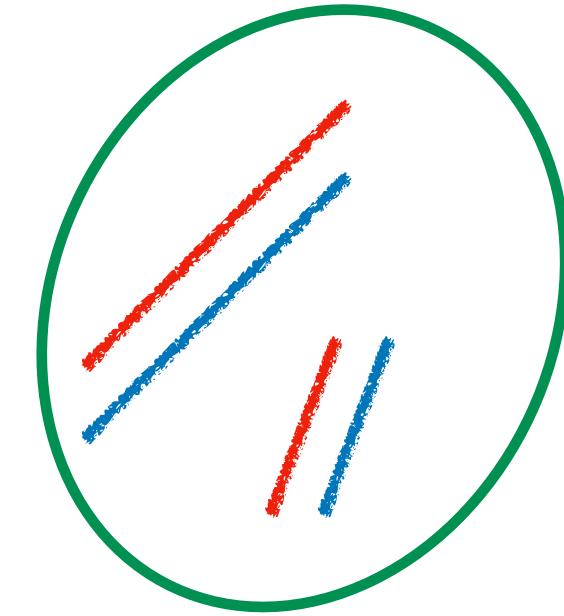


Part II - Sexual reproduction

Sex, Ageing and Foraging Theory

What is sexual reproduction? and what are sexes?

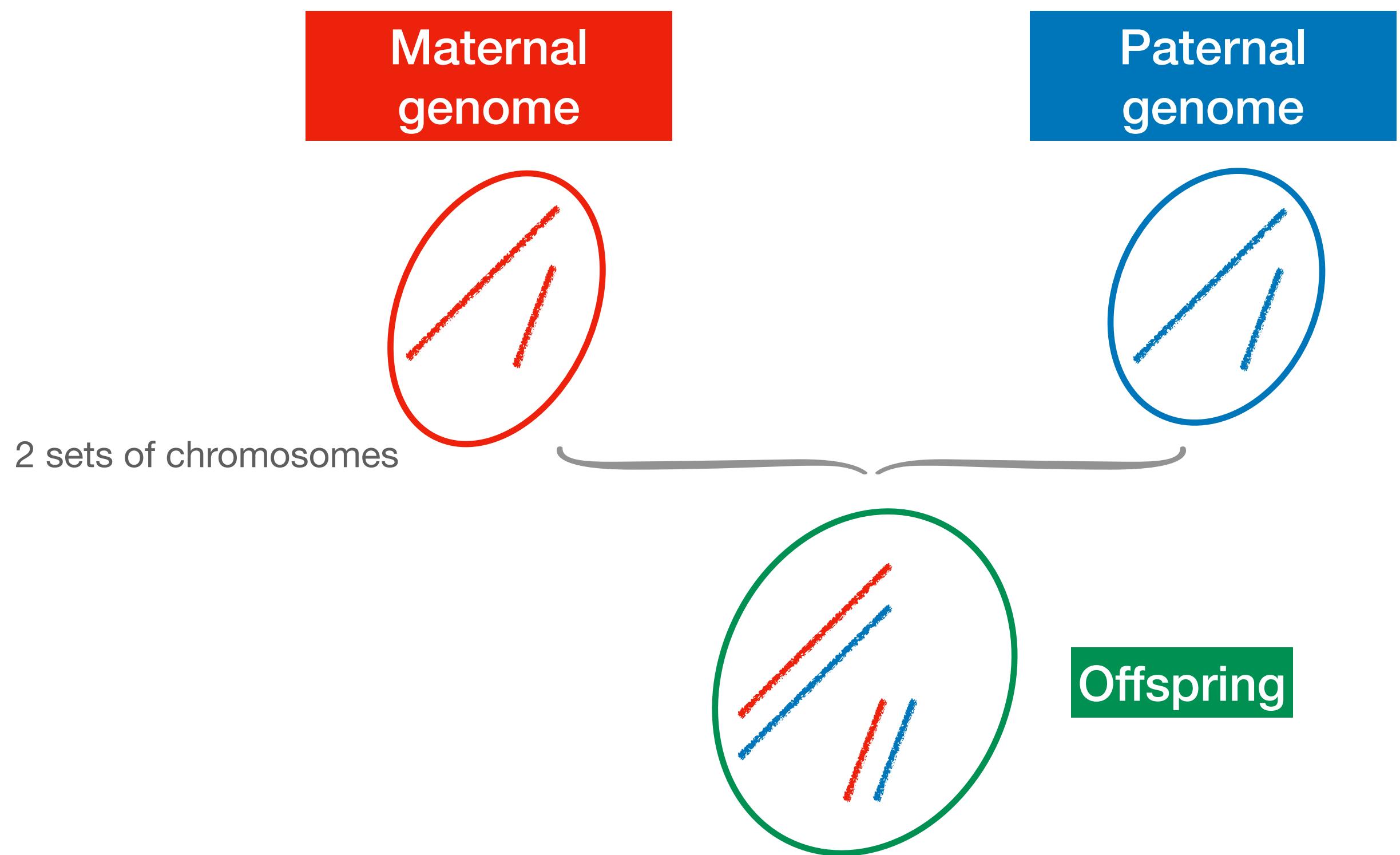
- Production of new organisms by the combination of genetic material of two individuals.



