PROTOCOL 1+: DRAWING IDIOGRAMS

Drawing a basic haploid idiogram

Step 1.- Open a new Excel document and create a three-column table with the following fields: *chromosome number* (use consecutive numbers and do not include characters as X or Y), *chromosome size* (in base pairs, bp), *intervals* (optimum number of intervals to divide a given a chromosome size) and *range* (number of bp per interval).

Step 2.- Calculate the number of intervals for each chromosome by using the following formula: =ROUND(1+LOG(*Chr. Size;2*),0)+1.

Step 3.- Calculate the range of the intervals by using the following formula: =ROUND((*Chr. Size*-1)/(*Interval*-1),0).

Step 4.- Create a new table with the following columns: *intervals*, *chromosome number* and *range* (the positions to be mapped in the graph). For each chromosome, include as many intervals as you calculated in **Step 2**. The range value for the first interval should be 1 (1st position of the chromosome). Calculate the following coordinates by adding the range you calculated for each chromosome in **Step 3** (you can use the formula =H2+$D$2). Last coordinate of each chromosome should correspond to their size.

Step 5.- Draw the scatter plot by selecting the whole table and inserting a scatter chart. Then, include the column with the size of the chromosomes in the Y axis and the column with chromosome numbers in the X axis by right clicking the table > select data > modify.

Step 6.- Customize the graph by selecting the different format options available.

Drawing a diploid idiogram

Step 7.- Duplicate the table of **Step4**. In the original table, create a column *Position -* and fill it with the chromosome number -0.25. Include the column *Position -* in the X-axis of your scatter plot by right clicking the table > select data > modify.

Step 8.- In the new table, create a column *Position +* and fill it with the chromosome number +0.25. Include the column *Position +* in the X-axis of your scatter plot by right clicking the table > select data > add. Include the column *range* in the Y-axis.

Constructing an idiogram with aneuploidies

Nulisomies

Step 9.- To draw a nulisomy, just delete the information of a specific chromosome in one of the previously created tables.

Trisomies

Step 10.- To draw an extra chromosome, create a new table for this chromosome with the following columns: *intervals*, *chromosome number* and *range*, and copy the information from

one of the previous tables. In the *chromosome number* column include the number of the chromosome selected.

Step 11.- Include the data from the new chromosome by right clicking the table > select data > add. Include the column *Position* in the X-axis and the column *range* in the Y-axis.

PROTOCOL 2+:MAPPING SEQUENCES ONTO AN IDIOGRAM

Step 1.- Open a new Excel document and create a table with five columns including the following fields: *chromosome number*, *start position* (for each cluster the first position it occupies in the chromosome), *stop position* (for each cluster the last position it occupies in the chromosome), *intervals* and *range*.

Step 2.- Calculate the number of intervals for each cluster by using the following formula: =ROUND(1+LOG(*Stop positon*),0)+1.

Step 3.- Calculate the range of the intervals by using the following formula: =ROUND((*Stop position-Start position*)/(*Interval*-1),0).

Step 4.- Create a new table with the following columns: *intervals*, *chromosome number* and *coordinates*. For each cluster, include as many intervals as you calculated in **Step 2**. The coordinates for the first interval of each cluster should be the start position of the cluster. Calculate the following coordinates by adding the range you calculated for each cluster in **Step 3** (you can use the formula =H2+$D$2). Last coordinate of each cluster should correspond to the stop position.

Step 5.- Use a previously constructed ideogram (see **Protocol 1**) to include mapping data. Include new data by right clicking the graph > select data > add. Then, add a new set of data including the coordinates in the Y axis and the column with the corresponding chromosome numbers in the X axis.

Step 6.- Customize the graph by selecting the different format options available.

Synteny analyses

Step 7.- In a new Excel document, copy the tables corresponding to the two haploid idiograms you want to compare. Add a new column *position* - to the tables of the first ideogram and fill it with =*chromosome number* -0.25. Delete the column *chromosome number*. Do the same for the tables belonging to the second idiogram but this time add a column *position +* and fill it with with =*chromosome number* -0.25.

Step 8.- Draw the scatter plot by right clicking the graph > select data > add. Add the data of both idiograms as in **Step 5**.

Step 9.- Customize the graph by selecting the different format options available.