Exchange Among Sex Chromosomes and Autosomes - Human, Chimp and Marmoset

Yan Zhang

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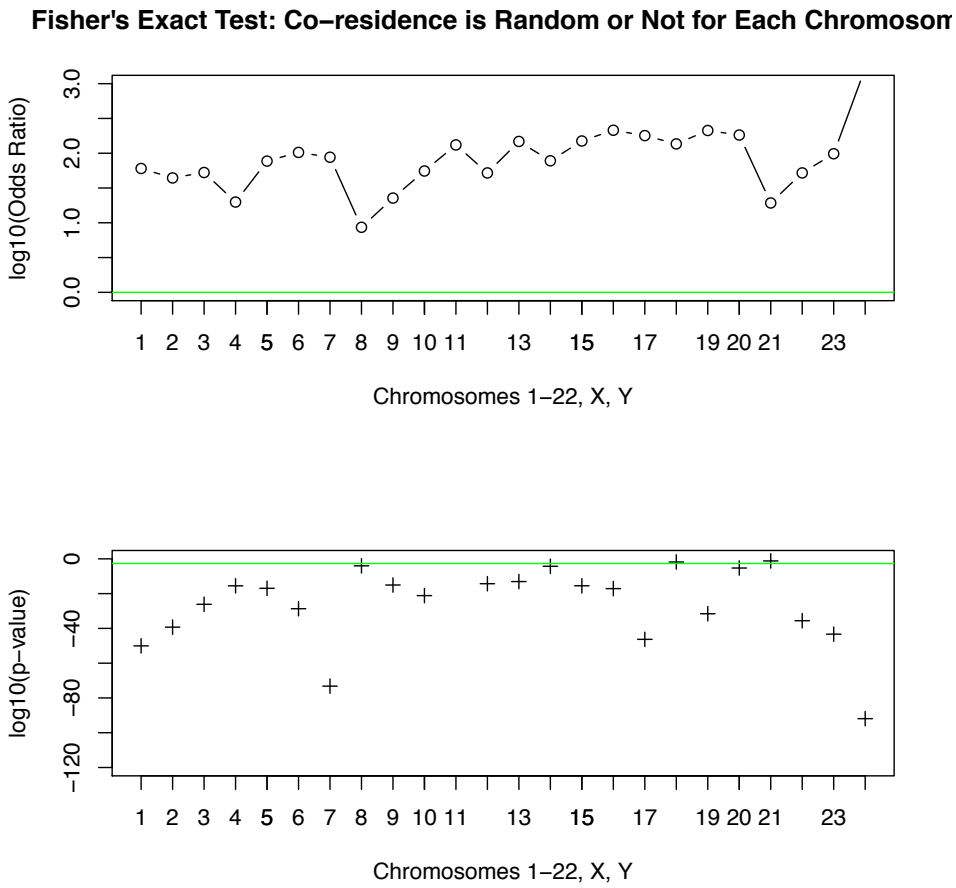
Outline

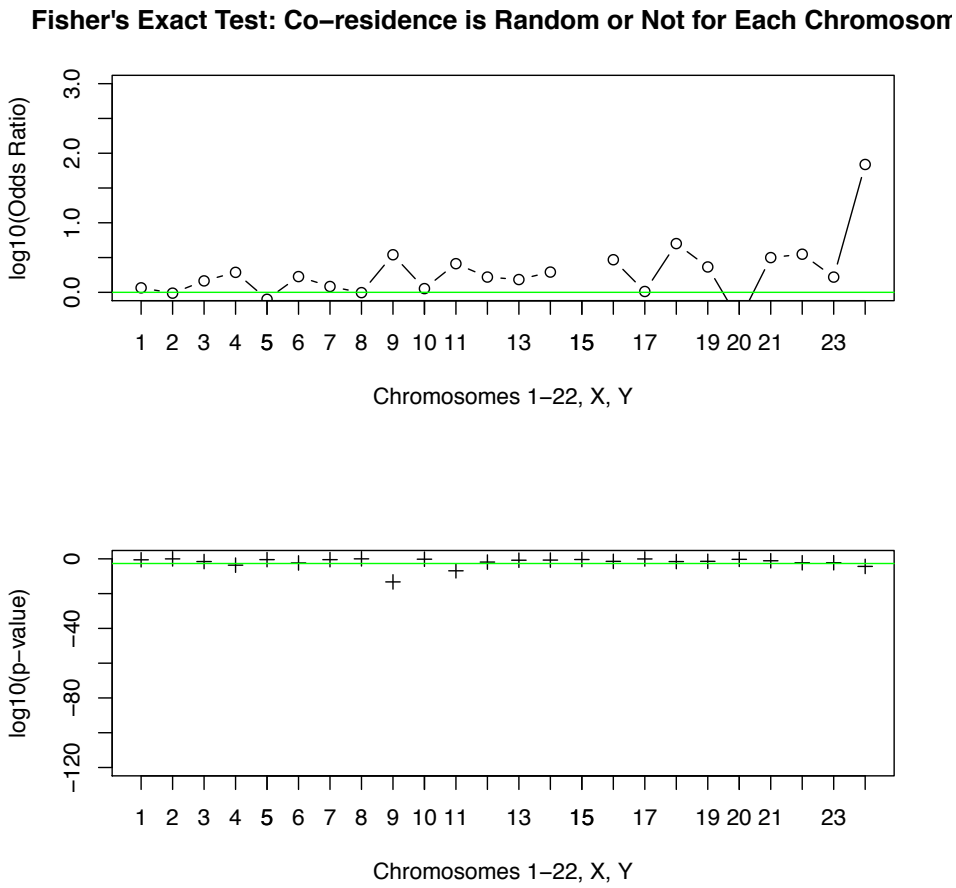
- Primates
  - Human, Chimp (Pan), Marmoset (Callithrix)
- Test co-residence randomness
  - For DUP and PSSD, separately
- Exchange between X, Y and autosomes
  - Export and import, respectively