Offspring

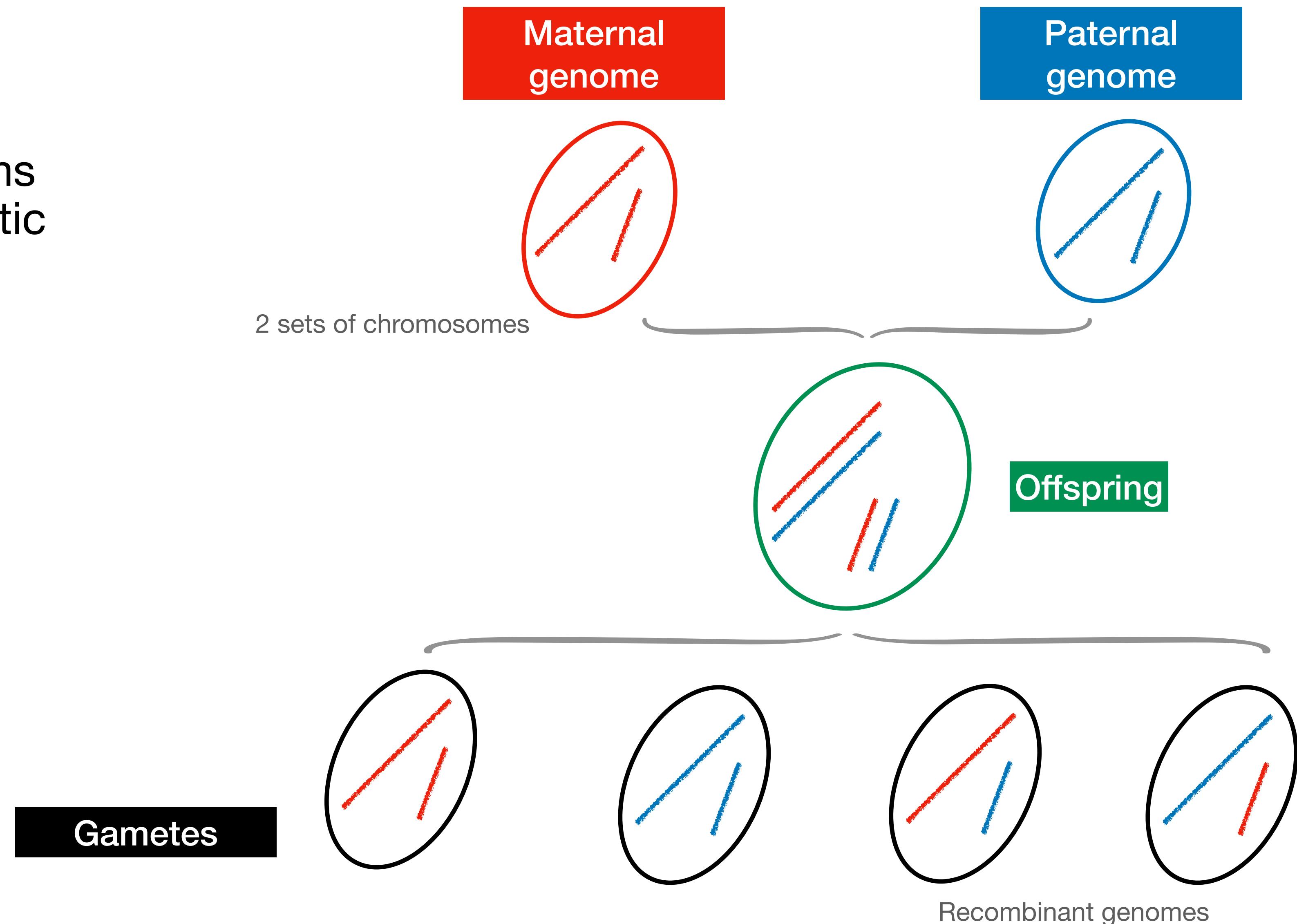
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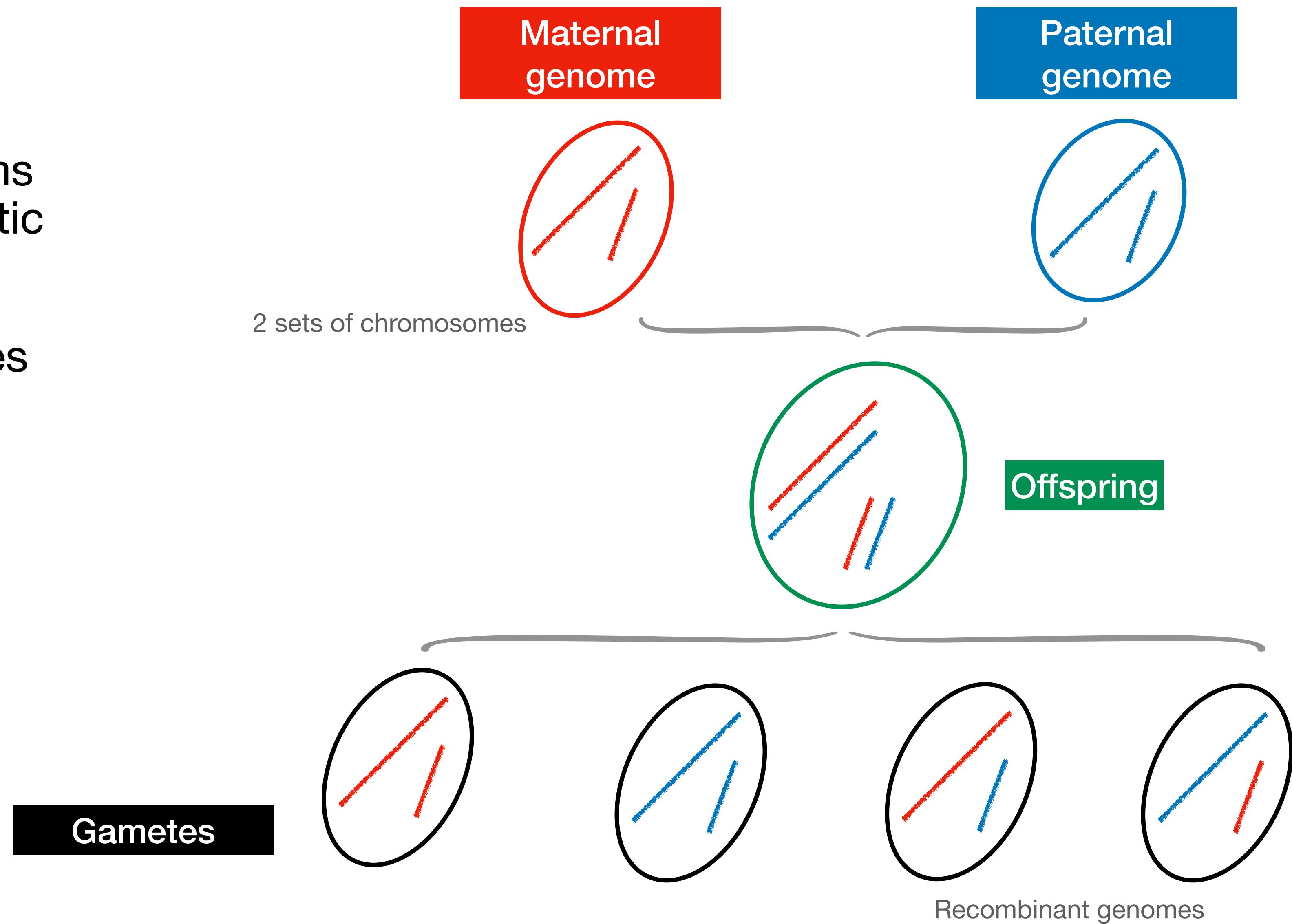
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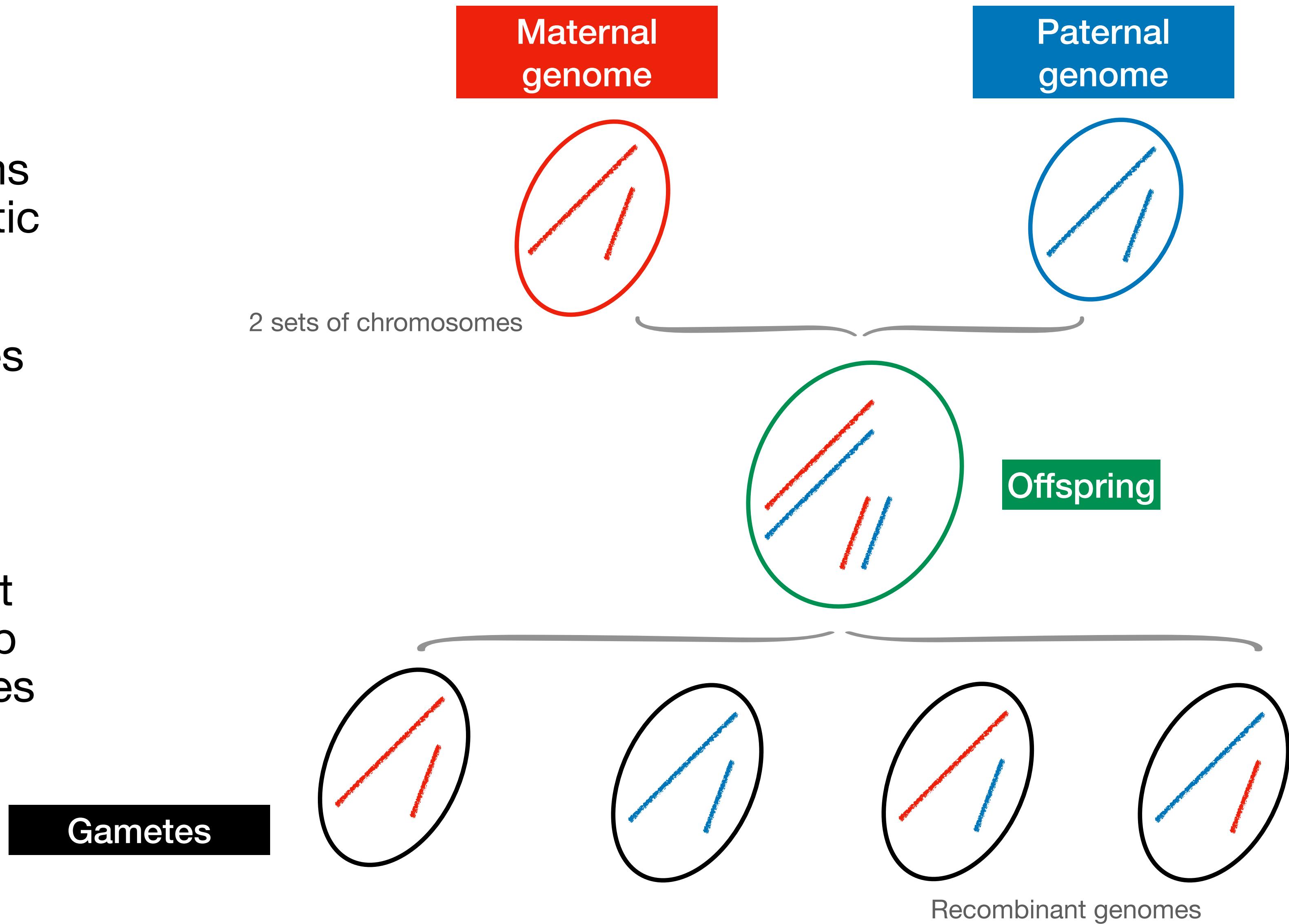
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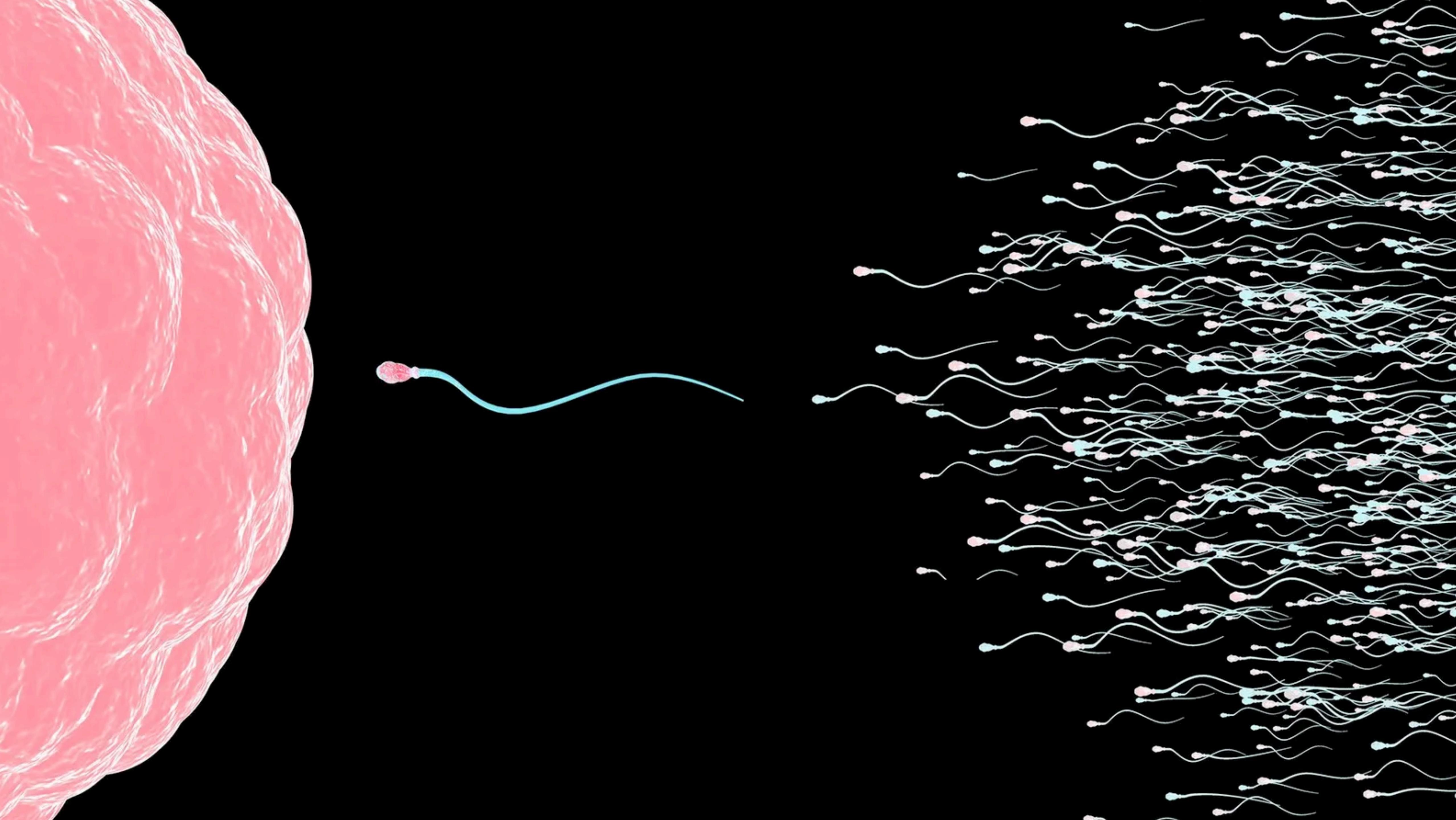
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- Sexes are defined as classes of individuals that are incompatible for sexual reproduction.



