

Exchange Among Sex Chromosomes and Autosomes - Primates

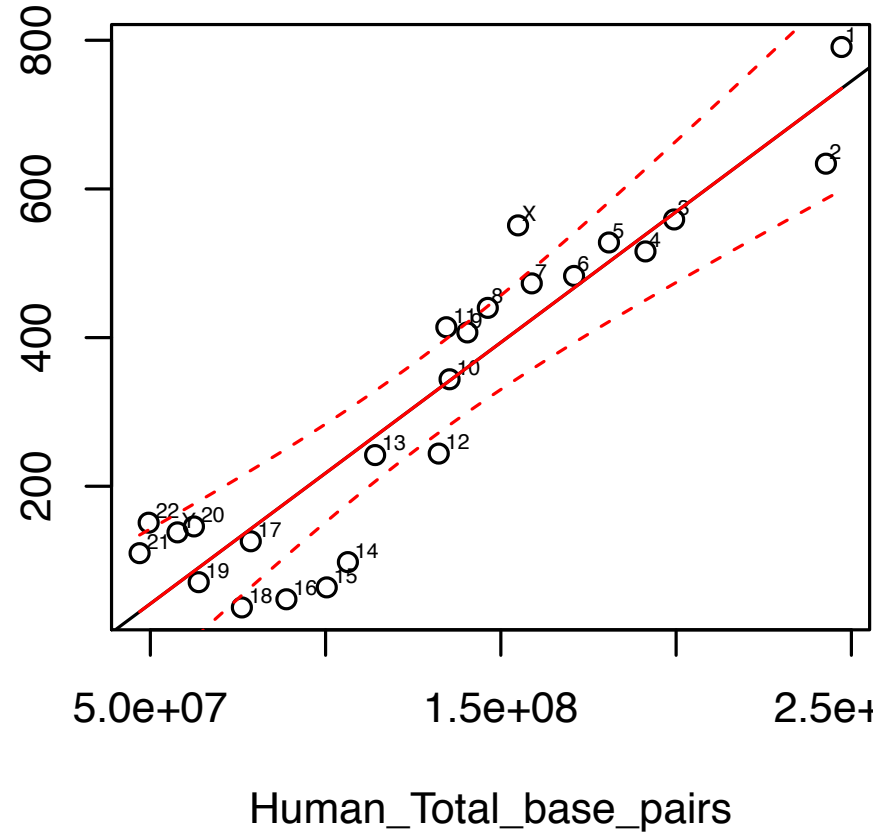
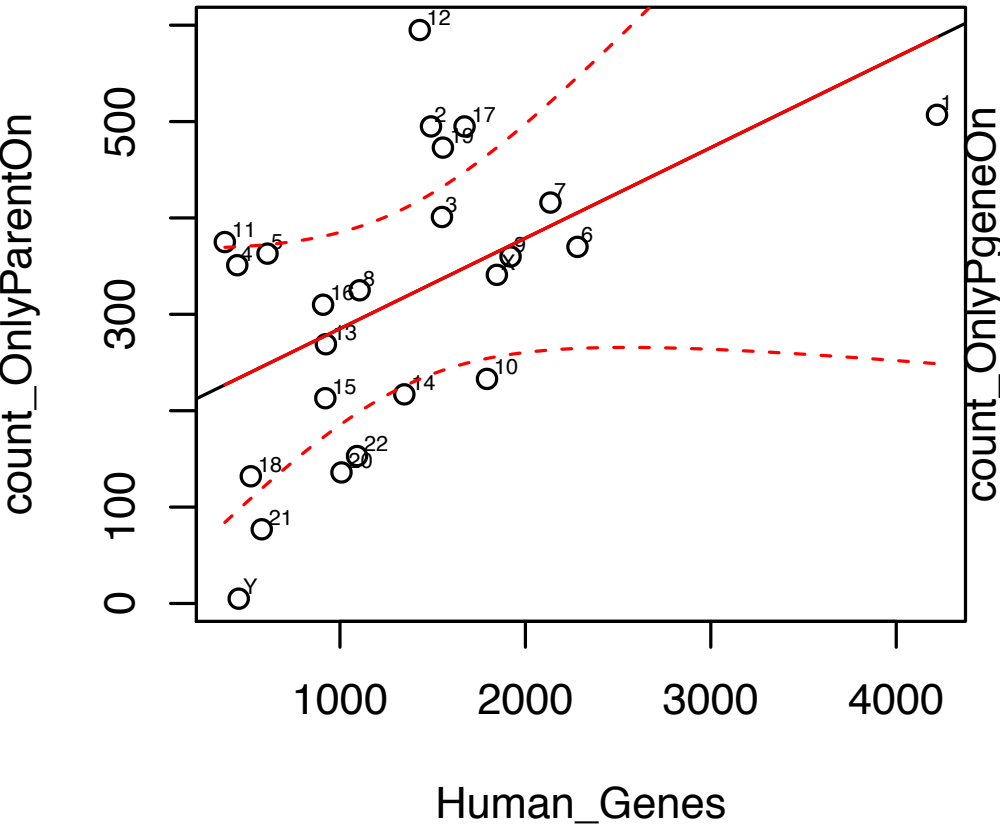
Yan Zhang

