Model: Selection on Diallelic Autosomal Locus

- Generation (t-1) genotypes: AA   Aa   aa
- \( p \) corresponds to the frequency of allele A
- \( q \) corresponds to the frequency of allele a
- **Fitness Coefficient**: \( w \) expresses the relative fitness of the genotypes
- **Selection Coefficient**: \( s \) expresses the relative fitness of the phenotype
- **Degree of Dominance**: \( h \) relates to the amount of dominance of A to a

\[
1 = p^2 + 2pq + q^2
\]

\[
\bar{w} = p^2 w_{AA} + 2pq w_{Aa} + q^2 w_{aa}
\]

**Model and Parameters**

Frequency of Alleles before selection:

\[
1 = p^2 + 2pq + q^2
\]

Frequency of Alleles after selection:

\[
\bar{w} = p^2 w_{AA} + 2pq w_{Aa} + q^2 w_{aa}
\]

- When \( w_{AA} = 1 \) and \( w_{Aa} = 0.95 \), what happens to A over time?
- How are the genotypic frequencies changing over time with these conditions?

If \( s = 0 \rightarrow \) phenotype is neutral
If \( s = 1 \rightarrow \) phenotype is lethal
If \( h = 0 \rightarrow A \) is dominant
If \( h = 1 \rightarrow a \) is dominant
If \( h = 0.5 \rightarrow Aa \) has intermediate fitness

\[
\begin{align*}
w_{AA} &= 1 \\
w_{Aa} &= 1 - hs \\
w_{aa} &= 1 - s
\end{align*}
\]

Defaults of the Populus model