0  1  1  0  0  1  0  1
 0  0
 0  1  0  0  1  0  1  0  0  1  1  0  1     0  1  0  1  1  0  0  1  0  1
 0  0
 0  1  0  0  1  1  1  0  0  1  1  0  1     0  1  0  1  1  0  0  1  0  1
 0  0
 0  0  0  1  1  1  0  1  1  0  0  1  0     0  1  0  1  1  0  0  1  0  1
 0  0
 0  1  0  0  1  1  1  0  0  1  1  0  1     0  1  0  1  1  0  0  1  0  1
 0  0
 0  1  0  0  1  1  1  0  0  1  1  0  1  …  0  1  0  1  1  0  0  1  0  1
 0  0
 1  0  0  1  0  1  0  1  1  0  0  1  0     0  1  0  1  1  0  0  1  0  1
 0  0
```

```
In [35]:  corCleanCh = cor(CleanCh)
          nRows  = size(corCleanCh,1)
```

Out[35]: 14127

```
In [36]:  LDMat  = zeros(nRows-1,200);
```
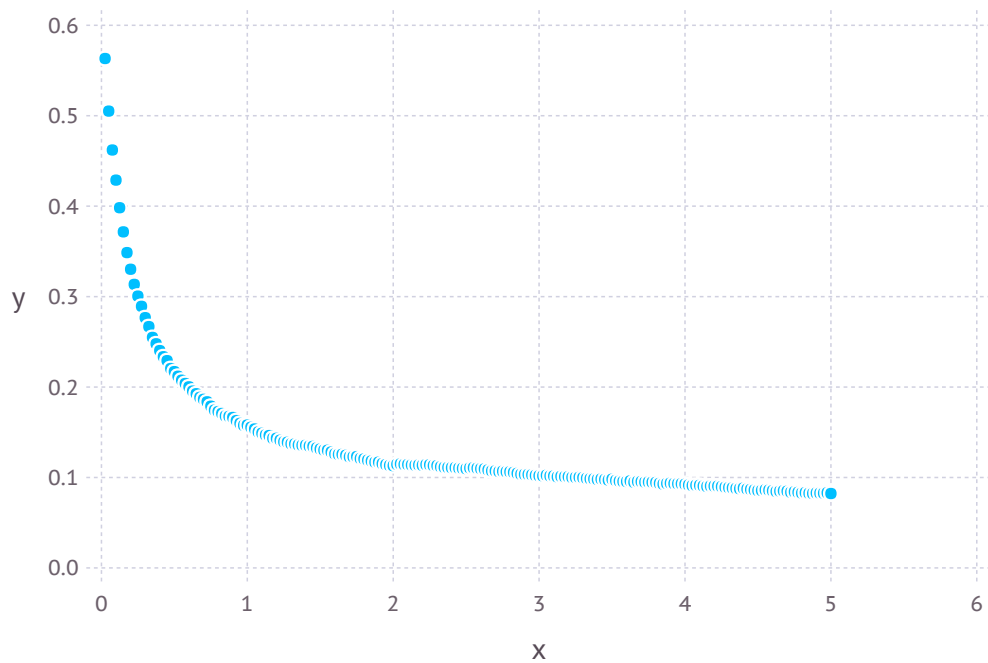
```
In [37]:  for i = 1:(nRows-200)
              LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
          end
```

```
In [38]:  y = mean(LDMat,1)
          sort(y,2)
```

Out[38]: 1x200 Array{Float64,2}:
           0.0822524 0.0822863 0.0825523 0.0826199 … 0.462129 0.505159 0.563
          273

```
In [39]:  plot(x=(1:200)/200*5,y=y)
```

Out[39]:

CleanCh27

```
In [40]: CleanCh = convert(Array,readtable("/home/nicole/Jupyter/HERdata/data/Clean/cl
```