What is sexual reproduction? and what are sexes?

- Production of new organisms by the combination of genetic material of two individuals.
- Sexes are defined as classes of individuals that are incompatible for sexual reproduction.
- Typically 2 sexes: males that produce many minute cheap gametes (sperm) and females that fewer produce large expensive ones (eggs).





Reproduction is female limited

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- Human female record claim: **69** offspring! (First wife of 18th century Russian peasant Fyodor Vassilyev with 16 pairs of twin, 7 sets of triplets and 4 sets of quadruplets)



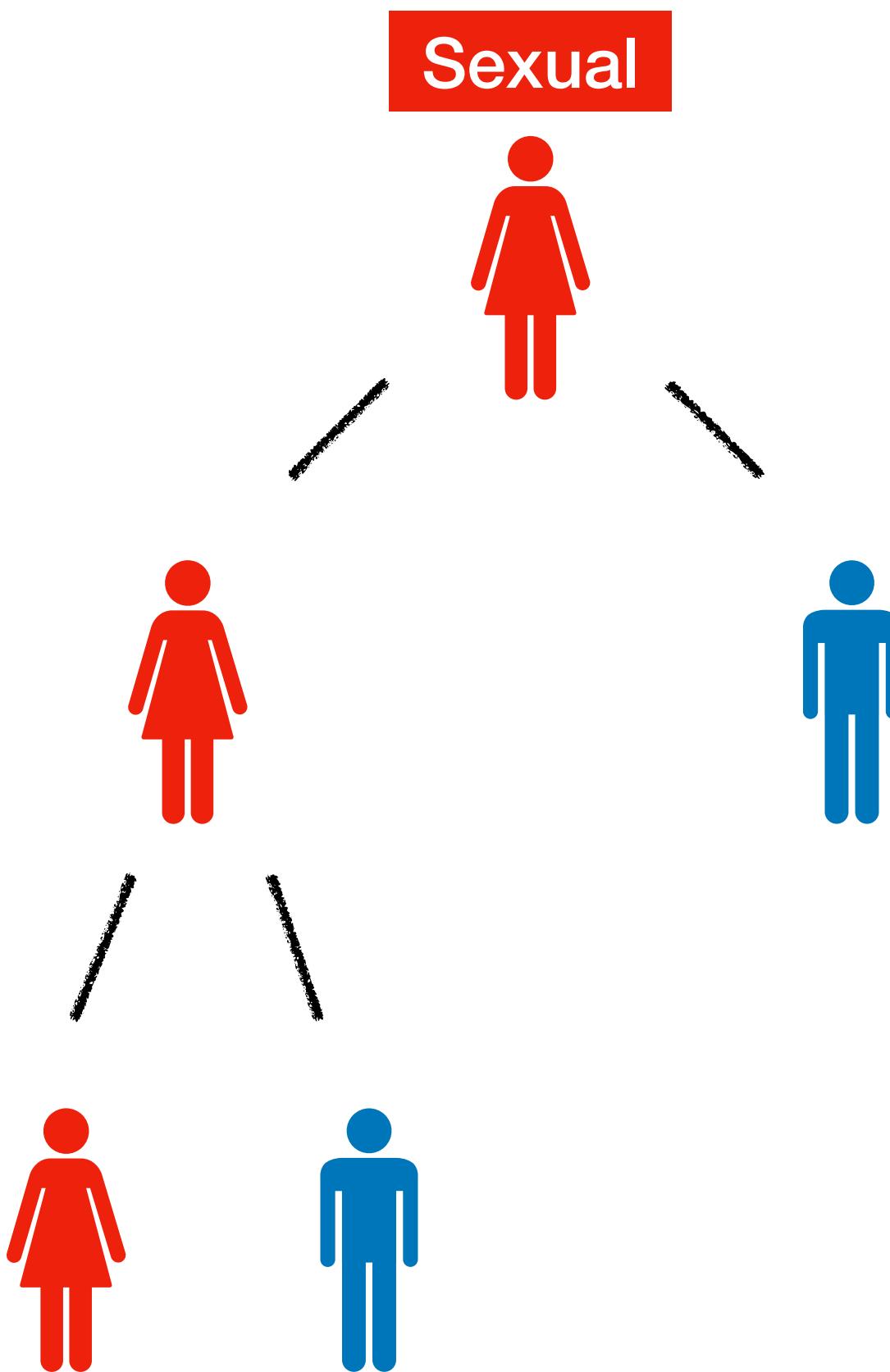
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- Human man record claim: **888** offspring Ismael the Bloodthirsty, emperor of Morocco (1672-1727)



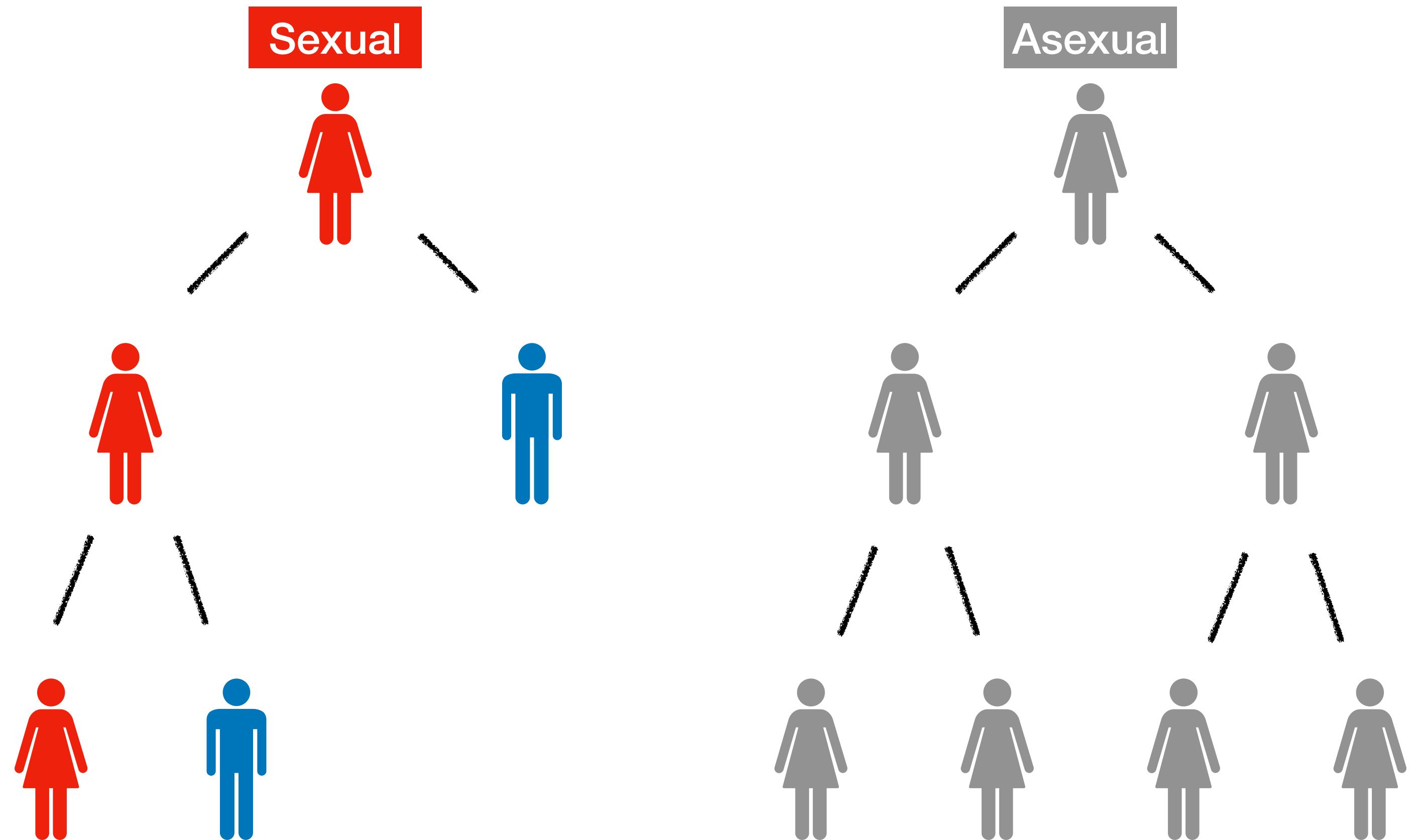
The demographic cost of sex

- For every daughter a sexual female makes, an asexual makes two.



