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

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

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

CleanCh11

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

Out[4]: 1442x29060 Array{Int64,2}:
```
1  0  1  0  0  0  0  1  0  0  1  0  0  …  0  1  1  1  0  0  1  1  0  1
1  1
1  0  1  0  0  0  0  1  1  0  1  0  0     0  1  1  1  0  0  1  1  0  1
1  1
1  0  1  0  0  0  0  1  1  0  1  0  0     0  0  1  1  1  1  1  0  1  0
1  1
1  1  1  0  0  1  1  0  0  0  1  0  0     1  1  0  0  1  0  0  1  0  0
1  1
1  0  0  0  1  1  0  0  1  0  1  0  0     0  0  1  1  1  1  1  0  1  0
1  0
1  1  1  0  1  1  1  1  0  1  0  1  1  …  1  1  0  0  1  0  0  1  0  0
1  1
1  1  1  0  1  1  0  1  0  0  1  0  1     1  1  0  0  1  0  0  1  0  0
1  0
1  1  1  0  1  1  1  0  0  0  1  0  1     0  1  1  1  0  0  1  1  0  1
1  1
1  0  0  0  1  1  0  0  1  0  1  0  0     0  1  1  1  0  0  1  1  0  1
1  0
1  0  1  0  0  0  0  1  1  0  1  0  0     0  1  1  1  0  0  1  1  0  1
1  1
1  1  1  0  1  1  0  1  1  0  1  0  0  …  1  1  0  0  1  0  0  1  0  0
1  1
1  1  1  0  1  1  1  0  1  0  1  0  0     1  1  0  0  1  0  0  1  0  0
1  1
0  0  1  0  1  1  0  0  1  0  1  0  0     1  1  0  0  1  0  0  1  0  0
1  1
⋮              ⋮                    ⋮           ⋱         ⋮                    ⋮
1  0  0  1  1  1  1  1  0  1  0  1  1  …  0  1  1  1  0  0  1  1  0  1
1  0
1  0  1  0  1  1  0  1  1  0  1  0  0     1  1  0  0  1  0  0  1  0  0
1  0
1  0  1  0  0  0  0  1  0  0  1  0  0     1  1  0  0  1  0  0  1  0  0
1  0
1  1  1  0  0  0  0  0  1  0  1  0  0     1  1  0  0  1  0  0  1  0  0
1  0
1  0  0  1  1  1  1  1  0  1  0  1  1     1  1  0  0  1  0  0  1  0  0
1  1
1  1  1  0  0  0  0  0  1  0  1  0  0  …  1  1  0  0  1  0  0  1  0  0
0  1
1  0  1  0  0  0  0  1  1  0  1  0  0     1  1  0  0  1  0  0  1  0  0
1  1
1  1  1  0  0  1  1  0  0  0  1  0  0     1  1  0  0  1  0  0  1  0  0
1  0
1  0  1  0  0  0  0  1  1  0  1  0  0     1  1  0  0  1  0  0  1  0  0
1  1
1  1  1  0  0  0  0  0  1  0  1  0  0     1  1  0  0  1  0  0  1  0  0
1  1
1  0  1  0  0  0  0  1  1  0  1  0  0  …  1  1  0  0  1  0  0  1  0  0
1  0
1  1  1  0  0  1  1  0  0  0  1  0  0     1  1  0  0  1  0  0  1  0  0
1  1
```

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

Out[5]: 29060

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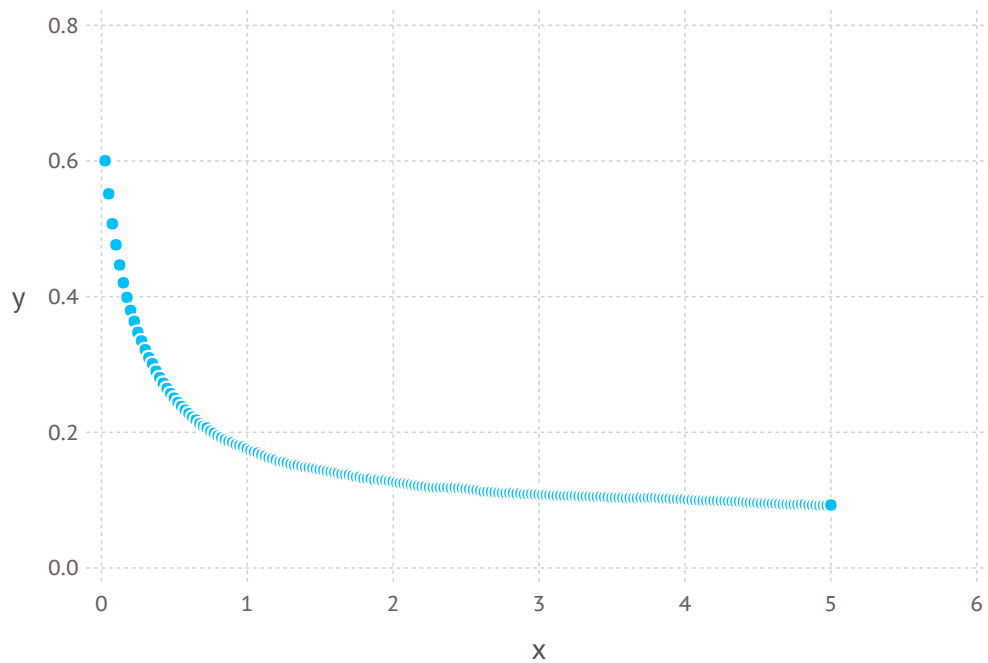
```
In [7]: for i = 1:(nRows-200)
            LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
        end
```

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

Out[8]: 1x200 Array{Float64,2}:
         0.0922364 0.0922795 0.0924761 0.0925023 … 0.507358 0.551545 0.600
        32

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

Out[9]:

CleanCh12

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

```
Out[10]: 1442x22780 Array{Int64,2}:
         0  1  1  1  1  1  1  1  0  1  0  0  0  …  0  1  1  0  1  0  0  1  1  0
         0  1
         1  0  0  0  1  1  0  0  1  1  1  1  1     0  1  1  0  1  0  0  1  1  0
         0  1
         0  1  1  1  1  1  1  1  0  1  0  0  0     1  1  1  1  0  0  1  1  0  1
         1  1
         1  0  0  0  1  1  0  1  1  1  1  1  1     0  1  1  0  1  0  0  1  1  0
         0  1
         0  1  1  1  1  1  1  1  0  0  0  0  0     1  1  1  1  1  0  1  1  0  1
         1  0
         1  0  0  0  1  1  0  1  1  1  1  1  1  …  1  1  0  1  0  0  1  1  0  1
         1  1
         1  0  0  0  1  1  0  0  1  1  1  1  1     1  0  1  1  0  1  1  0  0  1
         1  1
         1  0  0  0  1  1  0  1  1  1  1  1  1     1  0  1  1  0  1  1  0  0  1
         1  1
         1  0  0  1  0  0  1  1  1  1  1  1  0     1  1  0  1  0  0  1  1  0  1
         1  1
         1  0  0  1  0  0  1  1  1  1  1  1  0     1  1  0  1  0  0  1  1  0  1
         1  0
         0  1  1  1  1  1  1  1  0  0  0  0  0  …  0  1  1  0  1  0  0  1  1  0
         0  1
         1  0  0  0  1  1  0  1  1  1  1  1  1     1  1  1  1  0  0  1  1  0  1
         1  1
         0  1  1  1  1  1  1  1  0  1  0  0  0     0  1  1  0  1  0  0  1  1  0
         0  1
         ⋮              ⋮              ⋮        ⋱        ⋮              ⋮

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

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

Out[11]: 22780

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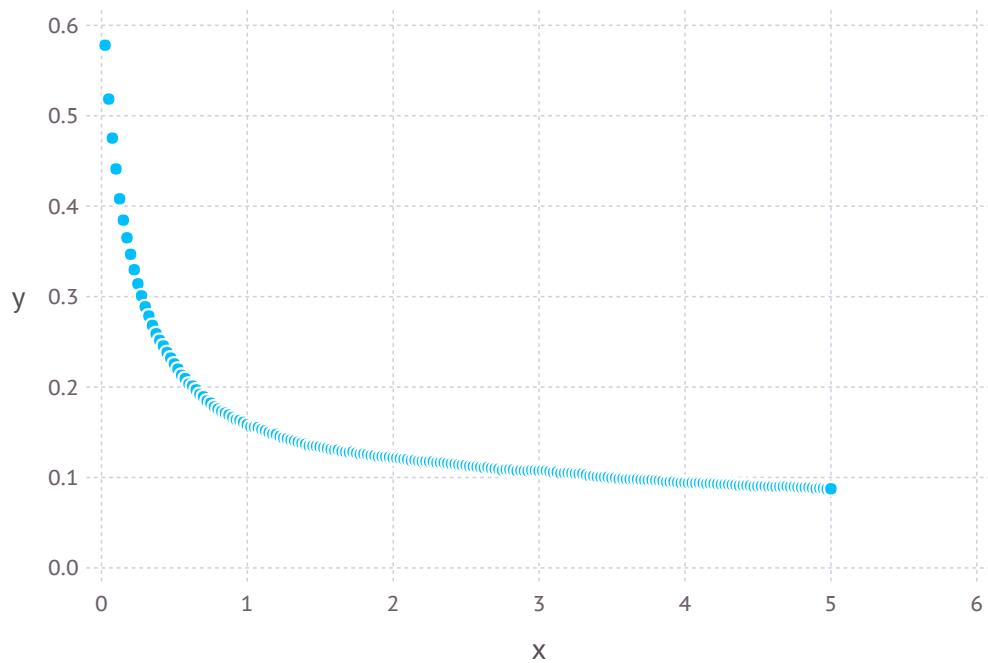
```
In [13]: for i = 1:(nRows-200)
             LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
         end
```

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

Out[14]: 1x200 Array{Float64,2}:
          0.0873302 0.0875593 0.0875739 0.0879958 … 0.475234 0.518398 0.578
         007

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

Out[15]:

CleanCh13

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

Out[16]: 1442x18198 Array{Int64,2}:
```
0  0  1  1  1  1  1  0  0  1  0  0  1  …  1  1  0  0  0  1  0  1  0  1
1  1
0  0  1  1  1  1  1  0  0  1  0  0  1     1  1  0  0  0  1  0  1  0  1
1  1
0  0  1  1  1  1  1  0  0  1  0  0  1     0  0  0  0  0  1  0  1  0  1
1  1
0  0  1  1  1  1  1  0  0  1  0  0  1     0  0  0  0  0  1  0  1  0  1
1  1
0  0  1  1  1  1  1  0  0  1  0  0  1     0  1  0  0  1  1  0  1  0  1
1  1
0  1  0  0  0  0  0  1  1  0  1  1  0  …  0  1  0  0  1  1  0  1  0  1
1  1
0  0  1  1  1  1  1  0  0  1  0  0  1     1  1  1  1  1  1  0  0  0  1
1  1
0  0  1  1  1  1  1  0  0  1  0  0  1     1  1  0  1  1  1  0  0  0  0
1  0
0  0  1  1  1  1  1  0  0  1  0  0  1     1  1  1  1  1  1  0  0  0  1
1  1
0  0  1  1  1  1  1  0  0  1  0  0  1     1  1  0  0  1  1  0  1  0  1
1  1
0  0  1  1  1  1  1  0  0  1  0  0  1  …  1  1  0  0  1  1  0  1  0  1
1  1
0  1  0  0  0  0  0  1  1  0  1  1  0     1  1  1  0  1  0  0  1  1  1
1  0
0  0  1  1  1  1  1  0  0  1  0  0  1     1  1  1  1  1  1  0  0  0  0
0  0
⋮                 ⋮                 ⋮           ⋱                 ⋮                 ⋮