```
Out[40]: 1442x12157 Array{Int64,2}:
         0  0  1  1  0  0  1  0  1  0  1  1  0  …  0  0  0  1  1  0  1  1  0  1
         0  1
         1  1  0  0  1  1  0  1  0  1  0  0  1     1  0  0  1  1  0  1  1  0  1
         1  1
         0  0  1  1  0  1  1  0  1  0  1  0  0     0  1  1  0  0  1  0  0  1  0
         0  0
         1  1  1  0  1  1  0  1  1  1  0  0  0     1  0  1  0  0  1  0  0  1  1
         0  0
         0  0  1  1  0  0  1  0  1  0  1  1  0     0  0  0  1  1  0  1  1  0  1
         0  1
         0  0  1  1  0  1  1  0  1  0  1  0  0  …  0  1  1  0  0  1  0  0  1  0
         0  0
         0  0  1  1  0  0  1  0  1  0  1  1  0     0  0  0  1  1  0  1  1  0  1
         0  1
         1  1  0  0  1  1  0  1  0  1  0  0  0     0  0  0  1  1  0  1  1  0  1
         0  1
         1  1  0  0  1  1  0  1  0  1  0  0  0     1  1  0  1  1  0  1  1  0  1
         1  1
         1  1  1  0  1  1  0  1  1  1  0  0  0     1  0  1  1  1  0  1  1  0  1
         1  1
         0  0  1  1  0  0  1  0  1  0  1  1  0  …  1  0  1  1  1  0  1  1  0  1
         1  1
         0  0  1  1  0  1  1  0  1  0  1  0  0     0  0  0  1  1  0  1  1  0  1
         0  1
         0  0  1  1  0  0  1  0  1  0  1  1  0     0  0  0  1  1  0  1  1  0  1
         0  1
         ⋮              ⋮              ⋮        ⋱  ⋮              ⋮              ⋮

         0  0  1  1  0  0  1  0  1  0  1  1  0  …  0  0  0  1  1  0  1  1  0  1
         0  1
         0  0  1  1  0  0  1  0  1  0  1  1  0     1  0  1  0  0  1  0  0  0  1
         0  1
         0  0  1  1  0  0  1  0  1  0  1  1  0     0  0  0  1  1  0  1  1  0  1
         0  1
         0  0  1  1  0  0  1  0  1  0  1  1  0     1  0  1  1  1  0  1  1  0  1
         1  1
         0  0  1  1  0  0  1  0  1  0  1  1  0     0  0  0  1  1  0  1  1  0  1
         0  1
         0  0  1  1  0  1  1  1  1  0  1  0  0  …  1  0  1  1  1  0  1  1  0  1
         1  1
         0  0  1  1  0  0  1  0  1  0  1  1  0     1  0  1  1  1  0  1  1  0  1
         1  1
         0  0  1  1  0  1  1  0  1  0  1  0  0     0  1  1  0  0  1  0  0  1  0
         0  0
         0  0  1  1  0  1  1  0  1  0  1  0  0     0  1  1  0  0  1  0  0  1  0
         0  0
         0  0  1  1  0  1  1  1  1  0  0  0  0     1  0  0  1  1  0  1  1  0  1
         1  1
         0  0  1  1  0  0  1  0  1  0  1  1  0  …  1  0  0  1  1  0  1  1  0  1
         1  1
         0  0  1  1  0  1  1  1  1  0  1  0  0     1  0  1  1  1  0  1  1  0  1
         1  1
```

```
In [41]:  corCleanCh = cor(CleanCh)
          nRows  = size(corCleanCh,1)
```

Out[41]: 12157