8/15/2013

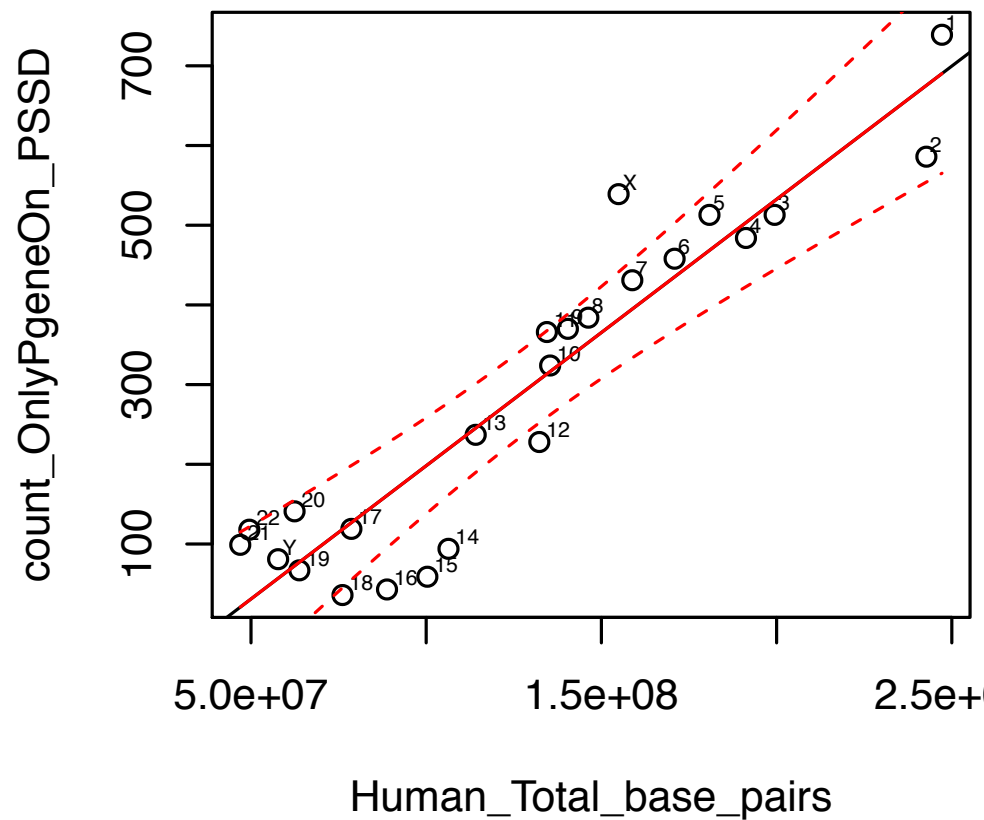
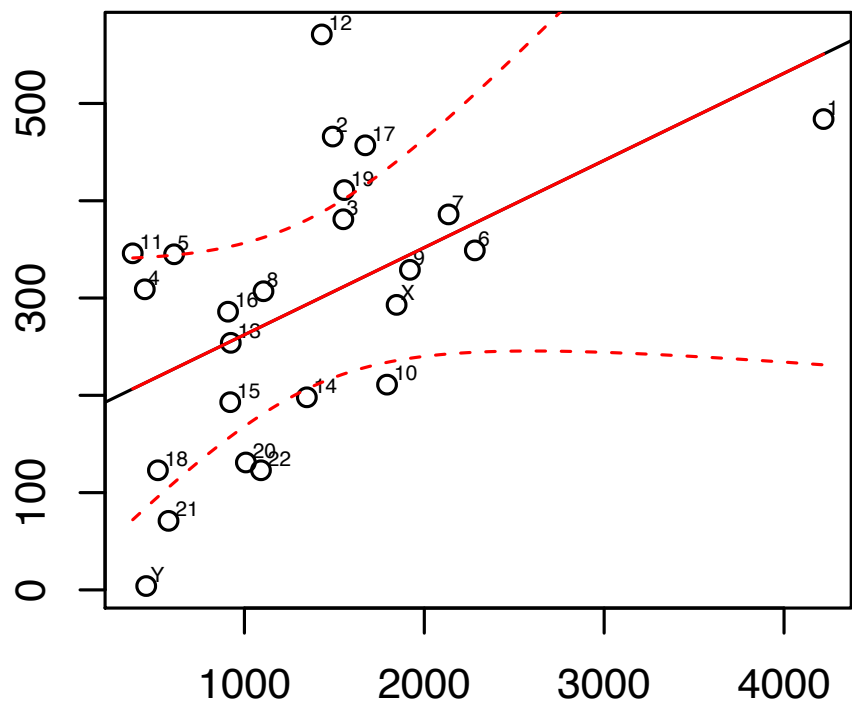
Outline

