DNA Microarrays

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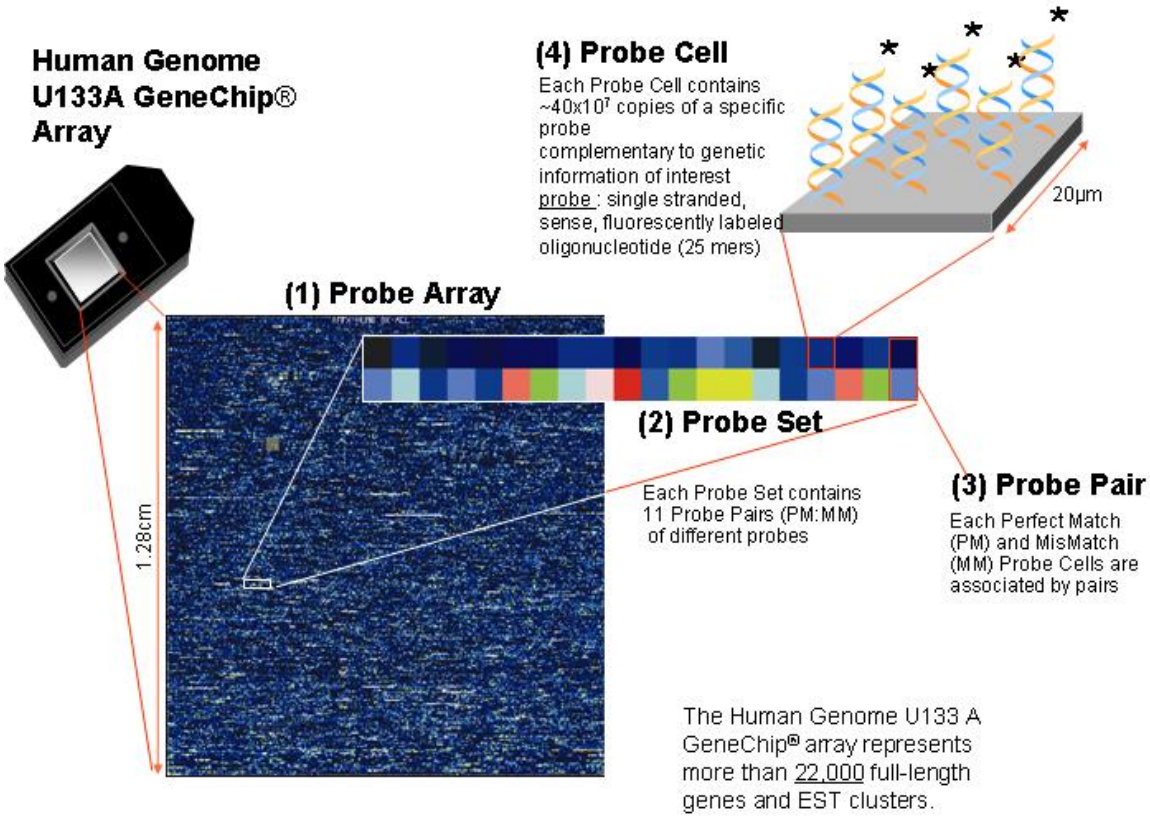

Un ejemplo

- gse21779

ExpressionSet

```
pacman::p_load(ALL)
```

```
data(ALL)
```

La clase del objeto la podemos ver con

```
class(ALL)
```

```
[1] "ExpressionSet"
attr(,"package")
[1] "Biobase"
```