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

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

Out[17]: 18198

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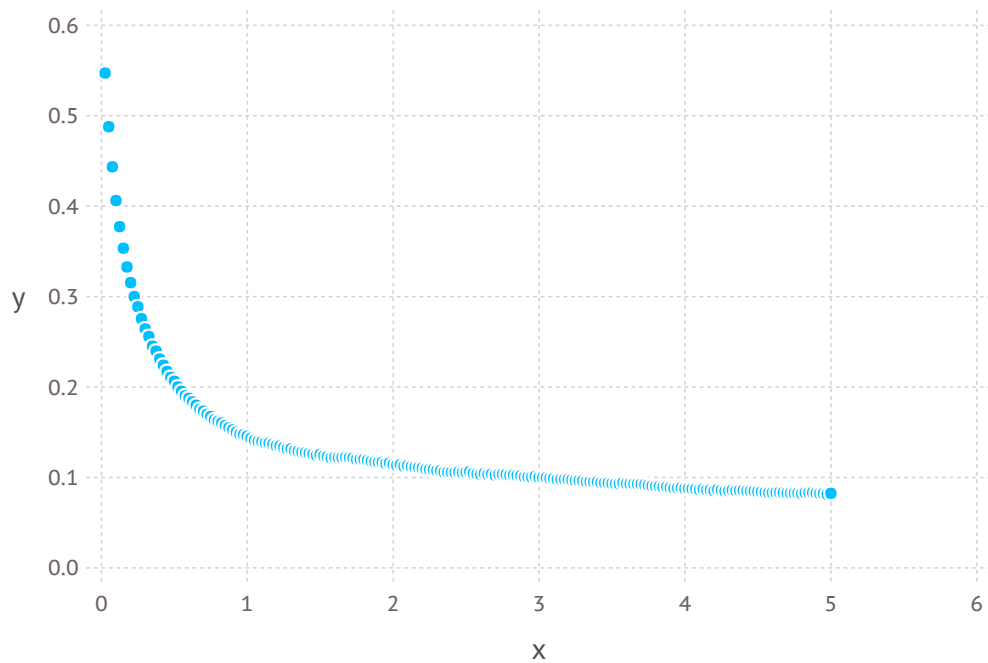
```
In [19]:  for i = 1:(nRows-200)
              LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
          end
```

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

Out[20]: 1x200 Array{Float64,2}:
           0.081483 0.0821583 0.0822103 0.0823036 … 0.443552 0.487913 0.5472
          19

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

Out[21]:

CleanCh14

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

```
Out[22]: 1442x18715 Array{Int64,2}:
         1  0  0  0  1  1  1  1  0  0  0  0  0  …  1  0  1  1  1  1  0  0  1  1
         0  1
         1  1  1  1  1  1  1  1  0  0  0  1  1     0  1  1  0  0  0  1  1  0  1
         1  0
         0  0  0  0  1  1  0  0  1  1  1  0  1     1  0  1  1  1  1  0  0  1  1
         0  1
         1  1  0  0  1  1  0  0  1  1  1  0  1     1  0  1  1  1  1  0  0  1  1
         1  1
         1  0  0  0  1  0  1  1  0  0  0  0  1     1  0  0  1  1  1  0  0  0  1
         1  1
         1  1  1  1  1  1  1  1  0  0  0  1  1  …  0  0  0  1  1  1  0  0  0  1
         1  0
         1  0  0  0  1  0  1  1  0  1  0  0  0     1  0  0  1  1  1  0  0  0  1
         1  1
         1  1  0  0  1  1  1  1  0  0  0  1  1     0  1  1  0  0  0  1  1  0  1
         1  0
         0  1  0  0  0  1  1  1  0  0  0  1  1     1  0  1  1  1  1  0  0  1  1
         1  1
         1  1  1  1  1  1  0  0  1  1  1  0  1     1  0  0  1  1  1  0  0  0  1
         1  1
         1  1  0  0  1  1  0  0  1  1  1  0  1  …  0  0  1  1  1  1  0  0  0  1
         1  0
         1  1  1  1  1  0  1  1  0  1  0  0  0     1  0  1  1  1  1  0  0  1  1
         1  1
         1  1  1  1  1  1  0  0  1  1  1  0  1     1  0  1  1  1  1  0  0  1  1
         1  1
         ⋮              ⋮              ⋮         ⋱         ⋮                 ⋮

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

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

Out[23]: 18715