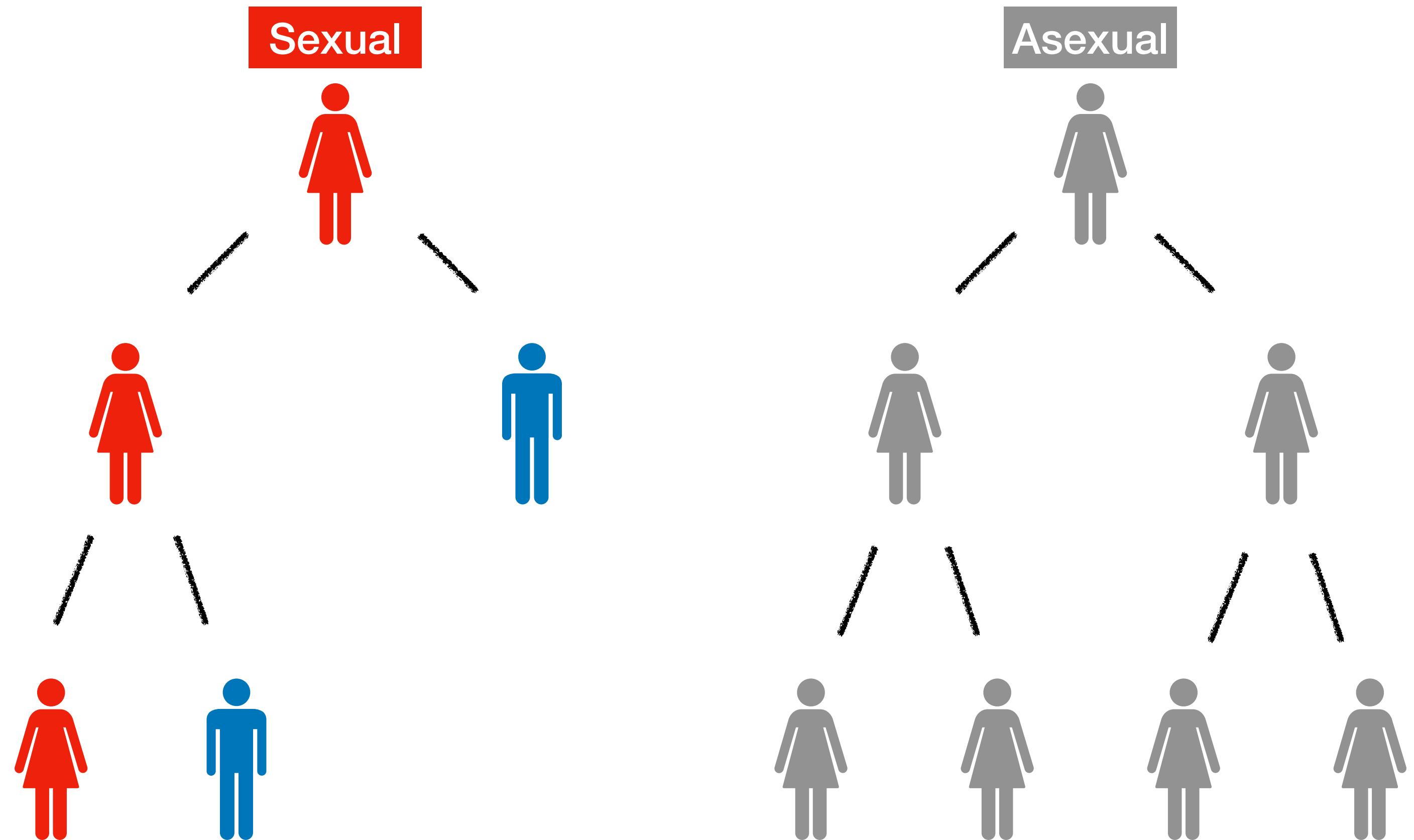
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The demographic cost of sex

- For every daughter a sexual female makes, an asexual makes two.
- Asexuals have a huge demographic advantage and should easily outcompete sexual.



The evolutionary cost of asexuality

- By not allowing their genomes to mix, asexuals face two potential problems

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 - Accumulation of deleterious mutations (especially in small populations) aka Muller's ratchet