Test Co-residence

Human (DUP)


Fisher's Exact Test: Co−residence is Random or Not for Each Chromosom
log10(Odds Ratio)
0.0
1.0
2.0
3.0
1 2 3 4 5 6 7 8 9 10 11 13 15 17 19 20 21 23
Chromosomes 1−22, X, Y
log10(p−value)
0
−40
−80
−120
1 2 3 4 5 6 7 8 9 10 11 13 15 17 19 20 21 23
Chromosomes 1−22, X, Y

Human (PSSD)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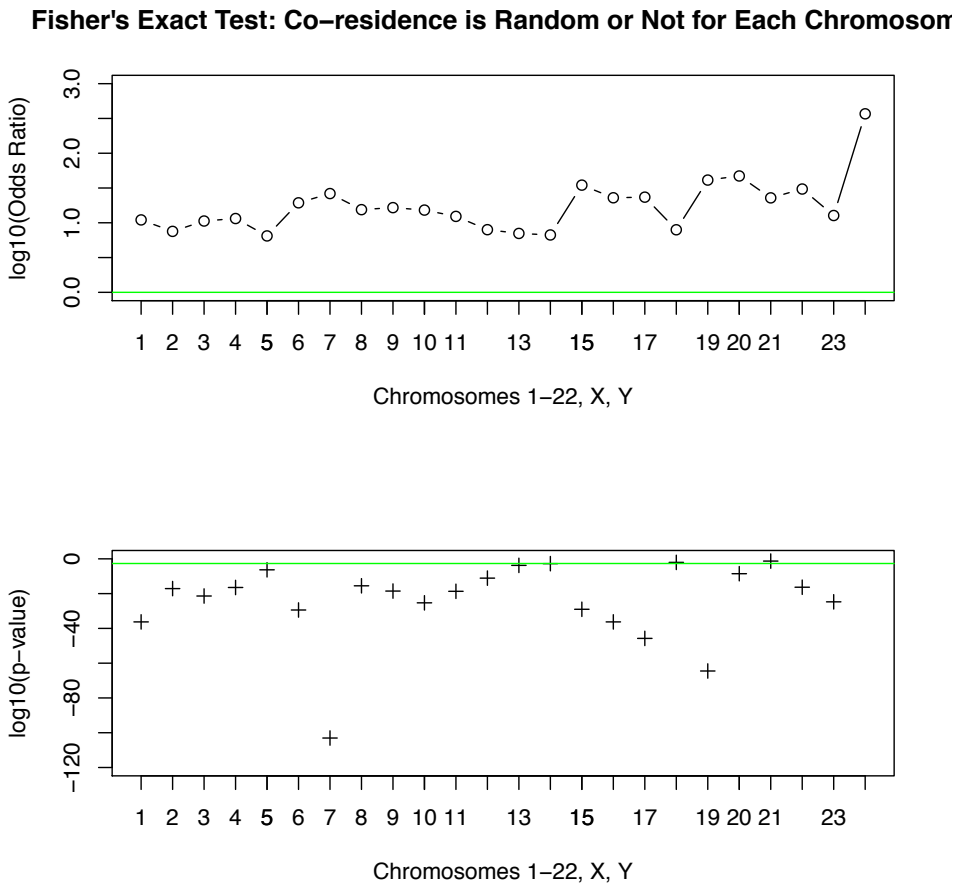
0.0
1.0
2.0
3.0
1 2 3 4 5 6 7 8 9 10 11 13 15 17 19 20 21 23
Chromosomes 1−22, X, Y
log10(p−value)
0
−40
−80
−120
1 2 3 4 5 6 7 8 9 10 11 13 15 17 19 20 21 23
Chromosomes 1−22, X, Y