```
In [24]: LDMat   = zeros(nRows-1,200);
```
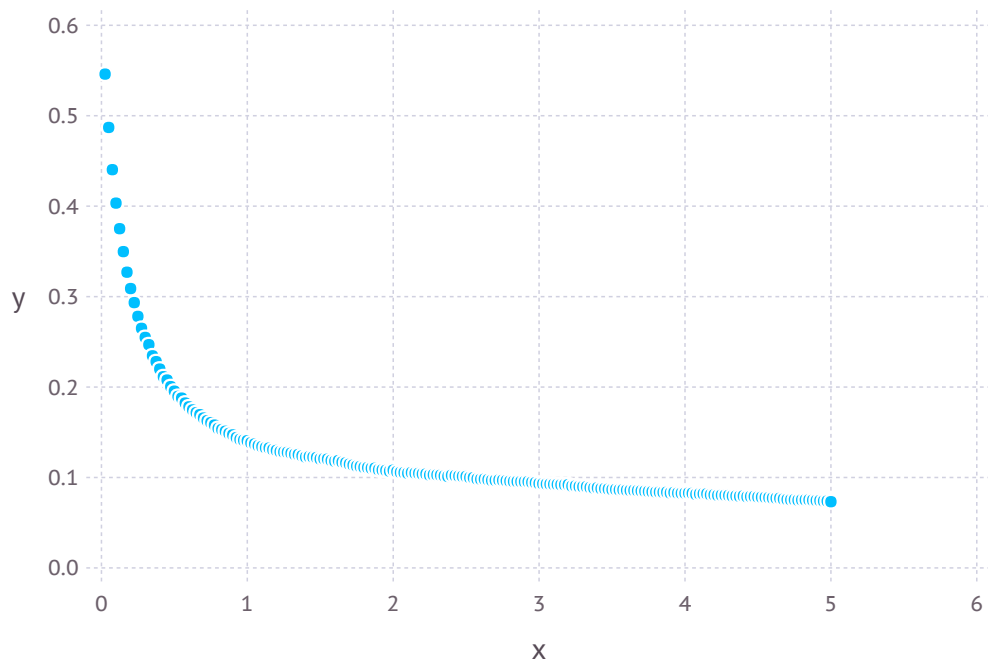
```
In [25]: for i = 1:(nRows-200)
             LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
         end
```

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

Out[26]: 1x200 Array{Float64,2}:
          0.0732514 0.0740301 0.0740335 0.0744739 … 0.440337 0.487091 0.546
         076

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

Out[27]:

CleanCh15

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

Out[64]: 1442x22002 Array{Int64,2}:
```
 0  1  1  0  1  1  1  1  0  0  1  0  1  …  1  1  1  0  0  0  0  1  1  0
 1  0
 1  1  1  0  1  1  1  1  0  0  1  0  1     0  0  0  1  1  1  1  0  0  0
 0  1
 0  0  1  0  1  1  1  1  0  0  1  0  1     0  0  0  1  1  1  1  0  0  0
 0  1
 1  1  0  1  0  0  0  0  1  1  0  1  1     0  0  0  1  1  1  1  0  0  0
 0  1
 1  1  0  1  0  0  0  0  1  1  0  1  0     0  0  0  1  1  1  0  0  0  0
 0  1
 1  1  0  1  0  0  0  0  1  1  0  1  0  …  1  1  1  0  0  0  0  1  1  0
 1  0
 1  1  0  1  0  0  0  0  1  1  0  1  0     0  0  0  1  1  1  1  0  0  0
 0  1
 1  1  0  1  0  0  0  0  1  1  0  1  0     0  0  0  1  1  1  0  0  0  0
 0  1
 1  1  0  1  0  0  0  0  1  1  0  1  0     1  1  1  0  0  0  0  1  1  1
 1  0
 1  1  0  1  0  0  0  0  1  1  0  1  0     0  0  0  1  1  1  1  0  0  0
 0  1
 0  0  1  0  1  1  1  1  0  0  1  0  1  …  0  0  0  1  1  1  0  0  0  0
 0  1
 0  0  1  0  1  1  1  1  0  0  1  0  1     0  0  0  1  1  1  1  0  0  0
 0  1
 0  0  1  0  1  1  1  1  0  0  0  0  1     0  0  0  1  1  1  1  0  0  0
 1  1
 ⋮              ⋮              ⋮      ⋱  ⋮              ⋮              ⋮
 0  0  1  0  1  1  1  1  0  0  1  0  1  …  1  1  1  0  1  1  0  1  1  1
 1  0
 1  1  1  1  1  0  0  1  1  1  0  1  1     0  0  0  1  1  1  1  0  0  0
 0  1
 1  1  0  1  0  0  0  0  1  1  0  1  0     1  1  1  0  1  1  0  1  1  1
 1  0
 1  1  1  1  1  0  0  1  1  1  0  1  0     0  0  0  1  1  1  1  0  0  0
 0  1
 0  0  1  0  1  1  1  1  0  0  1  0  1     0  0  0  1  1  1  1  0  0  0
 0  1
 1  1  0  1  0  0  0  0  1  1  0  1  0  …  1  1  1  0  1  1  0  1  1  1
 1  0
 0  0  1  0  1  1  1  1  0  0  0  0  1     0  0  0  1  1  1  0  0  0  0
 0  1
 0  0  1  0  1  1  1  1  0  0  1  0  1     0  0  0  1  1  1  1  0  0  0
 0  1
 0  0  1  0  1  1  1  1  0  0  1  0  1     1  1  1  0  1  1  1  1  1  1
 1  0
 1  1  0  1  0  0  0  0  1  1  0  1  0     1  1  1  0  1  1  0  1  1  1
 1  0
 1  1  0  1  0  0  0  0  1  1  0  1  0  …  0  0  0  1  1  1  1  0  0  0
 0  1
 1  1  0  1  0  0  0  0  1  1  0  1  0     0  0  0  1  1  1  0  0  0  0
 0  1
```

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

Out[65]: 22002

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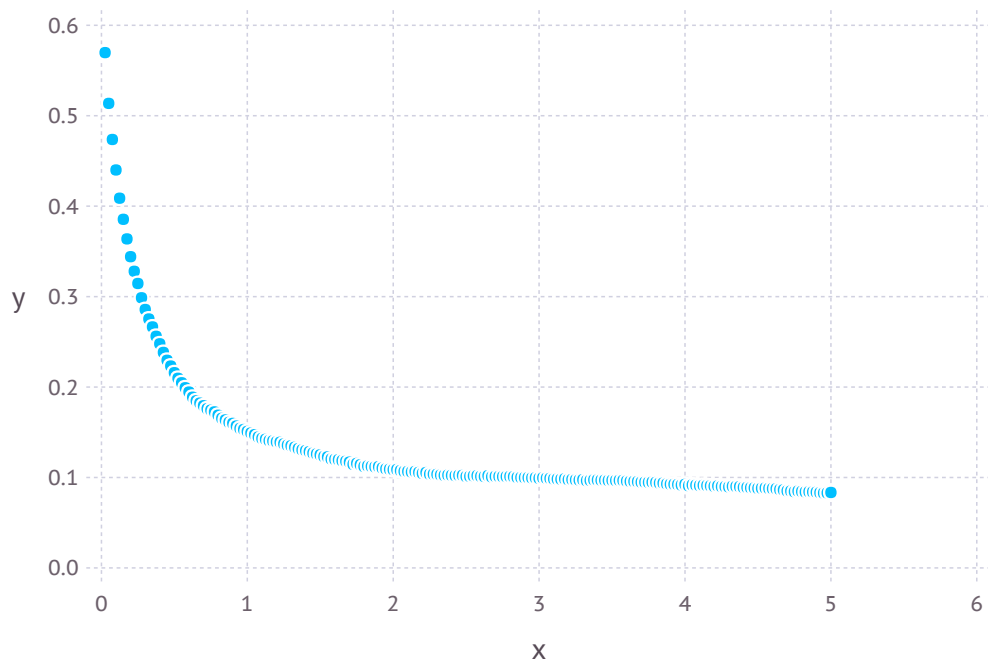
```
In [67]: for i = 1:(nRows-200)
             LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
         end
```

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

Out[68]: 1x200 Array{Float64,2}:
          0.082781 0.0829554 0.0831801 0.0834397 … 0.473712 0.513691 0.5697
         84

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

Out[69]:

CleanCh16

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

Out[34]: 1442x21259 Array{Int64,2}:
```
 0  1  1  0  1  1  1  1  1  0  1  1  1  …  1  1  0  0  1  1  0  1  0  1
 0  1
 1  0  1  1  1  0  0  0  0  1  1  1  0     1  1  0  0  1  1  0  1  0  1
 0  1
 1  0  1  1  1  0  0  0  0  1  1  1  0     1  1  0  0  1  0  1  0  1  1
 1  0
