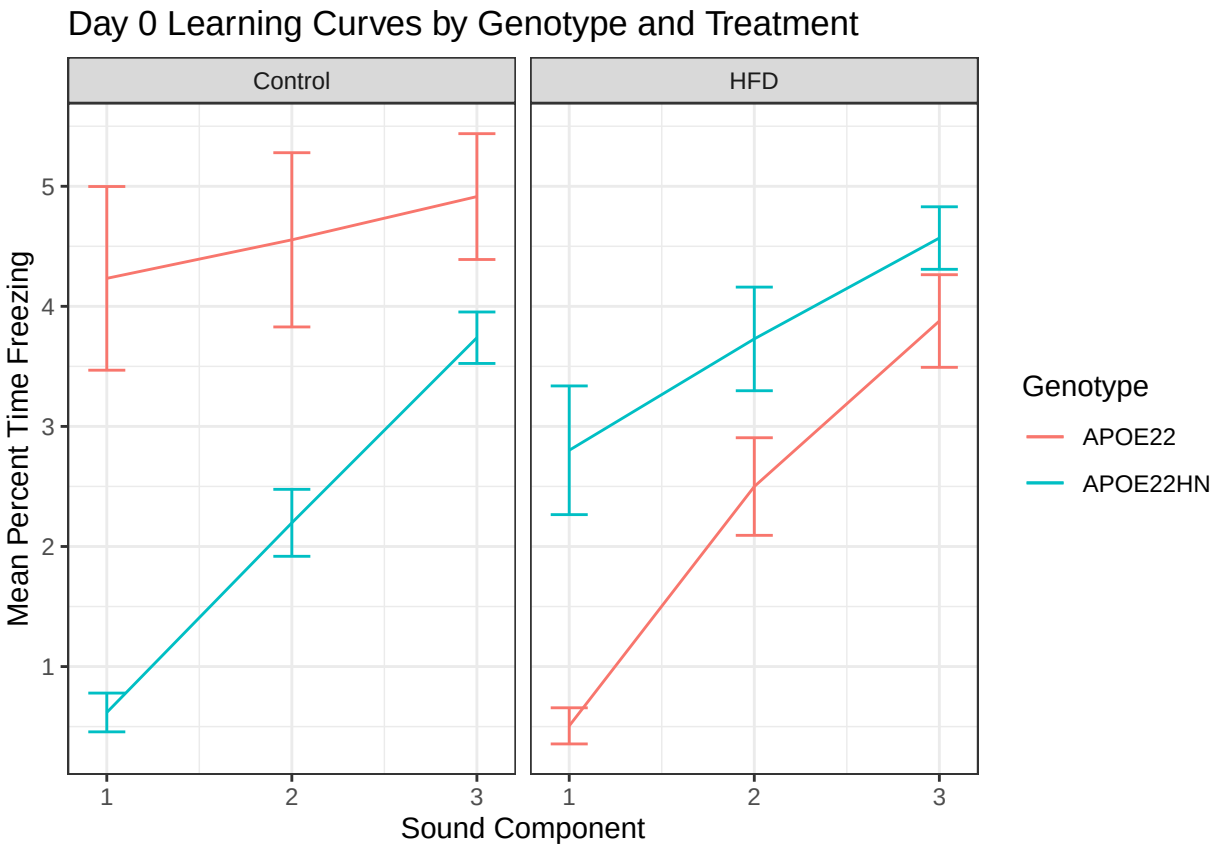
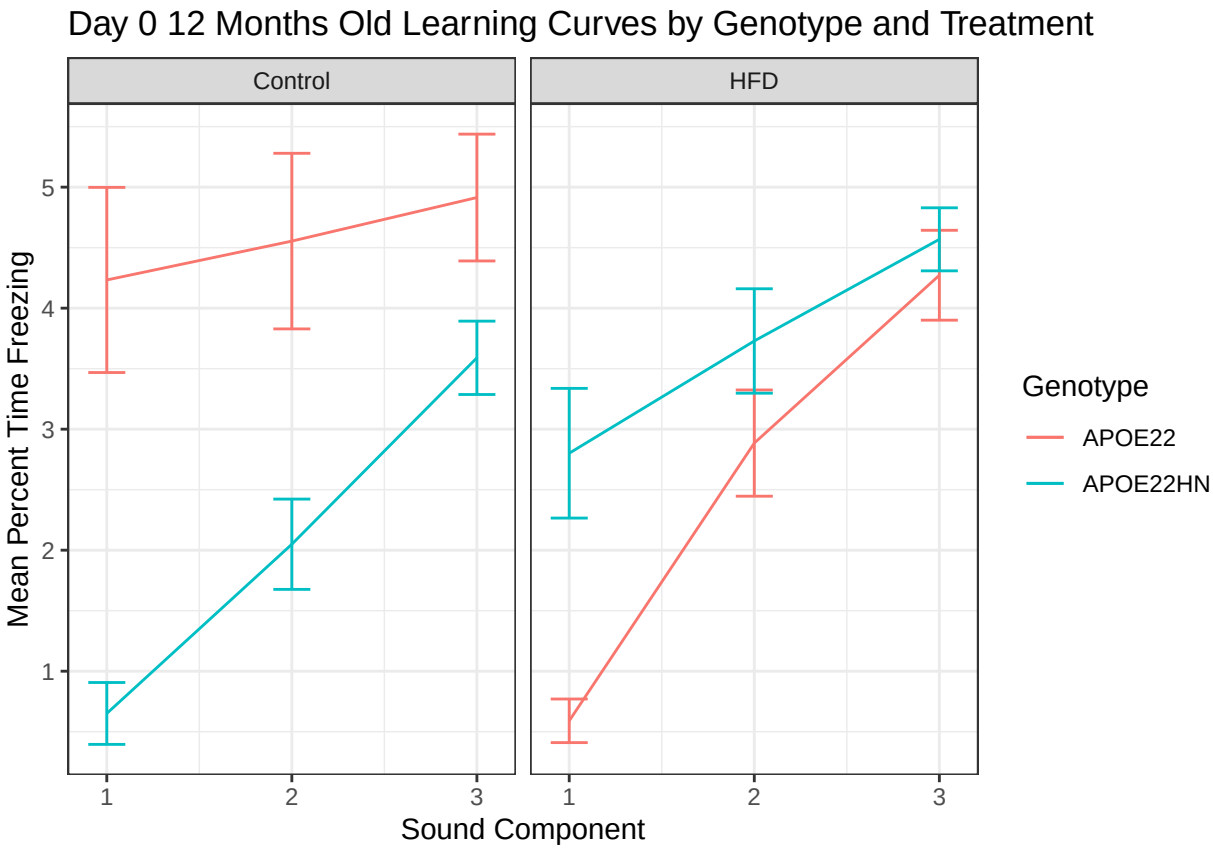
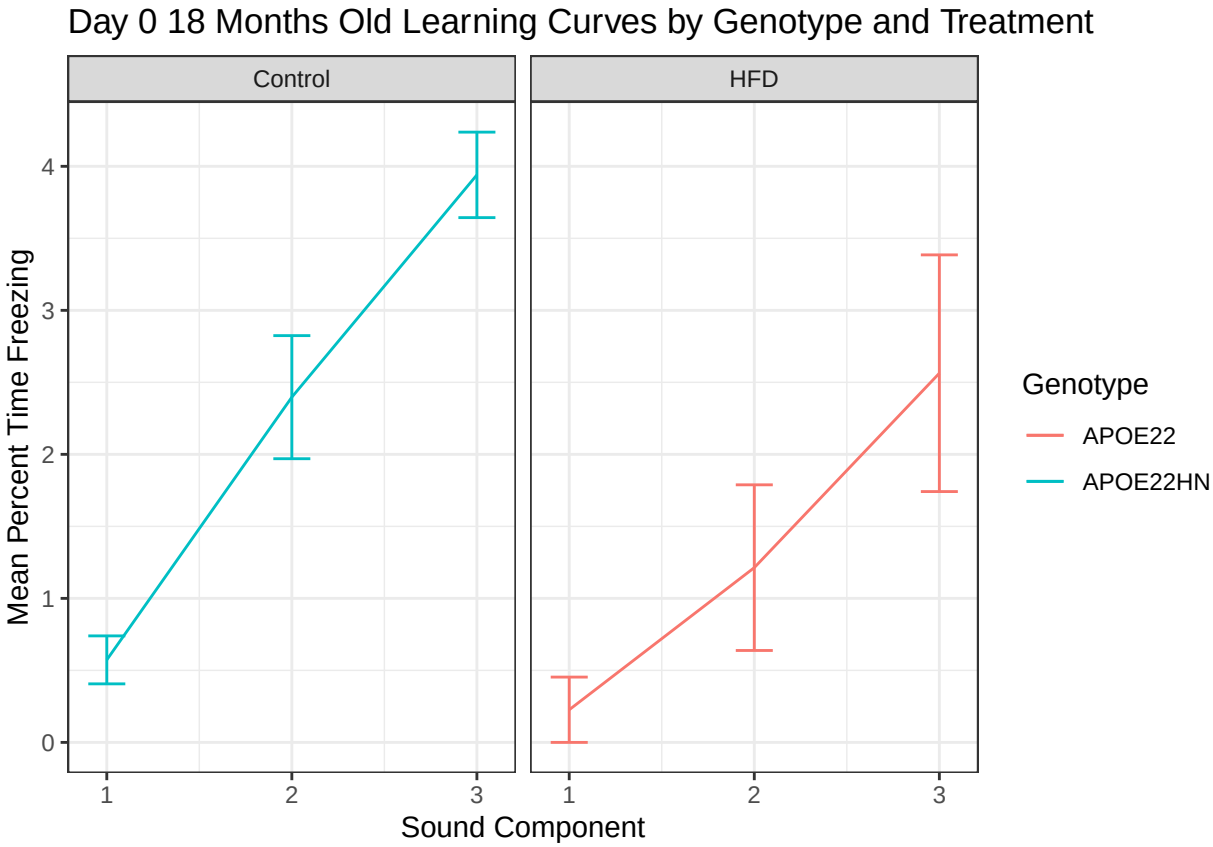
analysis

Daniel Jin

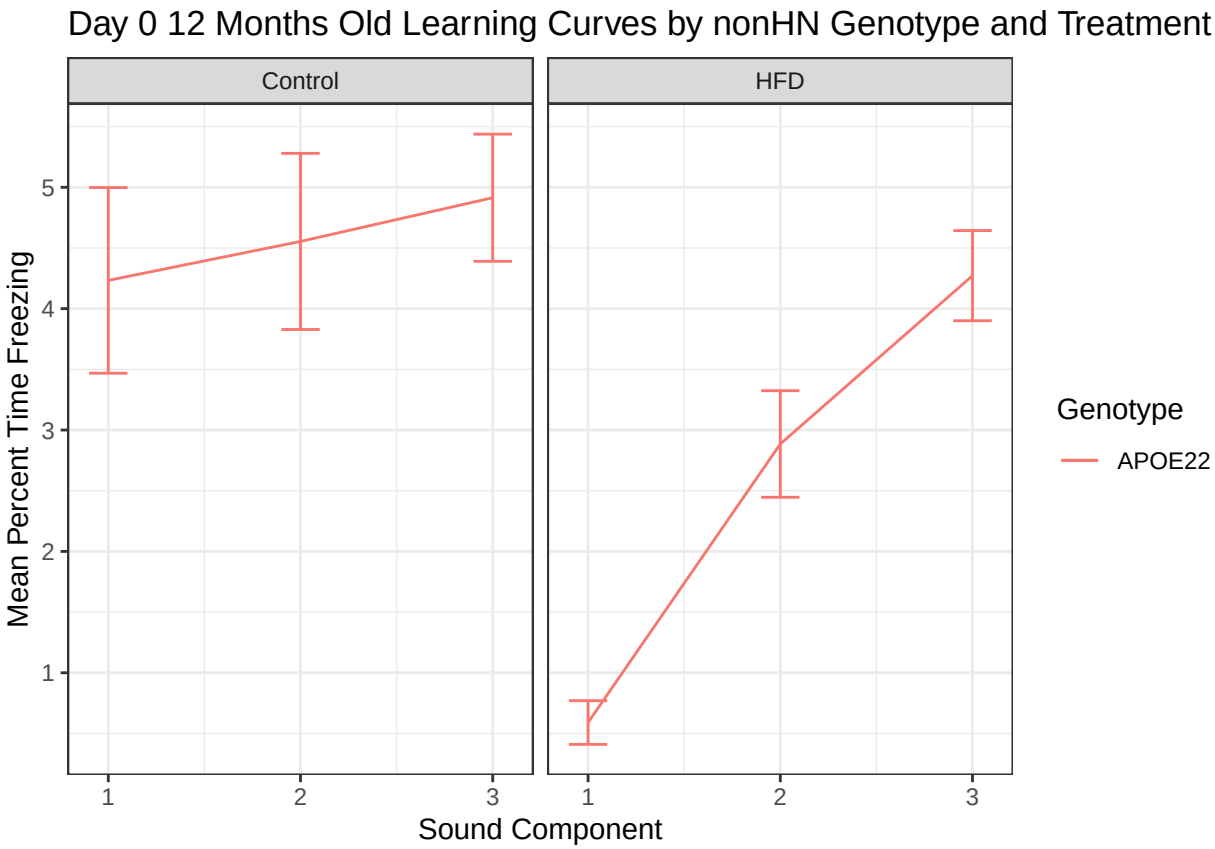
2022-08-01

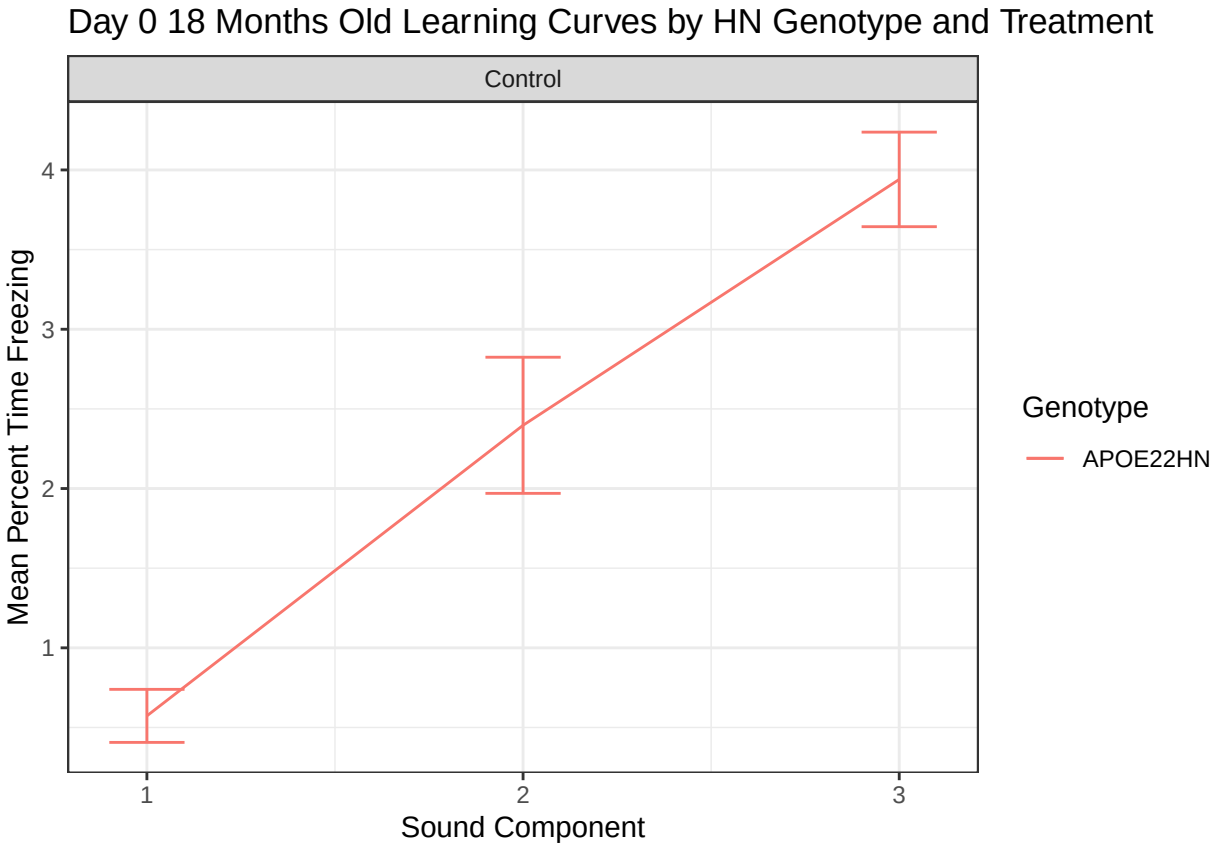


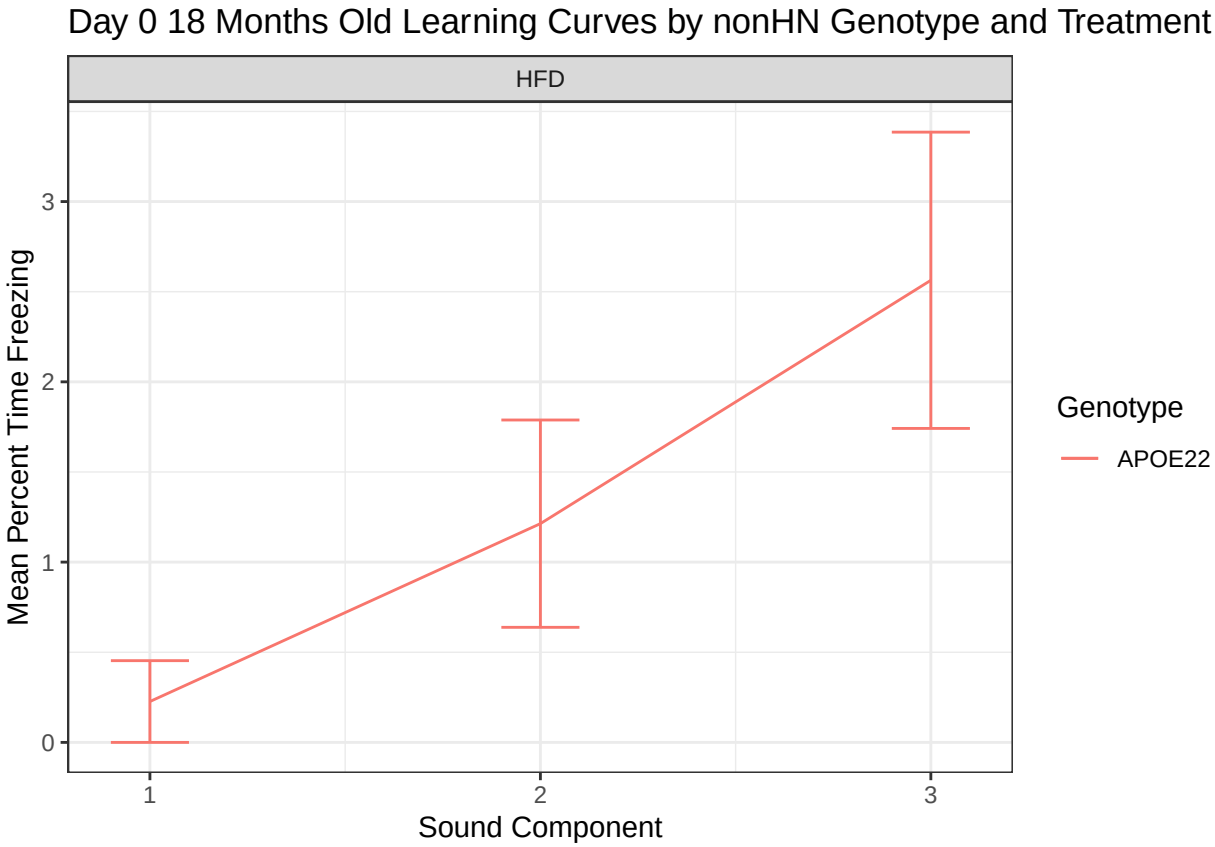

Day 0 12 Months Old Learning Curves by Genotype and Treatment
Control
HFD
Mean Percent Time Freezing
1
2
3
4
5
Sound Component
Genotype
APOE22
APOE22HN

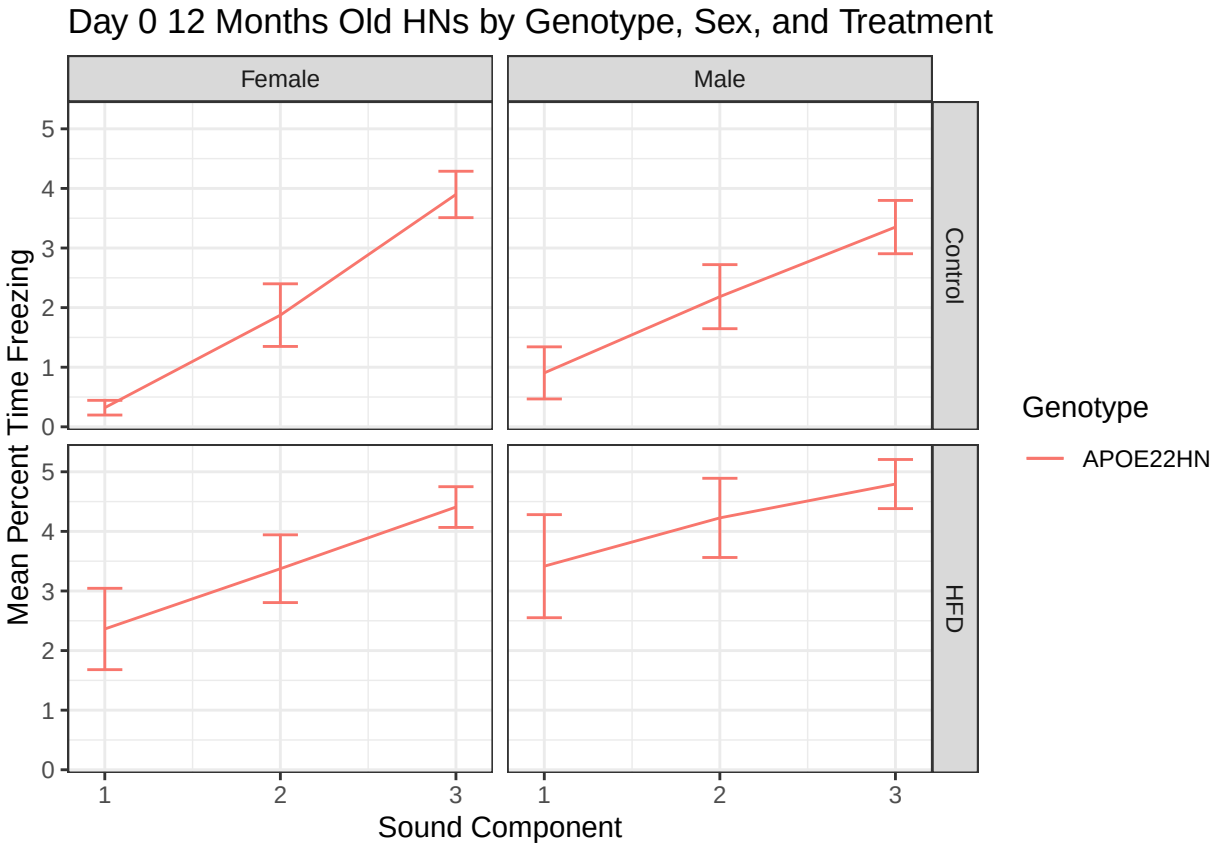

Day 0 18 Months Old Learning Curves by Genotype and Treatment
Control
HFD
Mean Percent Time Freezing
0
1
2
3
4
1
2
3
Sound Component
Genotype
APOE22
APOE22HN