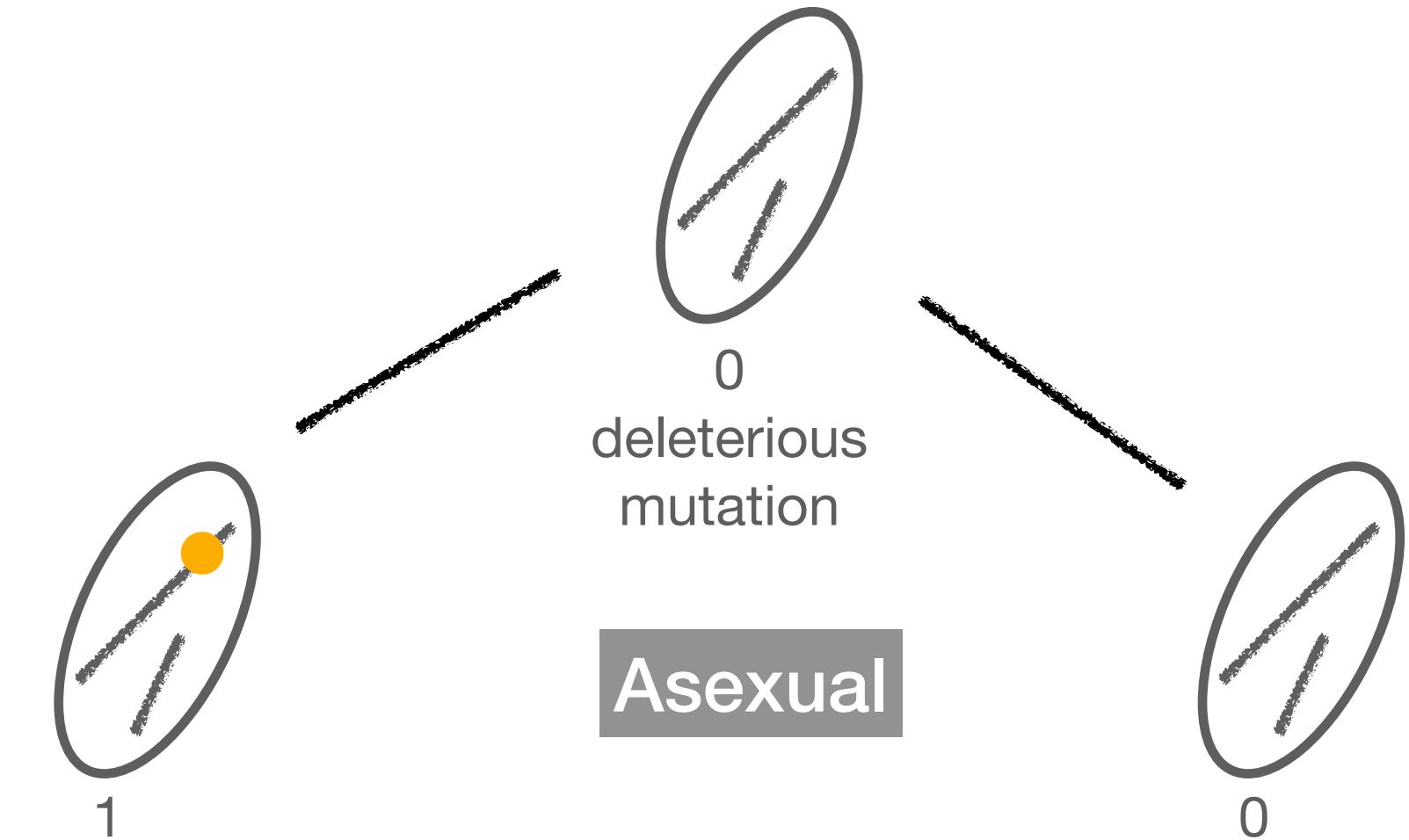
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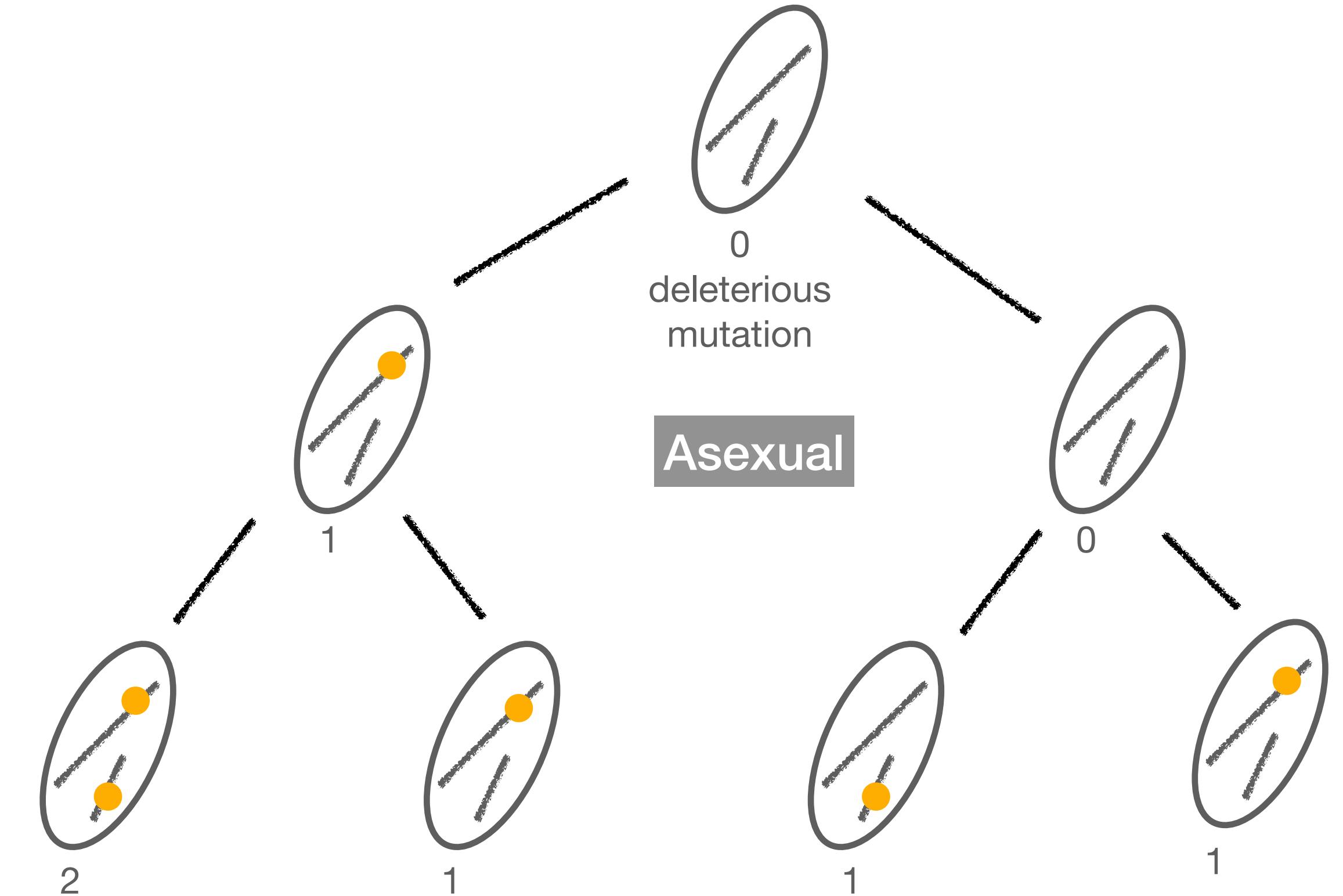
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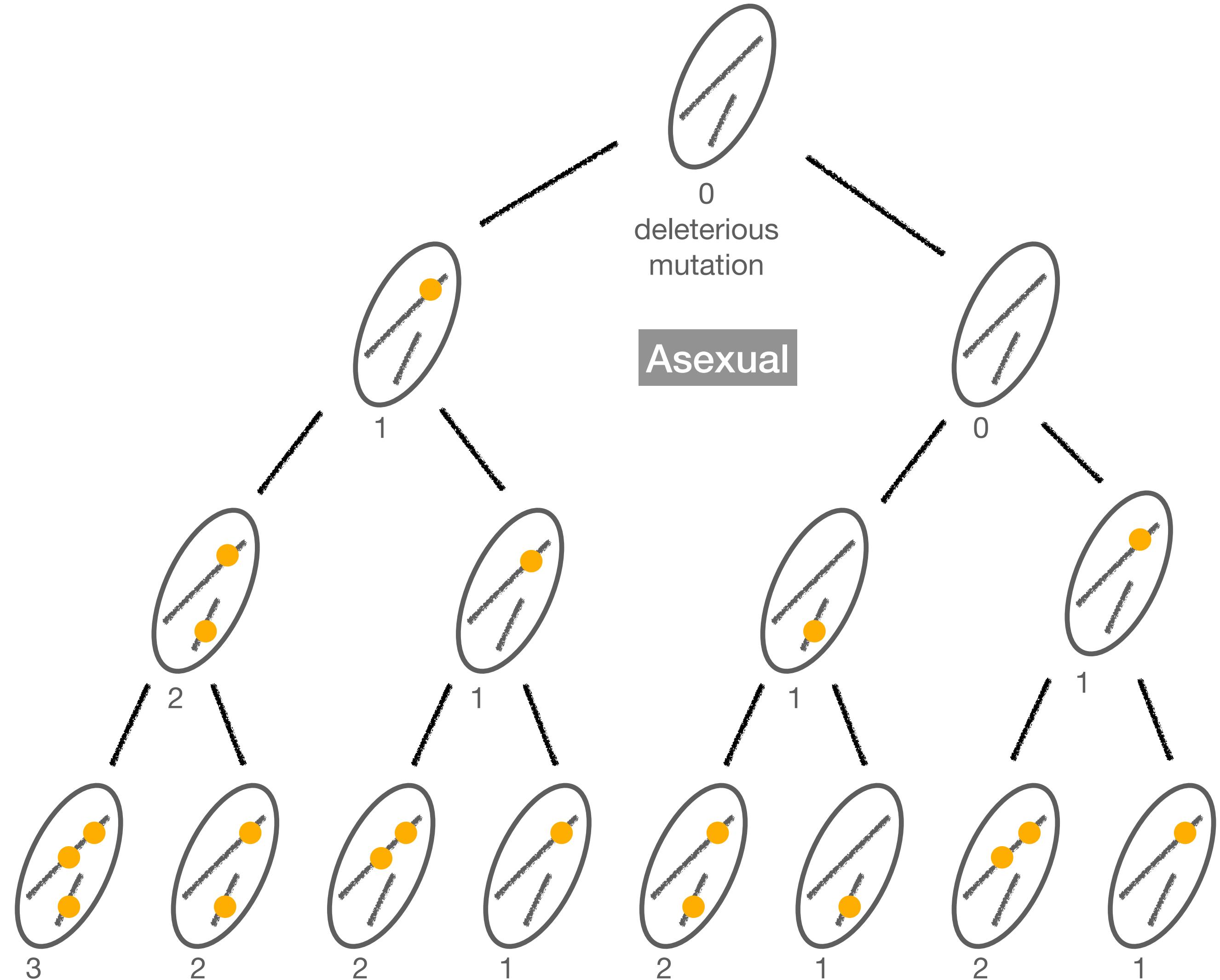
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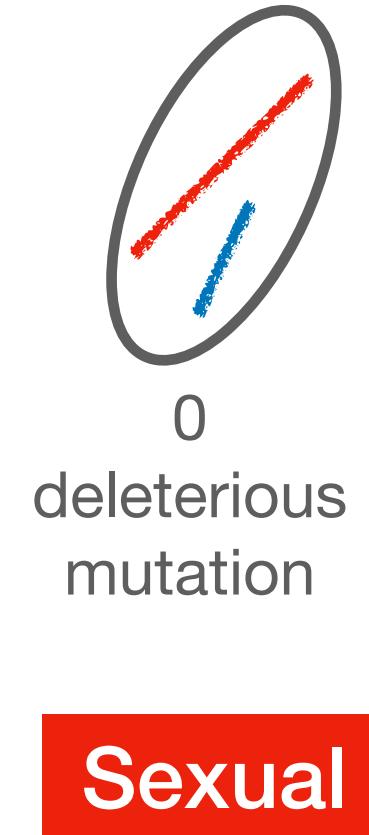
