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| --- | --- | --- | --- | --- | --- |
| Model | **Broad Scale**  **Landscape**  **Male telomere bias,**  **Female uniform** | **Chromatin Organization**  Female, longer axis (shorter DNA loops)  Male, shorter axis (longer DNA loops)  (interference is a consequence of DNA loop) | **Within mouse variance for CO number**  Female > Male within mouse variance  (eggs more variable than sperm in CO #) | **Reverse heterochiasmy direction**  Male > Female genome-wide recombination rate | **Positive correlation interference strength and CO number** |
| Haploid selection  Trivers  (Lenormand and Dutheil, 2005) | ? | ?  No prediction for chromosome axis | Yes  (strong selection in males reduces between cell variance) | No  (males should evolve to be lower) | No  (predictions don’t apply to chromosome level)? |
| S.A.C.E.  Sexual Antagonism Cis Epistasis  (Sardell and Kirkpatrick, 2020) | Yes  (male large blocks result with strong telomere bias) | ?  No prediction for chromosome axis | Yes/Maybe?  Keeping regulatory region and coding regions together could –unify lower between cell variance | Yes? No?  (males should evolve to be lower) | Yes? Maybe  Stronger interference pattern results is equivalent to larger cis blocks of chromosomes together (these strains might have different SA gene arch |
| Two locus modifier  (protection against meiotic drive systems)  (Brandvain and Coop, 2012) | Yes  Females generally higher RR and COs closer to centromeres. | ?  No prediction for chromosome axis | Yes  More variance between oocytes to reduce effectiveness of centromere drive.  (breaking up conspiracies of drive) | No  Females should always have higher recombination rates, since they are more susceptible to meiotic drivers. | No  Predictions don’t apply to Rec landscape? |
| Spindle based Selection  (Metaphase I) | Yes  Telomere position maximizes sister cohesion with tension. | ?  Longer axis – helps spindle? | Yes  Relaxed selection on SAC would increases variance across oocytes relative to spermatocytes. | Yes  Directional selection can cause faster evolution in males relative to females | Yes?  If sister cohesion influences spindle dynamics… |
| COM  (early prophase )  (other biophysical?)  (Hulten) | Yes?  (Movements cause –positive interfernce pattern – differen in sexes – is due to axis length differences ….? | Yes  (longer female axis because of larger egg size) | ?  (no prediction for between cell/gamete type variance) | ?No  No evolution predictions… |  |
| (differences in PGS pool) |  |  |  |  |  |

**References:**

1. Brandvain Y, Coop G (2012). Scrambling eggs: meiotic drive and the evolution of female recombination rates. *Genetics* **190**: 709–723.
2. Lenormand T, Dutheil J (2005). Recombination difference between sexes: a role for haploid selection. *PLoS Biol* **3**: e63.
3. Sardell JM, Kirkpatrick M (2020). Sex Differences in the Recombination Landscape. *Am Nat* **195**: 361–379.
4. Hultén, Maj A. "On the origin of crossover interference: A chromosome oscillatory movement (COM) model." Molecular cytogenetics 4.1 (2011): 10.