Chimp (DUP)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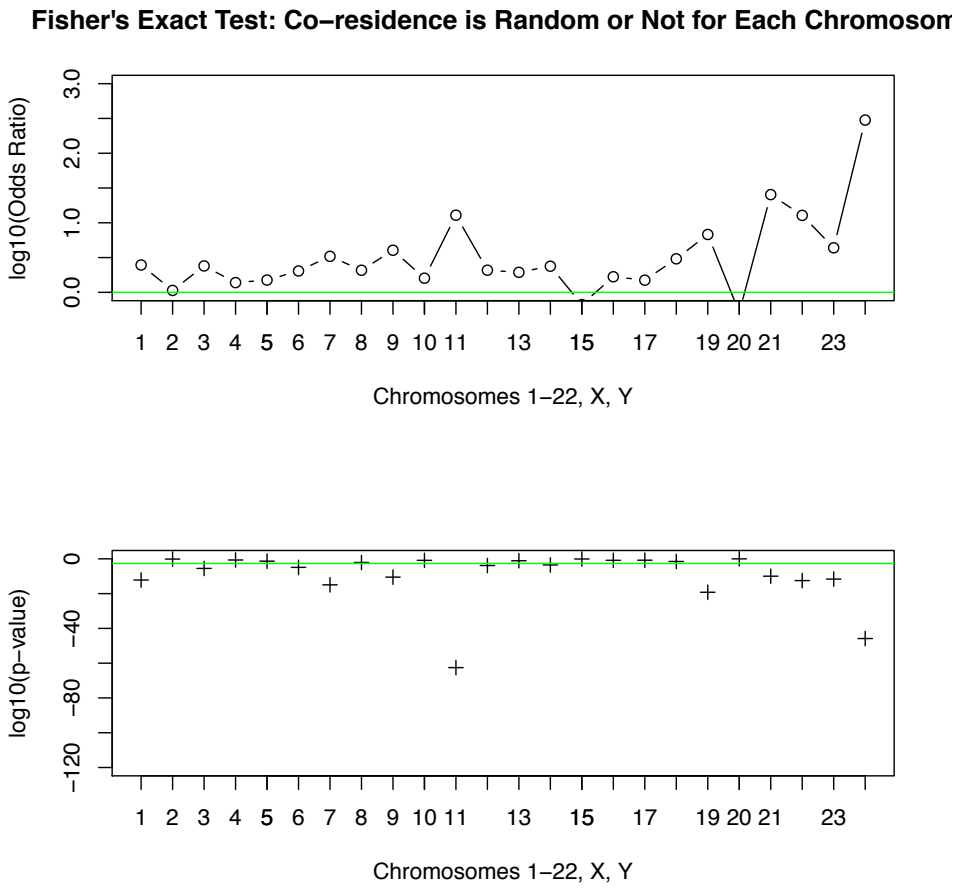
0
−40
−80
−120
1 2 3 4 5 6 7 8 9 10 11 13 15 17 19 20 21 23
Chromosomes 1−22, X, Y

Chimp (PSSD)


Fisher's Exact Test: Co−residence is Random or Not for Each Chromosom