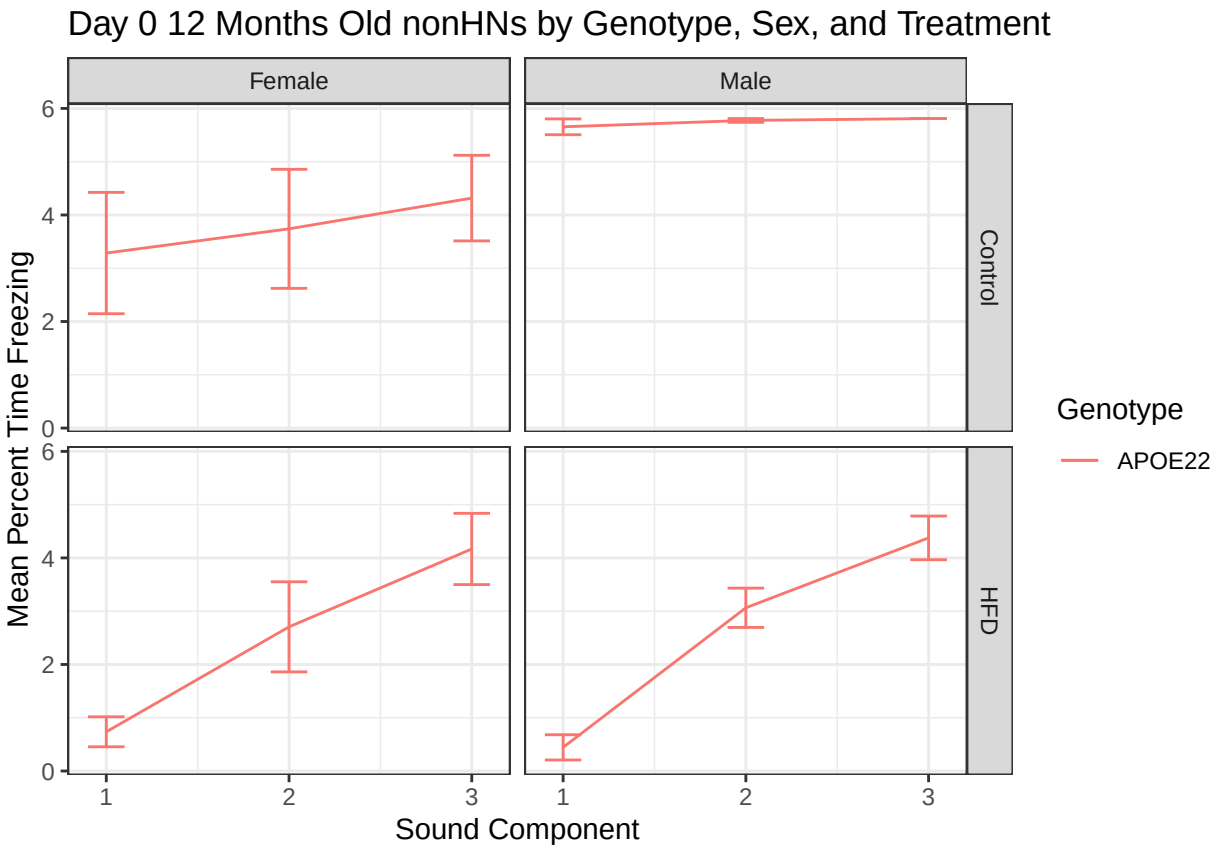

Day 0 12 Months Old Learning Curves by HN Genotype and Treatment
Control
HFD
Mean Percent Time Freezing
5
4
3
2
1
1
2
3
Sound Component
Genotype
APOE22HN


Day 0 12 Months Old Learning Curves by nonHN Genotype and Treatment
Control
HFD
Mean Percent Time Freezing
1
2
3
4
5
Sound Component
Genotype
APOE22

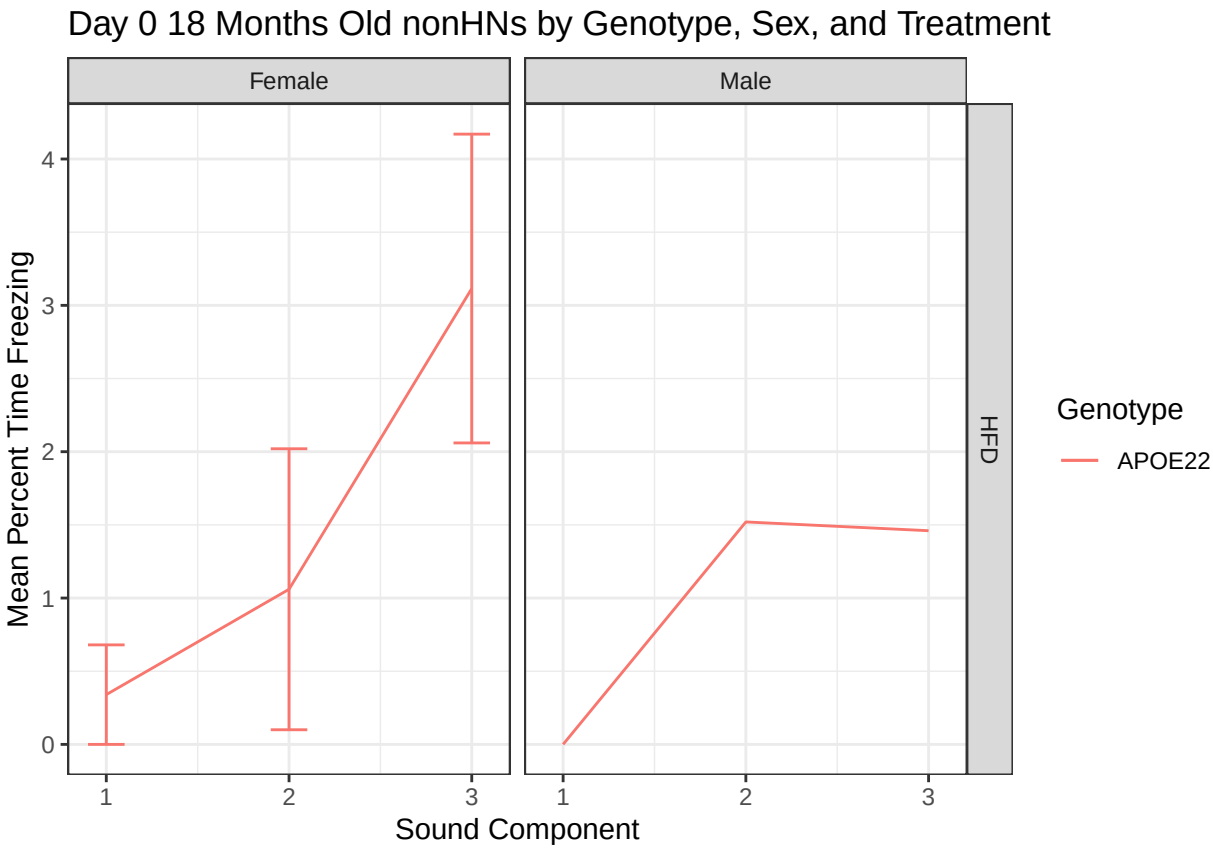

Day 0 18 Months Old Learning Curves by HN Genotype and Treatment
Control
Mean Percent Time Freezing
4
3
2
1
1
2
3
Sound Component
Genotype
APOE22HN

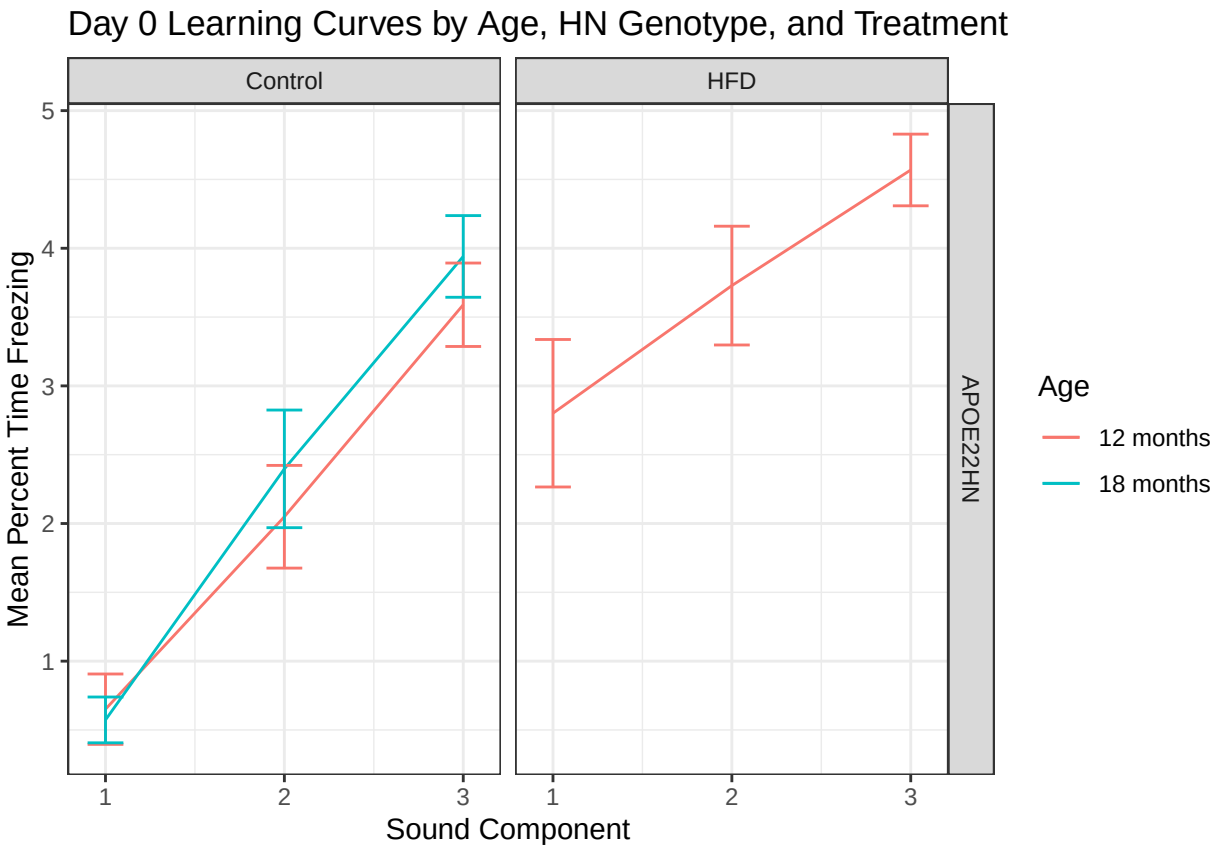

Day 0 18 Months Old Learning Curves by nonHN Genotype and Treatment
HFD
Mean Percent Time Freezing
0
1
2
3
1
2
3
Sound Component
Genotype
APOE22

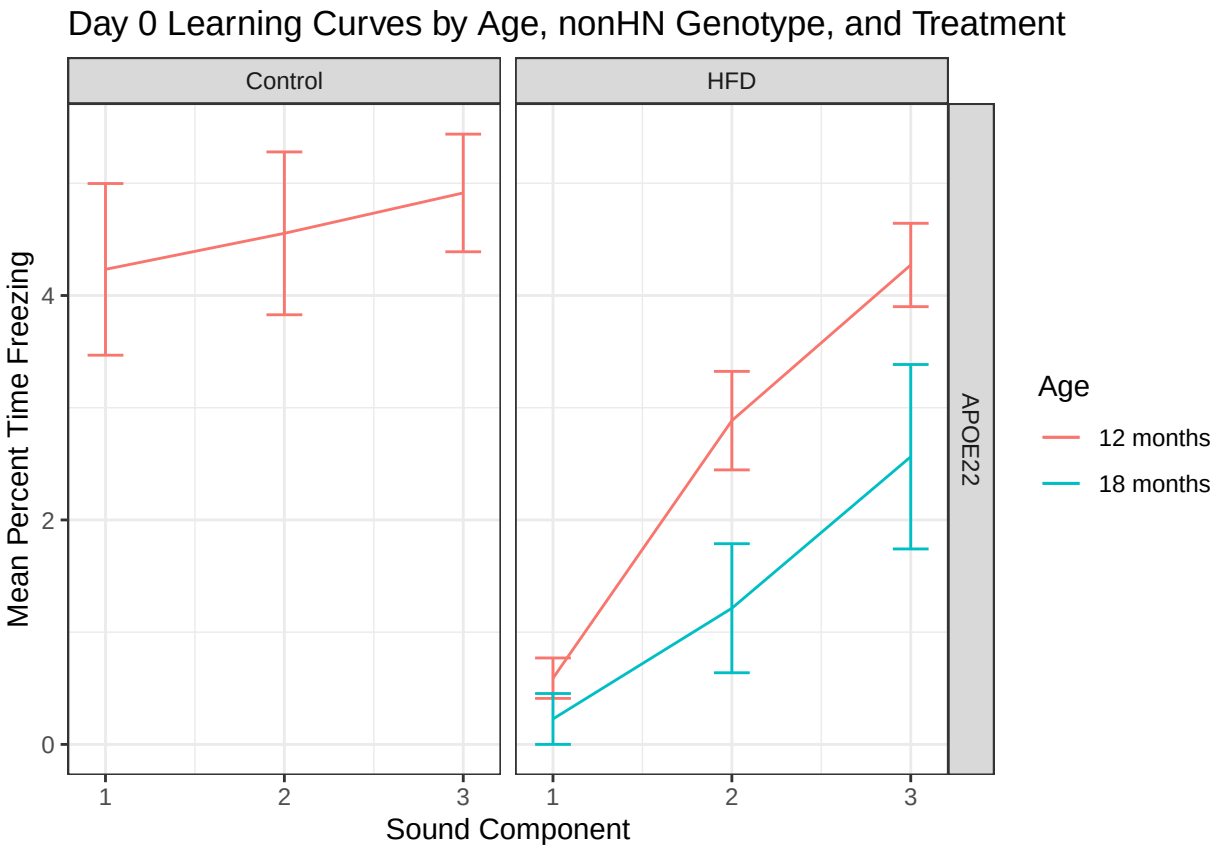

Day 0 12 Months Old HNs by Genotype, Sex, and Treatment
Female
Male
Control
HFD
Mean Percent Time Freezing
Sound Component
0
1
2
3
4
5
1
2
3
Genotype
APOE22HN

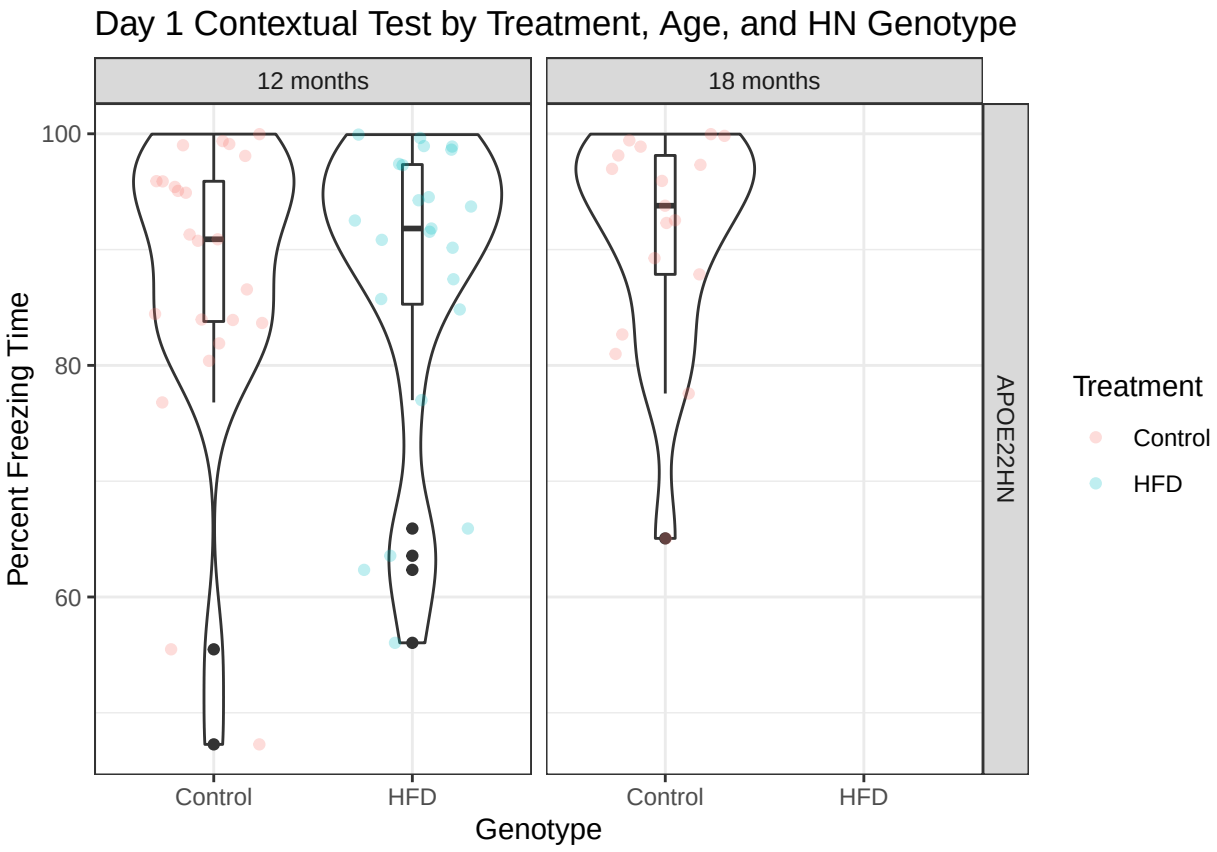

Day 0 12 Months Old nonHNs by Genotype, Sex, and Treatment
Female
Male
Control
HFD
Mean Percent Time Freezing
Sound Component
0
2
4
6
1
2
3
Genotype
APOE22

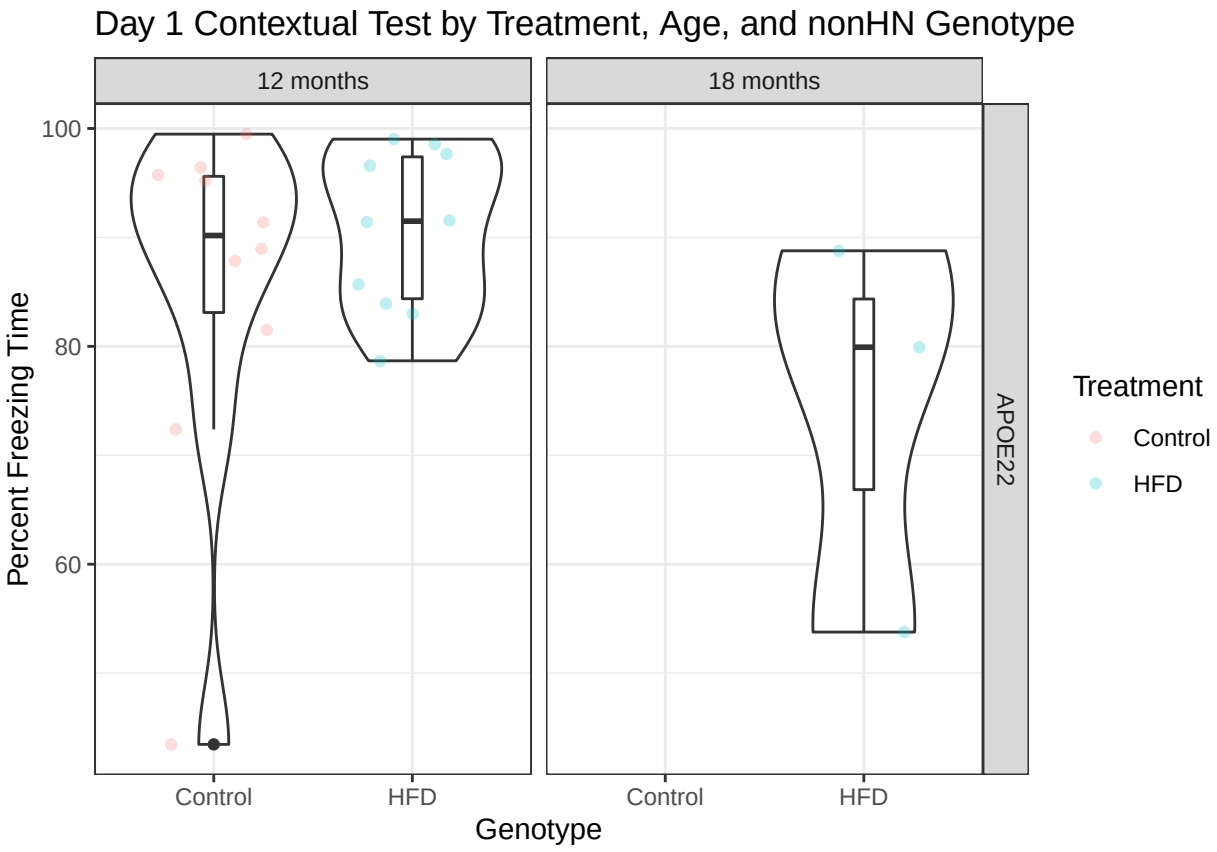

Day 0 18 Months Old HNs by Genotype, Sex, and Treatment
Female
Male
Control
Mean Percent Time Freezing
0
1
2
3
4
1
2
3
Sound Component
Genotype
APOE22HN

