

## Nondisjunction in Male Gametes

Written by Rose-Anne Meissner

**Question: In human males, do the X and Y chromosomes form tetrad structures and recombine with each other?**

Answer: Yes. There are homologous regions on the X and Y chromosomes called PAR1 and PAR2 that can line up with each other and participate in recombination. "PAR" stands for "pseudoautosomal region," referring to the idea that these regions on the sex chromosomes behave more like autosomes than the remaining DNA on the sex chromosomes.

In order for the X and Y sex chromosomes to complete meiosis I in males, it's believed that they must recombine before being separated during anaphase I. The inability of some X and Y chromosomes to recombine (due to structural abnormalities, for example) is a cause of male infertility.

In males during meiosis I, if the XXYY tetrad fails to separate into XX and YY sister chromatids in two different cells, then the result can be a trisomy such as XXY or XYY in the offspring.

Sources:

- 1) <http://www.encyclopedia.com/science-and-technology/biology-and-genetics/genetics-and-genetic-engineering/crossing-over>
- 2) [https://en.wikipedia.org/wiki/Pseudoautosomal\\_region](https://en.wikipedia.org/wiki/Pseudoautosomal_region)