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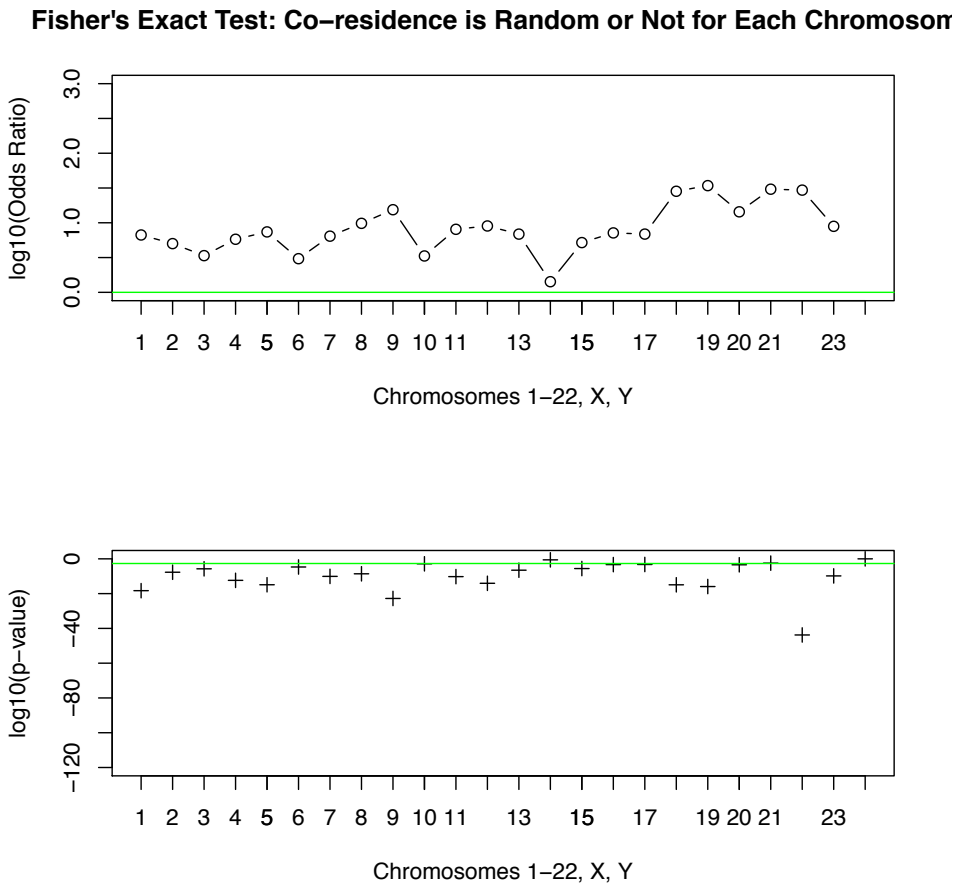
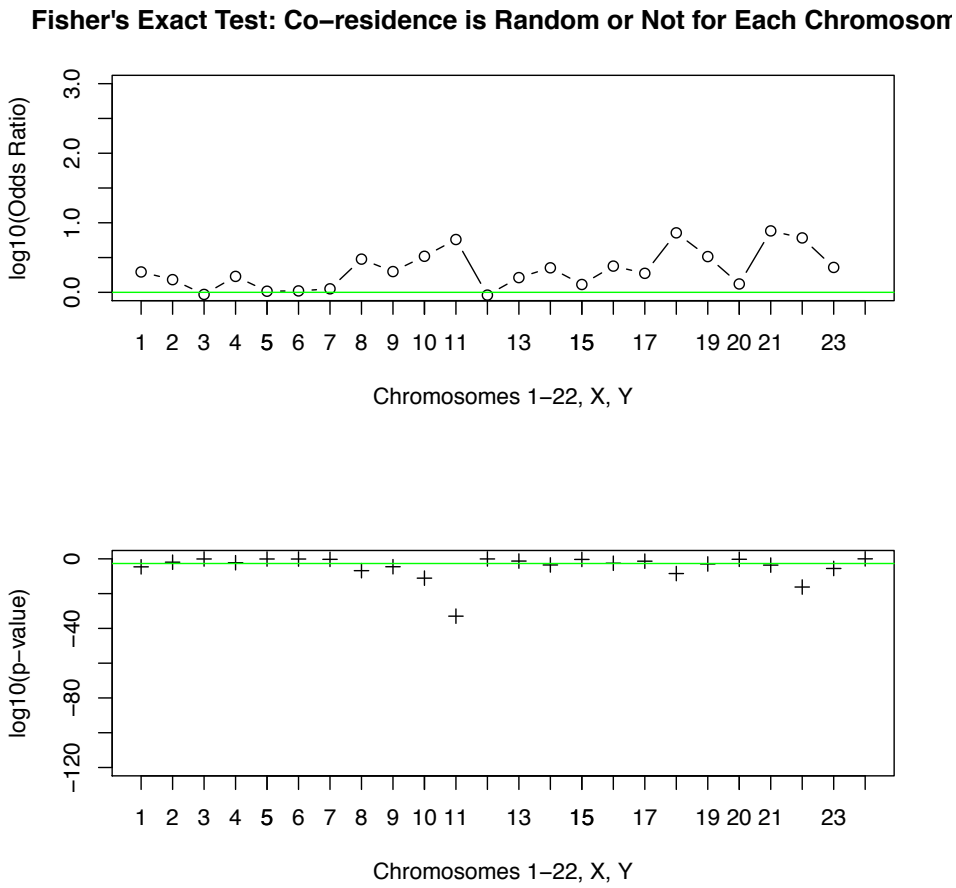
0.0
1.0
2.0
3.0
1 2 3 4 5 6 7 8 9 10 11 13 15 17 19 20 21 23
Chromosomes 1−22, X, Y
log10(p−value)
0
−40
−80
−120
1 2 3 4 5 6 7 8 9 10 11 13 15 17 19 20 21 23
Chromosomes 1−22, X, Y