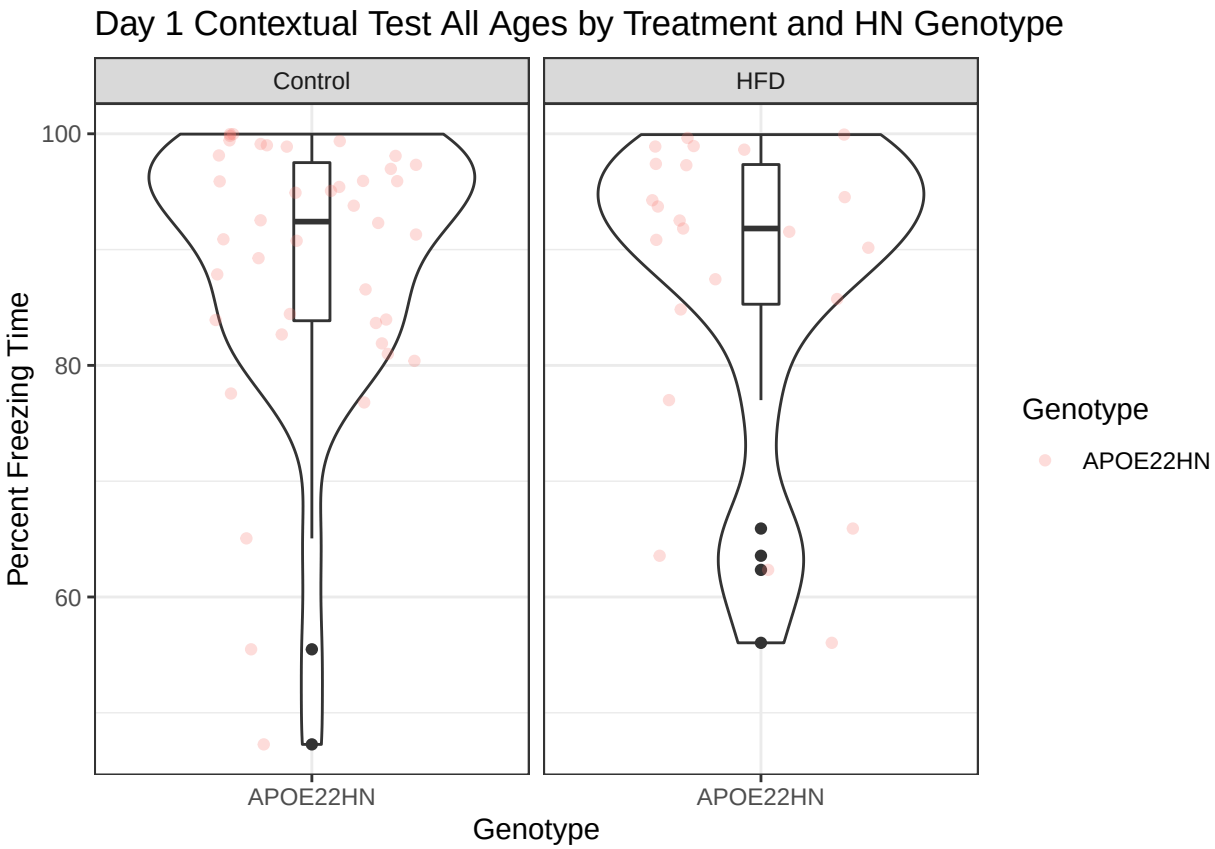

Day 0 18 Months Old nonHNs by Genotype, Sex, and Treatment
Female
Male
HFD
Mean Percent Time Freezing
0
1
2
3
4
1
2
3
Sound Component
Genotype
APOE22

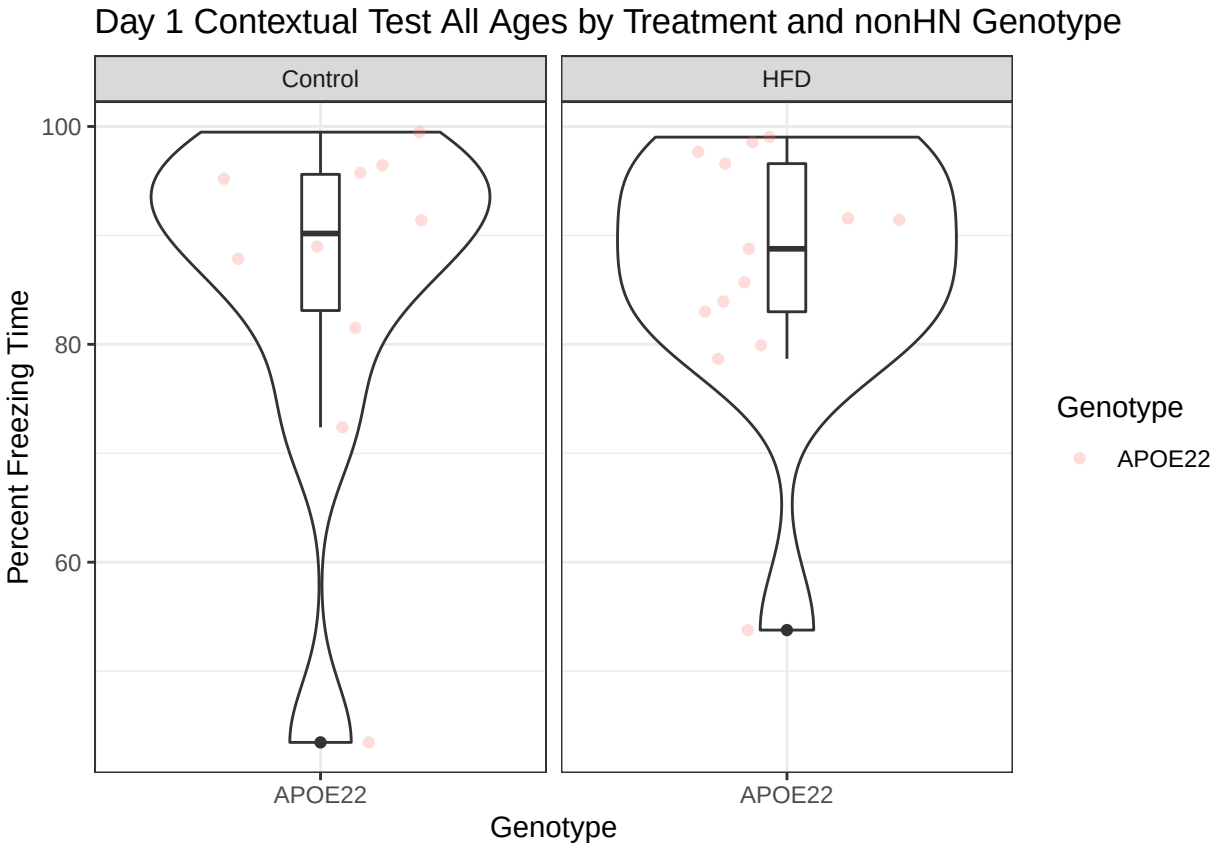

Day 0 Learning Curves by Age, HN Genotype, and Treatment
Control
HFD
APOE22HN
Mean Percent Time Freezing
Sound Component
1
2
3
4
5
Age
12 months
18 months

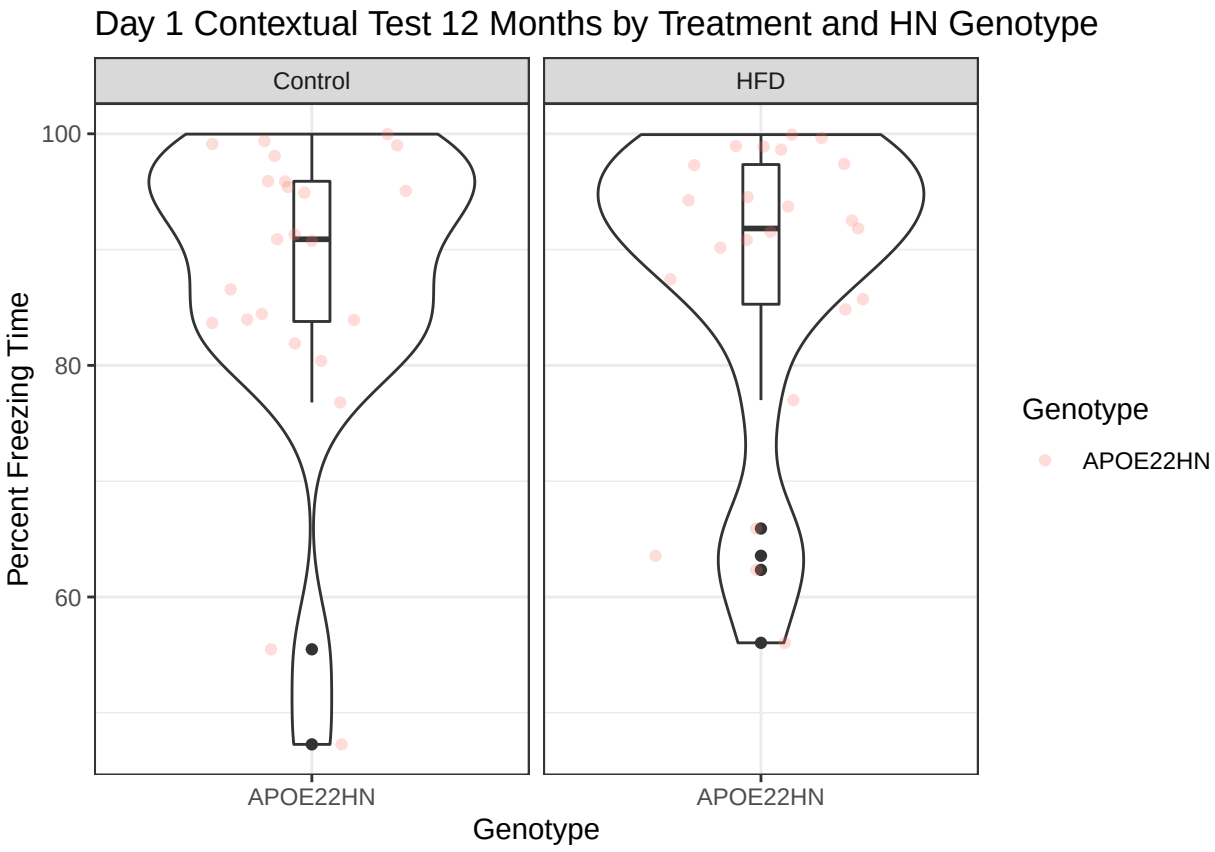

Day 0 Learning Curves by Age, nonHN Genotype, and Treatment
Control
HFD
APOE22
Mean Percent Time Freezing
0
2
4
1
2
3
Sound Component
Age
12 months
18 months

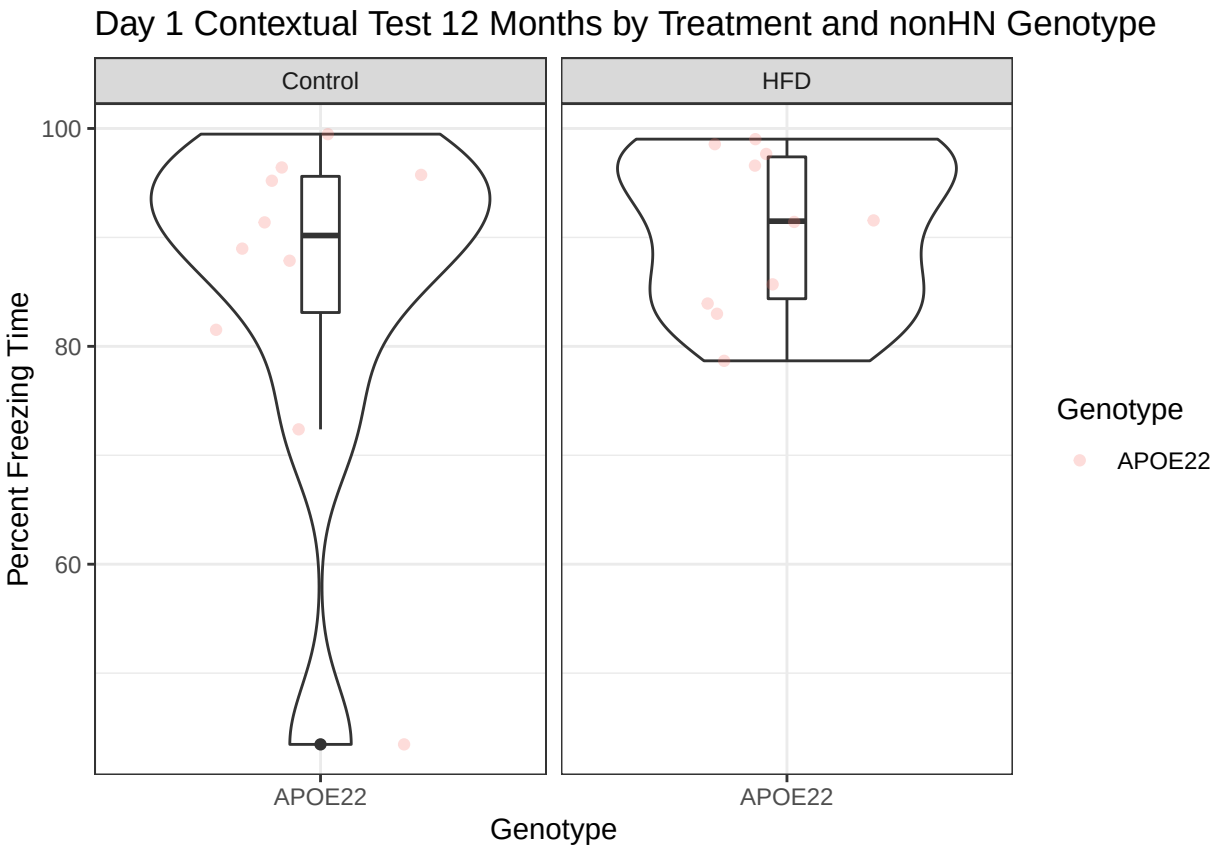

Day 1 Contextual Test by Treatment, Age, and HN Genotype
12 months
18 months
APOE22HN
Percent Freezing Time
100
80
60
Control
HFD
Control
HFD
Genotype
Treatment
Control
HFD

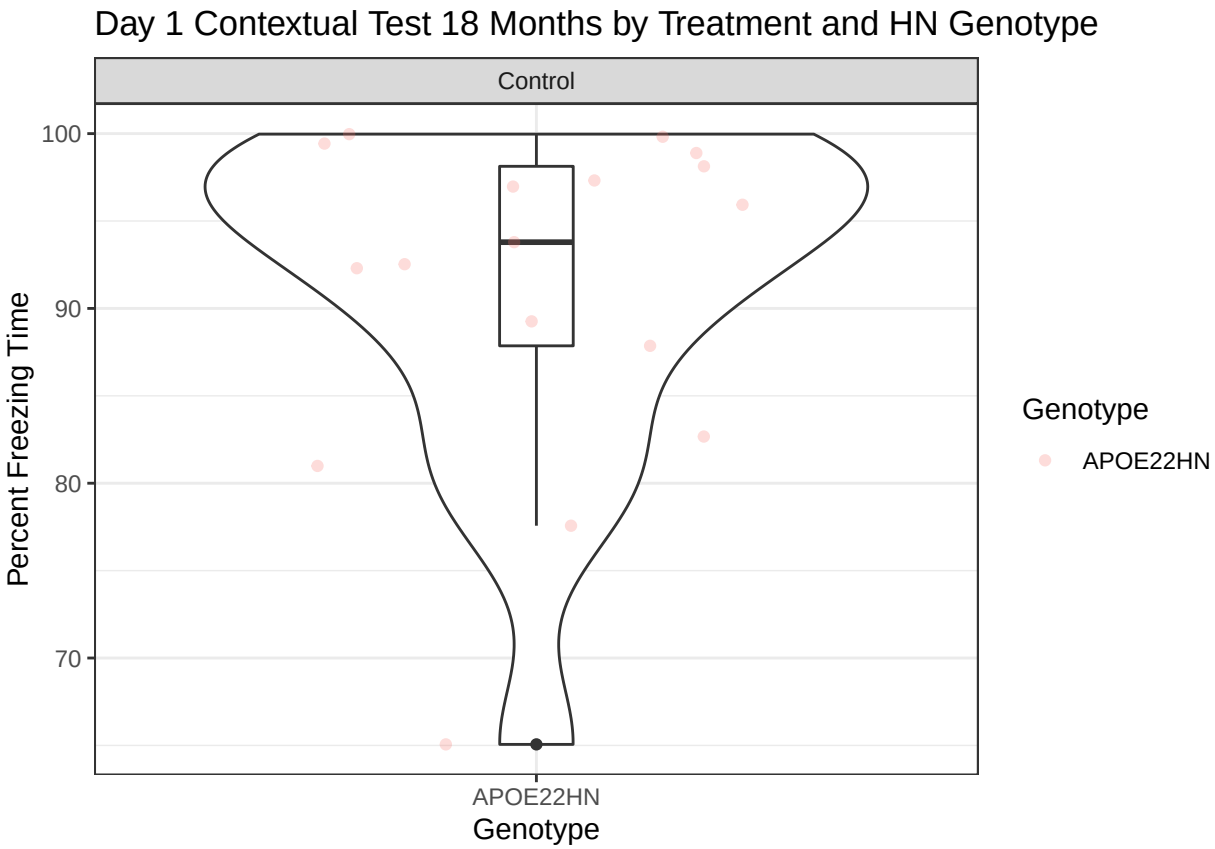

Day 1 Contextual Test by Treatment, Age, and nonHN Genotype
12 months
18 months
APOE22
Percent Freezing Time
100
80
60
Control
HFD
Control
HFD
Genotype
Treatment
Control
HFD

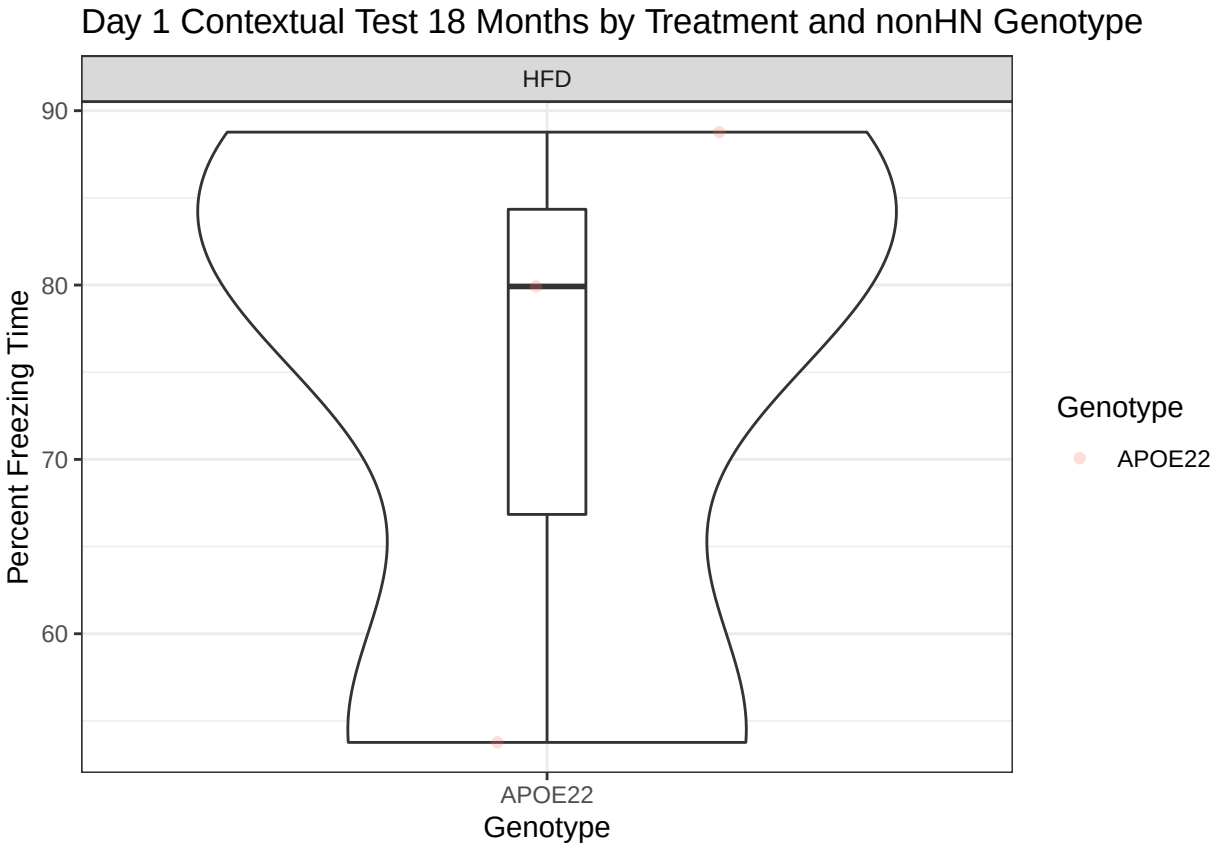

Day 1 Contextual Test All Ages by Treatment and HN Genotype
Control
HFD
100
80
60
Percent Freezing Time
APOE22HN
APOE22HN
Genotype
Genotype
APOE22HN