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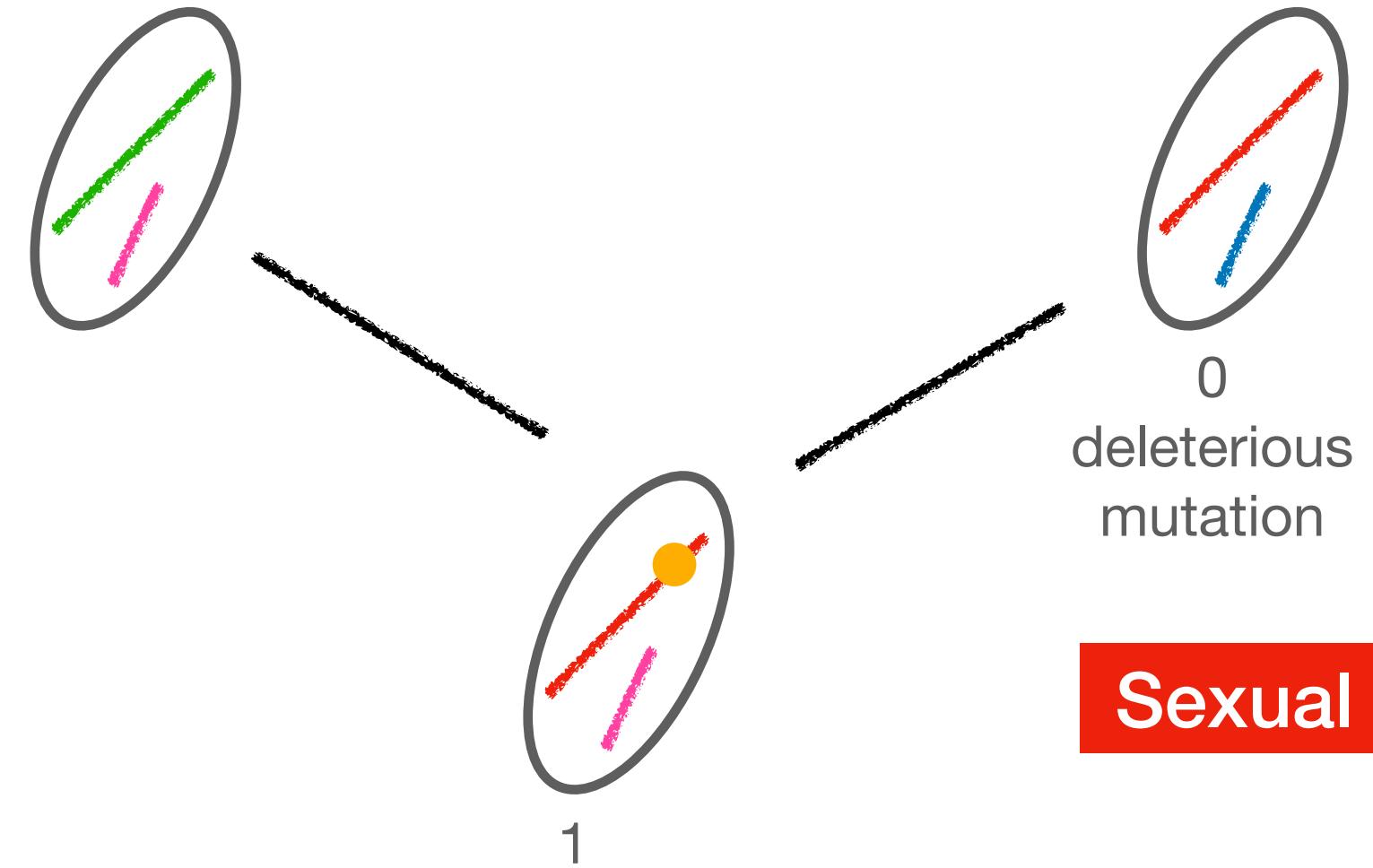
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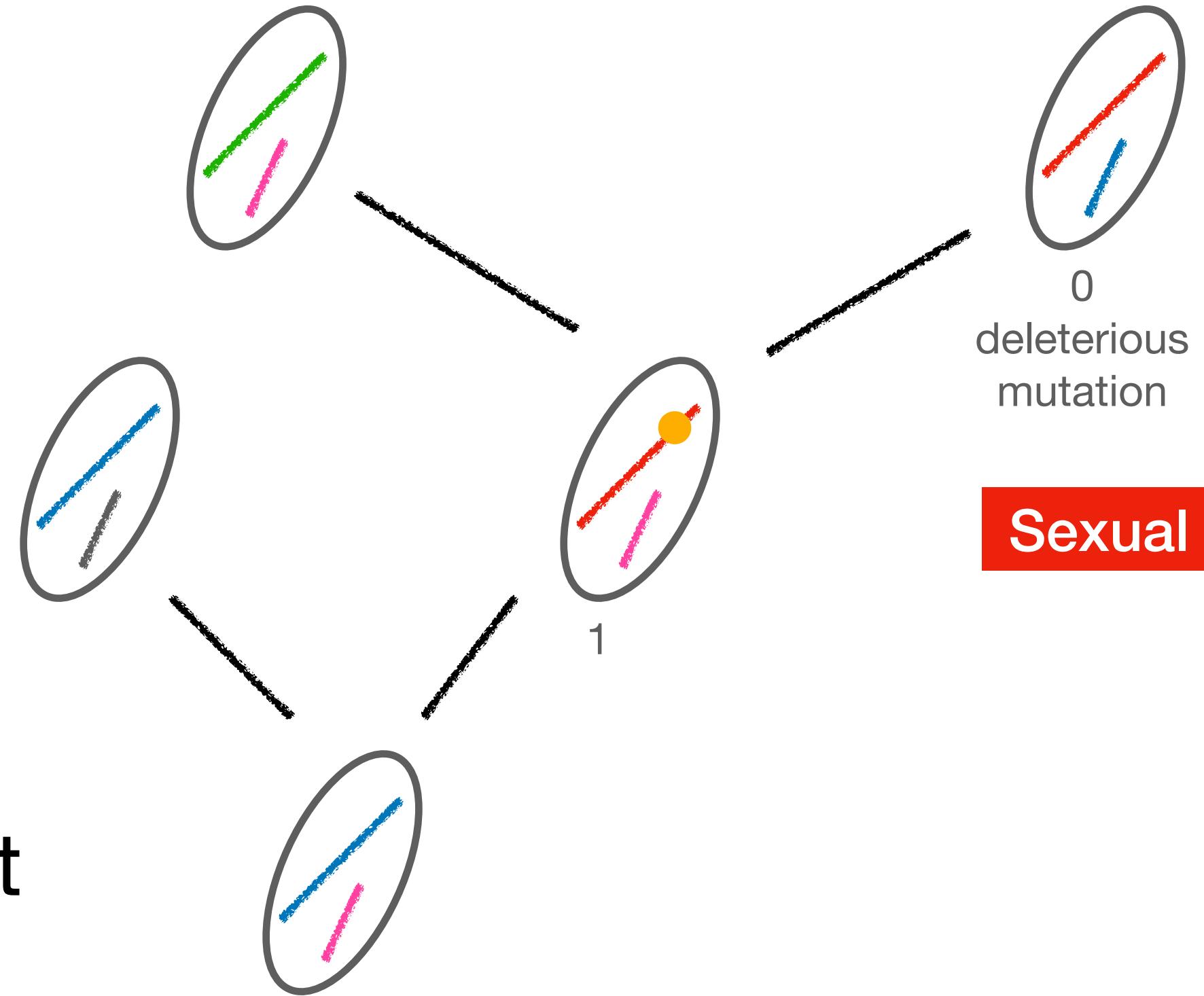
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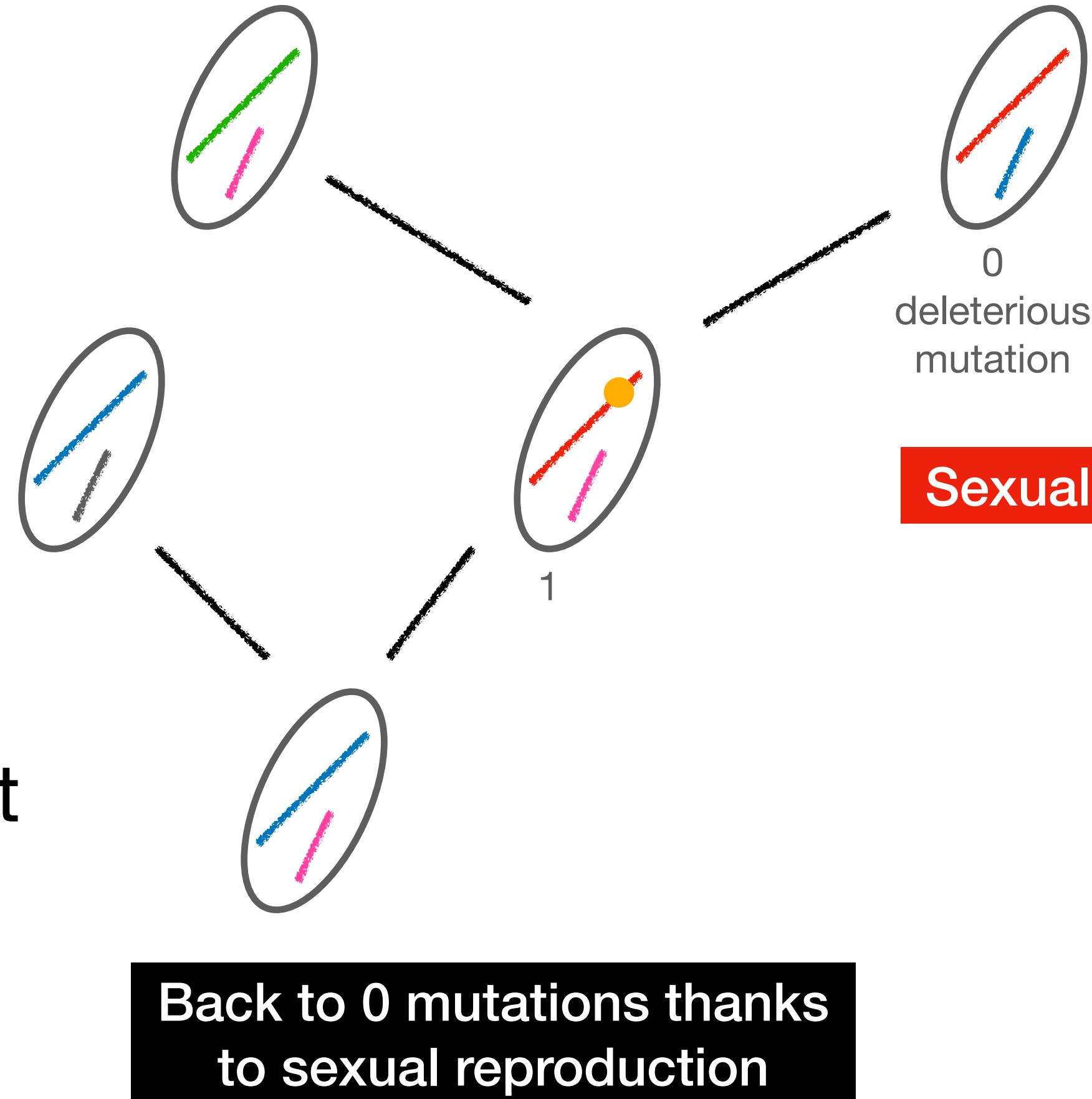
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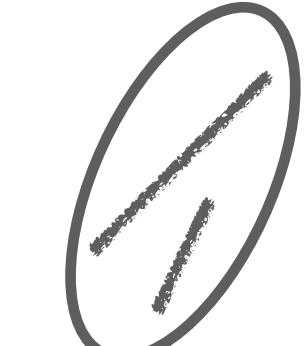