Marmoset (DUP)



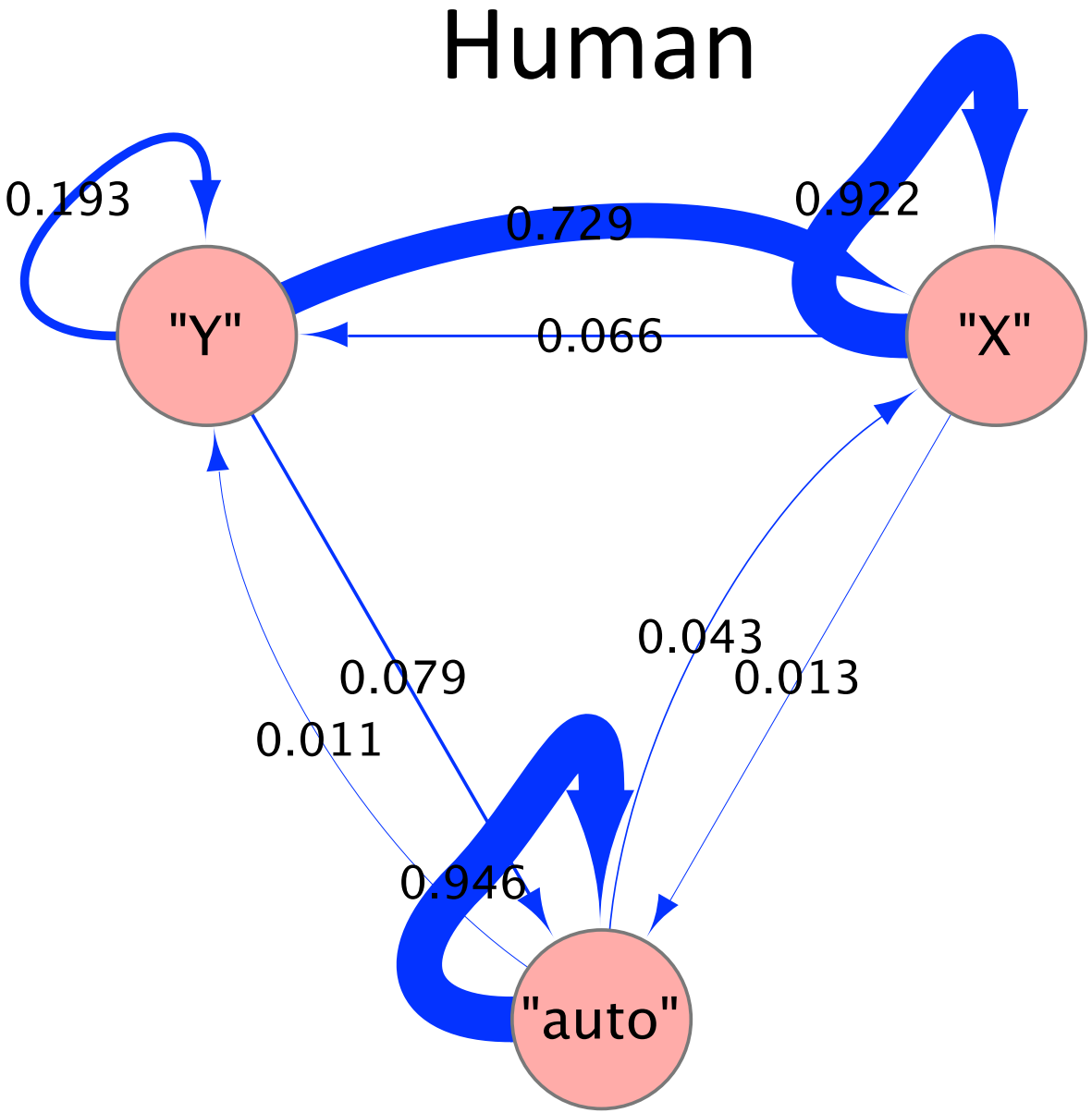
Marmoset (PSSD)