 1  0  1  1  1  0  0  0  0  1  1  1  0     0  1  0  0  1  0  0  1  0  0
 0  1
 0  1  1  1  0  1  0  1  1  1  1  1  1     0  1  0  0  1  0  0  1  0  1
 0  1
 1  0  1  1  1  0  0  0  0  1  1  1  0  …  1  1  0  0  1  0  1  1  0  1
 1  1
 0  1  1  0  1  1  1  1  1  0  1  1  1     0  1  0  0  1  0  0  1  0  0
 0  1
 1  0  1  1  1  0  0  0  0  1  1  1  0     1  1  0  0  1  0  1  0  1  1
 1  1
 0  1  0  1  0  1  0  1  1  1  0  1  1     1  1  0  0  1  1  0  1  0  1
 0  1
 1  0  1  1  1  0  0  0  0  1  1  1  0     1  0  1  1  0  0  1  1  0  1
 1  1
 0  1  1  1  0  1  0  1  1  1  1  1  1  …  1  1  0  0  1  0  1  0  1  1
 1  1
 1  0  1  1  1  0  0  0  0  1  1  1  0     1  0  1  1  0  0  0  1  0  0
 0  1
 1  0  1  1  1  0  0  0  0  1  1  1  0     1  1  1  1  1  1  0  1  0  1
 0  0
 ⋮              ⋮              ⋮        ⋱           ⋮              ⋮
 0  1  1  1  0  1  0  1  1  1  1  1  1  …  1  1  0  0  1  0  1  1  0  1
 1  0
 1  0  1  1  1  0  0  0  0  1  1  1  0     0  1  0  0  1  0  0  1  0  1
 0  1
 0  1  1  0  1  1  1  1  1  0  1  1  1     0  1  0  0  1  0  0  1  0  0
 0  1
 1  0  1  1  1  0  0  0  0  1  1  1  0     0  1  0  0  1  0  0  1  0  1
 0  1
 0  1  1  1  0  1  0  1  1  1  1  1  1     0  1  0  0  1  0  0  1  0  0
 0  1
 1  0  1  1  1  0  0  0  0  1  1  1  0  …  1  1  0  0  1  0  1  1  0  1
 1  0
 0  1  1  1  0  1  0  1  1  1  1  1  1     1  1  0  0  1  0  1  1  0  1
 1  1
 1  0  1  1  1  0  0  0  0  1  1  1  0     1  1  0  0  1  0  1  1  0  1
 1  1
 0  1  1  1  0  1  0  1  1  1  1  1  1     0  1  0  0  1  0  0  1  0  0
 0  1
 1  0  1  1  1  0  0  0  0  1  1  1  0     0  1  0  0  1  0  1  1  0  1
 1  0
 1  0  1  1  1  0  0  0  0  1  1  1  0  …  0  1  0  0  1  0  0  1  0  1
 0  1
 1  0  1  1  1  0  0  0  0  1  1  1  0     1  0  1  1  0  0  0  1  0  0
 0  1
```

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

Out[35]: 21259

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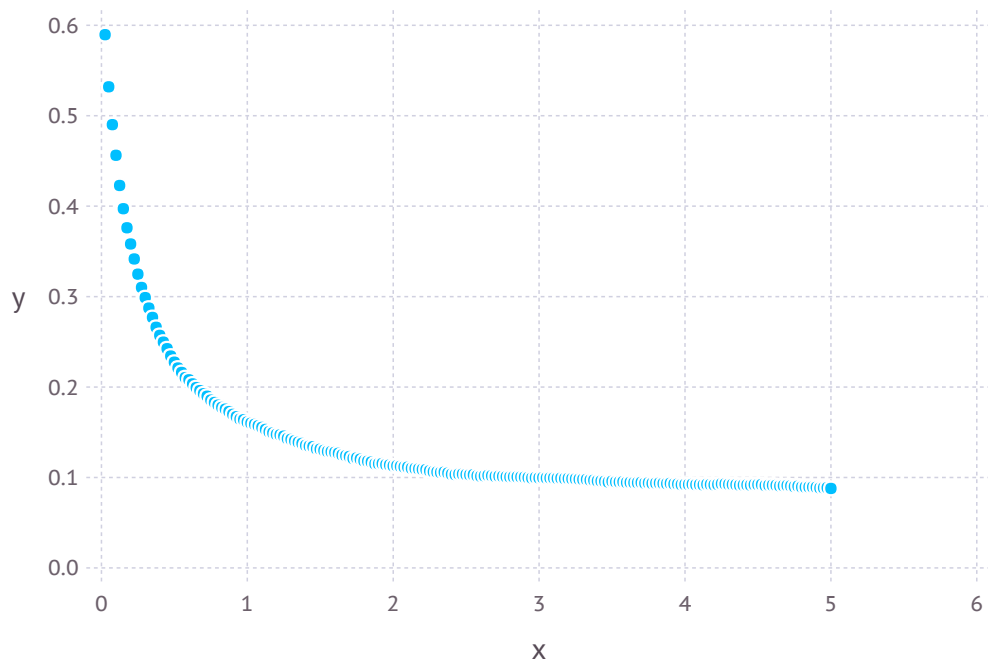
```
In [37]: for i = 1:(nRows-200)
             LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
         end
```

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

Out[38]: 1x200 Array{Float64,2}:
          0.0878546 0.0884237 0.0885186 0.0887595 … 0.490126 0.532004 0.589
         661

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

Out[39]:

CleanCh17

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

Out[40]: 1442x20102 Array{Int64,2}:
```
 0  1  1  1  1  1  0  1  1  1  0  0  1  …  1  1  1  0  0  1  0  0  0  0
 0  0
 0  1  1  1  1  1  1  0  1  0  1  1  0     0  1  1  0  1  0  1  1  0  0
 0  0
 0  1  1  1  1  1  0  1  1  1  0  0  1     0  1  1  0  1  0  1  1  0  0
 0  0
 1  0  1  0  1  1  0  1  1  1  0  0  1     1  1  1  0  0  1  0  0  0  0
 0  0
 0  1  1  1  1  1  0  1  1  1  0  0  1     1  1  1  0  0  1  0  0  0  0
 0  0
 1  0  0  0  1  1  1  0  1  0  1  1  0  …  0  1  1  0  1  1  1  1  0  0
 0  0
 0  1  1  1  1  1  0  1  1  1  0  0  1     0  1  1  0  1  1  1  1  0  0
 0  0
 1  0  0  0  0  0  0  1  0  1  0  0  1     0  0  0  1  1  0  1  1  1  0
 1  1
 1  0  0  0  1  1  0  1  1  1  0  0  1     1  1  1  0  0  1  0  0  0  0
 0  0
 1  0  1  0  1  1  0  1  1  1  0  0  1     1  1  1  0  0  1  0  0  0  0
 0  0
 0  1  1  1  1  1  0  1  1  1  0  0  1  …  0  0  0  1  1  0  1  1  1  0
 1  1
 1  0  0  0  0  0  0  1  0  1  0  0  1     0  1  1  0  1  1  1  1  0  0
 0  0
 0  1  1  1  1  1  0  1  1  1  0  0  1     0  1  1  0  1  1  1  1  0  0
 0  0
 ⋮              ⋮              ⋮        ⋱  ⋮              ⋮              ⋮