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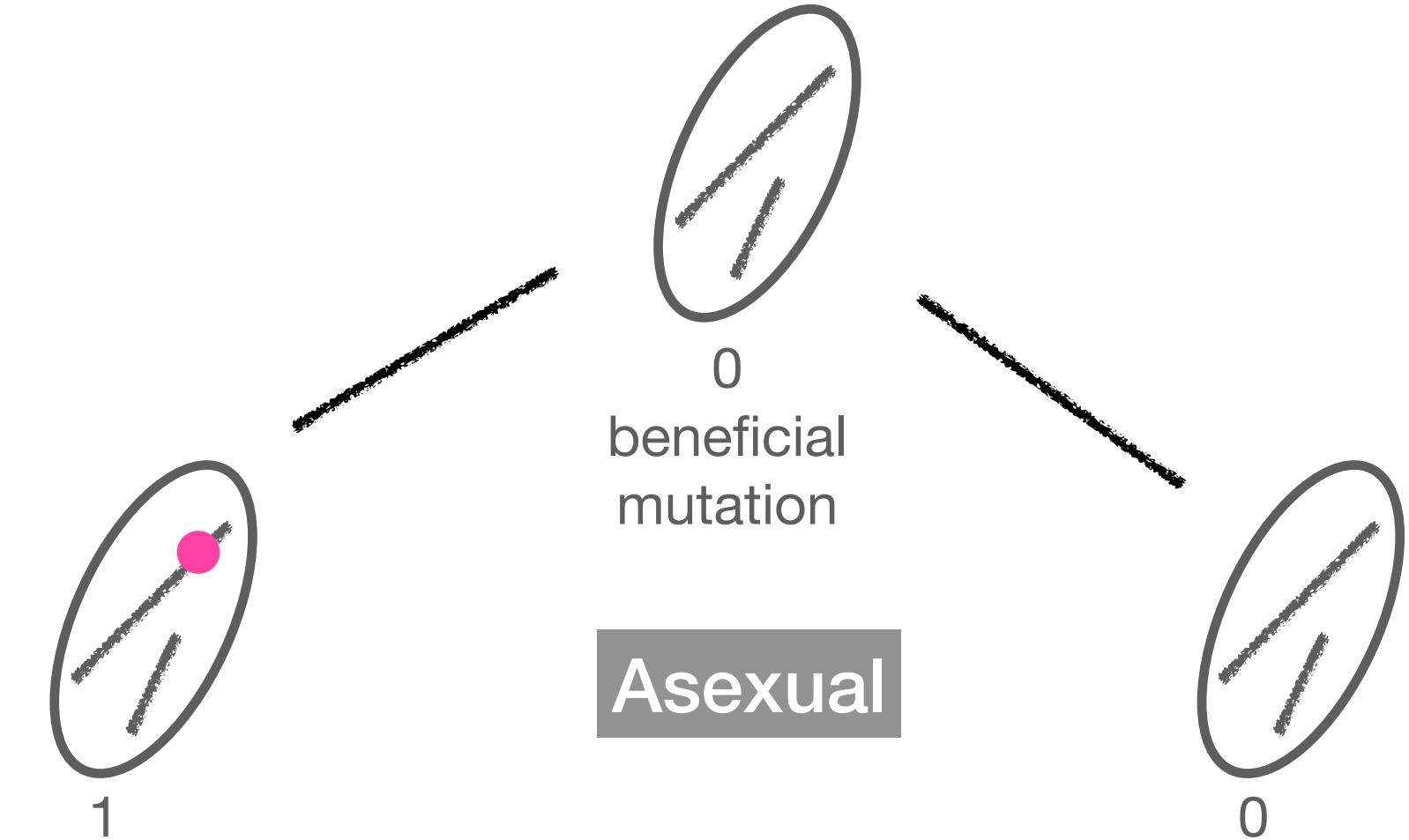