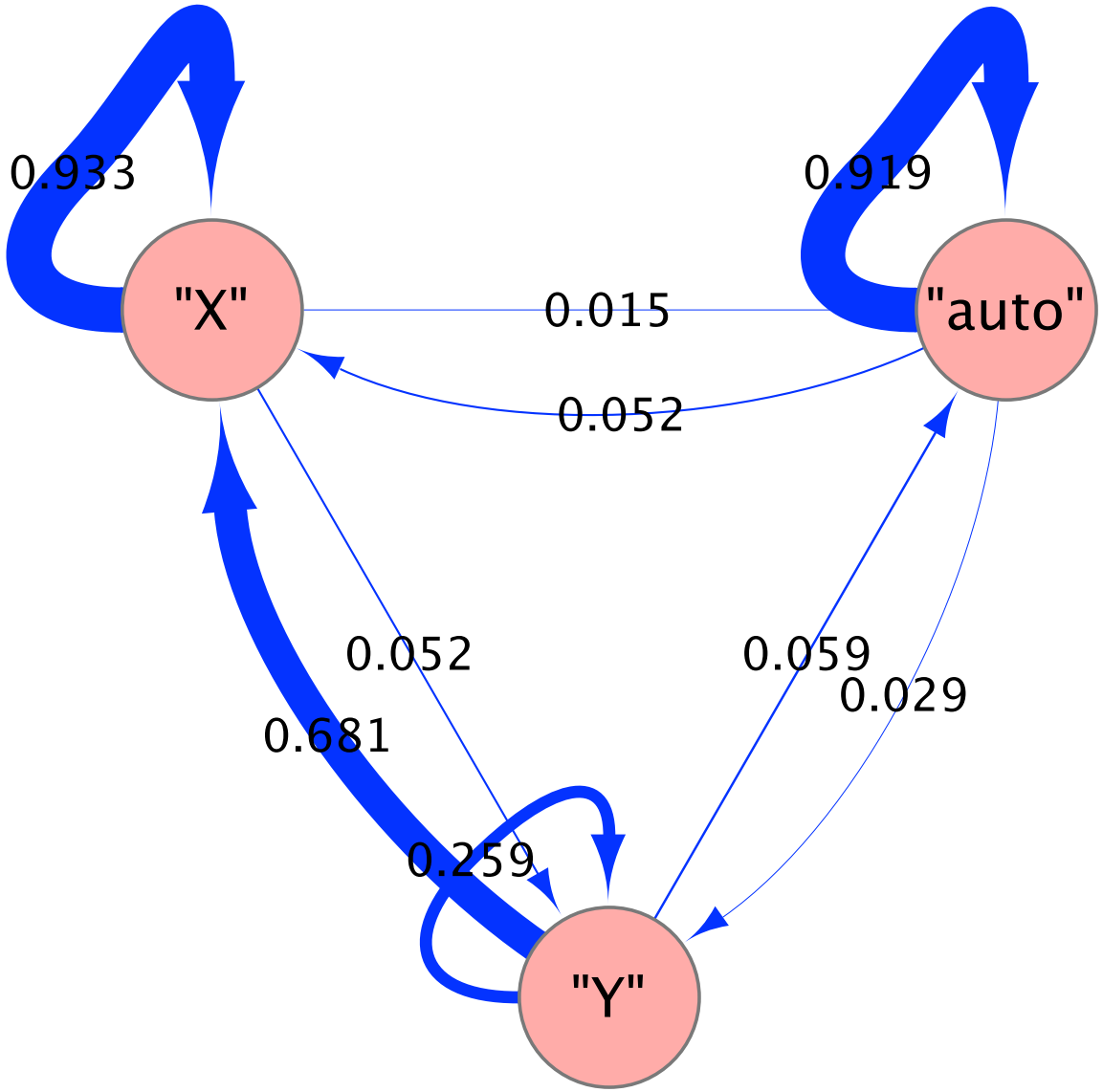
Observations

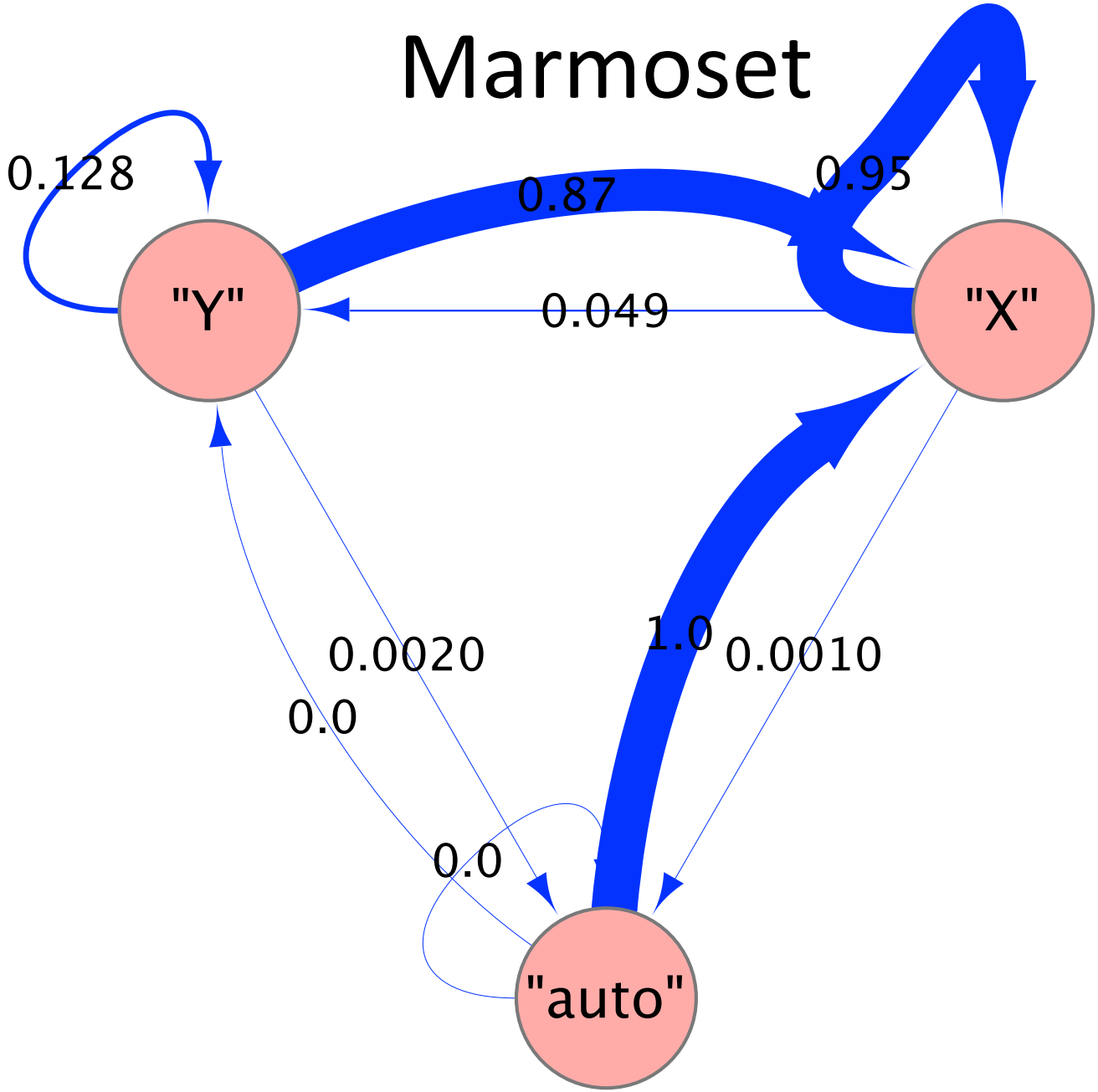
- For DUP, co-residence is significant compared to background – not random.
- For PSSD, co-residence is not as significant compared to background.

