|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Model | **Broad Scale**  **Landscape**  **Male telomere bias,**  **Female uniform** | **Within mouse variance for CO number**  Female > Male within mouse variance  (eggs more variable than sperm in CO #) | **Chromatin Organization**  Female, longer axis (shorter DNA loops)  Male, shorter axis (longer DNA loops) | **Reverse heterochiasmy direction**  Male > Female genome-wide recombination rate | **Positive correlation interference strength and CO number** |
| Haploid selection  Trivers  (Lenormand and Dutheil, 2005) | ? | Yes/Maybe  (strong selection in males reduces between cell variance) | ?  No prediction for chromosome axis | No  (males should evolve to be lower) | No  Predictions don’t apply to single meiotic events or recombination landscape. |
| S.A.C.E.  Sexual Antagonism Cis Epistasis  (Sardell and Kirkpatrick, 2020) | Yes  Maintain large blocks, ‘push’ crossovers to telomeres | Yes/Maybe  Keeping regulatory region and coding regions together could –unify lower between cell variance | ?  No prediction for chromosome axis | No  (males should evolve to be lower gwRR) | Yes? Maybe  Stronger interference pattern results is equivalent to larger cis blocks of chromosomes together |
| Two locus modifier  (protection against meiotic drive systems), (breaking up conspiracies of drive)  (Brandvain and Coop, 2012) | **Yes**  Females generally higher RR and COs closer to centromeres. | Yes/Maybe  More variance between oocytes to reduce effectiveness of centromere drive.  No  Females should evolve consistent manner to limit drivers | ?  No prediction for chromosome axis | Yes / (maybe)  Depends on the stage driver acts (MI or MII) | No  Predictions don’t apply to single meiotic events or recombination landscape. |
| Spindle based Selection  (Metaphase I)  (many citations, )  (lane K  Schuh Ellenburg | Yes  Telomere position maximizes sister cohesion with tension. | 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 interference pattern – different in sexes – is due to axis length differences ….? | ?unknown  (no prediction for between cell/gamete type variance) | Yes  (longer female axis because of larger egg size) | ?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.