El método `print` nos da un breve resumen de la clase.

```
ALL
```

La matriz de expresión la obtenemos con el accessor `Biobase::exprs`.

```
            01005     01010    03002    04006    04007     04008     04010
1000_at   7.597323  7.479445 7.567593 7.384684 7.905312  7.065914  7.474537
1001_at   5.046194  4.932537 4.799294 4.922627 4.844565  5.147762  5.122518
1002_f_at 3.900466  4.208155 3.886169 4.206798 3.416923  3.945869  4.150506
1003_s_at 5.903856  6.169024 5.860459 6.116890 5.687997  6.208061  6.292713
1004_at   5.925260  5.912780 5.893209 6.170245 5.615210  5.923487  6.046607
1005_at   8.570990 10.428299 9.616713 9.937155 9.983809 10.063484 10.662059
              04016    06002     08001    08011    08012    08018    08024
1000_at    7.536119 7.183331  7.735545 7.591498 7.824284 7.231814 7.879988
1001_at    5.016132 5.288943  4.633217 4.583148 4.685951 5.059300 4.830464
1002_f_at  3.576360 3.900935  3.630190 3.609112 3.902139 3.804705 3.862914
1003_s_at  5.665991 5.842326  5.875375 5.733157 5.762857 5.770914 6.079410
1004_at    5.738218 5.994515  5.748350 5.922568 5.679899 6.044520 6.057632
1005_at   11.269115 8.812869 10.165159 9.381072 8.227970 7.627248 7.667445
              09008     09017    11005    12006    12007    12012     12019
1000_at    7.891793  7.756734 7.640012 7.759599 7.678636 7.464285  7.652719
1001_at    5.999496  4.987595 4.967288 4.770481 5.456332 4.785863  5.175609
1002_f_at  4.001606  4.048901 3.796550 3.912707 3.870893 3.930832  3.932360
1003_s_at  5.832952  6.097900 6.094379 6.235795 5.971466 6.037364  6.194623
1004_at    5.717497  6.210092 5.751805 5.883340 5.918456 5.725421  5.969027
1005_at   10.206353 10.015466 9.358516 8.824348 9.262478 7.232927 10.243610
             12026    14016     15001    15004    15005    16004    16009
1000_at   7.501591 7.570417  7.331509 7.366208 7.455451 7.328875 7.297313
1001_at   5.188992 5.258312  4.627955 4.733495 5.125098 5.332775 5.215707
1002_f_at 4.188444 4.028859  4.099497 3.831617 3.786741 4.648154 4.176687
1003_s_at 6.231228 6.348593  6.057790 6.043205 6.303592 5.905220 6.274415
1004_at   6.357476 6.173530  5.729543 5.671164 5.977084 5.721572 6.000902
1005_at   7.808452 7.557919 10.233185 9.749860 8.477219 9.884608 9.599149
```

```
             19005    20002    22009    22010    22011    22013    24001
1000_at   7.563561 7.541133 8.016818 7.862181 7.702580 7.412003 7.916169
1001_at   4.858392 4.964424 5.216252 5.135825 4.802946 5.222676 4.790170
1002_f_at 4.097332 3.789888 3.980839 3.954917 3.971934 4.109899 3.899038
1003_s_at 5.838829 6.160238 6.343042 6.195307 5.865581 6.243157 6.022905
1004_at   5.970021 6.054232 6.024327 6.114502 6.035582 5.896131 5.800271
1005_at   9.683996 9.221405 8.571812 8.841628 8.489550 8.998592 8.933302
             24005     24008    24010    24011     24017    24018     24019
1000_at   7.595848  7.296349 7.506236 7.144425  7.513972 7.815971  7.406135
1001_at   4.804743  5.002518 4.218220 5.228892  5.264158 4.899316  4.791335
1002_f_at 3.677240  3.906343 3.579385 3.829513  3.965467 4.058576  4.131234
1003_s_at 5.669771  5.668509 5.273965 5.817272  6.088179 6.387995  6.343673
1004_at   5.475892  5.437155 4.634124 5.552223  5.982065 5.874817  6.048209
1005_at   9.626267 10.826157 8.782330 7.881855 11.069535 9.102971 10.037809
             24022    25003     25006    26001    26003    26005    26008
1000_at   7.300980 7.845054  7.651229 7.376930 7.663977 7.250353 7.663612
1001_at   5.177703 5.250315  4.896195 5.123546 5.078104 4.945670 5.124591
1002_f_at 3.838198 4.046442  4.120495 4.131492 3.803233 4.105035 4.119660
1003_s_at 5.863318 6.205917  6.298788 6.118064 6.199316 5.782105 6.271931
1004_at   5.669051 5.931859  5.915944 6.002812 5.822230 5.930979 6.073099
1005_at   9.095296 8.670866 10.496309 9.046483 9.104846 9.756972 9.071812
             27003    27004    28001    28003    28005    28006     28007
1000_at   7.329996 7.360754 7.035203 7.705260 7.551734 7.538601  7.501531
1001_at   5.438098 4.757900 5.005279 5.009705 4.944978 4.511194  4.888814
1002_f_at 3.677207 3.638739 3.800893 4.238111 3.719482 3.788262  3.626149
1003_s_at 5.899308 5.664813 5.732956 6.379139 5.833428 5.362676  5.702537
1004_at   5.718582 5.595820 5.485361 5.881472 5.554058 4.986320  5.743743
1005_at   6.969776 8.867644 7.067019 9.080559 8.245585 7.807180 10.085771
             28019    28021    28023    28024    28028     28031    28032
1000_at   7.116676 7.107979 7.427808 6.549926 7.514761  7.377215 6.973861
1001_at   5.275964 4.865566 5.057619 5.185277 4.788468  4.778381 4.970430
1002_f_at 4.192648 3.979372 3.791415 3.943834 3.924333  3.657005 3.706332
1003_s_at 6.196541 5.804445 5.719376 5.943116 5.719659  5.939648 5.968072
1004_at   5.926093 5.768851 5.478333 5.756534 5.740607  5.770578 5.905965
1005_at   8.097072 8.661098 9.106441 8.804075 8.235771 10.607653 6.760202
             28035    28036    28037    28042    28043    28044    28047
1000_at   7.227516 7.407561 7.158049 7.235291 7.589310 7.988476 7.362458
1001_at   6.408157 5.042222 5.431469 4.686293 4.851805 4.894379 4.843868
1002_f_at 3.995074 3.714084 4.302001 3.677909 3.831514 3.690856 3.646990
1003_s_at 6.272305 5.733332 6.253362 6.098969 6.132159 6.130691 5.628370
1004_at   6.050495 5.651345 6.494545 6.109255 5.867806 5.592139 5.644372
1005_at   8.957027 8.764321 9.102879 7.008132 7.720932 7.861043 6.642728
             30001    31007    31011     33005     36001    36002    37013
```

```
1000_at   7.508667 7.147843 7.651676  7.486432  7.759074 7.473427 7.627685
1001_at   5.587029 4.943857 4.741654  4.642628  4.962544 4.953122 5.358236
1002_f_at 3.765444 3.789166 3.790688  3.682768  3.740679 3.688162 4.008891
1003_s_at 6.078532 5.858604 6.251328  5.961910  5.936883 5.642185 6.314849
1004_at   5.935291 5.526191 5.820374  5.810047  5.616831 5.678327 6.044299
1005_at   9.075910 9.588264 9.585180 11.609025 11.653732 8.893931 7.950866
             43001     43004    43007    43012     48001    49006     57001
1000_at   7.577529  7.600206 7.776844 7.585928  7.450666 7.004613  7.195206
1001_at   5.054157  4.879037 4.949908 5.057530  4.960382 4.836905  4.744006
1002_f_at 3.932435  4.028704 3.689141 3.891536  4.061201 3.699625  3.973128
1003_s_at 6.310934  6.086349 5.658127 6.363734  6.099140 5.616555  5.962672
1004_at   5.782177  5.817414 5.621938 5.975024  5.853644 5.704549  5.765632
1005_at   8.569400 10.693175 7.601647 9.377819 10.929231 9.193089 10.691061
             62001    62002    62003    63001    64001     64002    65005
1000_at   7.407351 7.756195 7.913324 7.270997 7.694588  7.583071 7.609538
1001_at   4.930312 5.238937 5.074681 4.513671 4.928159  4.804083 4.715693
1002_f_at 3.734818 3.945514 3.926906 3.639640 3.806746  4.104208 3.453649
1003_s_at 5.730142 6.061704 6.208286 5.519846 5.834263  6.340025 5.584102
1004_at   5.512776 5.956554 6.028228 5.041052 5.912557  6.056120 5.611407
1005_at   9.108345 9.507559 9.693530 7.758929 8.883131 10.320243 7.757368
             68001    68003    84004     LAL5    01003    01007    02020
1000_at    7.324502 7.545120 7.679603 7.604093 7.240252 7.676749 7.934247
1001_at    5.379102 4.650231 4.795495 4.988922 5.224752 5.129002 5.667907
1002_f_at  4.066075 3.626514 3.554142 3.960894 3.862458 4.169622 4.173444
1003_s_at  6.121059 6.347044 5.471594 5.761373 6.430906 6.202916 6.083160
1004_at    6.224473 5.884682 5.505538 6.048169 5.940335 5.979690 6.127251
1005_at   11.165801 8.986872 9.984865 9.741136 9.790736 8.671713 8.308241
             04018    09002    10005    11002    12008    15006    16002
1000_at   7.874448 7.404271 7.775253 7.771891 7.355677 7.388882 7.589734
1001_at   5.005420 5.127949 4.423445 4.476761 5.461252 5.330129 4.836986
1002_f_at 3.772763 3.979145 3.529124 3.656052 4.121548 4.146230 3.956283
1003_s_at 6.041962 6.013443 5.156087 5.528908 6.054917 6.028770 5.990144
1004_at   5.751041 6.138876 5.038015 5.396687 5.984467 6.282975 5.860502
1005_at   8.324171 6.379843 8.841847 7.536542 8.685069 9.657075 8.481350
             16007     17003    18001    19002    19008    19014     19017
1000_at   7.675929  7.662426 7.584008 7.840099 7.164922 7.843162  7.695714
1001_at   4.959669  5.743215 4.674920 5.208166 4.554529 5.718569  4.498515
1002_f_at 3.819324  4.142183 3.556962 3.942920 3.541456 4.000303  3.667304
1003_s_at 5.763215  6.307570 5.825432 6.181242 5.869161 6.131560  5.787218
1004_at   5.781565  5.857727 5.786847 5.935438 5.628791 5.613913  5.226277
1005_at   9.314393 10.336505 9.238966 8.941103 8.005422 9.629751 10.907283
             20005    24006    26009    28008    28009    31015     37001
1000_at   7.520867 7.836577 7.470524 7.520806 7.646947 7.727560  7.849455
```

```
1001_at   5.135697 5.129836 5.213340 4.690815 4.902946 4.866731  4.959450
1002_f_at 4.165152 4.002384 4.126231 3.655414 3.894576 3.970375  4.047428
1003_s_at 6.019615 6.110763 6.271189 5.513344 5.814061 5.779816  6.193790
1004_at   5.850529 5.847115 6.089797 5.211162 5.828099 5.738370  5.824930
1005_at   8.034295 7.967475 9.382400 7.727615 8.067144 9.211820 10.408645
             43006    43015    44001    49004    56007     64005    65003
1000_at   7.960842 8.188617 7.399999 7.813474 7.816922  7.913249 7.800199
1001_at   4.537677 5.154500 5.071885 4.874525 4.788699  5.403640 5.443827
1002_f_at 3.694877 3.949546 3.837517 3.767672 4.248075  4.119252 3.957468
1003_s_at 5.973162 6.033704 5.560886 5.930329 5.878533  6.193376 6.006443
1004_at   5.841095 5.870163 5.686555 5.793403 5.913503  6.053053 5.549087
1005_at   7.524865 8.381740 8.055760 7.234242 8.083834 10.163355 8.184442
             83001     LAL4
1000_at   8.030047 7.702217
1001_at   5.178633 5.029670
1002_f_at 4.053458 4.002306
1003_s_at 6.050129 6.297549
1004_at   5.932412 5.827131
1005_at   8.798521 7.687370
```

Los datos fenotípicos los tendremos con `Biobase::pData`.

```
pData(ALL)
```

¿Cuál fue chip que se utilizó para obtener estos datos?

```
annotation(ALL)
```

```
[1] "hgu95av2"
```

Los identificadores de las filas los tenemos con

```
featureNames(ALL)
```