Export of DNA

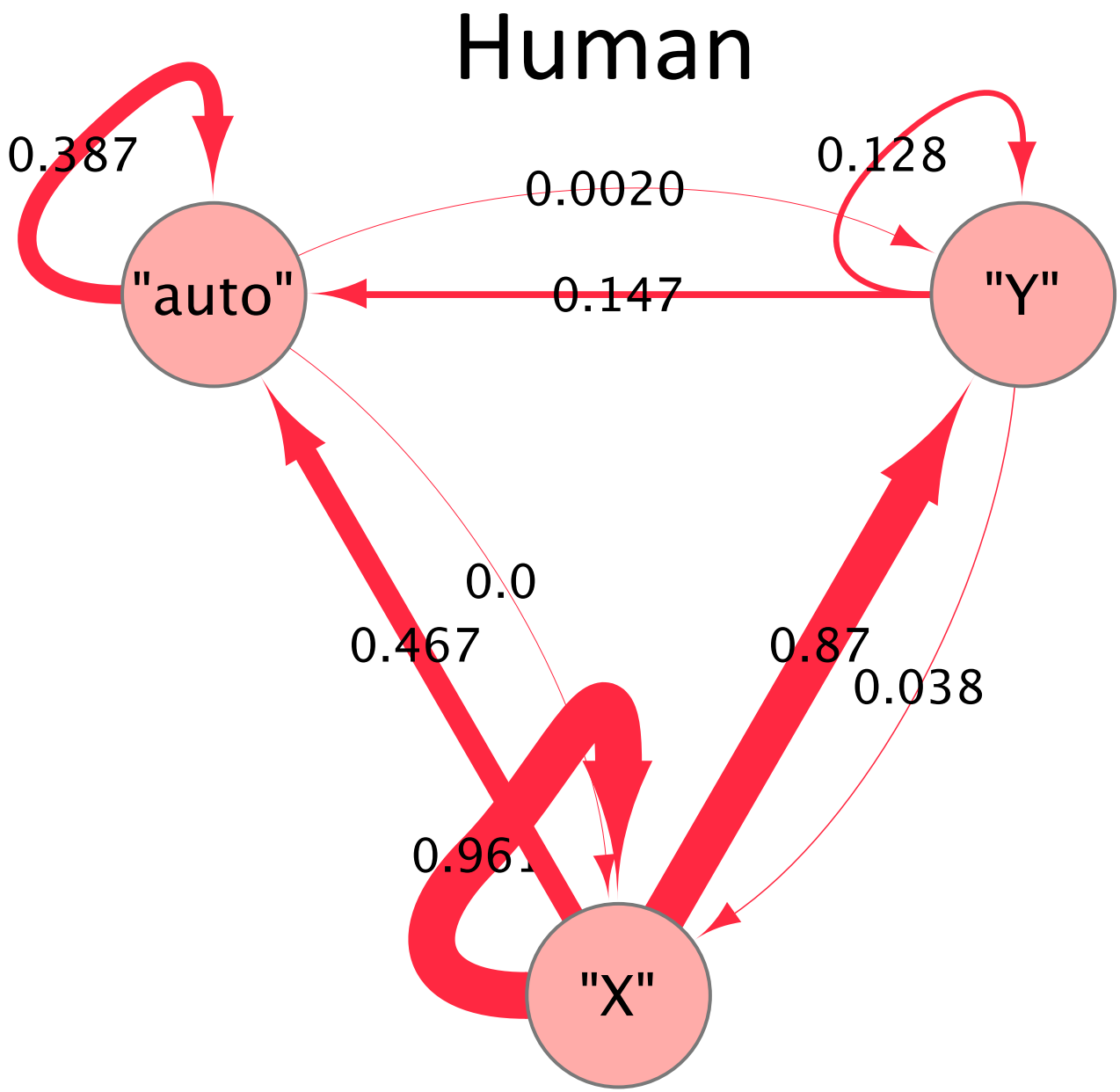

Human
0.193
0.729
0.922
"Y"
"X"
0.066
0.043
0.079
0.013
0.011
0.946
"auto"