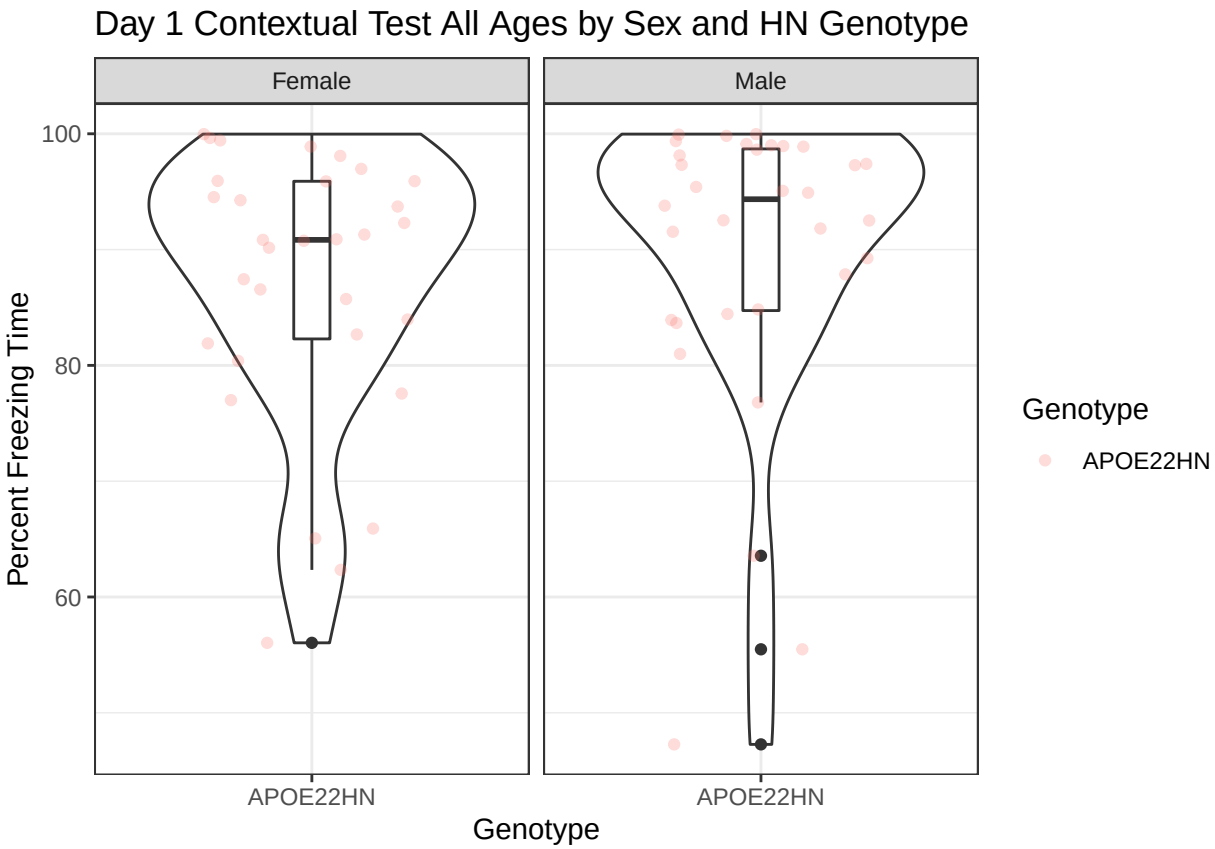

Day 1 Contextual Test All Ages by Treatment and nonHN Genotype
Control
HFD
100
80
60
Percent Freezing Time
APOE22
APOE22
Genotype
Genotype
APOE22

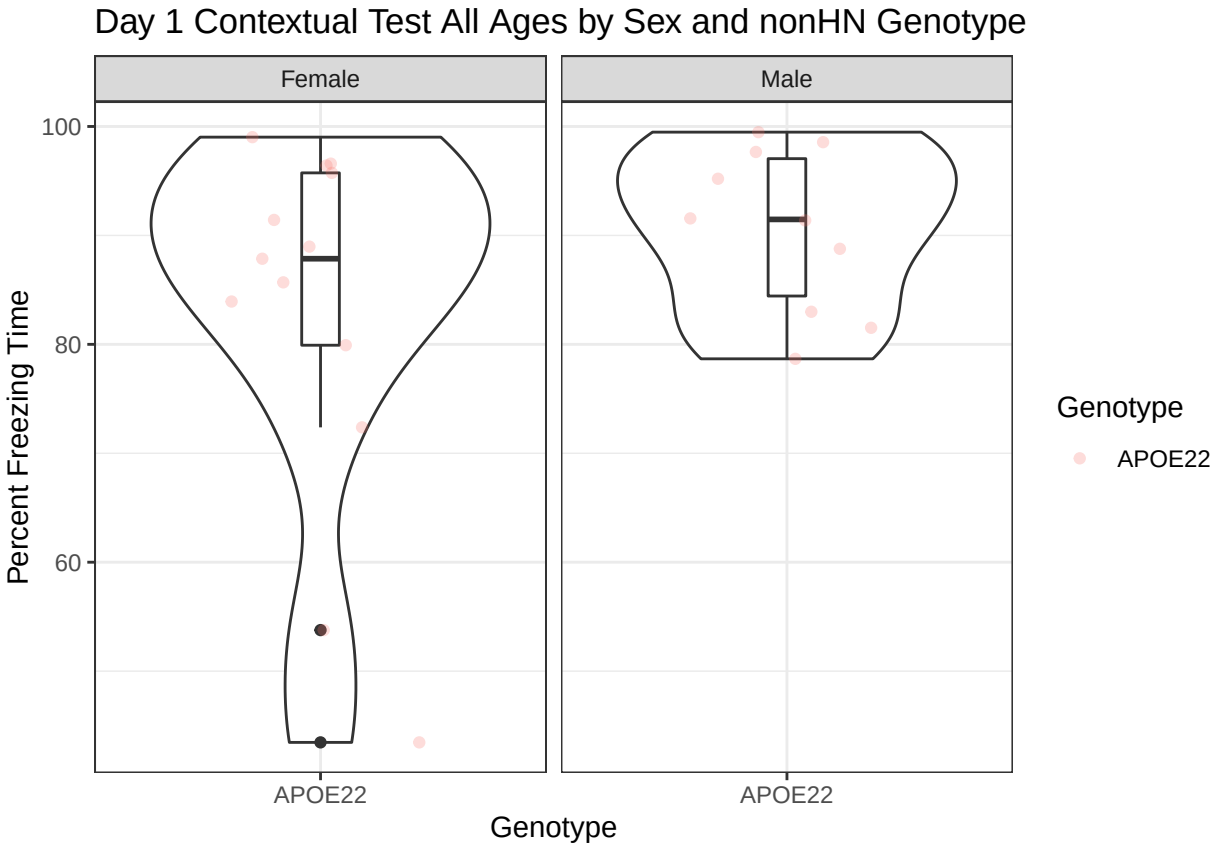

Day 1 Contextual Test 12 Months by Treatment and HN Genotype
Control
HFD
Percent Freezing Time
100
80
60
APOE22HN
APOE22HN
Genotype
Genotype
APOE22HN

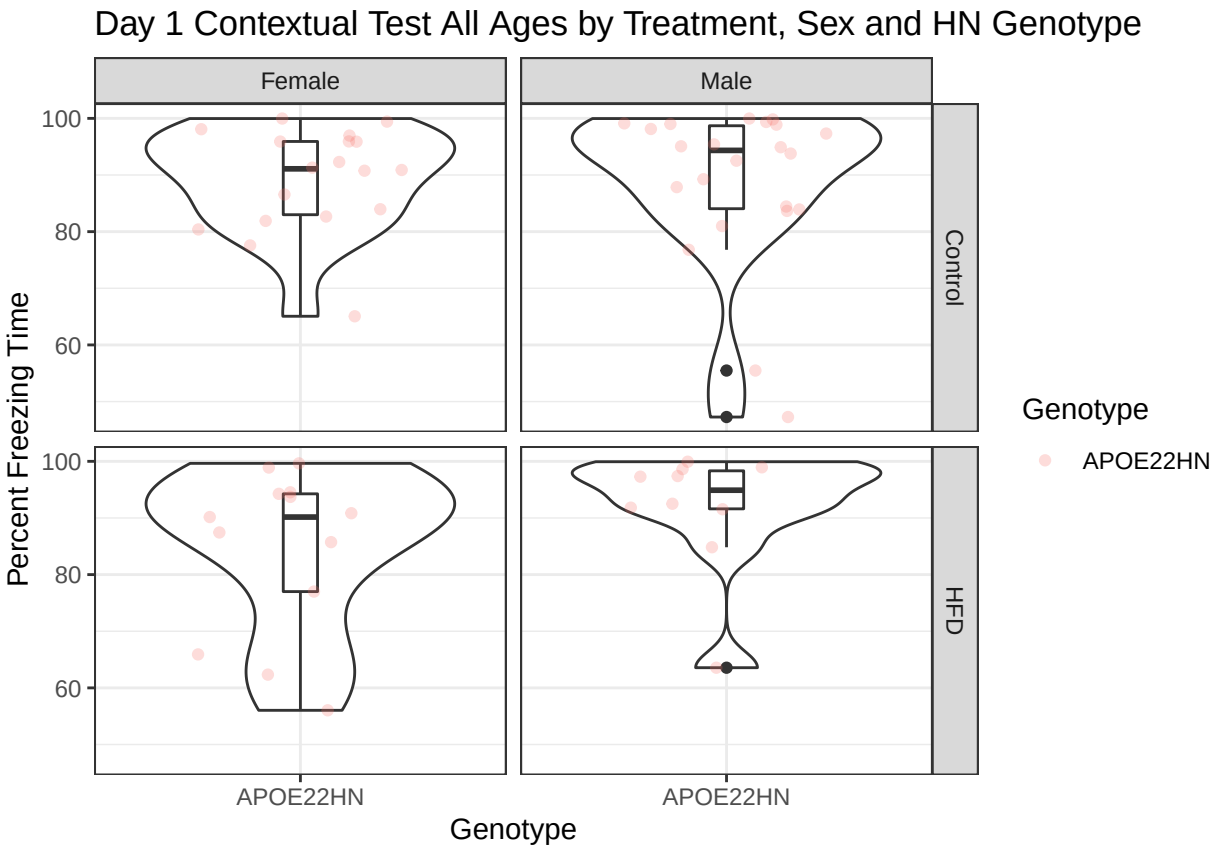

Day 1 Contextual Test 12 Months by Treatment and nonHN Genotype
Control
HFD
100
80
60
Percent Freezing Time
APOE22
APOE22
Genotype
Genotype
APOE22

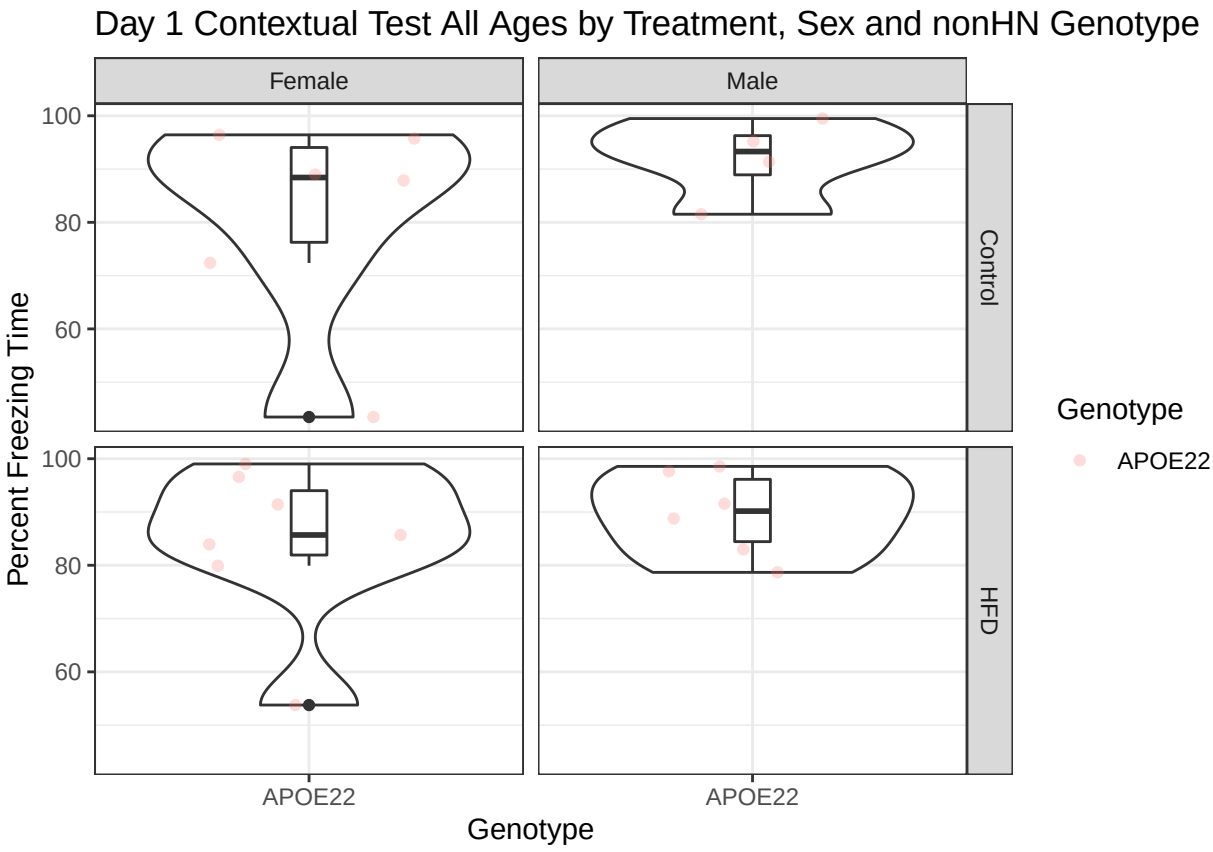

Day 1 Contextual Test 18 Months by Treatment and HN Genotype
Control
100
90
80
70
Percent Freezing Time
APOE22HN
Genotype
Genotype
APOE22HN

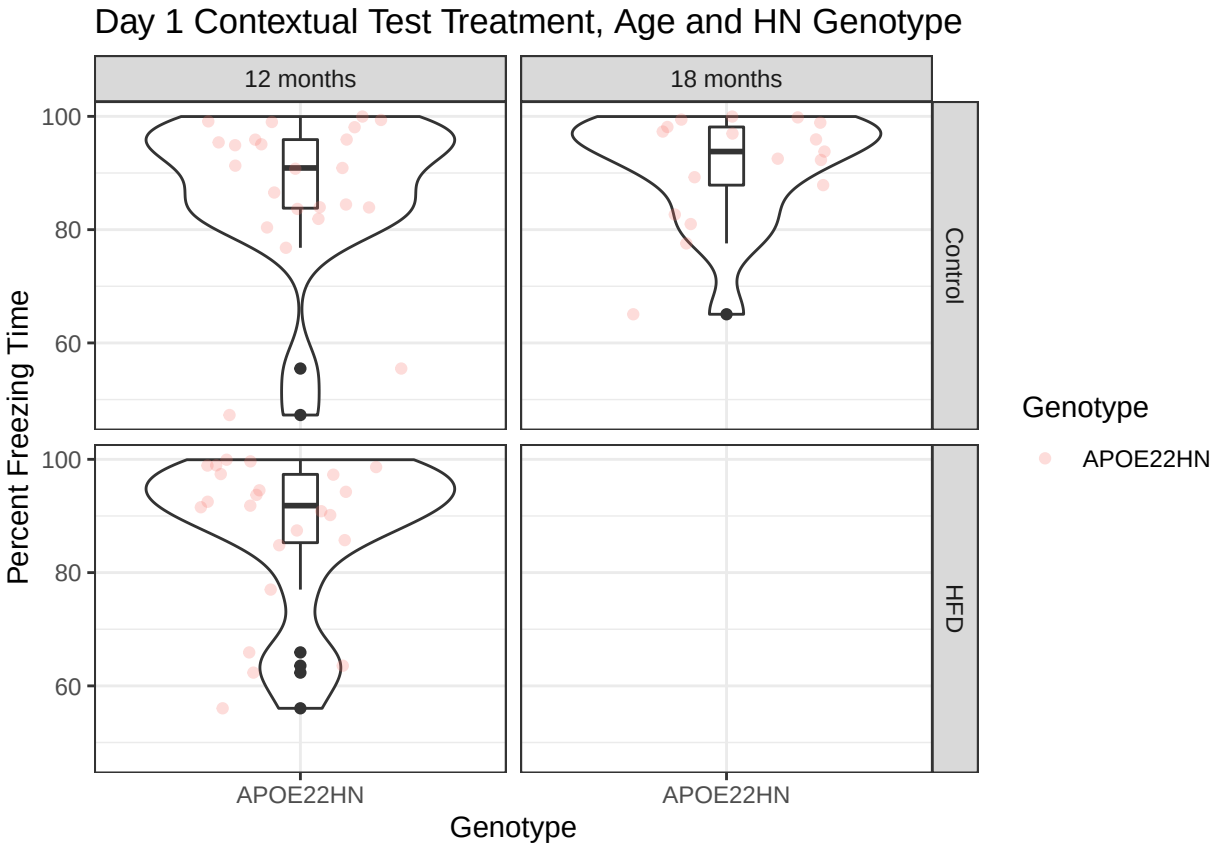

Day 1 Contextual Test 18 Months by Treatment and nonHN Genotype
HFD
90
80
70
60
Percent Freezing Time
APOE22
Genotype
Genotype
APOE22

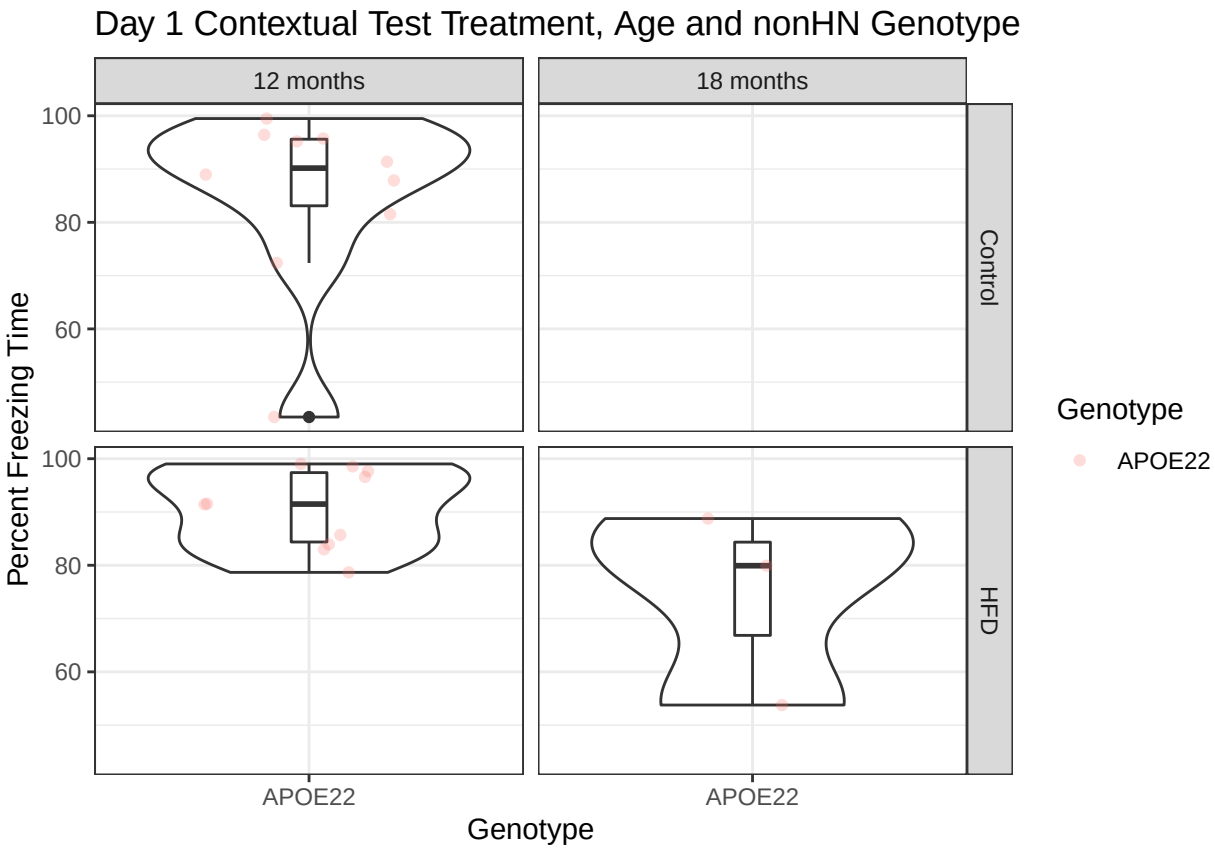

Day 1 Contextual Test All Ages by Sex and HN Genotype
Female
Male
100
80
60
Percent Freezing Time
APOE22HN
APOE22HN
Genotype
Genotype
APOE22HN

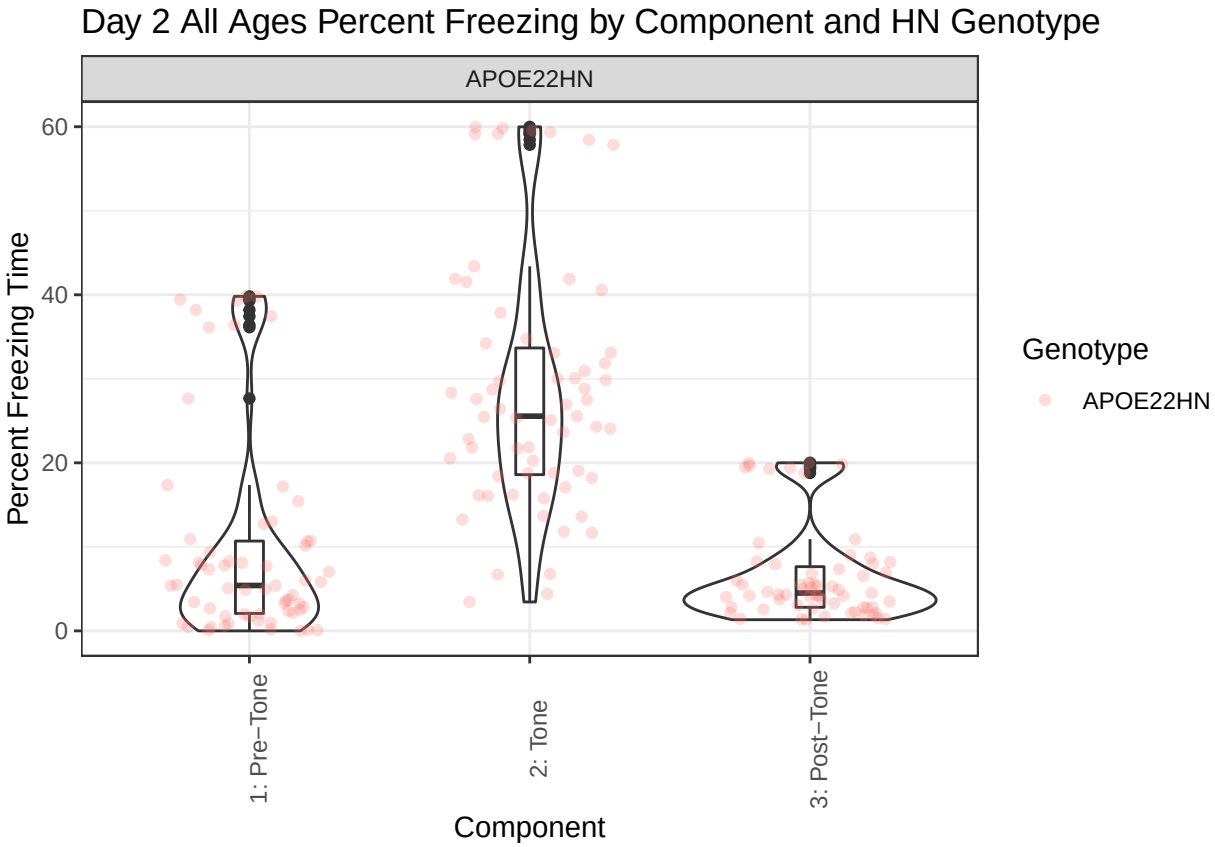

Day 1 Contextual Test All Ages by Sex and nonHN Genotype
Female
Male
100
80
60
Percent Freezing Time
APOE22
APOE22
Genotype
Genotype
APOE22