```
In [42]:  LDMat  = zeros(nRows-1,200);
```
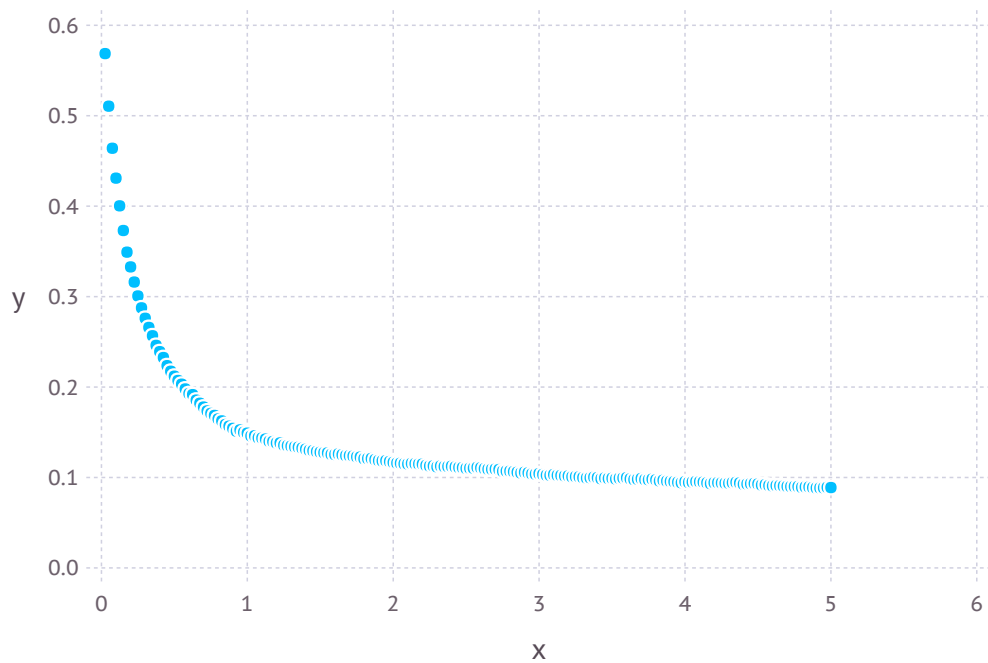
```
In [43]:  for i = 1:(nRows-200)
              LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
          end
```

```
In [44]:  y = mean(LDMat,1)
          sort(y,2)
```

Out[44]: 1x200 Array{Float64,2}:
          0.0883754 0.0884766 0.0885226 0.0888933 … 0.464043 0.510586 0.568
         687

