

CHROMOSOME FUSION RESULTS

I. THE CHALLENGE

DNA DETAILS

11. gggattgggattgggattaatcccaatcccaatccc

12. multiple **g**'s end, and multiple **c**'s begin

II. THE SEARCH

A. Visual Search:

5. NT-022135
14. bp#121 is **a**; bp#150 is **g**
15. 176,734; the letter is **c**

B. Blast2 Search:

5. 108552 to **108574**
8. about 108310
9. 108561 or 108562
10. about 109113
11. about 270 bp
12. about 560 bp
13. They must have fused (joined) together end-to-end.
14. 108561-2
15. c. The fact that two opposite head-to-head telomere DNA sequences are found in the middle of chrom.#2 clearly indicates that two chromosomes must have fused there, otherwise, why would those sequences be there? Also, if chrom.#2 existed before the apes branched off, this would have required identical subsequent fissions at least 3 times, with the addition of telomere sequences to each new chromosome each time, relatively unlikely.

C. Sanger Genome Search

2. 242,951,149 bps; Known Genes: 1354; Pseudogene Count is 40.
4. [estimate; should be about 46% (~40-48%)]
9. 114,076,640 minus 114,076,620 = 20; 20 nucleotides; counting nucleotides/bases.
10. Multiple Cs end; Multiple Gs begin.
11. begins at about 114,076,724
12. No Cs; Many sets of multiple Gs (GGG or GGGG),
13. Multiple Gs stop; Multiple Cs begin!
14. Around 114,076,976; About 9 window shifts; ends at about 114,077,528
15. The ends (telomeres).
16. Two chromosomes fused (joined) head-to-head to form our #2 chromosome.
17. Fusion point
18. 47%: $\{(114076976 / 242951149) \times 100\}$.
19. Chimp chromosomes #2A and 2B; #2A (green) has the same centromere as our #2

For those who try the challenge, they should find the current #2 centromere between 89,958,830 bp (at the upper "p" end) and 96,689,900 bp (at the "q" end). This is a region with no contigs, showing only pink Xs for amino acids. The region where the former centromere (from the ape 2B chromosome) should be in the q21.2 region of our #2 chromosome.

D. Paper Search

1. bp#107041 is g; bp#107060 is c
2. about 108310
3. about 108561
4. about 109113
5. about 270 bp
6. about 560 bp
7. They must have joined together (fused) end to end.
8. about 108561
9. c. The fact that two opposite head-to-head telomere DNA sequences are found in the middle of chrom.#2 clearly indicates that two chromosomes must have fused there, otherwise, why would those sequences be there? Also, if chrom.#2 existed before the apes branched off, this would have required identical subsequent fissions at least 3 times, with the addition of telomere sequences to each new chromosome each time, relatively unlikely.