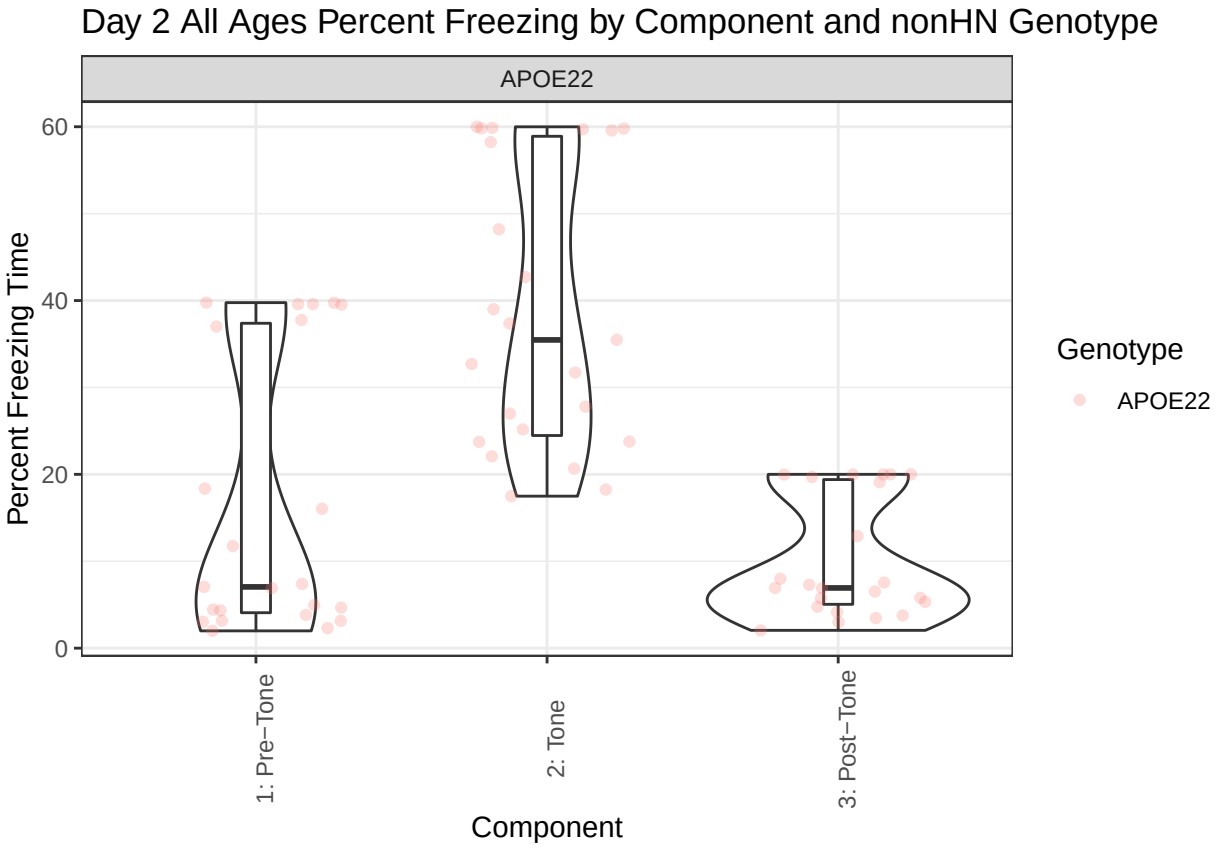

Day 1 Contextual Test All Ages by Treatment, Sex and HN Genotype
Female
Male
Control
HFD
Percent Freezing Time
100
80
60
APOE22HN
Genotype
Genotype
APOE22HN

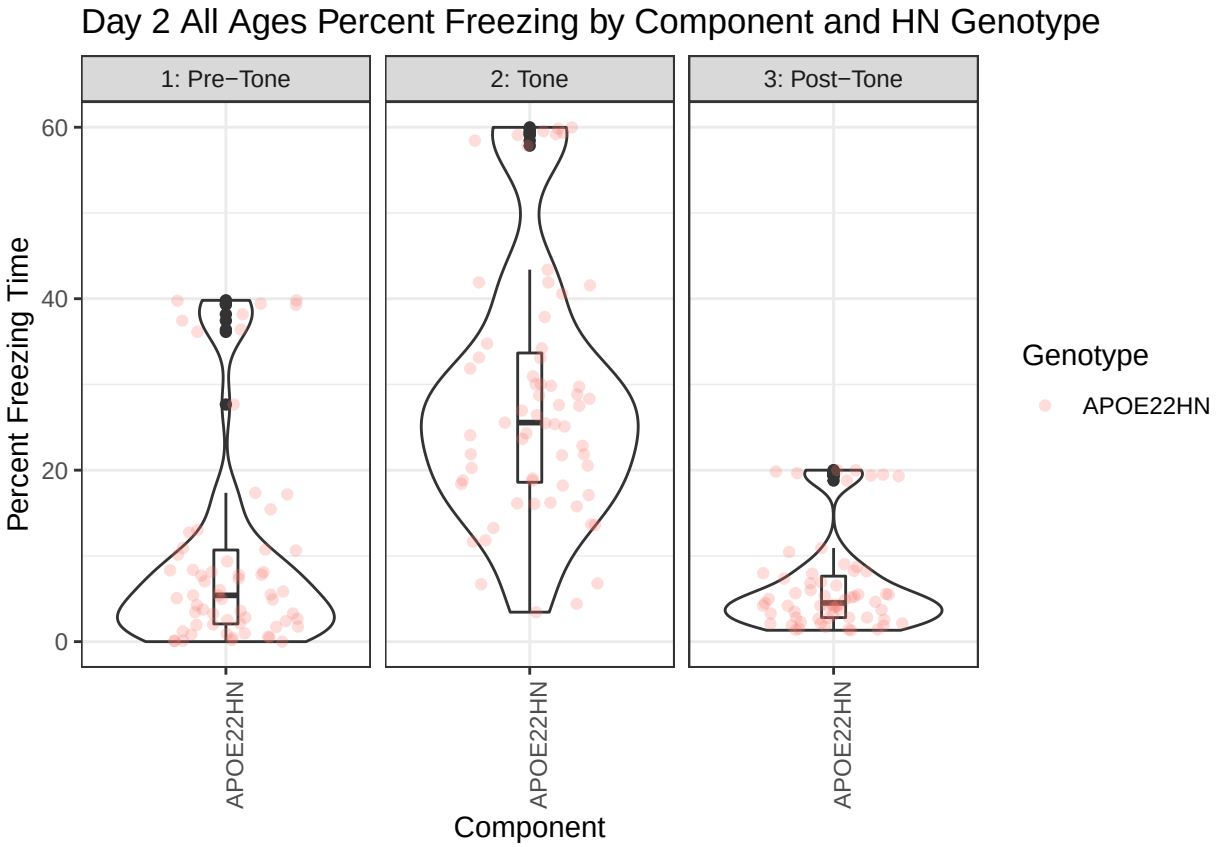

Day 1 Contextual Test All Ages by Treatment, Sex and nonHN Genotype
Female
Male
Control
HFD
Percent Freezing Time
100
80
60
APOE22
Genotype
Genotype
APOE22

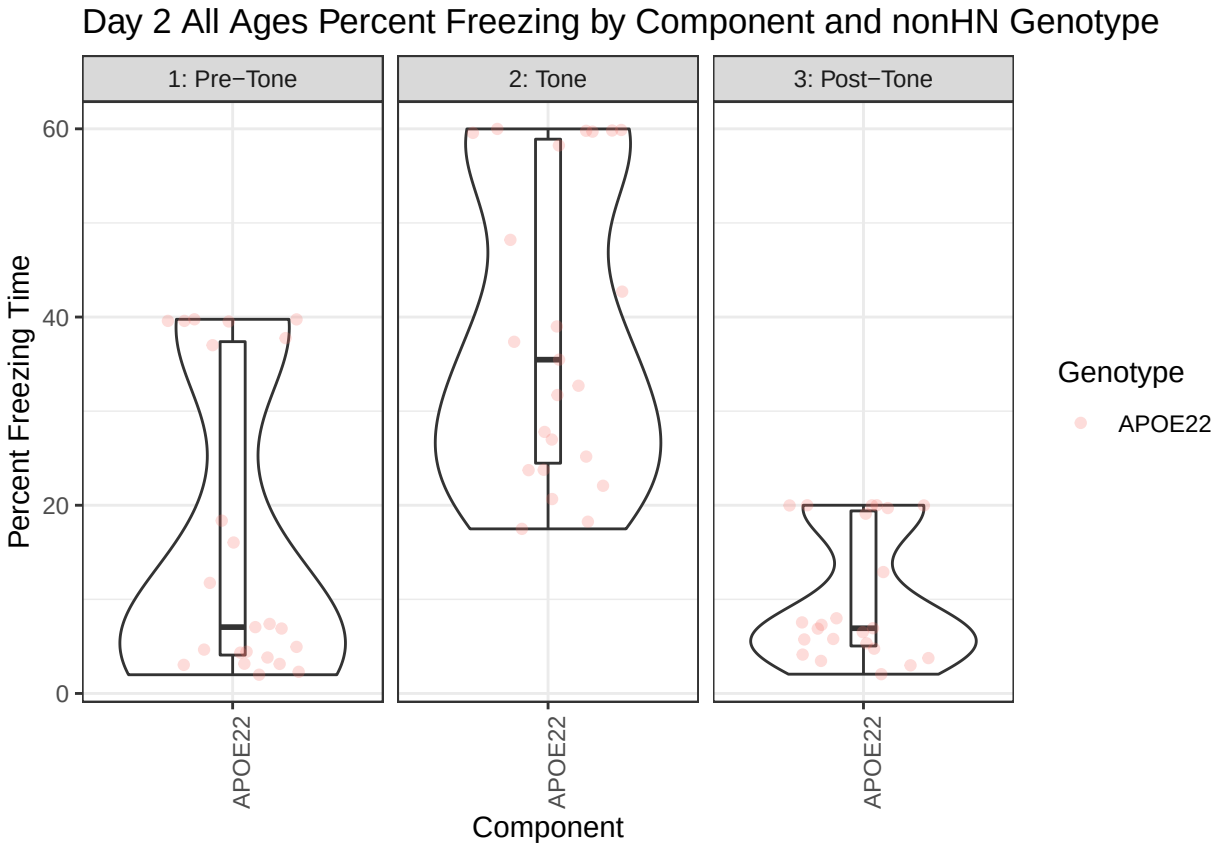

Day 1 Contextual Test Treatment, Age and HN Genotype
12 months
18 months
Control
HFD
Percent Freezing Time
100
80
60
APOE22HN
Genotype
Genotype
APOE22HN

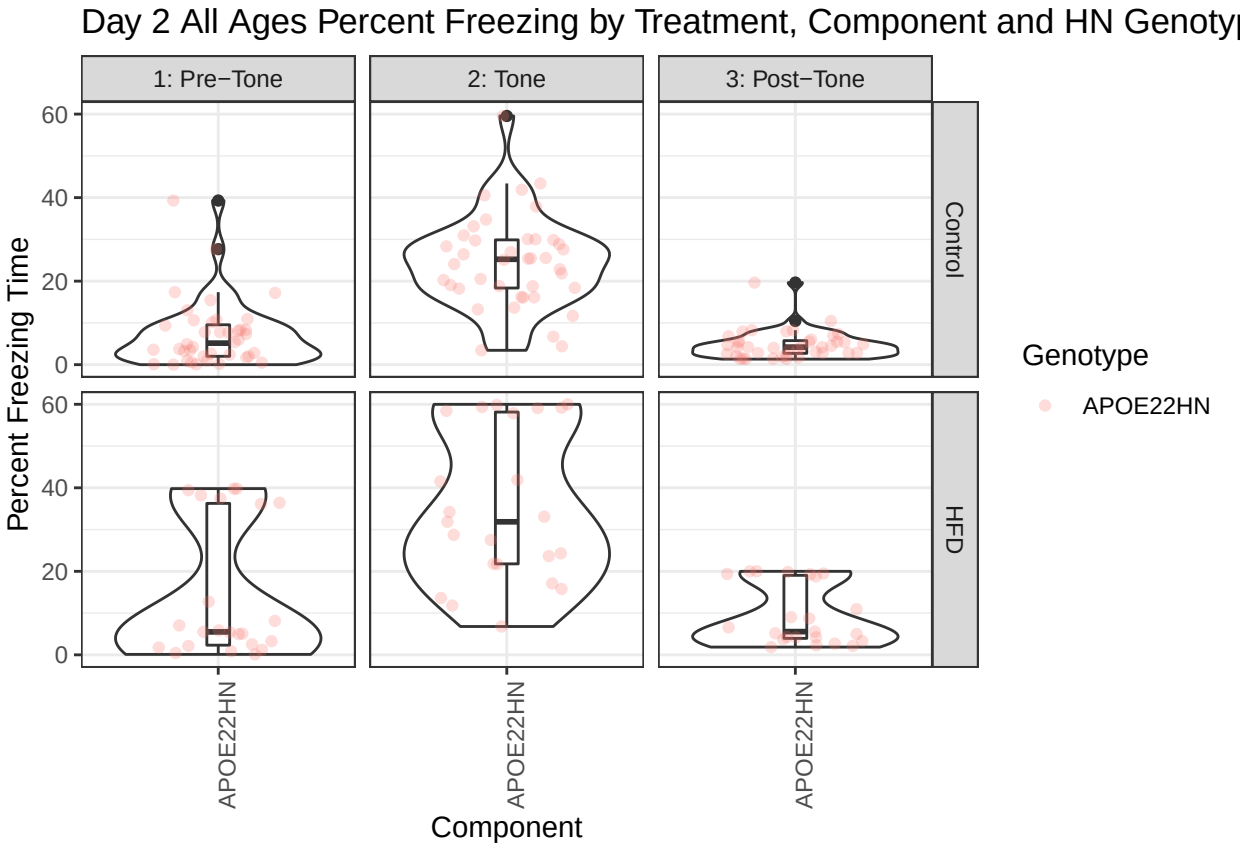

Day 1 Contextual Test Treatment, Age and nonHN Genotype
12 months
18 months
Control
HFD
Percent Freezing Time
100
80
60
APOE22
Genotype
Genotype
APOE22

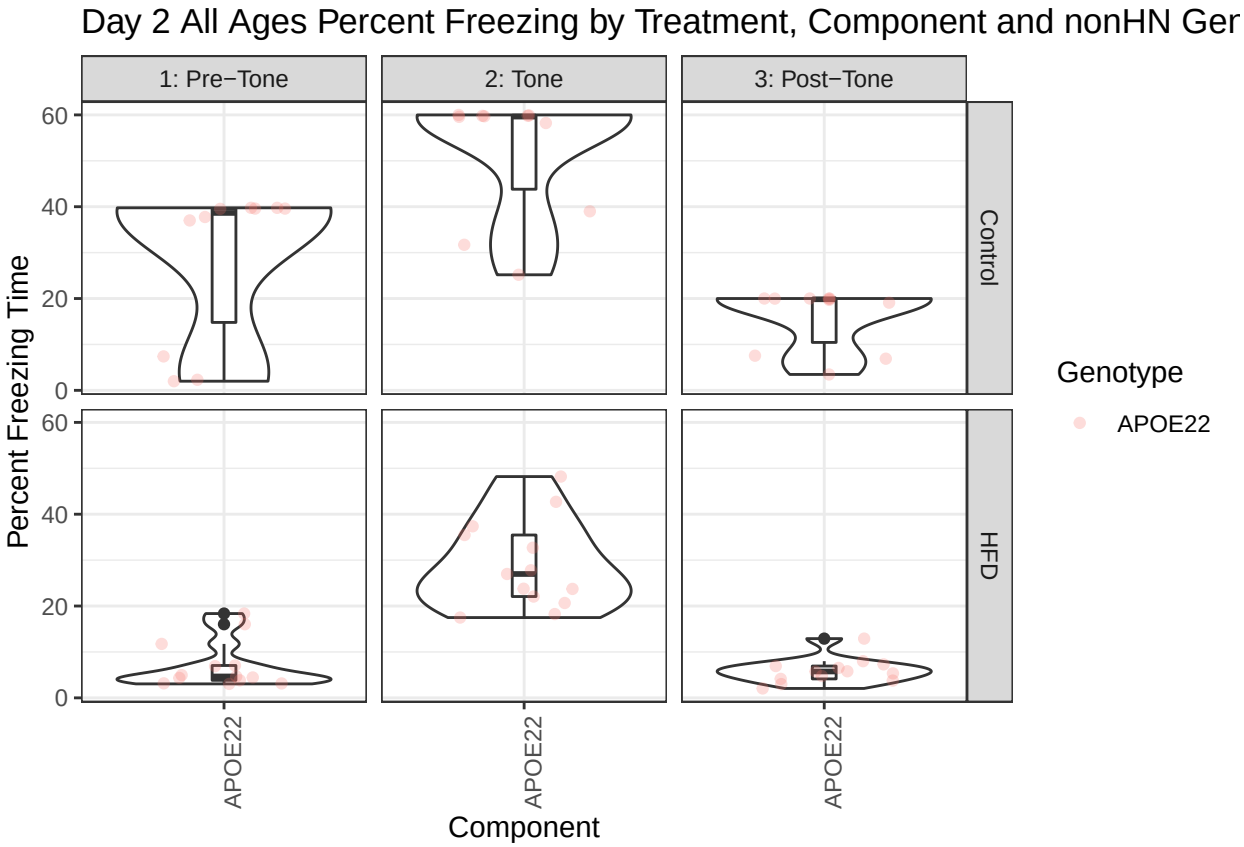

Day 2 All Ages Percent Freezing by Component and HN Genotype
APOE22HN
Percent Freezing Time
60
40
20
0
1: Pre−Tone
2: Tone
3: Post−Tone
Component
Genotype
APOE22HN

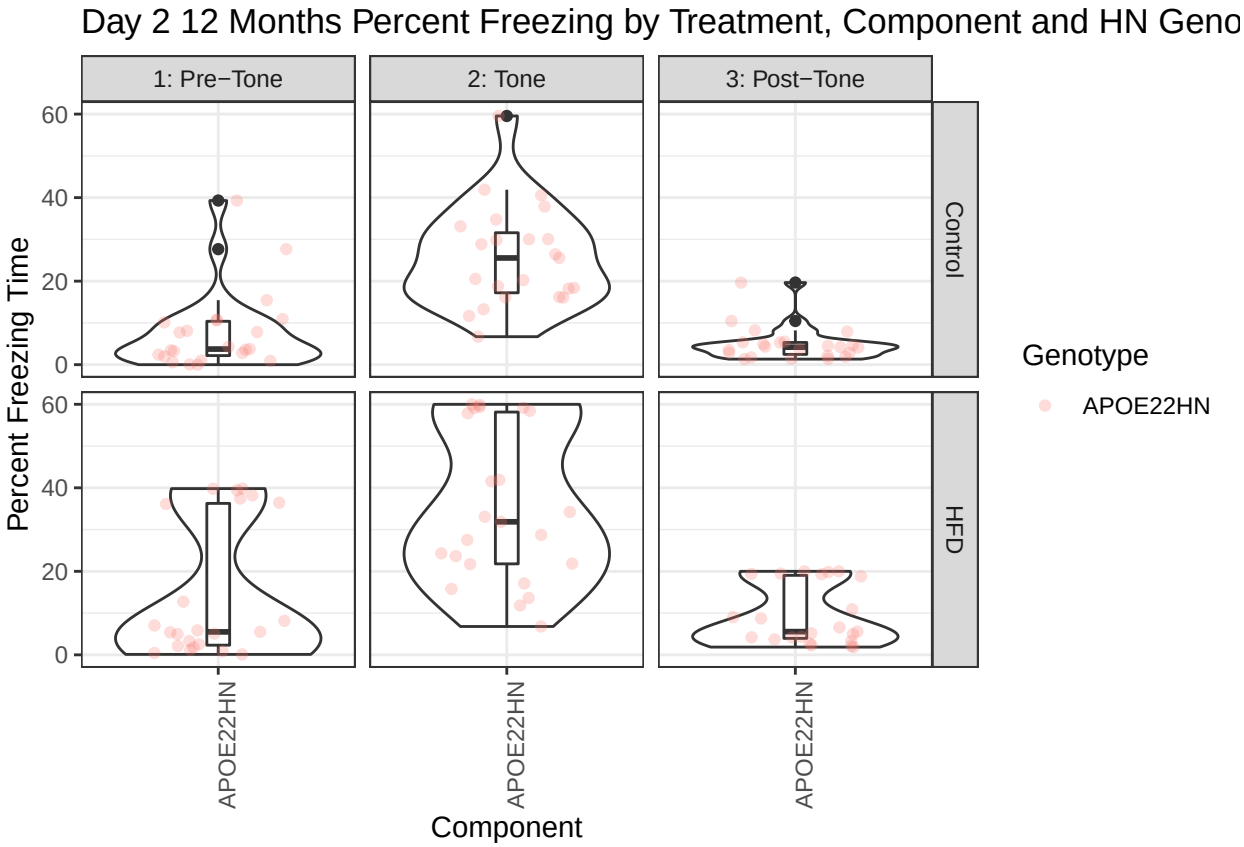

Day 2 All Ages Percent Freezing by Component and nonHN Genotype
APOE22
Percent Freezing Time
60
40
20
0
1: Pre−Tone
2: Tone
3: Post−Tone
Component
Genotype
APOE22