```
In [45]:  plot(x=(1:200)/200*5,y=y)
```

Out[45]:

CleanCh28

```
In [46]: CleanCh = convert(Array,readtable("/home/nicole/Jupyter/HERdata/data/Clean/cl
```

Out[46]: 1442x12086 Array{Int64,2}:
```
 1  0  0  0  1  1  1  0  1  1  1  1  0  …  1  0  1  1  1  1  1  1  0  1
 1  0
 1  0  0  0  1  1  1  0  1  1  1  1  0     1  0  1  1  1  1  1  1  0  1
 1  0
 0  1  0  0  1  0  0  1  0  0  0  1  0     1  0  1  1  1  1  1  1  0  1
 1  0
 1  0  1  1  0  1  1  1  1  0  0  0  1     1  0  1  1  1  1  1  1  0  1
 1  0
 0  0  0  0  1  0  0  1  0  1  1  1  1     1  0  1  1  1  1  1  1  0  1
 1  0
 0  1  1  1  0  1  1  1  1  0  1  0  0  …  1  0  1  1  1  1  1  1  0  1
 1  0
 0  0  1  1  0  1  1  1  1  0  1  1  0     0  0  0  1  1  0  0  0  0  0
 1  0
 1  0  0  0  1  1  1  0  1  1  1  1  0     1  0  1  0  1  1  1  1  0  1
 1  0
 0  0  1  1  0  1  1  1  1  0  1  1  0     0  1  1  0  0  1  1  1  1  1
 0  1
 1  1  1  1  0  1  1  1  1  0  1  0  0     1  0  1  1  1  1  1  1  0  1
 1  0
 1  1  1  1  0  1  1  1  1  0  1  0  0  …  0  0  0  1  1  0  0  0  0  0
 1  0
 1  1  1  1  1  1  1  0  1  0  1  0  1     1  0  1  1  1  1  1  1  0  1
 1  0
 0  0  1  1  0  1  1  1  1  0  1  1  0     0  0  0  1  1  0  0  0  0  0
 1  0
 ⋮              ⋮              ⋮      ⋱     ⋮                    ⋮
 ⋮
 0  1  0  0  1  0  0  1  0  0  0  1  0  …  0  0  0  1  1  0  0  0  0  0
 1  0
 1  1  1  1  1  1  1  0  1  0  1  0  1     1  0  1  1  1  1  1  1  0  1
 1  0
 1  1  1  1  0  1  1  1  1  0  0  0  1     0  0  0  1  1  0  0  0  0  0
 1  0
 1  1  1  1  1  1  1  0  1  0  1  0  1     1  0  1  1  1  1  0  0  0  1
 1  0
 0  1  0  0  1  0  0  1  0  0  0  1  0     0  0  0  1  1  0  0  0  0  0
 1  0
 1  1  1  1  0  1  1  1  1  0  1  0  0  …  0  0  0  1  1  0  0  0  0  0
 1  0
 1  0  1  1  1  1  1  0  1  0  1  0  1     0  0  0  1  1  0  0  0  0  0
 1  0
 1  1  1  1  1  1  1  0  1  0  1  0  1     1  0  1  0  1  1  1  1  0  1
 1  0
 0  1  0  0  1  0  0  1  0  0  0  1  0     1  0  1  1  1  1  0  0  0  1
 1  0
 1  1  1  1  0  1  1  1  1  0  0  0  1     0  0  0  0  1  1  1  1  0  1
 1  0
 1  1  0  0  1  0  0  1  0  1  1  1  0  …  1  0  1  1  1  1  1  1  0  1
 1  0
 1  1  1  1  0  1  1  1  1  0  0  0  1     1  0  1  1  1  1  1  1  0  1
 1  0
```

```
In [47]: corCleanCh = cor(CleanCh)
         nRows   = size(corCleanCh,1)
```

Out[47]: 12086

```
In [48]: LDMat  = zeros(nRows-1,200);
```
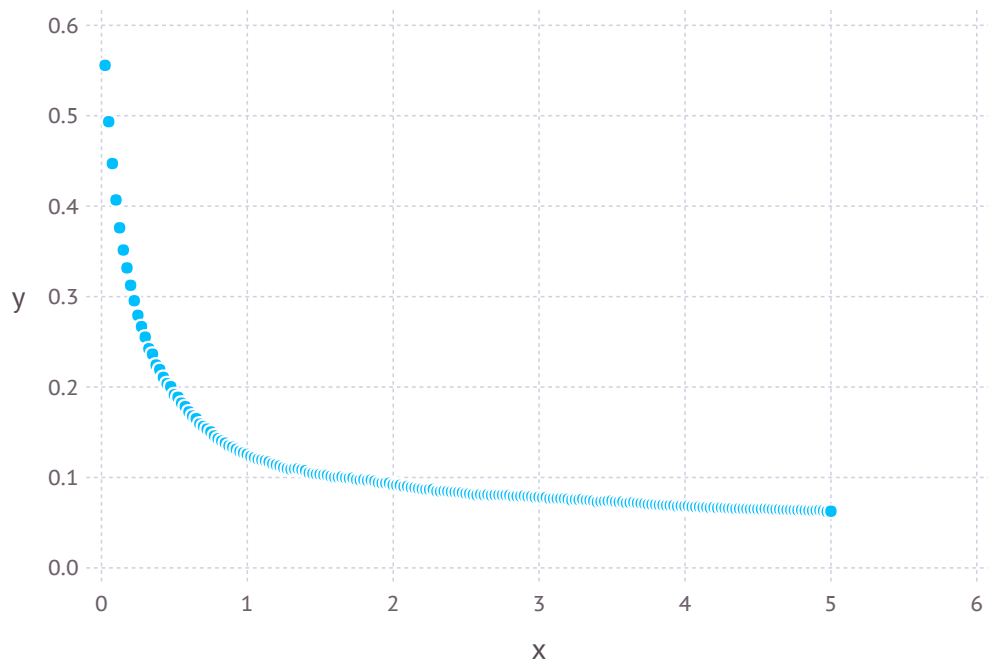
```
In [49]: for i = 1:(nRows-200)
             LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
         end
```