0
beneficial
mutation

Asexual

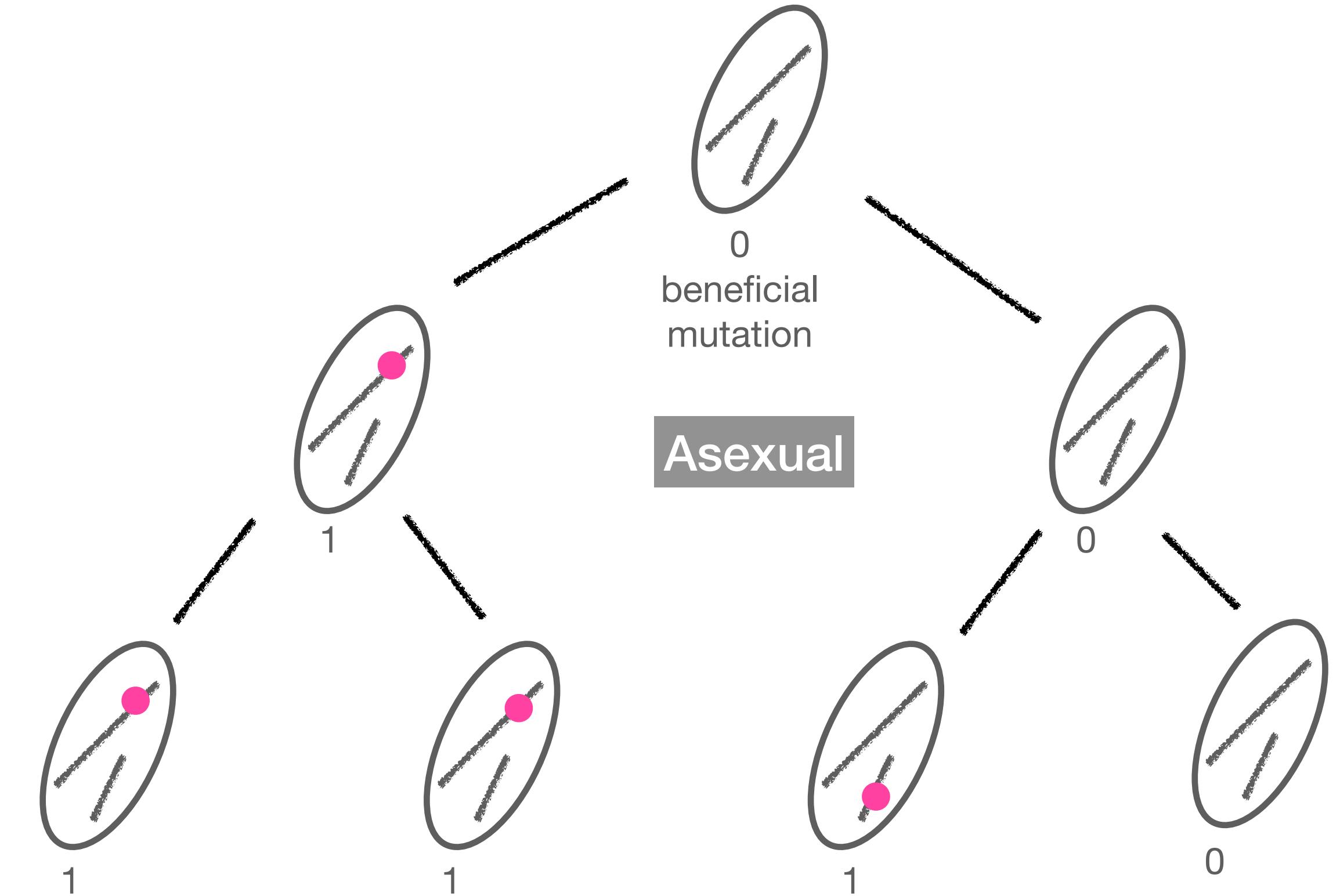
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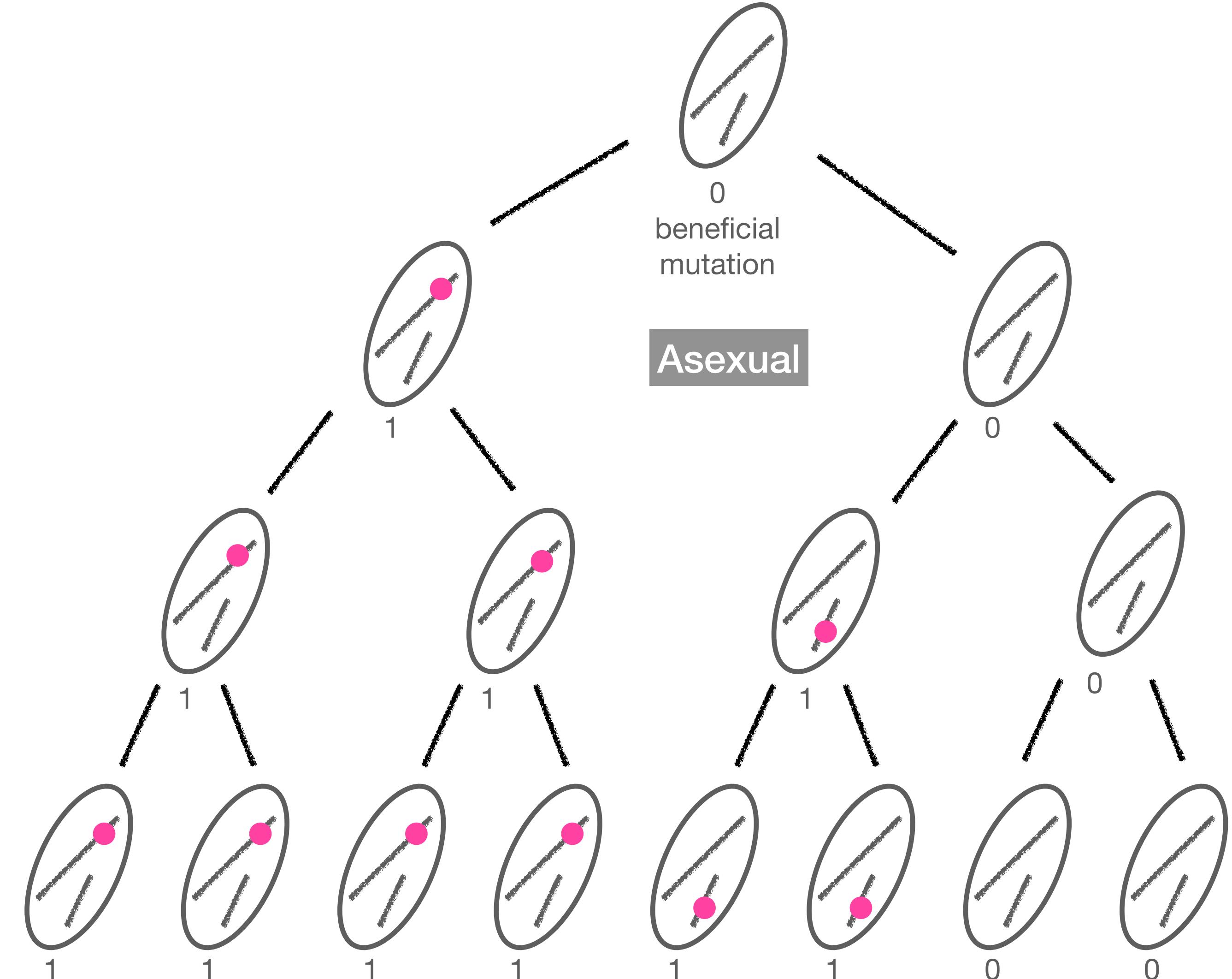
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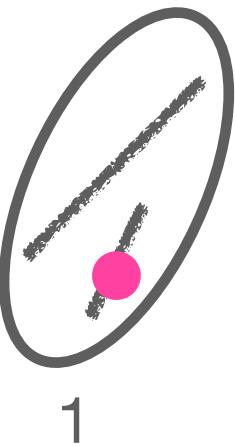
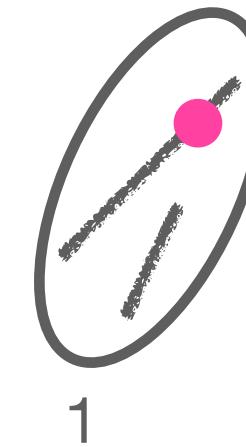
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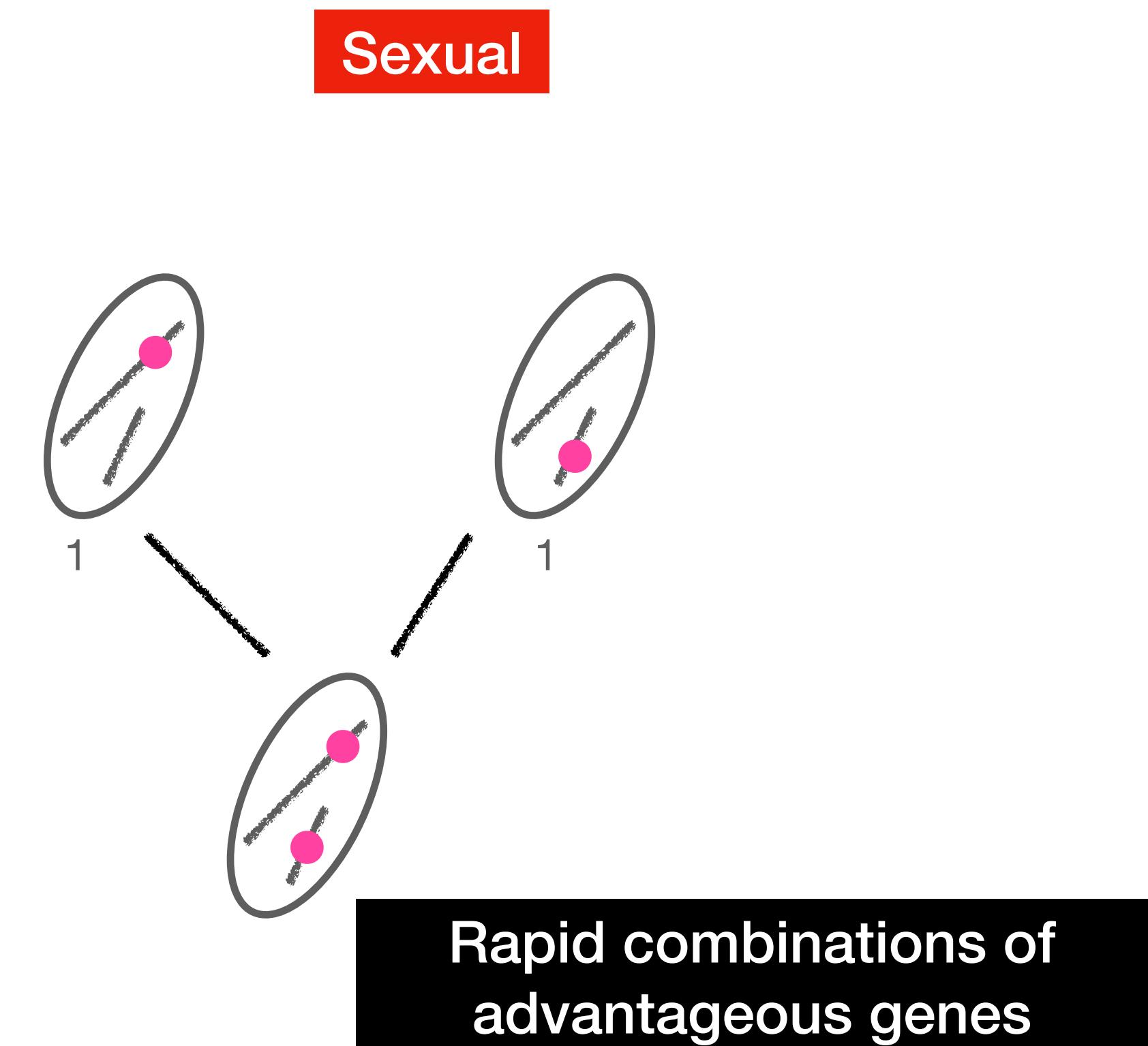
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Sexual



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Summary

- Sex = production of new organisms by the combination of genetic information of two individuals.
- Males = many small gametes (sperm). Females = fewer larger gametes (egg).
- Population growth is female limited.
- Two-fold demographic cost of sex.
- Asexuals accumulate more deleterious mutations and adapt less efficiently than sexual.