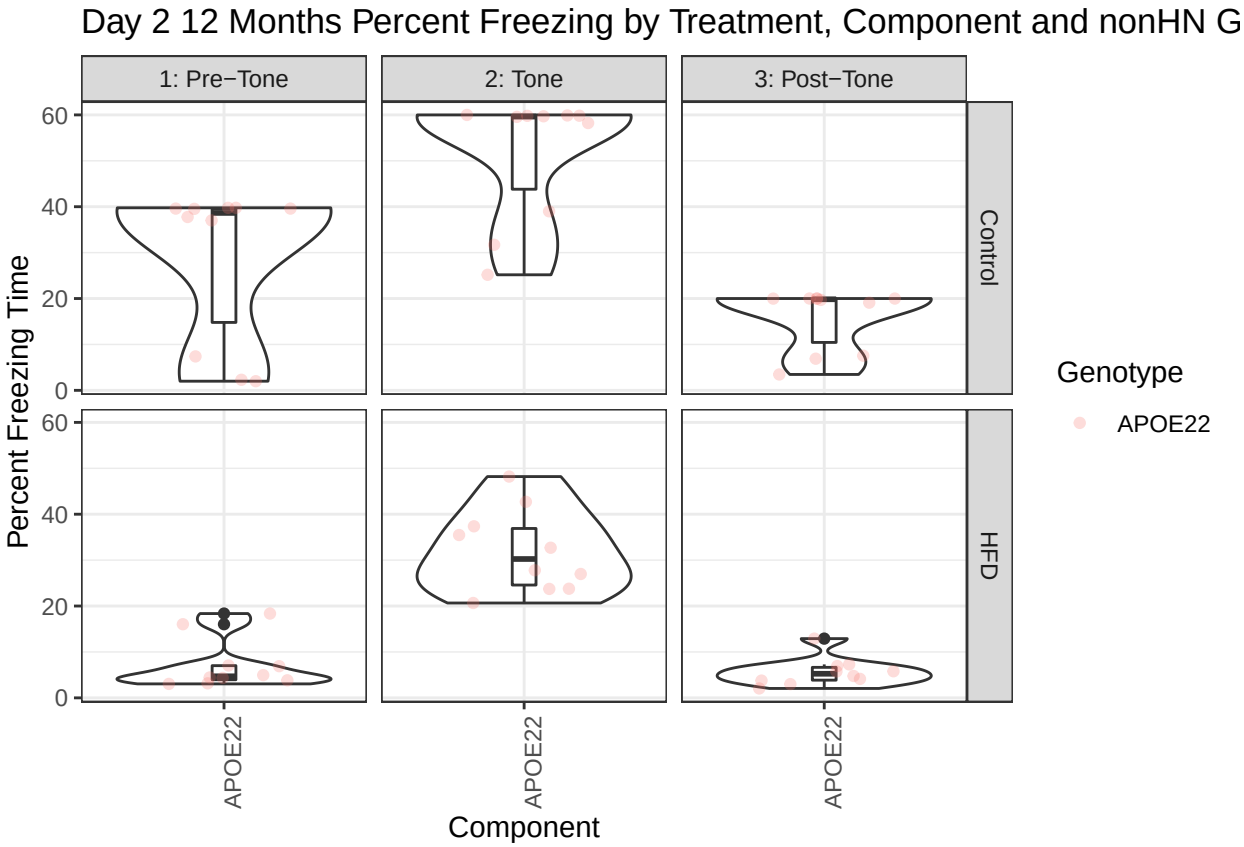

Day 2 All Ages Percent Freezing by Component and HN Genotype
1: Pre−Tone
2: Tone
3: Post−Tone
Percent Freezing Time
60
40
20
0
APOE22HN
APOE22HN
APOE22HN
Component
Genotype
APOE22HN

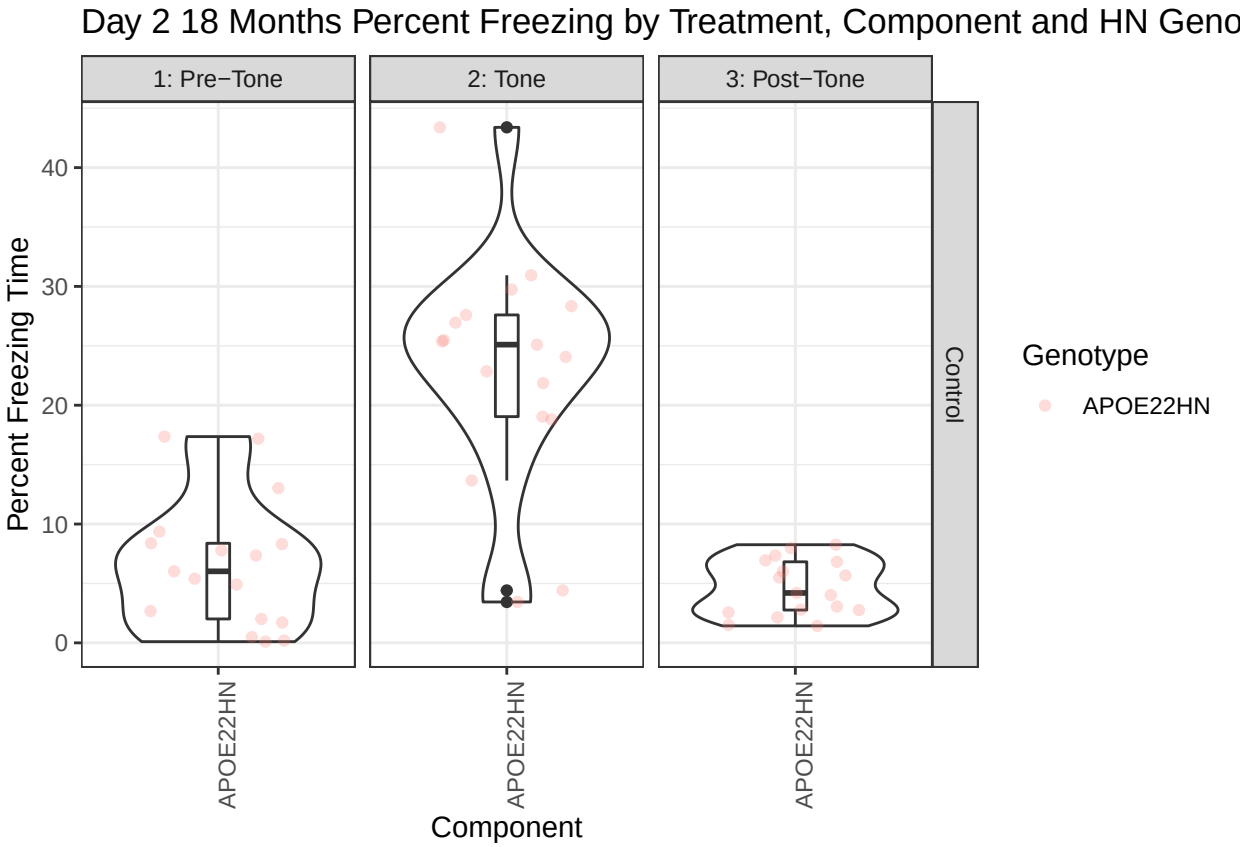

Day 2 All Ages Percent Freezing by Component and nonHN Genotype
1: Pre−Tone
2: Tone
3: Post−Tone
Percent Freezing Time
60
40
20
0
APOE22
APOE22
APOE22
Component
Genotype
APOE22

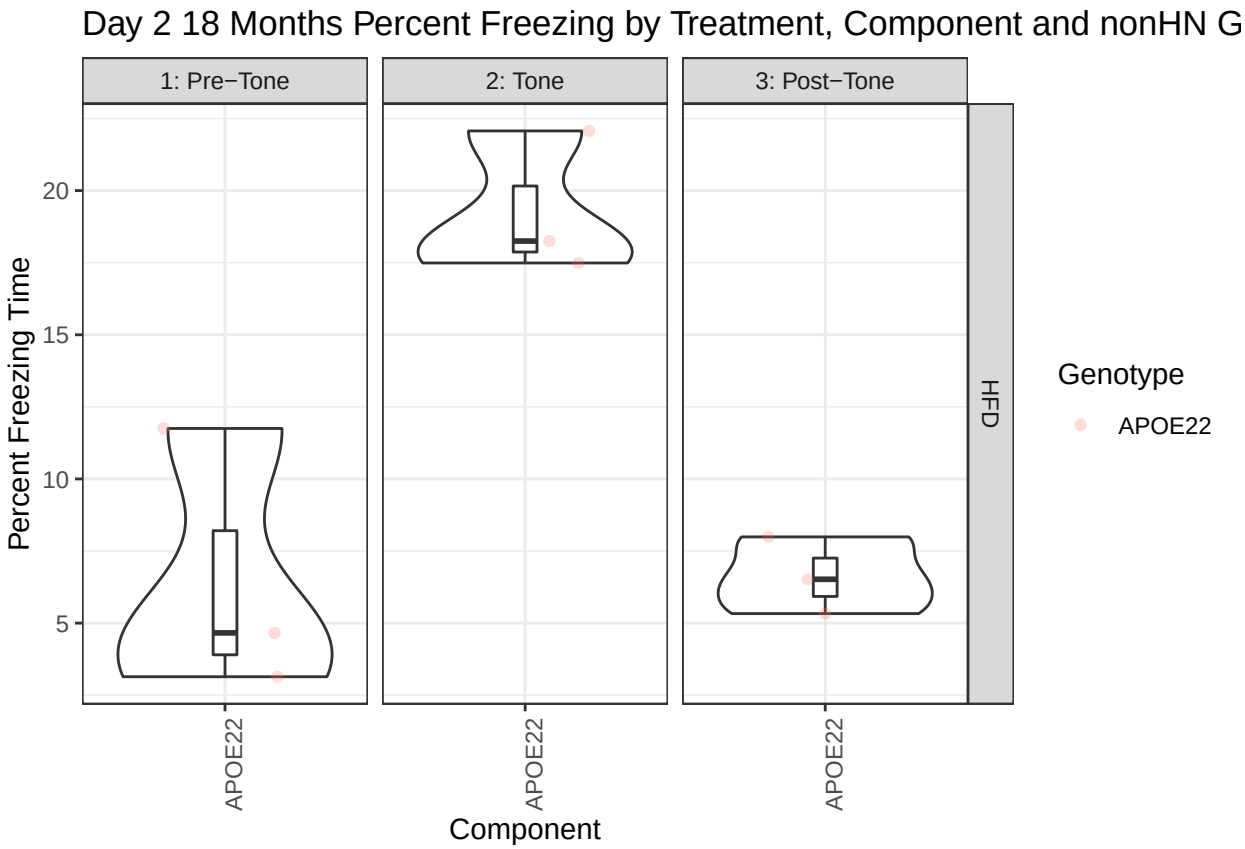

Day 2 All Ages Percent Freezing by Treatment, Component and HN Genoty
1: Pre−Tone
2: Tone
3: Post−Tone
Control
HFD
Percent Freezing Time
60
40
20
0
APOE22HN
Component
Genotype
APOE22HN

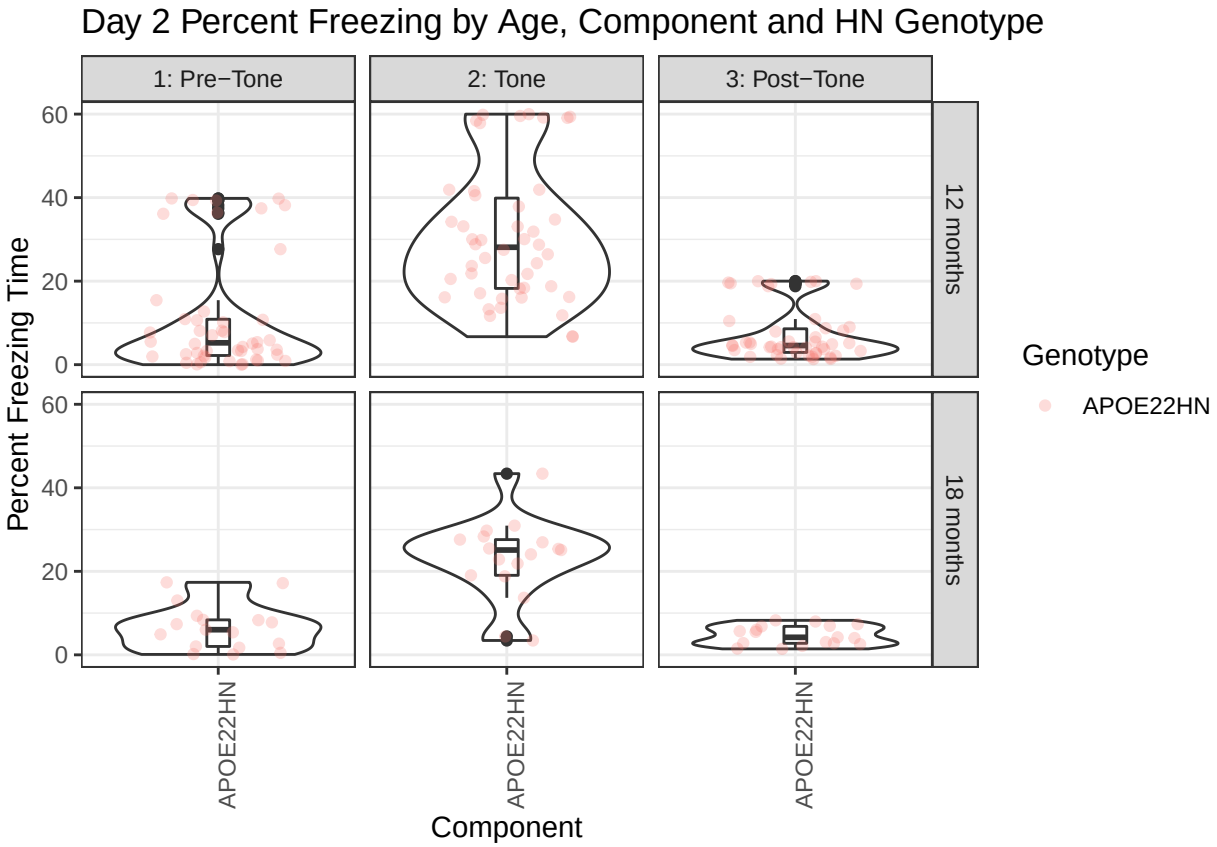

Day 2 All Ages Percent Freezing by Treatment, Component and nonHN Ger
1: Pre−Tone
2: Tone
3: Post−Tone
Control
HFD
Percent Freezing Time
60
40
20
0
APOE22
Component
Genotype
APOE22

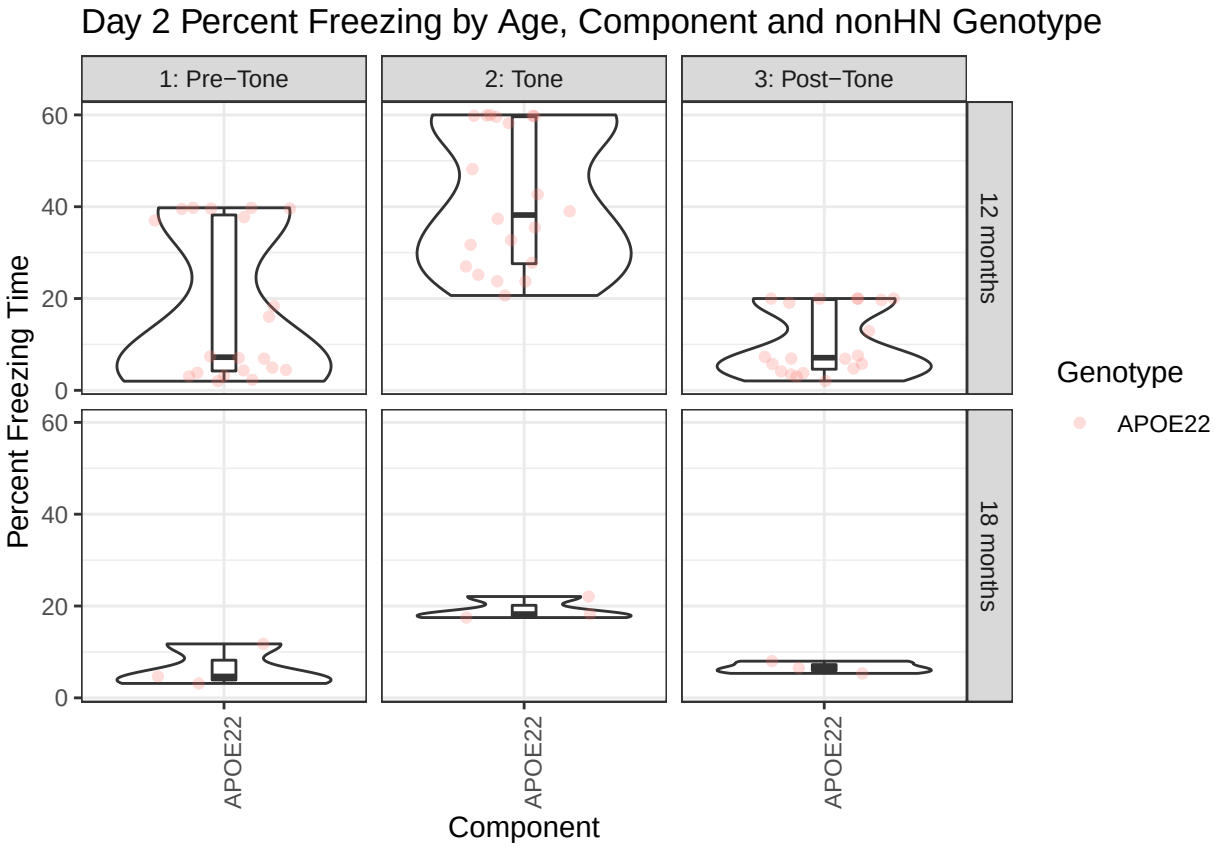

Day 2 12 Months Percent Freezing by Treatment, Component and HN Geno
1: Pre−Tone
2: Tone
3: Post−Tone
Control
HFD
Percent Freezing Time
0
20
40
60
APOE22HN
Component
Genotype
APOE22HN


Day 2 12 Months Percent Freezing by Treatment, Component and nonHN G
1: Pre−Tone
2: Tone
3: Post−Tone
Control
HFD
Percent Freezing Time
60
40
20
0
APOE22
Component
Genotype
APOE22


Day 2 18 Months Percent Freezing by Treatment, Component and HN Geno
1: Pre−Tone
2: Tone
3: Post−Tone
Control
Percent Freezing Time
0
10
20
30
40
APOE22HN
APOE22HN
APOE22HN
Component
Genotype
APOE22HN


Day 2 18 Months Percent Freezing by Treatment, Component and nonHN G
1: Pre−Tone
2: Tone
3: Post−Tone
HFD
Percent Freezing Time
20
15
10
5
APOE22
APOE22
APOE22
Component
Genotype
APOE22