```
In [50]: y = mean(LDMat,1)
         sort(y,2)
```

Out[50]: 1x200 Array{Float64,2}:
          0.0623798 0.062704 0.0632938 0.0633963 … 0.447129 0.493406 0.5557
         78

```
In [51]: plot(x=(1:200)/200*5,y=y)
```

Out[51]:

CleanCh29

```
In [52]: CleanCh = convert(Array,readtable("/home/nicole/Jupyter/HERdata/data/Clean/cl
```

```
Out[52]: 1442x13491 Array{Int64,2}:
         1  0  0  0  1  1  1  1  0  1  0  0  1  …  0  1  0  0  1  1  1  1  1  0
         1  1
         1  0  0  0  1  1  1  1  0  1  0  0  1     0  1  0  0  1  1  1  1  1  0
         1  1
         1  1  1  0  0  0  0  0  1  0  1  1  0     0  0  1  1  0  0  0  0  1  1
         1  0
         1  1  1  0  0  0  0  0  1  0  1  1  0     0  1  0  1  1  1  1  0  1  1
         1  0
         1  0  0  0  1  1  1  1  0  1  0  0  1     0  1  0  0  1  1  1  1  1  0
         1  1
         1  0  0  0  1  1  1  1  0  1  1  1  0  …  1  1  0  0  1  1  1  1  1  0
         1  1
         0  1  1  1  0  0  0  0  1  0  1  0  1     1  1  0  0  1  1  1  1  1  0
         1  1
         1  0  0  0  1  1  1  1  0  1  0  0  1     0  1  0  0  1  1  1  1  1  0
         1  1
         1  0  0  0  1  1  1  1  0  1  0  0  1     0  1  0  0  1  1  1  1  1  0
         1  1
         1  0  0  0  1  1  1  1  0  1  0  0  1     1  1  0  0  1  1  1  1  1  0
         1  1
         0  1  1  1  0  0  0  0  1  0  1  0  1  …  0  1  0  1  1  1  1  0  1  1
         1  0
         1  0  0  0  1  1  1  1  0  1  0  0  1     0  1  0  1  1  1  1  0  1  1
         1  0
         1  0  0  0  1  1  1  1  0  1  0  0  1     0  1  0  1  1  1  1  0  1  1
         1  0
         ⋮                 ⋮                 ⋮              ⋱        ⋮                          ⋮
           ⋮
         0  1  1  0  0  1  0  1  0  1  0  0  1  …  0  1  0  0  1  1  1  1  1  0
         1  1
         1  0  0  0  1  1  1  1  0  1  0  0  1     0  1  0  1  1  1  1  0  1  1
         1  0
         1  0  0  0  1  1  1  1  0  1  0  0  1     0  1  0  1  1  1  1  0  1  1
         1  0
         1  1  1  0  0  0  0  0  1  0  1  1  0     0  1  0  1  1  1  1  0  1  1
         1  0
         1  0  0  0  1  1  1  1  0  1  0  0  1     0  1  0  1  1  1  1  0  1  1
         1  0
         1  1  1  0  0  0  0  0  1  0  1  1  0  …  0  1  0  1  1  1  1  0  1  1
         1  0
         0  1  1  1  0  0  0  0  1  0  1  0  1     0  1  0  1  1  1  1  0  1  1
         1  0
         1  1  1  0  0  0  0  0  1  0  1  1  0     0  1  0  1  1  1  1  0  1  1
         1  0
         0  1  1  0  0  1  0  1  0  1  0  0  1     0  1  0  0  1  1  0  1  1  0
         0  0
         1  0  0  0  1  1  1  1  0  1  0  0  1     1  1  0  1  1  1  1  1  1  0
         0  0
         1  1  1  0  0  0  0  0  1  0  1  1  0  …  0  1  0  1  1  1  1  0  1  1
         1  0
         1  1  1  0  0  0  0  0  1  0  1  1  0     1  1  0  1  1  1  1  1  1  0
         0  0
```