- Human (confidence intervals, $\alpha=0.05$, Bonferroni)
- Other primates
 - Test co-residence randomness
 - Exchange between autosomes and sex chromosomes

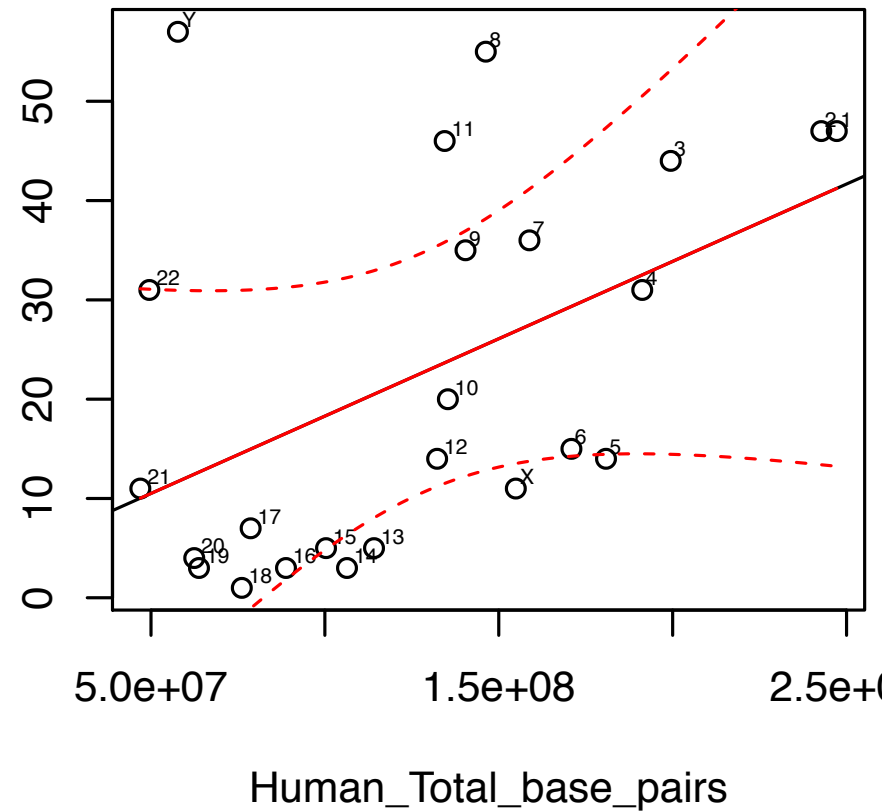
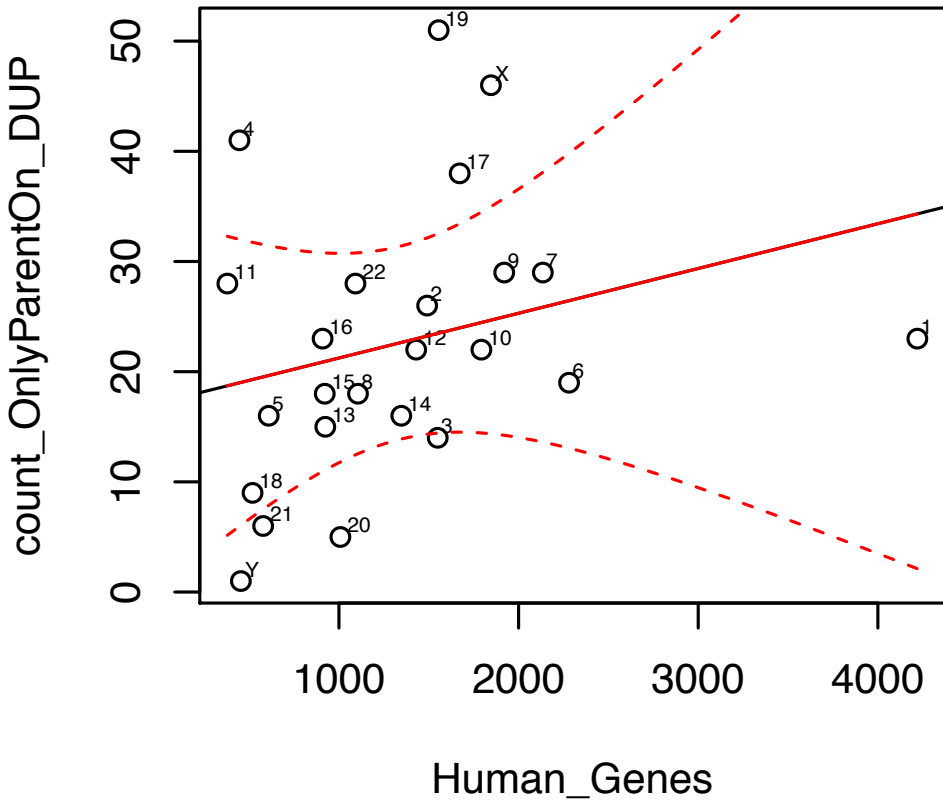
Human (total pgenes)



Human (PSSD)



Human (DUP)

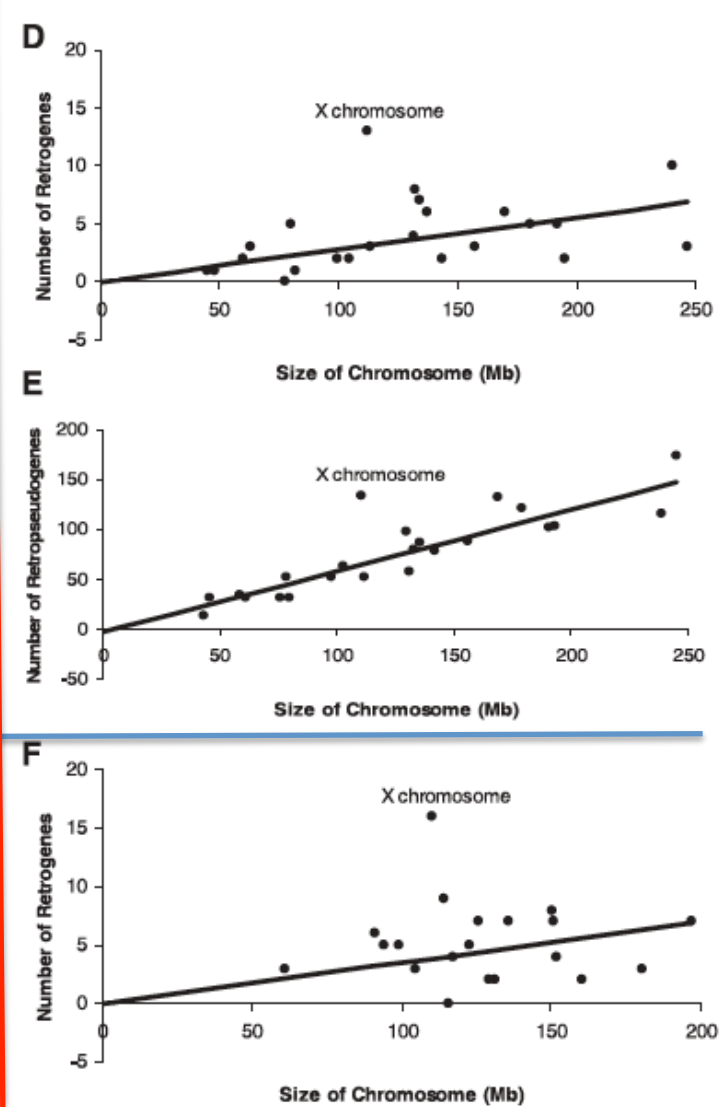
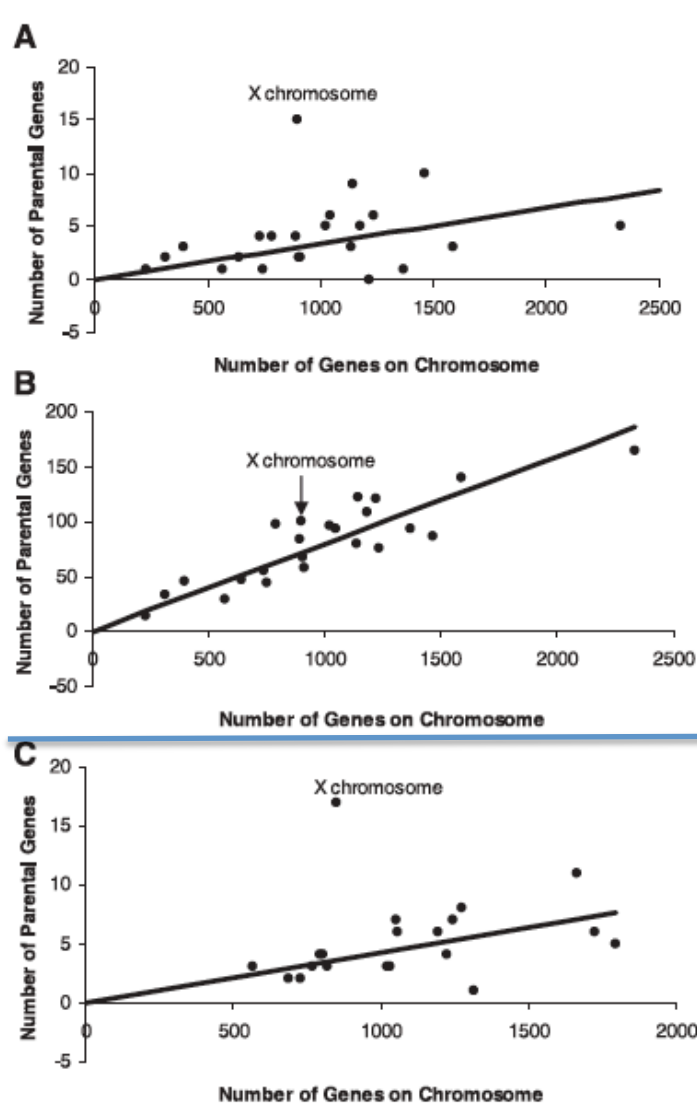


Reference:

Rough summary from their work (ctd)

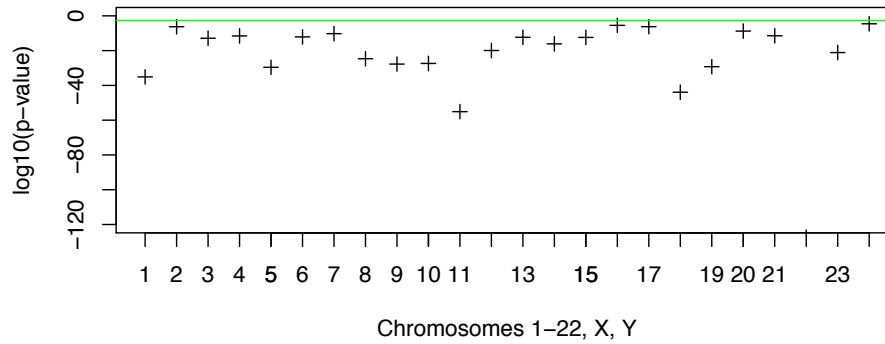
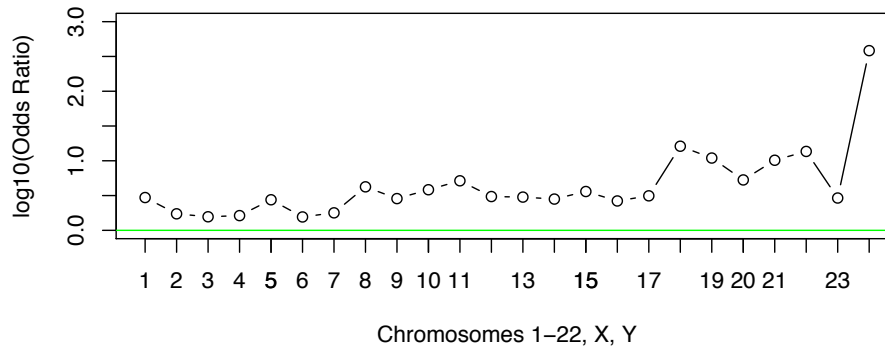
- Linear regression results (Y was not included):