Day 2 Percent Freezing by Age, Component and HN Genotype
1: Pre−Tone
2: Tone
3: Post−Tone
12 months
18 months
Percent Freezing Time
60
40
20
0
APOE22HN
Component
Genotype
APOE22HN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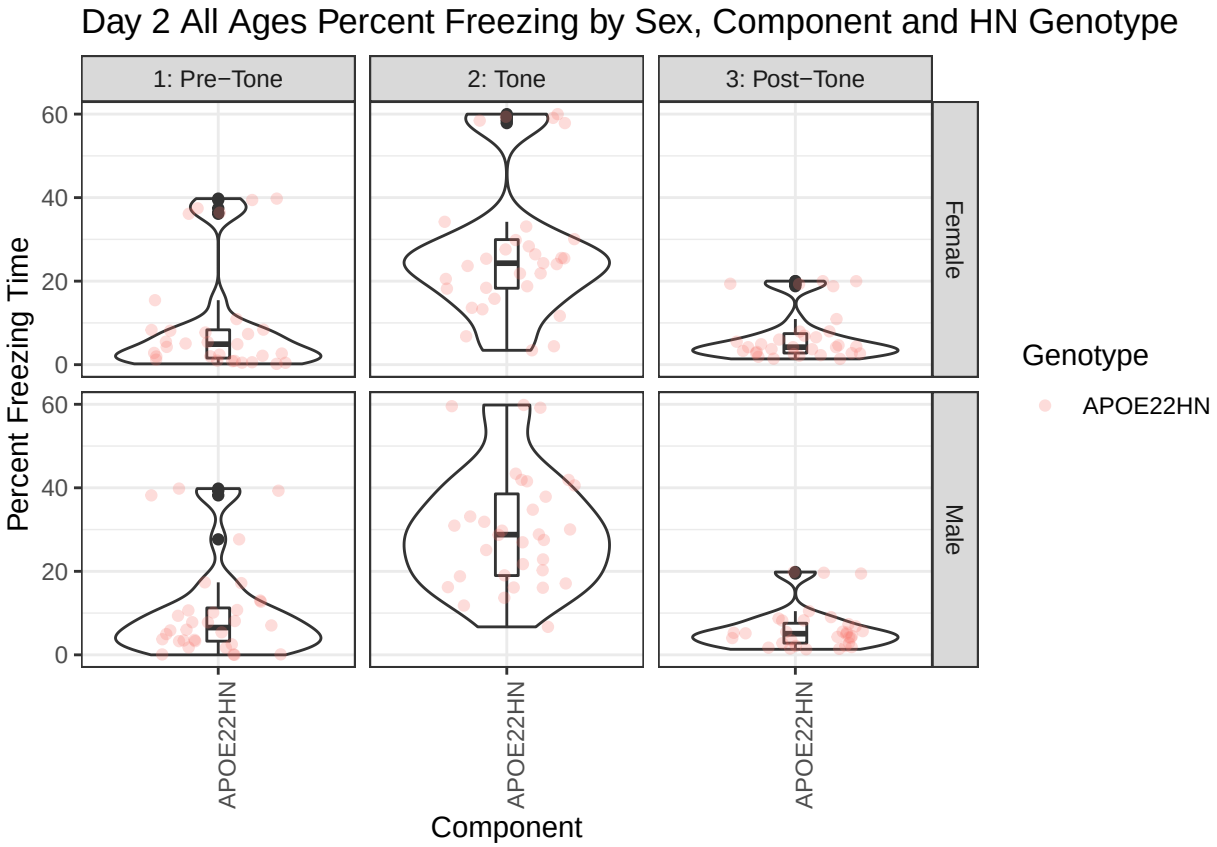
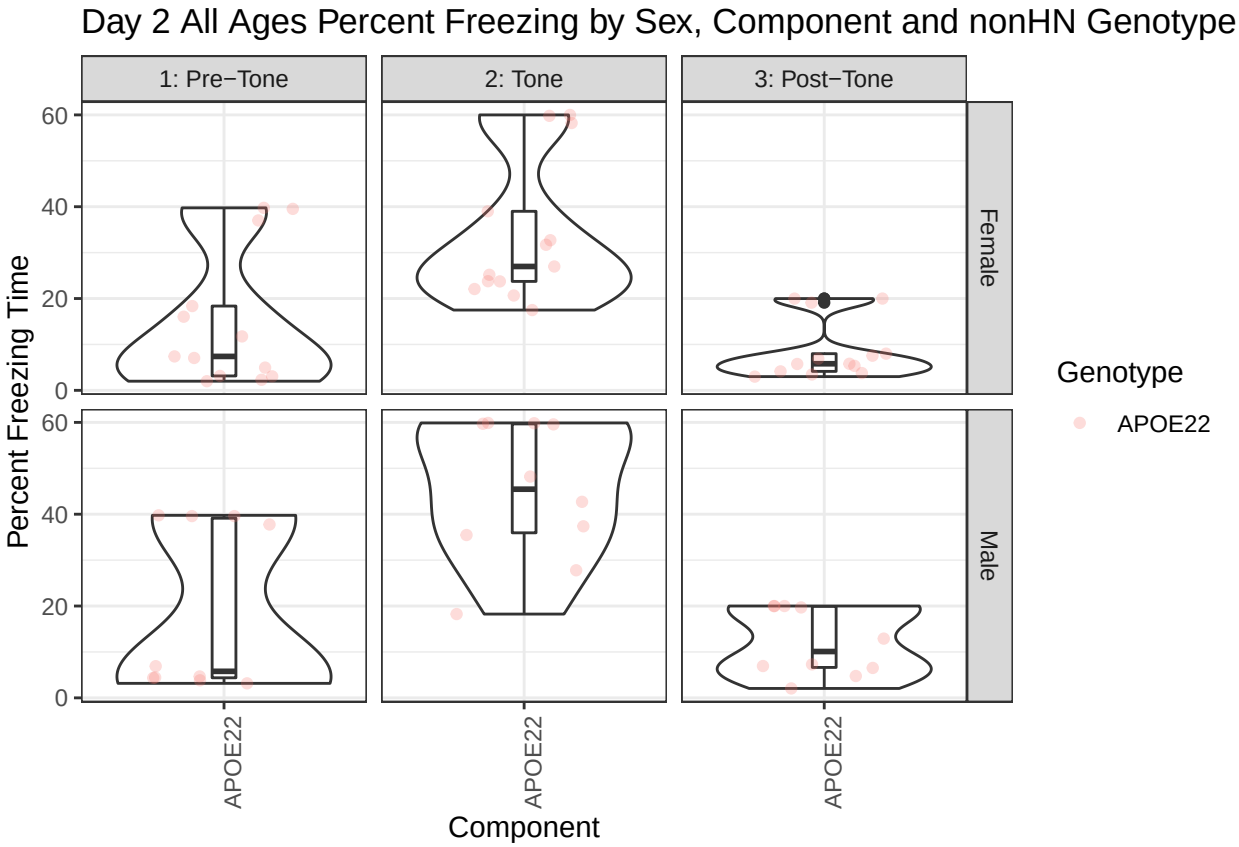
3: Post−Tone
12 months
18 months
Percent Freezing Time
0
20
40
60
APOE22
Component
Genotype
APOE22


Day 2 All Ages Percent Freezing by Sex, Component and HN Genotype
1: Pre−Tone
2: Tone
3: Post−Tone
Female
Male
Percent Freezing Time
60
40
20
0
APOE22HN
Component
Genotype
APOE22HN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40
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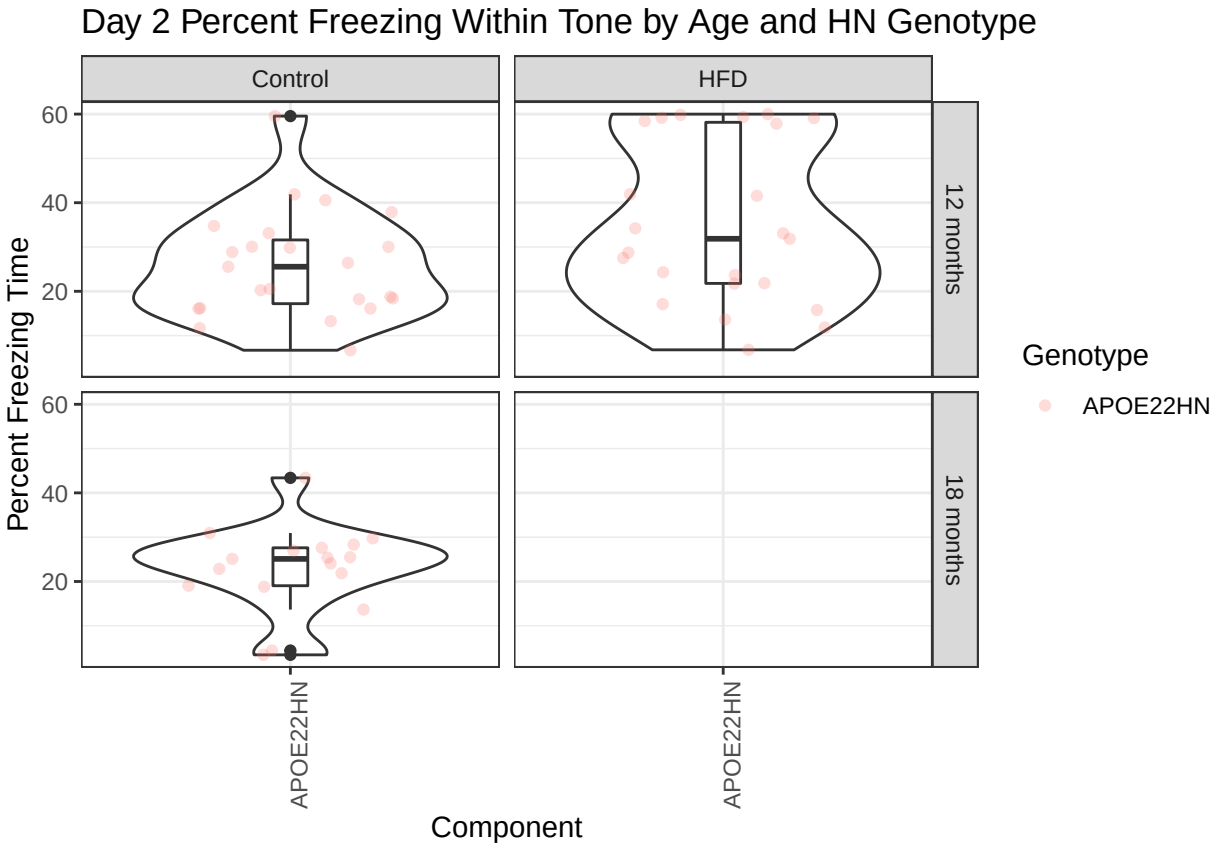
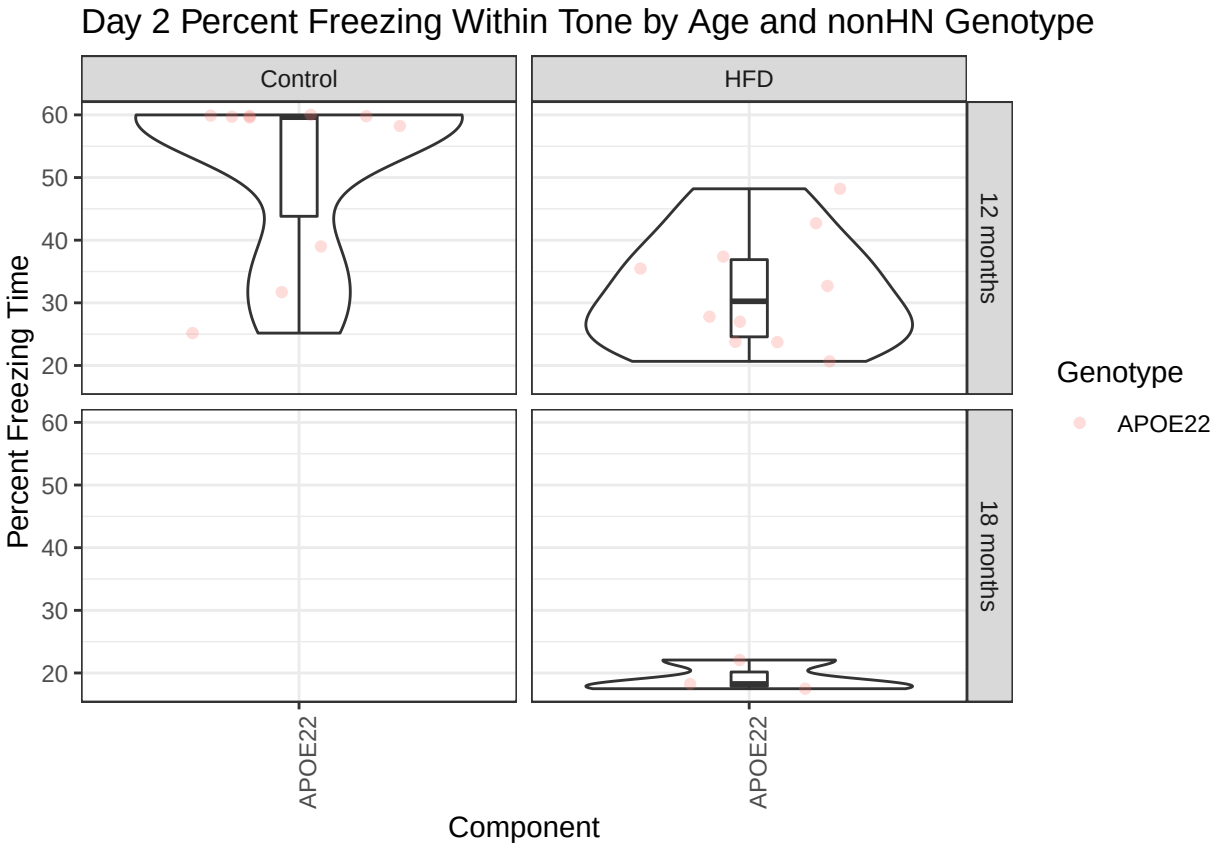
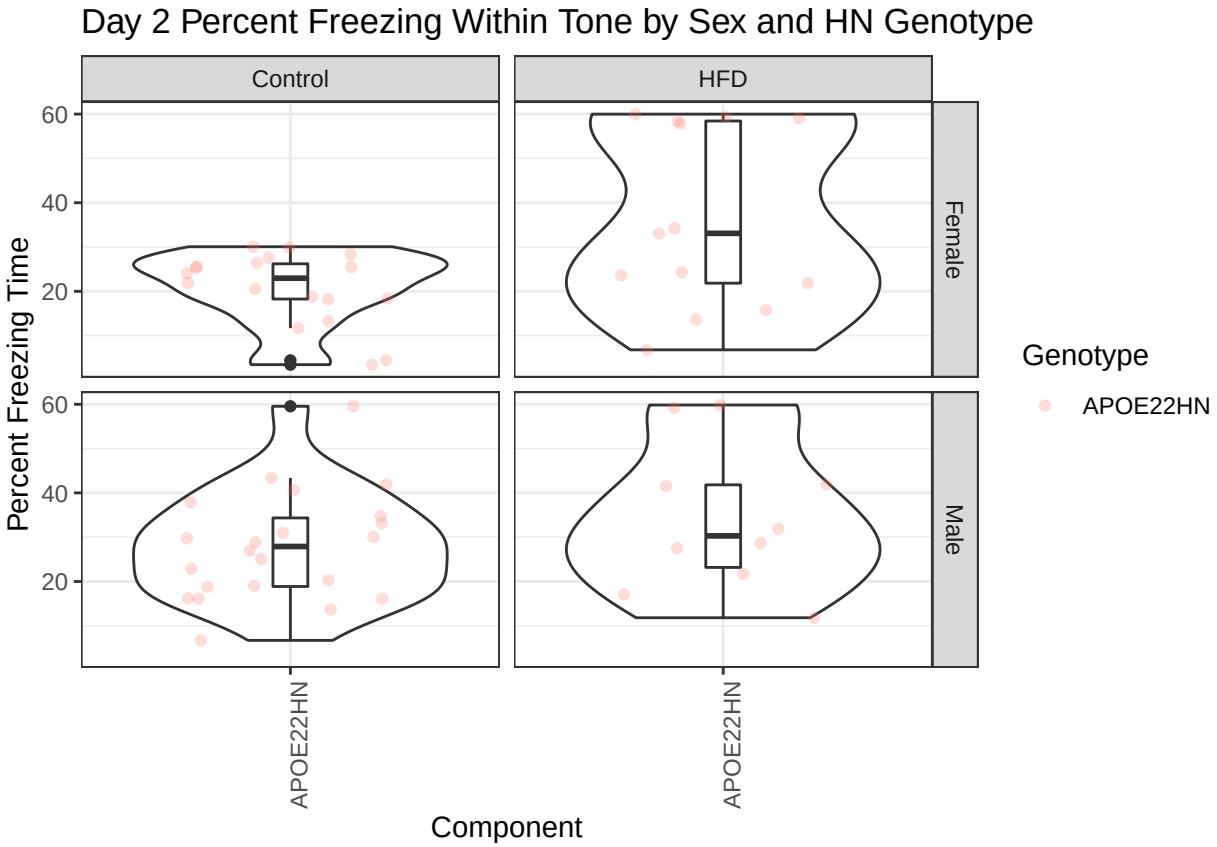
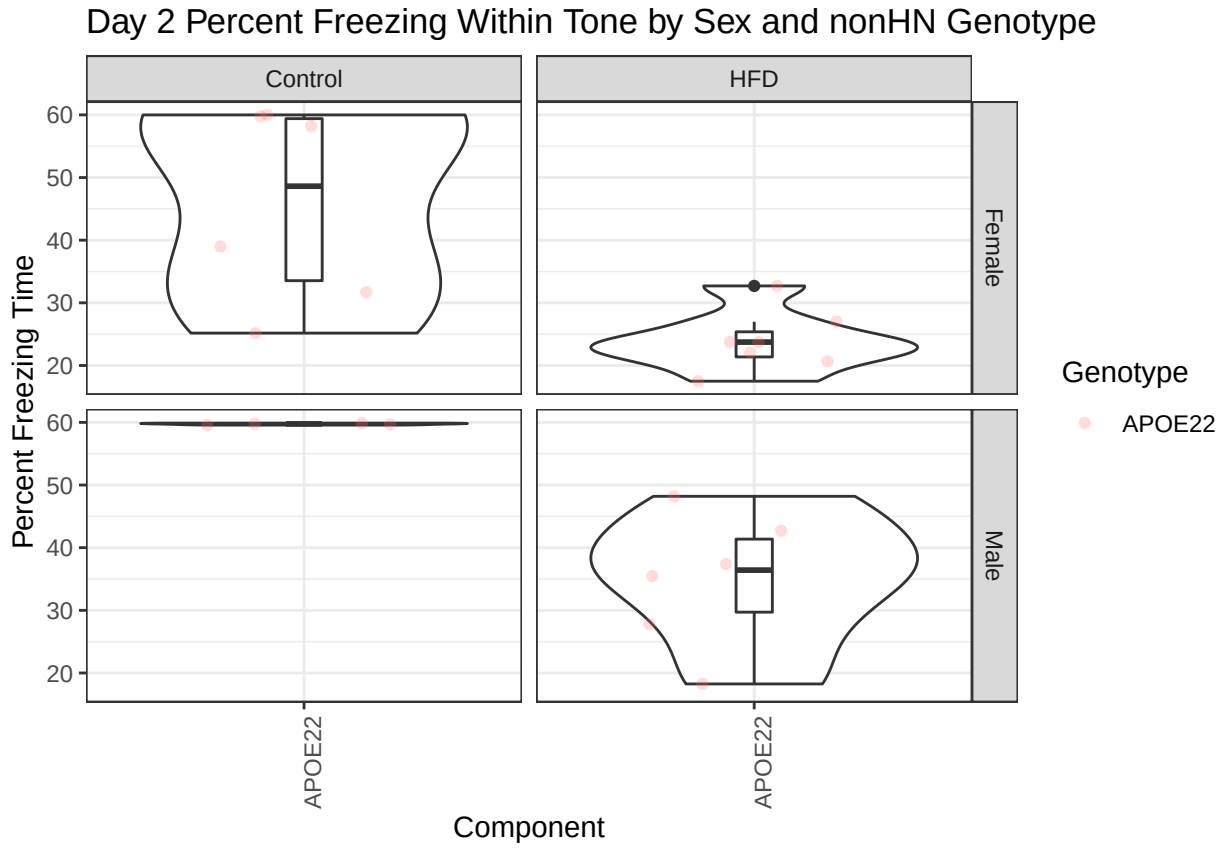
APOE22
Component
Genotype
APOE22


Day 2 Percent Freezing Within Tone by Age and HN Genotype
Control
HFD
12 months
18 months
Percent Freezing Time
60
40
20
APOE22HN
Component
Genotype
APOE22HN


Day 2 Percent Freezing Within Tone by Age and nonHN Genotype
Control
HFD
12 months
18 months
Percent Freezing Time
60
50
40
30
20
APOE22
Component
Genotype
APOE22