```
In [53]:   corCleanCh = cor(CleanCh)
           nRows  = size(corCleanCh,1)
```

Out[53]: 13491

```
In [54]:   LDMat  = zeros(nRows-1,200);
```
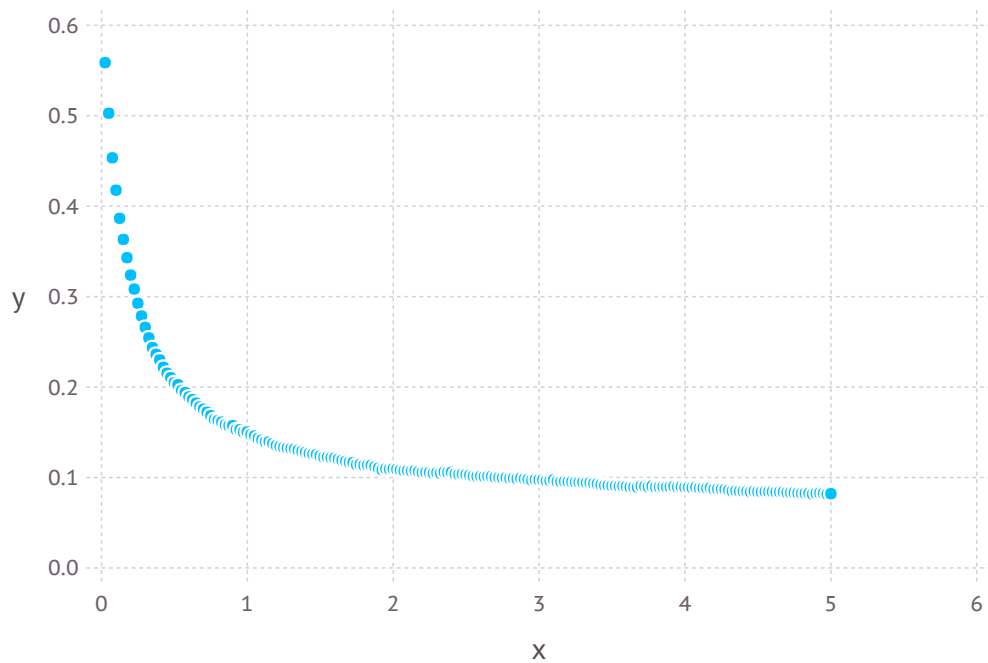
```
In [55]:   for i = 1:(nRows-200)
               LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
           end
```

```
In [56]:   y = mean(LDMat,1)
           sort(y,2)
```

Out[56]: 1x200 Array{Float64,2}:
           0.0815571 0.0817187 0.0821057 0.0824618 … 0.453473 0.502796 0.558
          714

```
In [57]:   plot(x=(1:200)/200*5,y=y)
```

Out[57]:

CleanCh30

```
In [58]:  CleanCh = convert(Array,readtable("/home/nicole/Jupyter/HERdata/data/Clean/cl
```

Out[58]: 1442x16442 Array{Int64,2}:
         1 0 1 0 0 0 1 0 0 1 1 1 1 … 0 0 0 0 1 0 0 0 1 1
         1 0
         1 0 1 0 0 0 1 0 0 1 1 1 1   1 0 0 0 0 1 1 1 0 0
         0 0
         1 0 1 1 1 0 0 1 1 0 1 0 0   0 0 0 0 1 0 0 0 1 1
         1 1
         1 0 1 1 1 0 0 1 1 0 1 0 0   0 0 0 0 1 0 0 0 1 1
         1 1
         1 0 1 1 1 0 0 1 1 0 1 0 0   1 1 0 0 1 1 1 1 1 1
         1 1
         1 0 1 1 1 0 0 1 1 0 1 0 0 … 0 0 0 1 1 1 0 0 1 1
         0 1
         1 0 1 1 1 0 0 1 1 0 1 0 0   1 1 0 0 1 1 1 1 1 1
         1 1
         1 0 1 1 1 0 0 1 1 0 1 0 0   0 0 0 1 1 1 0 0 0 0
         0 1
         1 0 1 1 1 0 0 1 1 0 1 0 0   1 0 0 1 0 1 0 0 0 0
         0 0
         1 0 1 1 1 0 0 1 1 0 1 0 0   0 1 0 0 1 1 0 0 0 1
         0 0
         1 1 0 0 0 1 1 0 1 1 1 1 1 … 0 1 0 0 1 1 0 0 0 1
         0 0
         1 1 0 0 0 1 1 0 1 1 1 1 1   1 1 0 0 1 1 0 0 1 1
         1 1
         1 1 0 0 0 1 1 0 1 1 1 1 1   0 0 0 1 1 0 0 0 0 0
         0 0
         ⋮   ⋮   ⋮   ⋱ ⋮   ⋮   ⋮

         1 0 1 1 1 0 0 1 1 0 1 0 0 … 1 0 0 0 1 1 0 0 0 1
         0 0
         1 0 1 1 1 0 0 1 1 0 1 0 0   1 0 0 0 1 1 0 0 1 1
         0 0
         1 0 1 1 1 0 0 1 1 0 1 0 0   1 0 0 1 1 0 0 0 0 1
         0 0
         1 0 1 1 1 0 0 1 1 0 1 0 0   0 1 0 0 1 1 0 0 1 1
         0 0
         1 1 0 0 0 1 1 0 1 1 1 1 1   0 0 0 1 1 0 0 0 0 0
         0 0
         1 1 0 0 0 1 1 0 1 1 1 1 1 … 1 0 0 1 1 1 0 1 1 1
         0 0
         1 0 1 1 1 0 0 1 1 0 1 0 0   1 0 0 1 1 1 0 1 1 1
         0 0
         1 0 1 1 1 0 0 1 1 0 1 0 0   1 1 0 0 1 1 0 0 1 1
         0 1
         1 0 1 1 1 0 0 1 1 0 1 0 0   1 1 0 0 1 1 0 0 0 0
         1 0
         1 0 1 1 1 0 0 1 1 0 1 0 0   0 1 0 0 1 1 0 0 1 1
         1 1
         1 1 0 0 0 1 1 0 1 1 1 1 1 … 1 1 0 0 1 1 1 1 1 1
         1 1
         1 1 0 0 0 1 1 0 1 1 1 1 1   0 0 0 1 1 0 0 0 0 0
         0 0
```

```
In [59]: corCleanCh = cor(CleanCh)
         nRows    = size(corCleanCh,1)
```

Out[59]: 16442

```
In [60]: LDMat    = zeros(nRows-1,200);
```

```
In [61]: for i = 1:(nRows-200)
             LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
         end
```

```
In [62]: y = mean(LDMat,1)
         sort(y,2)
```

Out[62]: 1x200 Array{Float64,2}:
          0.039628 0.0398073 0.0398436 0.0398708 … 0.423859 0.473081 0.5415
         44

```
In [63]: plot(x=(1:200)/200*5,y=y)
```

Out[63]: