

Quantitative genetics from genome assemblies to neural network aided omics-based prediction of complex traits

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CCTB

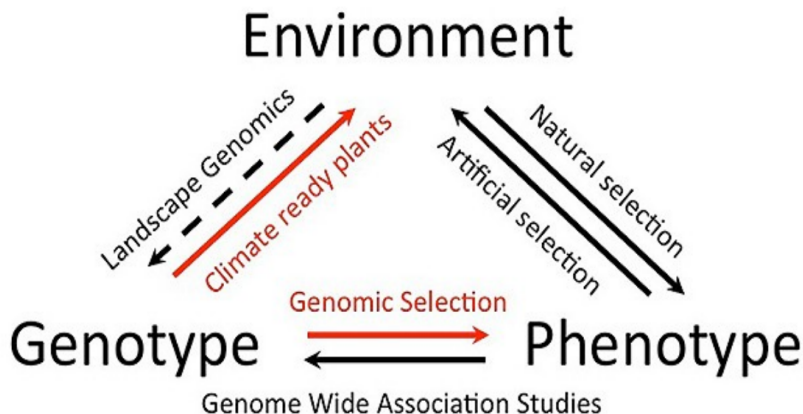
Evolutionary genomics

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Quantitative genetics

Quantitative genetics aims to explain the heritable parts of traits that follow certain statistical distributions.



Quantitative genetics



Decomposition of phenotypic variance

$$\sigma_P = \sigma_G + \sigma_E + \sigma_{G \times E}$$

$$\sigma_G = \sigma_A + \sigma_D + \sigma_I$$

$$\sigma_I = \sigma_{AA} + \sigma_{AD} + \sigma_{DD}$$

$$h^2 = \frac{\sigma_A}{\sigma_P}$$

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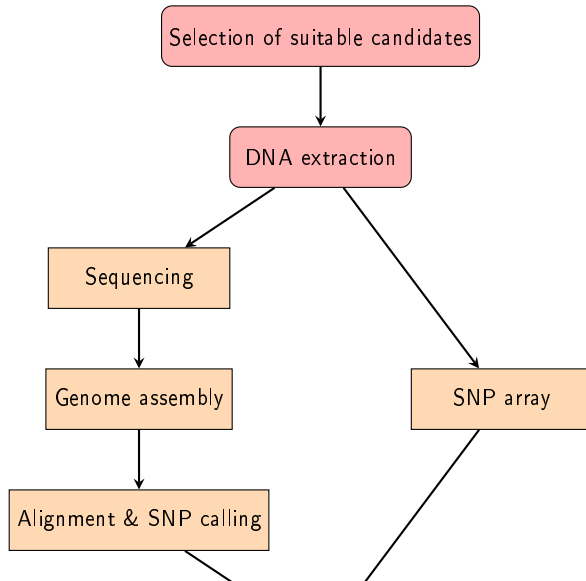
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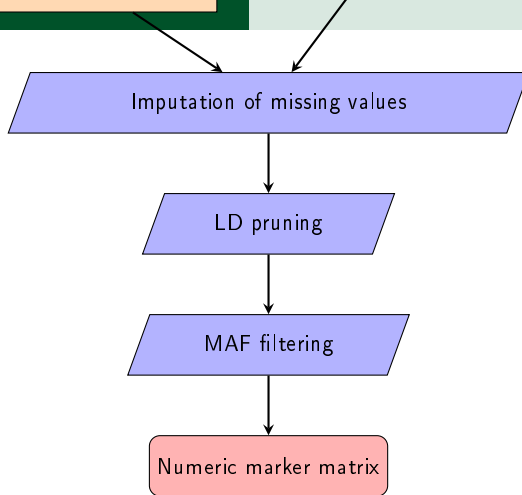
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Workflow in quantitative Genetics





Schematic process of genotyping for quantitative genetics analyses with its crucial steps

Numeric marker matrices

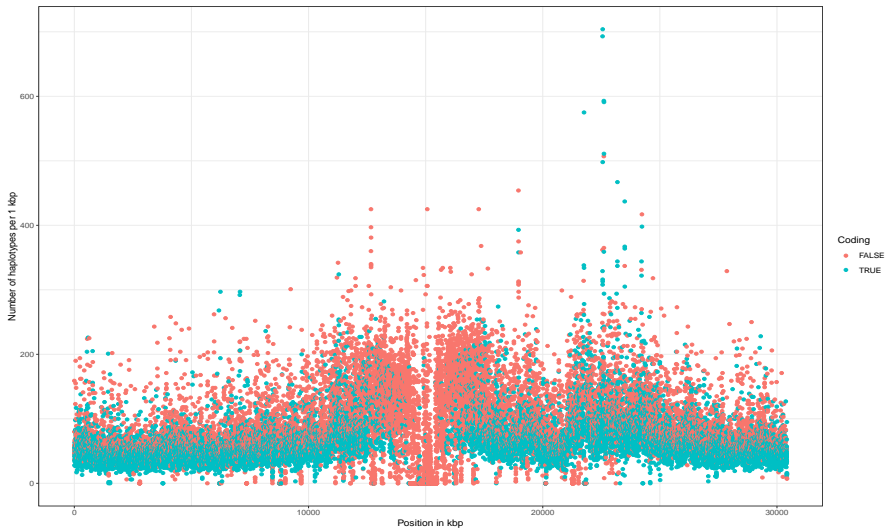


Tabelle: Schematic representation of the enhanced genotype matrix for across environment prediction of maize phenotypes with DHs 1-2 with markers M 1-2 in environments E1-2

	M-1	M-2	M-3	M-4
Acc1	0	1	1	0
Acc2	1	0	1	0
Acc3	0	1	0	1
Acc4	1	0	0	1

Methods in quantitative genetics



GWAS

Genomic Selection