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

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

Out[41]: 20102

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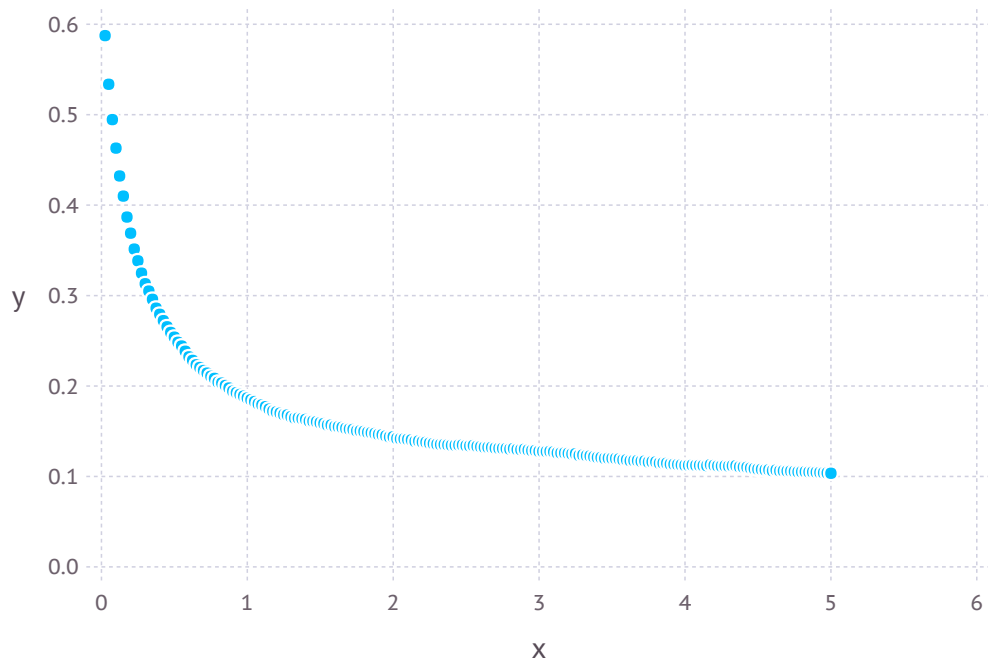
```
In [43]:  for i = 1:(nRows-200)
              LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
          end
```

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

Out[44]: 1x200 Array{Float64,2}:
           0.103575 0.103862 0.104027 0.104453 … 0.494609 0.533672 0.587453

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

Out[45]:

CleanCh18

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

Out[46]: 1442x17838 Array{Int64,2}:
```
 1  0  0  0  0  0  1  1  0  0  0  0  0  …  1  0  0  1  0  0  0  1  1  0
 1  1
 1  0  1  1  1  1  0  0  1  0  1  0  0     1  0  0  1  0  0  0  0  1  0
 1  1
 1  0  0  0  0  0  1  0  1  0  1  0  0     1  0  0  1  0  0  0  1  1  0
 1  1
 1  0  0  0  0  0  1  1  0  0  0  0  0     1  0  0  1  0  0  0  0  1  0
 1  1
 1  0  0  0  0  0  1  1  0  0  0  0  0     1  0  0  1  0  0  0  0  1  0
 1  1
 1  0  0  0  0  0  1  1  0  0  0  0  0  …  0  1  1  0  1  1  1  1  1  1
 0  0
 1  0  0  0  0  0  1  1  0  0  0  0  0     1  0  0  1  0  0  0  1  1  0
 1  1
 1  0  0  0  0  0  1  1  0  0  0  0  0     1  0  0  1  0  0  0  0  1  0
 1  1
 1  0  0  0  0  0  1  1  0  0  0  0  0     1  0  0  1  0  0  0  0  1  0
 1  1
 1  0  0  0  0  0  1  1  0  0  0  0  0     1  0  0  1  0  0  0  0  1  0
 1  1
 1  0  0  0  0  0  1  1  0  0  0  0  0  …  1  1  1  1  1  1  0  1  1  0
 1  1
 1  0  0  0  0  0  1  1  0  0  0  0  0     1  0  0  1  0  0  0  1  1  0
 1  1
 1  0  0  0  0  0  1  0  1  0  1  0  0     1  0  0  1  0  0  0  1  1  0
 1  1
 ⋮              ⋮              ⋮        ⋱           ⋮              ⋮
 0  1  1  1  1  1  0  0  1  0  1  0  0  …  1  0  0  1  0  0  0  1  1  0
 1  1
 1  0  0  0  0  0  1  0  1  0  1  0  0     1  0  0  1  0  0  0  0  1  0
 1  1
 1  0  0  0  0  0  1  0  1  0  1  0  0     1  0  0  1  0  0  0  1  1  0
 1  1
 1  0  0  0  0  0  1  1  0  0  0  0  0     1  0  0  1  0  0  0  1  1  0
 1  1
 0  1  1  1  1  1  0  0  1  0  1  0  0     0  1  1  0  1  1  1  1  1  1
 0  0
 1  0  0  0  0  0  1  1  0  0  0  0  0  …  1  0  0  1  0  0  0  1  1  0
 1  1
 1  0  0  0  0  0  1  1  0  0  0  0  0     1  0  0  1  0  0  0  0  1  0
 1  1
 1  0  0  0  0  0  1  1  0  0  0  0  0     1  0  0  1  0  0  0  1  1  0
 1  1
 1  0  0  0  0  0  1  1  0  0  0  0  0     1  0  0  1  0  0  0  1  1  0
 1  1
 1  0  0  0  0  0  1  1  0  0  0  0  0     0  1  1  0  1  1  1  1  1  1
 0  0
 0  1  1  1  1  1  0  0  1  0  1  0  0  …  1  0  1  1  0  1  0  1  1  1
 1  1
 1  0  0  0  0  0  1  0  1  0  1  0  0     1  0  0  1  0  0  0  1  1  0
 1  1
```