Fig. 1. Regressions for the parental genes of retrogenes in (A) human and (C) mouse and for the parental genes of retropseudogenes (B) in human. Regressions for the size of a chromosome in (D) human and (F) mouse and for the retropseudogenes (E) in human. In the plots, X is shown as 75% of its size as predicted by the model (15), although allowing X to assume 100% of its size does not change the results. Probabilities for the hypothesis that the chromosome with the highest observed/expected ratio [where the expected number is calculated as in (16)] is an outlier are calculated using Grubbs and Dixon outlier tests (16). For every distribution [except (B)], the X has the largest ratio and is an outlier with $P < 0.005$ and $P < 0.01$ for the Grubbs and Dixon tests, respectively; (B) shows no such outliers.



Callithrix

Fisher's Exact Test: Co-residence is Random or Not for Each Chromosom



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	parent_auto	X	Y
<u>pgene_auto</u>	9300	447	3
X	482	66	0
Y	11	1	0

Pearson's Chi-squared test

data: table_XYauto

X-squared = 61.3747, df = 4, p-value = 1.491e-12

Fisher's Exact Test for Count Data

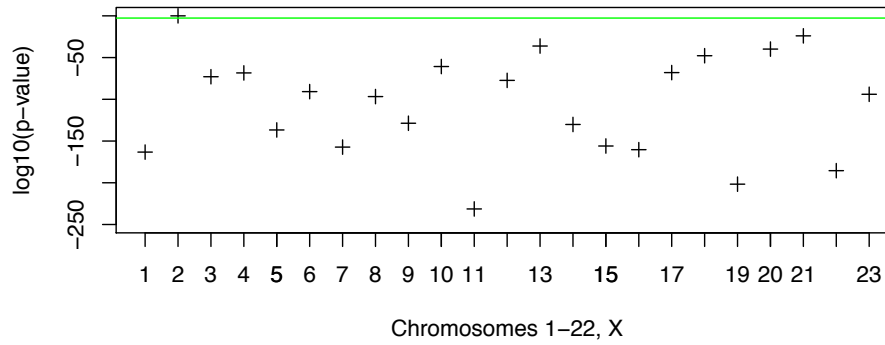
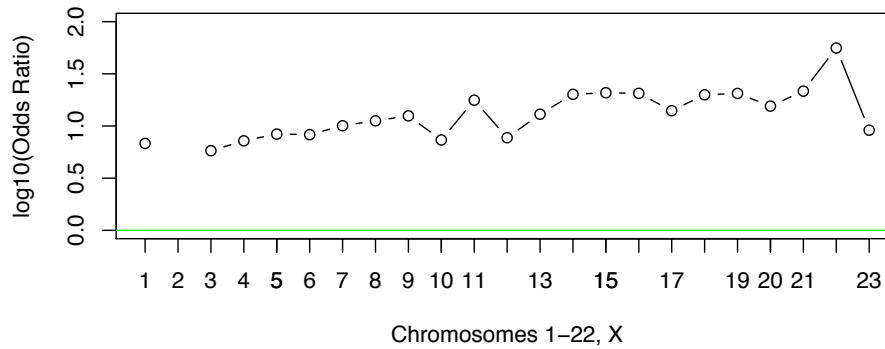
data: table_XYauto

p-value = 4.759e-10

alternative hypothesis: two.sided

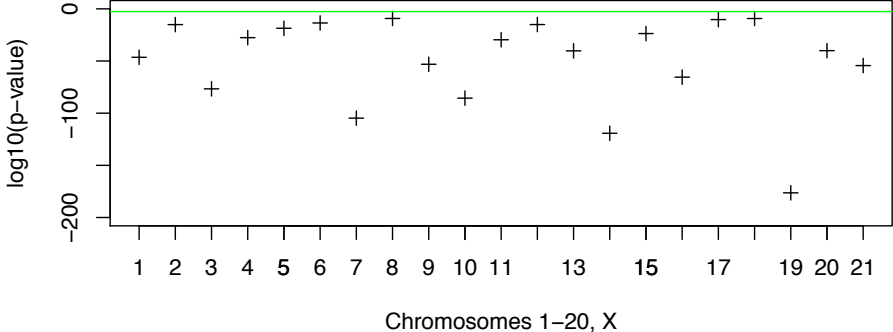
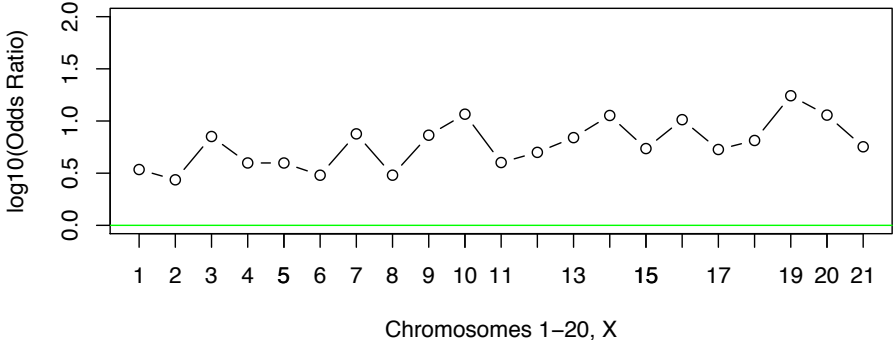
Gorilla

Fisher's Exact Test: Co-residence is Random or Not for Each Chromosom



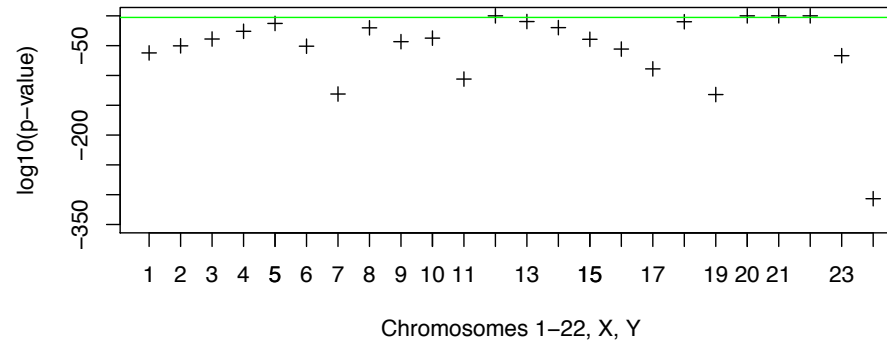
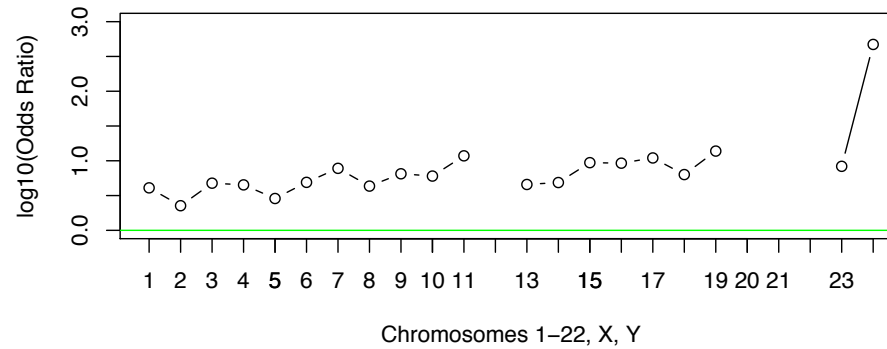
Macaca

Fisher's Exact Test: Co-residence is Random or Not for Each Chromosom



Pan

Fisher's Exact Test: Co-residence is Random or Not for Each Chromosom



Pan

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	parent_auto	X	Y
<u>pgene_auto</u>	8095	218	9
X	446	83	5
Y	125	19	159

Pearson's Chi-squared test

data: table_XYauto

X-squared = 4598.395, df = 4, p-value < 2.2e-16

Fisher's Exact Test for Count Data

data: table_XYauto

p-value < 2.2e-16

alternative hypothesis: two.sided

Pongo

Fisher's Exact Test: Co-residence is Random or Not for Each Chromosom