Day 2 Percent Freezing Within Tone by Sex and HN Genotype
Control
HFD
Female
Male
Percent Freezing Time
60
40
20
APOE22HN
Component
Genotype
APOE22HN




```
## Type III Analysis of Variance Table with Satterthwaite's method
##                          Sum Sq Mean Sq NumDF  DenDF F value    Pr(>F)
## Age                      0.0153  0.0153     1 30.211  0.0356   0.85169
## Sex                      0.7958  0.7958     1 30.211  1.8539   0.18340
## Treatment               18.4282 18.4282     1 30.211 42.9312 2.913e-07 ***
## Time                    20.5480 20.5480     1 40.000 47.8696 2.434e-08 ***
## Age:Sex                  0.1047  0.1047     1 30.211  0.2440   0.62490
## Sex:Treatment            1.7537  1.7537     1 30.211  4.0856   0.05219 .
## Age:Time                 2.5765  2.5765     1 40.000  6.0023   0.01876 *
## Sex:Time                 0.9347  0.9347     1 40.000  2.1776   0.14786
## Treatment:Time          23.3629 23.3629     1 40.000 54.4275 5.620e-09 ***
## Age:Sex:Time             0.8669  0.8669     1 40.000  2.0196   0.16303
## Sex:Treatment:Time       1.1603  1.1603     1 40.000  2.7032   0.10799
## Age:Treatment
## Age:Sex:Treatment
## Age:Treatment:Time
## Age:Sex:Treatment:Time
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Type III Analysis of Variance Table with Satterthwaite's method
##                                Sum Sq Mean Sq NumDF  DenDF  F value    Pr(>F)
## Age                            48.552  48.552     1 584.67  88.6462 < 2.2e-16
## Genotype                       72.330  14.466     5 583.78  26.4116 < 2.2e-16
## Sex                             1.445   1.445     1 584.50   2.6378 0.1048852
```

```
## Treatment                          12.952  12.952     1 583.63  23.6481 1.489e-06
## Time                              248.766 248.766     1 572.09 454.1938 < 2.2e-16
## Age:Genotype                       44.694   8.939     5 584.27  16.3204 4.357e-15
## Age:Sex                             0.255   0.255     1 584.69   0.4658 0.4951958
## Genotype:Sex                        4.240   0.848     5 583.65   1.5483 0.1729463
## Age:Treatment                       6.937   6.937     1 583.80  12.6658 0.0004027
## Genotype:Treatment                 53.511  10.702     5 583.80  19.5399 < 2.2e-16
## Sex:Treatment                       1.311   1.311     1 583.27   2.3933 0.1223962
## Age:Time                           14.497  14.497     1 572.09  26.4680 3.687e-07
## Genotype:Time                      47.698   9.540     5 572.09  17.4171 4.548e-16
## Sex:Time                            0.340   0.340     1 572.09   0.6214 0.4308598
## Treatment:Time                     11.753  11.753     1 572.09  21.4580 4.481e-06
## Age:Genotype:Sex                    2.599   0.520     5 584.12   0.9492 0.4485815
## Age:Genotype:Treatment             19.690   9.845     2 584.12  17.9746 2.658e-08
## Age:Sex:Treatment                   1.593   1.593     1 583.51   2.9090 0.0886176
## Genotype:Sex:Treatment             18.036   3.607     5 583.81   6.5860 5.633e-06
## Age:Genotype:Time                  24.794   4.959     5 572.09   9.0537 2.690e-08
## Age:Sex:Time                        0.230   0.230     1 572.09   0.4204 0.5170184
## Genotype:Sex:Time                   5.219   1.044     5 572.09   1.9056 0.0915716
## Age:Treatment:Time                  6.095   6.095     1 572.09  11.1285 0.0009052
## Genotype:Treatment:Time            40.366   8.073     5 572.09  14.7400 1.299e-13
## Sex:Treatment:Time                  1.661   1.661     1 572.09   3.0333 0.0821113
## Age:Genotype:Sex:Treatment          1.504   1.504     1 583.51   2.7468 0.0979885
## Age:Genotype:Sex:Time               6.634   1.327     5 572.09   2.4224 0.0345539
## Age:Genotype:Treatment:Time        14.443   7.222     2 572.09  13.1853 2.522e-06
## Age:Sex:Treatment:Time              2.039   2.039     1 572.09   3.7232 0.0541540
## Genotype:Sex:Treatment:Time        10.008   2.002     5 572.09   3.6545 0.0029044
## Age:Genotype:Sex:Treatment:Time     3.948   3.948     1 572.09   7.2076 0.0074701
##
## Age                               ***
## Genotype                          ***
## Sex
## Treatment                         ***
## Time                              ***
## Age:Genotype                      ***
## Age:Sex
## Genotype:Sex
## Age:Treatment                     ***
## Genotype:Treatment                ***
## Sex:Treatment
## Age:Time                          ***
## Genotype:Time                     ***
## Sex:Time
## Treatment:Time                    ***
## Age:Genotype:Sex
## Age:Genotype:Treatment            ***
## Age:Sex:Treatment                 .
## Genotype:Sex:Treatment            ***
## Age:Genotype:Time                 ***
## Age:Sex:Time
## Genotype:Sex:Time                 .
## Age:Treatment:Time                ***
## Genotype:Treatment:Time           ***
## Sex:Treatment:Time                .
```

```
## Age:Genotype:Sex:Treatment      .
## Age:Genotype:Sex:Time           *
## Age:Genotype:Treatment:Time     ***
## Age:Sex:Treatment:Time          .
## Genotype:Sex:Treatment:Time     **
## Age:Genotype:Sex:Treatment:Time **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
## Type III Analysis of Variance Table with Satterthwaite's method
##              Sum Sq Mean Sq NumDF  DenDF  F value    Pr(>F)
## HN             0.82    0.82     1 577.86   1.0590    0.3039
## APOE          61.53   30.77     2 577.67  39.6953 < 2.2e-16 ***
## Time         367.04  367.04     1 607.00 473.5769 < 2.2e-16 ***
## HN:APOE       27.63   13.81     2 577.67  17.8245 3.079e-08 ***
## HN:Time        0.01    0.01     1 607.00   0.0112    0.9159
## APOE:Time     41.01   20.50     2 607.00  26.4545 9.647e-12 ***
## HN:APOE:Time  21.07   10.53     2 607.00  13.5899 1.684e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
## Type III Analysis of Variance Table with Satterthwaite's method
##                                 Sum Sq Mean Sq NumDF  DenDF F value    Pr(>F)
## Age                             194.08  194.08     1 831.99 14.6623 0.0001382
## Genotype                         84.17   16.83     5 832.08  1.2718 0.2739922
## Sex                               9.59    9.59     1 832.01  0.7242 0.3950035
## Treatment                         9.76    9.76     1 832.10  0.7375 0.3907051
## Time                            624.09  624.09     1 571.70 47.1476 1.721e-11
## Age:Genotype                    148.27   29.65     5 832.03  2.2402 0.0485525
## Age:Sex                          27.01   27.01     1 831.99  2.0409 0.1534971
## Genotype:Sex                      5.65    1.13     5 832.09  0.0854 0.9945399
## Age:Treatment                     6.44    6.44     1 832.08  0.4866 0.4856403
## Genotype:Treatment               63.05   12.61     5 832.08  0.9527 0.4460844
## Sex:Treatment                     0.03    0.03     1 832.13  0.0022 0.9622443
## Age:Time                        517.49  517.49     1 571.70 39.0941 7.909e-10
## Genotype:Time                   364.04   72.81     5 571.70  5.5003 5.884e-05
## Sex:Time                         53.24   53.24     1 571.70  4.0224 0.0453697
## Treatment:Time                   50.74   50.74     1 571.70  3.8334 0.0507265
## Age:Genotype:Sex                 11.51    2.30     5 832.05  0.1739 0.9723016
## Age:Genotype:Treatment           45.95   22.98     2 832.05  1.7357 0.1769124
## Age:Sex:Treatment                 8.39    8.39     1 832.11  0.6335 0.4262868
## Genotype:Sex:Treatment           19.93    3.99     5 832.08  0.3011 0.9122806
## Age:Genotype:Time               432.91   86.58     5 571.70  6.5409 6.258e-06
## Age:Sex:Time                     91.56   91.56     1 571.70  6.9168 0.0087688
## Genotype:Sex:Time                24.50    4.90     5 571.70  0.3702 0.8691022
## Age:Treatment:Time               27.45   27.45     1 571.70  2.0735 0.1504249
## Genotype:Treatment:Time         252.96   50.59     5 571.70  3.8220 0.0020526
## Sex:Treatment:Time                0.57    0.57     1 571.70  0.0428 0.8362204
## Age:Genotype:Sex:Treatment        0.43    0.43     1 832.11  0.0328 0.8564128
## Age:Genotype:Sex:Time            43.89    8.78     5 571.70  0.6632 0.6515412
## Age:Genotype:Treatment:Time     125.29   62.64     2 571.70  4.7324 0.0091530
## Age:Sex:Treatment:Time            5.80    5.80     1 571.70  0.4382 0.5082508
## Genotype:Sex:Treatment:Time     153.12   30.62     5 571.70  2.3135 0.0426173
## Age:Genotype:Sex:Treatment:Time   6.82    6.82     1 571.70  0.5156 0.4730371
```

```
##
## Age                              ***
## Genotype
## Sex
## Treatment
## Time                             ***
## Age:Genotype                     *
## Age:Sex
## Genotype:Sex
## Age:Treatment
## Genotype:Treatment
## Sex:Treatment
## Age:Time                         ***
## Genotype:Time                    ***
## Sex:Time                         *
## Treatment:Time                   .
## Age:Genotype:Sex
## Age:Genotype:Treatment
## Age:Sex:Treatment
## Genotype:Sex:Treatment
## Age:Genotype:Time                ***
## Age:Sex:Time                     **
## Genotype:Sex:Time
## Age:Treatment:Time
## Genotype:Treatment:Time          **
## Sex:Treatment:Time
## Age:Genotype:Sex:Treatment
## Age:Genotype:Sex:Time
## Age:Genotype:Treatment:Time      **
## Age:Sex:Treatment:Time
## Genotype:Sex:Treatment:Time      *
## Age:Genotype:Sex:Treatment:Time
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Type III Analysis of Variance Table with Satterthwaite's method
##              Sum Sq Mean Sq NumDF  DenDF F value    Pr(>F)
## HN            30.81   30.81     1 897.26  1.8342 0.1759685
## APOE          37.78   18.89     2 897.31  1.1248 0.3251857
## Time         326.45  326.45     1 606.75 19.4370  1.23e-05 ***
## HN:APOE       10.55    5.28     2 897.31  0.3141 0.7304985
## HN:Time       77.78   77.78     1 606.75  4.6312 0.0317891 *
## APOE:Time    287.00  143.50     2 606.75  8.5441 0.0002191 ***
## HN:APOE:Time  91.99   45.99     2 606.75  2.7385 0.0654676 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Analysis of Variance Table
##
## Response: Pct.Total.Time.Freezing
##                             Df Sum Sq Mean Sq F value   Pr(>F)
## Age                          1    297  296.99  2.1877 0.140323
## Genotype                     5   2633  526.69  3.8797 0.002078 **
## Sex                          1    425  424.69  3.1284 0.078110 .
```

```
## Treatment                    1    237  237.25  1.7477 0.187329
## Age:Genotype                 5   1661  332.14  2.4466 0.034469 *
## Age:Sex                      1     16   15.58  0.1147 0.735087
## Genotype:Sex                 5    921  184.20  1.3568 0.241036
## Age:Treatment                1    309  308.70  2.2740 0.132773
## Genotype:Treatment           5    881  176.30  1.2986 0.264819
## Sex:Treatment                1     33   32.59  0.2401 0.624565
## Age:Genotype:Sex             5    408   81.57  0.6008 0.699340
## Age:Genotype:Treatment       2    502  250.92  1.8483 0.159562
## Age:Sex:Treatment            1      8    7.55  0.0556 0.813774
## Genotype:Sex:Treatment       5    618  123.50  0.9097 0.475175
## Age:Genotype:Sex:Treatment   1     17   17.01  0.1253 0.723666
## Residuals                  261  35432  135.76
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Analysis of Variance Table
##
## Response: Pct.Total.Time.Freezing
##            Df Sum Sq Mean Sq F value   Pr(>F)
## Genotype    5   2893  578.67  4.1271 0.001224 **
## Residuals 296  41503  140.21
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Analysis of Variance Table
##
## Response: Pct.Total.Time.Freezing
##            Df Sum Sq Mean Sq F value    Pr(>F)
## HN          1    178  178.29  1.2716 0.2603803
## APOE        2   2171 1085.37  7.7409 0.0005286 ***
## HN:APOE     2    544  272.16  1.9410 0.1453794
## Residuals 296  41503  140.21
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Analysis of Variance Table
##
## Response: Freeze.Cnt
##                             Df Sum Sq Mean Sq F value   Pr(>F)
## Age                          1   1397  1397.0  1.0728 0.301267
## Genotype                     5  24053  4810.5  3.6941 0.003012 **
## Sex                          1   5983  5983.4  4.5948 0.032993 *
## Treatment                    1   3046  3045.7  2.3389 0.127390
## Age:Genotype                 5  13069  2613.7  2.0072 0.078003 .
## Age:Sex                      1   1164  1164.4  0.8941 0.345234
## Genotype:Sex                 5   7465  1493.0  1.1465 0.336203
## Age:Treatment                1   1329  1328.8  1.0204 0.313363
## Genotype:Treatment           5  11659  2331.8  1.7906 0.115061
## Sex:Treatment                1    568   568.0  0.4362 0.509543
## Age:Genotype:Sex             5   5087  1017.4  0.7813 0.563920
## Age:Genotype:Treatment       2   4047  2023.3  1.5537 0.213408
## Age:Sex:Treatment            1   1166  1166.4  0.8957 0.344807
```

```
## Genotype:Sex:Treatment       5   3251   650.2  0.4993 0.776662
## Age:Genotype:Sex:Treatment   1    228   228.3  0.1753 0.675784
## Residuals                  261 339876  1302.2
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Analysis of Variance Table
##
## Response: Freeze.Cnt
##            Df Sum Sq Mean Sq F value    Pr(>F)
## HN          1     94    94.4  0.0702 0.7912505
## APOE        2  21853 10926.7  8.1273 0.0003663 ***
## HN:APOE     2   3482  1741.0  1.2949 0.2754596
## Residuals 296 397958  1344.5
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Type III Analysis of Variance Table with Satterthwaite's method
##                                       Sum Sq Mean Sq NumDF  DenDF F value
## Age                                   4741.3  4741.3     1 731.03 19.0036
## Genotype                              9547.5  1909.5     5 731.03  7.6535
## Sex                                    102.3   102.3     1 731.03  0.4099
## Treatment                              853.8   853.8     1 731.03  3.4220
## Component                             2880.5  2880.5     1 563.00 11.5453
## Age:Genotype                          2631.4   526.3     5 731.03  2.1094
## Age:Sex                                  4.7     4.7     1 731.03  0.0187
## Genotype:Sex                           166.5    33.3     5 731.03  0.1335
## Age:Treatment                          523.5   523.5     1 731.03  2.0982
## Genotype:Treatment                    3477.7   695.5     5 731.03  2.7878
## Sex:Treatment                          133.8   133.8     1 731.03  0.5361
## Age:Component                          965.6   965.6     1 563.00  3.8704
## Genotype:Component                    1920.0   384.0     5 563.00  1.5391
## Sex:Component                          17.1    17.1     1 563.00  0.0686
## Treatment:Component                    231.5   231.5     1 563.00  0.9281
## Age:Genotype:Sex                       332.2    66.4     5 731.03  0.2663
## Age:Genotype:Treatment                1033.0   516.5     2 731.03  2.0702
## Age:Sex:Treatment                      33.7    33.7     1 731.03  0.1351
## Genotype:Sex:Treatment                2130.0   426.0     5 731.03  1.7075
## Age:Genotype:Component                 470.6    94.1     5 563.00  0.3773
## Age:Sex:Component                        3.4     3.4     1 563.00  0.0136
## Genotype:Sex:Component                 131.6    26.3     5 563.00  0.1055
## Age:Treatment:Component                121.5   121.5     1 563.00  0.4870
## Genotype:Treatment:Component           670.5   134.1     5 563.00  0.5375
## Sex:Treatment:Component                 25.8    25.8     1 563.00  0.1036
## Age:Genotype:Sex:Treatment             194.7   194.7     1 731.03  0.7805
## Age:Genotype:Sex:Component              66.4    13.3     5 563.00  0.0532
## Age:Genotype:Treatment:Component       140.5    70.3     2 563.00  0.2816
## Age:Sex:Treatment:Component              0.1     0.1     1 563.00  0.0005
## Genotype:Sex:Treatment:Component       480.4    96.1     5 563.00  0.3851
## Age:Genotype:Sex:Treatment:Component    44.9    44.9     1 563.00  0.1798
##                                         Pr(>F)
## Age                                  1.492e-05 ***
## Genotype                             5.035e-07 ***
## Sex                                  0.5222357
```

```
## Treatment                              0.0647375 .
## Component                              0.0007272 ***
## Age:Genotype                           0.0624116 .
## Age:Sex                                0.8912927
## Genotype:Sex                           0.9846508
## Age:Treatment                          0.1479015
## Genotype:Treatment                     0.0166839 *
## Sex:Treatment                          0.4642709
## Age:Component                          0.0496347 *
## Genotype:Component                     0.1757663
## Sex:Component                          0.7934127
## Treatment:Component                    0.3357798
## Age:Genotype:Sex                       0.9314894
## Age:Genotype:Treatment                 0.1269014
## Age:Sex:Treatment                      0.7133060
## Genotype:Sex:Treatment                 0.1304937
## Age:Genotype:Component                 0.8643798
## Age:Sex:Component                      0.9073119
## Genotype:Sex:Component                 0.9910321
## Age:Treatment:Component                0.4855358
## Genotype:Treatment:Component           0.7479285
## Sex:Treatment:Component                0.7476664
## Age:Genotype:Sex:Treatment             0.3772733
## Age:Genotype:Sex:Component             0.9982233
## Age:Genotype:Treatment:Component       0.7546626
## Age:Sex:Treatment:Component            0.9817590
## Genotype:Sex:Treatment:Component       0.8590817
## Age:Genotype:Sex:Treatment:Component 0.6717321
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Type III Analysis of Variance Table with Satterthwaite's method
##                     Sum Sq Mean Sq NumDF  DenDF F value    Pr(>F)
## HN                   495.3   495.3     1 852.92  2.0477  0.152801
## APOE                7675.9  3838.0     2 852.92 15.8673 1.714e-07 ***
## Component          10227.5 10227.5     1 598.00 42.2836 1.668e-10 ***
## HN:APOE             2692.2  1346.1     2 852.92  5.5652  0.003969 **
## HN:Component         110.3   110.3     1 598.00  0.4561  0.499733
## APOE:Component      1882.5   941.3     2 598.00  3.8915  0.020933 *
## HN:APOE:Component    331.7   165.9     2 598.00  0.6857  0.504109
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Type III Analysis of Variance Table with Satterthwaite's method
##                                      Sum Sq Mean Sq NumDF  DenDF F value
## Age                                   542.1   542.1     1 780.51  1.2171
## Genotype                             2009.5   401.9     5 780.51  0.9023
## Sex                                   272.1   272.1     1 780.51  0.6109
## Treatment                             768.9   768.9     1 780.51  1.7262
## Component                           10147.0 10147.0     1 563.00 22.7812
## Age:Genotype                          556.2   111.2     5 780.51  0.2497
## Age:Sex                               212.7   212.7     1 780.51  0.4776
## Genotype:Sex                         1739.9   348.0     5 780.51  0.7813
## Age:Treatment                          58.0    58.0     1 780.51  0.1302
```

```
## Genotype:Treatment                    1052.4   210.5     5 780.51  0.4725
## Sex:Treatment                          183.2   183.2     1 780.51  0.4113
## Age:Component                          208.8   208.8     1 563.00  0.4689
## Genotype:Component                    1744.3   348.9     5 563.00  0.7832
## Sex:Component                           39.2    39.2     1 563.00  0.0879
## Treatment:Component                    524.8   524.8     1 563.00  1.1782
## Age:Genotype:Sex                      1597.9   319.6     5 780.51  0.7175
## Age:Genotype:Treatment                 135.7    67.9     2 780.51  0.1524
## Age:Sex:Treatment                      366.2   366.2     1 780.51  0.8221
## Genotype:Sex:Treatment                1768.0   353.6     5 780.51  0.7939
## Age:Genotype:Component                 504.6   100.9     5 563.00  0.2266
## Age:Sex:Component                        1.0     1.0     1 563.00  0.0024
## Genotype:Sex:Component                 445.2    89.0     5 563.00  0.1999
## Age:Treatment:Component                  0.5     0.5     1 563.00  0.0010
## Genotype:Treatment:Component           347.4    69.5     5 563.00  0.1560
## Sex:Treatment:Component                479.4   479.4     1 563.00  1.0763
## Age:Genotype:Sex:Treatment             118.7   118.7     1 780.51  0.2664
## Age:Genotype:Sex:Component             663.2   132.6     5 563.00  0.2978
## Age:Genotype:Treatment:Component        26.9    13.4     2 563.00  0.0302
## Age:Sex:Treatment:Component              4.0     4.0     1 563.00  0.0089
## Genotype:Sex:Treatment:Component      2001.1   400.2     5 563.00  0.8985
## Age:Genotype:Sex:Treatment:Component     0.0     0.0     1 563.00  0.0000
##                                        Pr(>F)
## Age                                    0.2703
## Genotype                               0.4789
## Sex                                    0.4347
## Treatment                              0.1893
## Component                           2.317e-06 ***
## Age:Genotype                           0.9400
## Age:Sex                                0.4897
## Genotype:Sex                           0.5633
## Age:Treatment                          0.7183
## Genotype:Treatment                     0.7969
## Sex:Treatment                          0.5215
## Age:Component                          0.4938
## Genotype:Component                     0.5620
## Sex:Component                          0.7670
## Treatment:Component                    0.2782
## Age:Genotype:Sex                       0.6104
## Age:Genotype:Treatment                 0.8587
## Age:Sex:Treatment                      0.3648
## Genotype:Sex:Treatment                 0.5542
## Age:Genotype:Component                 0.9510
## Age:Sex:Component                      0.9613
## Genotype:Sex:Component                 0.9625
## Age:Treatment:Component                0.9742
## Genotype:Treatment:Component           0.9782
## Sex:Treatment:Component                0.3000
## Age:Genotype:Sex:Treatment             0.6059
## Age:Genotype:Sex:Component             0.9141
## Age:Genotype:Treatment:Component       0.9703
## Age:Sex:Treatment:Component            0.9249
## Genotype:Sex:Treatment:Component       0.4817
## Age:Genotype:Sex:Treatment:Component   0.9945
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Type III Analysis of Variance Table with Satterthwaite's method
##                     Sum Sq Mean Sq NumDF  DenDF F value    Pr(>F)
## HN                  2312.0  2312.0     1 858.01  5.3355   0.02113 *
## APOE                 359.5   179.8     2 858.01  0.4148   0.66058
## Component          24890.6 24890.6     1 598.00 57.4416 1.333e-13 ***
## HN:APOE               70.2    35.1     2 858.01  0.0810   0.92218
## HN:Component         597.5   597.5     1 598.00  1.3789   0.24076
## APOE:Component      1465.2   732.6     2 598.00  1.6907   0.18527
## HN:APOE:Component    532.7   266.3     2 598.00  0.6146   0.54119
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Analysis of Variance Table
##
## Response: Pct.Total.Time.Freezing
##                              Df Sum Sq Mean Sq F value    Pr(>F)
## Age                           1  13539 13538.5 88.6893 < 2.2e-16 ***
## Genotype                      5  24295  4859.1 31.8313 < 2.2e-16 ***
## Sex                           1    442   441.7  2.8934  0.090133 .
## Treatment                     1    207   207.4  1.3586  0.244845
## Age:Genotype                  5   7750  1550.0 10.1542 6.682e-09 ***
## Age:Sex                       1    140   140.1  0.9176  0.338996
## Genotype:Sex                  5    697   139.3  0.9126  0.473304
## Age:Treatment                 1    221   221.4  1.4503  0.229577
## Genotype:Treatment            5   4921   984.2  6.4472 1.140e-05 ***
## Sex:Treatment                 1    145   144.9  0.9495  0.330740
## Age:Genotype:Sex              5    377    75.5  0.4945  0.780238
## Age:Genotype:Treatment        2   1513   756.3  4.9548  0.007727 **
## Age:Sex:Treatment             1      5     5.5  0.0360  0.849723
## Genotype:Sex:Treatment        5   2844   568.9  3.7267  0.002823 **
## Age:Genotype:Sex:Treatment    1    177   177.1  1.1603  0.282393
## Residuals                   261  39842   152.7
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Analysis of Variance Table
##
## Response: Pct.Total.Time.Freezing
##             Df Sum Sq Mean Sq F value    Pr(>F)
## HN           1   3692  3691.8  14.289 0.0001896 ***
## APOE         2  11713  5856.5  22.668 6.925e-10 ***
## HN:APOE      2   5235  2617.6  10.132 5.546e-05 ***
## Residuals  296  76476   258.4
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Analysis of Variance Table
##
## Response: Freeze.Cnt
##                              Df Sum Sq Mean Sq F value    Pr(>F)
```

```
## Age                          1  23230 23230.3 39.9439 1.124e-09 ***
## Genotype                     5  44242  8848.3 15.2144 4.045e-13 ***
## Sex                          1    489   489.0  0.8408   0.36001
## Treatment                    1    682   682.4  1.1734   0.27971
## Age:Genotype                 5   3390   678.0  1.1658   0.32641
## Age:Sex                      1    315   314.6  0.5409   0.46271
## Genotype:Sex                 5   5102  1020.5  1.7547   0.12259
## Age:Treatment                1    999   999.1  1.7179   0.19112
## Genotype:Treatment           5   6577  1315.4  2.2617   0.04879 *
## Sex:Treatment                1      0     0.1  0.0002   0.98972
## Age:Genotype:Sex             5   5846  1169.3  2.0105   0.07753 .
## Age:Genotype:Treatment       2   1075   537.4  0.9240   0.39821
## Age:Sex:Treatment            1      1     1.1  0.0019   0.96565
## Genotype:Sex:Treatment       5   7032  1406.5  2.4184   0.03636 *
## Age:Genotype:Sex:Treatment   1    909   908.7  1.5625   0.21242
## Residuals                  261 151791   581.6
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

## Analysis of Variance Table
##
## Response: Freeze.Cnt
##            Df Sum Sq Mean Sq F value   Pr(>F)
## HN          1   8606  8606.0 11.9270 0.000634 ***
## APOE        2  16123  8061.5 11.1725  2.1e-05 ***
## HN:APOE     2  13371  6685.6  9.2656 0.000125 ***
## Residuals 296 213580   721.6
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```