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

Out[47]: 17838

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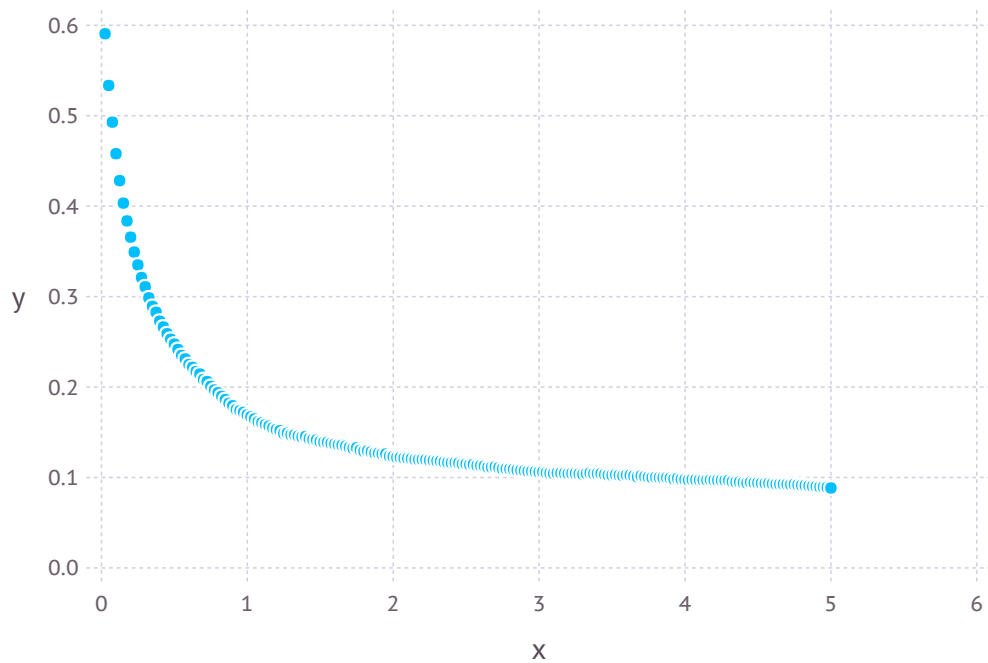
```
In [49]: for i = 1:(nRows-200)
             LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
         end
```

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

Out[50]: 1x200 Array{Float64,2}:
          0.0883728 0.0891494 0.0894617 0.0895811 … 0.492939 0.533483 0.590
         598

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

Out[51]:

CleanCh19

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

Out[52]: 1442x17439 Array{Int64,2}:
```
 0  1  0  0  1  1  1  1  1  1  1  0  1  …  0  1  1  1  0  1  1  0  0  0
 0  1
 0  1  1  1  1  0  0  1  0  1  1  0  0     0  1  1  1  0  1  0  0  0  0
 0  0
 0  0  1  1  0  0  0  0  0  0  1  0  0     1  0  0  0  1  0  1  1  1  1
 0  0
 0  1  1  1  1  0  0  1  0  1  1  0  0     1  0  0  0  1  0  1  1  1  1
 0  0
 0  0  1  1  0  0  0  0  0  0  1  0  0     1  0  0  0  1  0  1  1  1  1
 0  1
 0  1  0  0  1  1  1  1  1  1  1  0  1  …  1  0  0  0  1  0  1  1  1  1
 0  0
 0  1  0  0  1  1  1  1  1  1  1  0  1     1  0  0  0  1  0  1  1  1  1
 0  1
 0  1  1  1  1  0  0  1  0  1  1  0  0     0  1  1  1  0  1  1  0  0  0
 0  1
 0  1  1  1  1  0  0  1  0  1  1  0  0     0  1  1  1  0  1  1  0  0  0
 0  0
 0  1  1  1  1  0  0  1  0  1  1  0  0     0  1  1  1  0  1  1  0  0  0
 0  0
 0  0  1  1  0  0  0  0  0  0  1  0  0  …  1  0  0  0  1  0  1  1  1  1
 0  0
 0  1  1  1  1  0  0  1  0  1  1  0  0     1  0  0  0  1  0  1  1  1  1
 0  0
 0  0  1  1  0  0  0  0  0  0  1  0  0     1  1  0  0  1  0  0  1  1  0
 1  1
 ⋮              ⋮              ⋮           ⋱           ⋮              ⋮
 0  1  1  1  1  0  0  1  0  1  1  0  0  …  1  0  0  0  1  0  1  1  1  1
 0  0
 1  1  1  1  1  1  1  1  1  1  0  1  1     1  1  0  0  1  0  0  1  1  0
 1  1
 0  0  1  1  0  0  0  0  0  0  1  0  0     0  1  1  1  0  1  1  0  0  0
 0  0
 0  1  1  1  1  0  0  1  0  1  1  0  0     0  1  1  1  0  1  1  0  0  0
 0  1
 0  0  1  1  0  0  0  0  0  0  1  0  0     0  1  1  1  0  1  0  0  0  0
 0  0
 0  0  1  1  0  0  0  0  0  0  1  0  0  …  0  1  1  1  0  1  1  0  0  0
 0  0
 0  0  1  1  0  0  0  0  0  0  1  0  0     1  0  0  0  1  0  1  1  1  1
 0  0
 0  0  1  1  0  0  0  0  0  0  1  0  0     0  1  1  1  0  1  1  0  0  0
 0  1
 0  0  1  1  0  0  0  0  0  0  1  0  0     1  0  0  0  1  0  1  1  1  1
 0  0
 0  1  1  1  1  0  0  1  0  1  1  0  0     0  1  1  1  0  1  1  0  0  0
 0  1
 0  0  1  1  0  0  0  0  0  0  1  0  0  …  0  1  1  1  0  1  0  0  0  0
 0  0
 0  0  1  1  0  0  0  0  0  0  1  0  0     1  0  0  0  1  0  1  1  1  1
 0  0
```