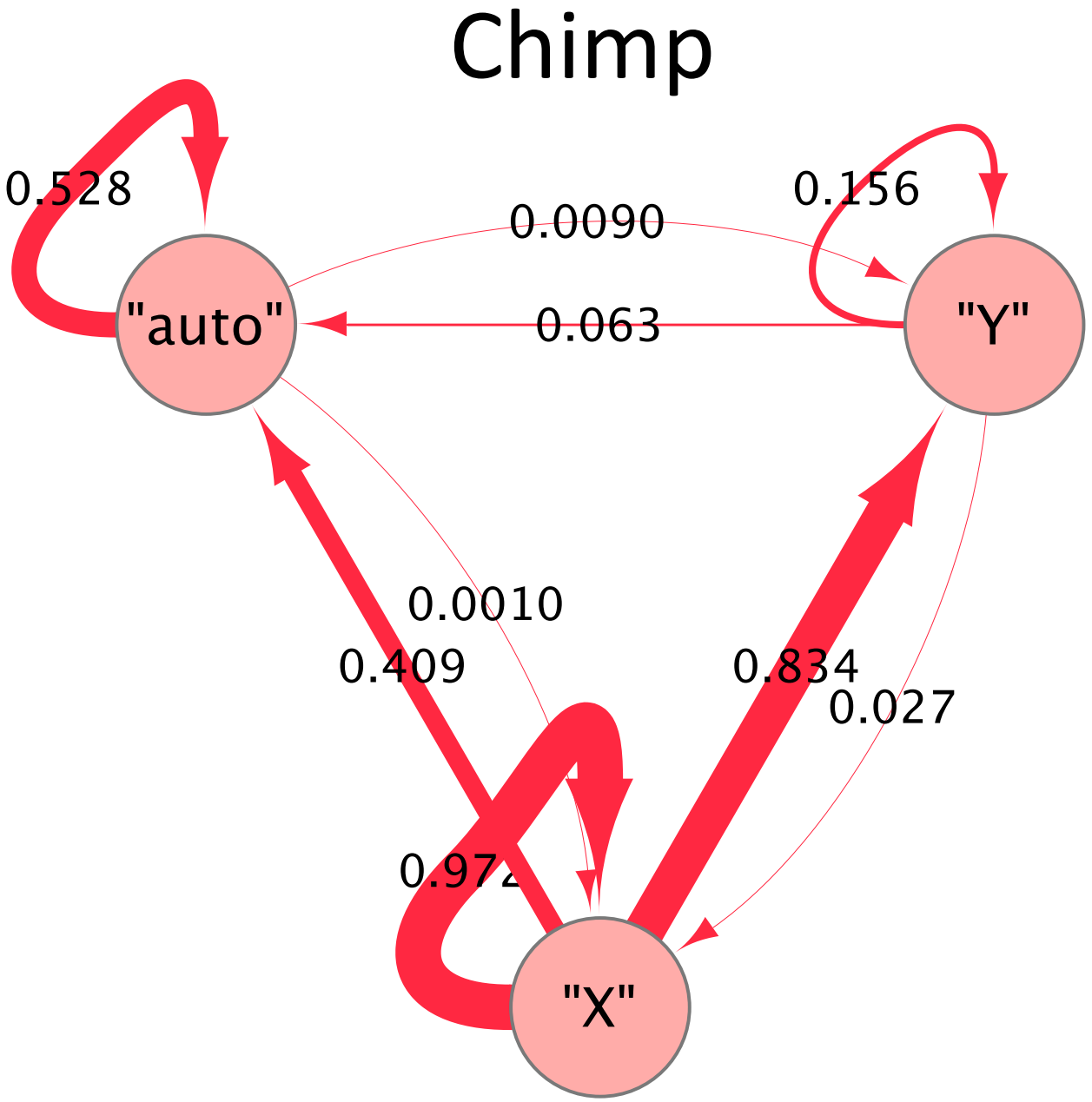
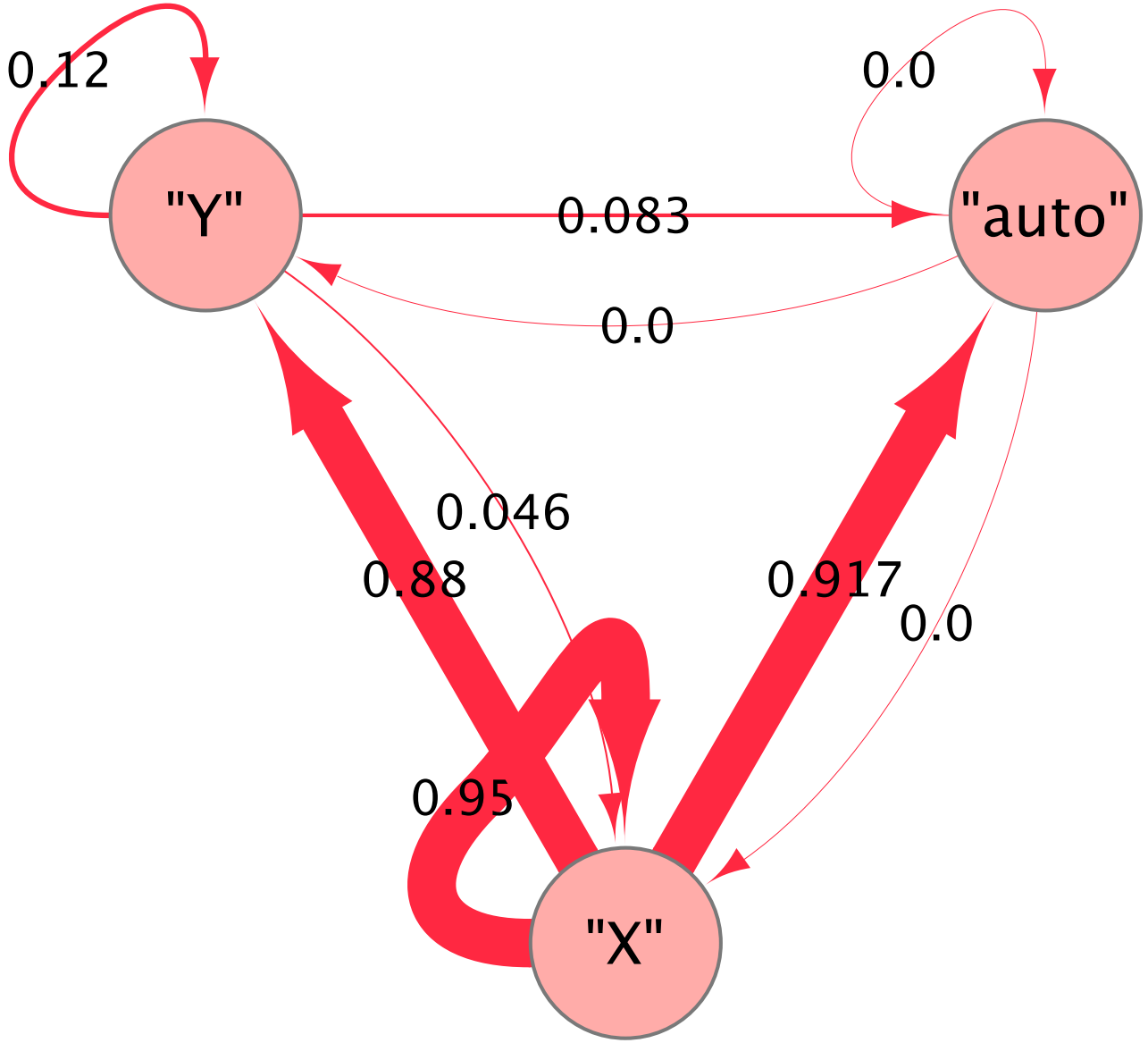
Chimp




Marmoset
0.128
0.87
0.95
"Y"
"X"
0.049
0.0020
0.0
1.0
0.0010
0.0
"auto"

Import of DNA


Human
0.387
0.0020
0.128
"auto"
0.147
"Y"
0.0
0.467
0.87
0.038
0.961
"X"


Chimp
0.528
0.0090
0.156
"auto"
0.063
"Y"
0.0010
0.409
0.834
0.027
0.972
"X"

Marmoset