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

Out[53]: 17439

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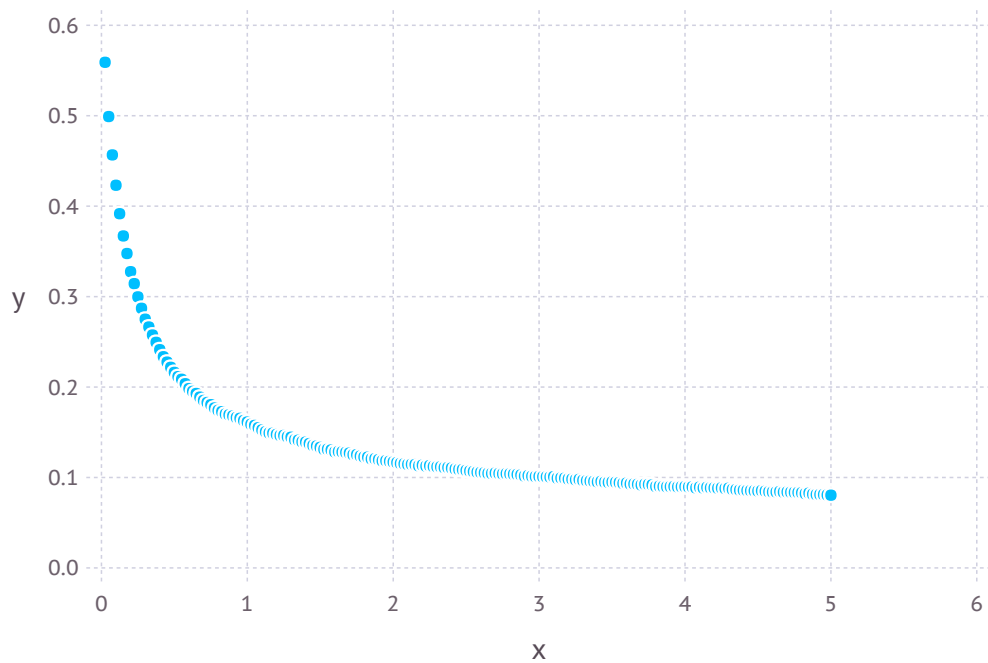
```
In [55]:  for i = 1:(nRows-200)
              LDMat[i,:] = corCleanCh[i,(i+1):(i+200)].^2
          end
```

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

Out[56]: 1x200 Array{Float64,2}:
           0.0804725 0.0807242 0.0810925 0.0811416 … 0.456653 0.499091 0.559
          078

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

Out[57]:

CleanCh20

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

Out[58]: 1442x19641 Array{Int64,2}:
```
 0  1  0  1  1  0  0  1  0  0  1  0  1  …  0  1  1  0  1  1  1  0  0  1
 0  0
 1  0  1  1  1  0  0  1  0  0  1  0  1     1  0  0  0  1  1  1  0  0  1
 0  0
 1  0  1  1  1  0  0  1  0  0  1  0  1     0  1  1  1  1  0  1  1  0  0
 1  1
 1  0  1  1  1  0  0  1  0  0  1  0  1     1  1  1  1  1  0  1  1  0  0
 1  1
 0  1  0  0  0  1  1  0  1  1  0  1  0     1  1  1  0  1  1  1  0  0  1
 0  0
 0  1  0  1  1  0  0  1  0  0  1  0  1  …  1  1  1  0  1  1  1  0  0  1
 0  0
 0  1  0  1  1  0  0  1  0  0  1  0  1     0  0  1  0  1  1  1  0  0  1
 0  0
 1  0  1  1  1  0  0  1  0  0  1  0  1     0  1  1  0  1  1  1  0  0  1
 0  0
 0  1  1  1  1  0  0  1  0  0  1  0  1     1  0  0  0  0  1  0  0  0  1
 0  0
 1  0  1  1  1  0  0  1  0  0  1  0  1     1  0  0  0  0  1  0  0  1  1
 0  0
 0  1  1  0  0  1  1  0  1  1  0  1  0  …  1  0  0  0  1  1  1  0  0  1
 0  0
 1  0  1  1  1  0  0  1  0  0  1  0  1     1  1  1  0  0  1  0  0  0  1
 0  0
 1  0  1  1  1  0  0  1  0  0  1  0  1     1  1  1  0  0  1  0  0  0  1
 0  0
 ⋮              ⋮              ⋮         ⋱     ⋮                    ⋮
   ⋮
 0  1  1  0  0  1  1  0  1  1  0  1  0  …  1  1  1  0  0  1  0  0  0  1
 0  0
 1  0  1  1  1  0  0  1  0  0  1  0  1     1  1  1  0  1  1  1  0  0  1
 0  0
 0  1  0  1  1  0  0  1  0  0  1  0  1     1  0  0  0  1  1  1  0  0  1
 0  0
 0  1  1  0  0  1  1  0  1  1  0  1  0     1  1  1  0  1  1  1  0  0  1
 0  0
 0  1  1  0  0  1  1  0  1  1  0  1  0     1  0  0  0  1  1  1  0  0  1
 0  0
 0  1  1  0  0  1  1  0  1  1  0  1  0  …  1  1  1  0  1  1  1  0  0  1
 0  0
 0  1  1  0  0  0  1  0  1  1  0  1  0     1  1  1  0  1  1  1  0  0  1
 0  0
 0  1  1  0  0  1  1  0  1  1  0  1  0     1  1  1  0  1  1  1  0  0  1
 0  0
 0  1  1  0  0  0  1  0  1  1  0  1  0     1  0  0  0  1  1  1  0  0  1
 0  0
 0  1  1  0  0  1  1  0  1  1  0  1  0     1  1  1  0  1  1  1  0  0  1
 0  0
 0  1  0  0  0  1  1  0  1  1  0  1  0  …  1  1  1  0  0  1  0  0  1  1
 0  0
 0  1  1  0  0  1  1  0  1  1  0  1  0     0  0  1  0  1  1  1  0  0  1
 0  0
```

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

Out[59]: 19641

```
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}:
         0.0997791 0.100347 0.100749 0.101396 … 0.496881 0.543091 0.595015

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

Out[63]: