

. I GCATGCATGCATGCATGCATGCATGCATGCATGCATG GCATGCATGCATGCATCCATGCATGCATGCA **N**extGenerationSequencing

Genomics

CATGCATO JUATOLA 'GCATGCA ATGCATGCATGCA CATGCA **GCATGCATGCATGCATGCA** *TGCATGCATGCATGCATGCATGCA TATGCATGCATGCAT? ATGC ATGCATGCATGCA GCATGCAATGCATG SCAGTGCATGCAT ATGCA" SCATEL TATGCAN **CATGCA** 'ATCGCA' TGCATGC ATGCATGC ATGCATGC TGCATG TGCAT CATG `*TGC*

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- LAIGCATGCATGCATGCATGCA. I L CATGCATCGCATGCATCGCATGCATGCATGCATG

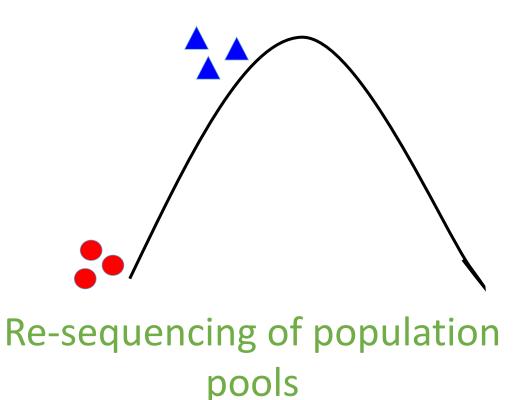
> **Niklaus Zemp** June 2020

Bioinformatics Genetic Diversity Centre (GDC) **ETH Zurich**

JCATGCATG LATGCATGCAIGCATG STGC. GCAAT NGCATGCATGCATGCATGCAT 76 CATGCATAAAGCA) SCA' JUATGCATGCATTCCATCC LATGCATGCATGCATGCA TGCATGCATGCAATGCATTT GCATGCAGTSCATGCATGC CATGCATGCA[®] JCATGCATGCA ATGCATGCATGCAT CATGCATGU TECATGCAT THERITGETA ATGCATG JAT G CAT

Which genes genes are responsible for altitudinal adaptation in Carnation?





Fior, unpublished 1

GDC Genetic Centre SM

Population genomics in a non model organism

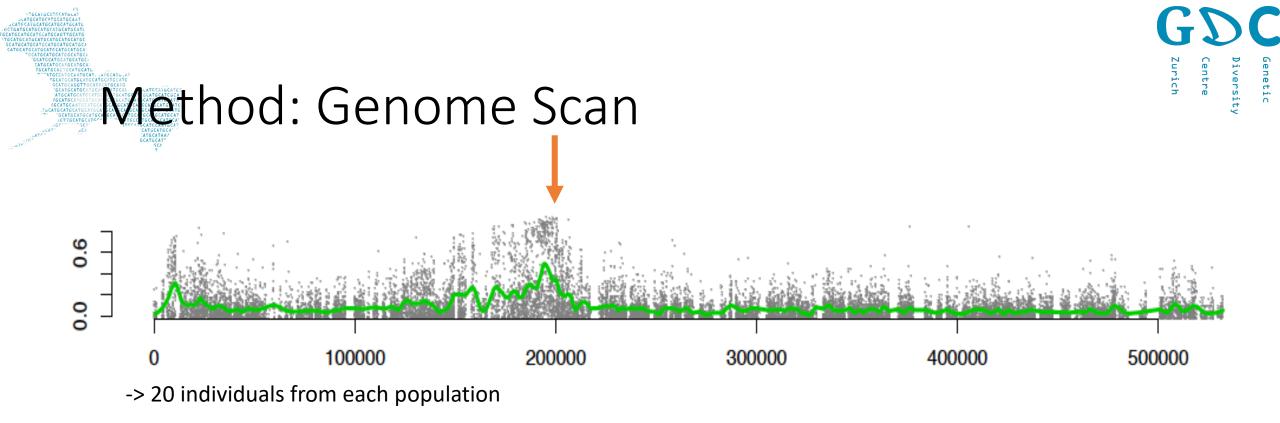
- 1) Genome assembly: short paired-end reads at 100 X, different mate-pair libraries from one individual
 - Option 1: Long reads only PacBio/Nanopore reads at 80 X coverage and for polishing short Illumina reads, Optical mapping/10X/Hi-C
 Option 2: PacBio/Nanopore read at 10 X plus Illumina at 50X
 Option 3: Ilumina paired-end reads (100X)
 RNAseq data for the genome annotation (Illumina or ONT)
- Resequencing (80X, short paired-end reads) of multiple populations (Poolseq)

Option: ultra low coverage sequencing (0.5-2X)



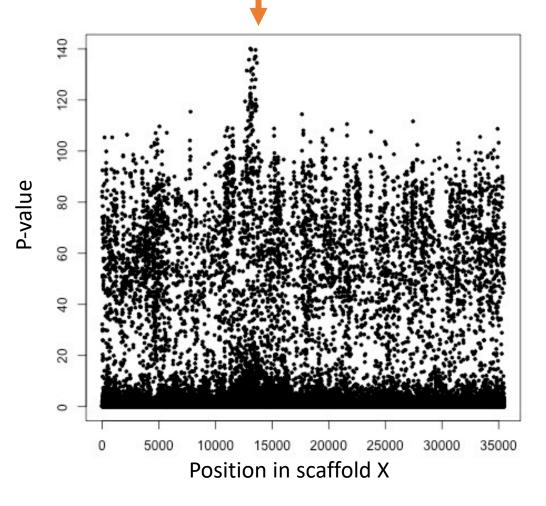


3 low-high altitudinal population pairs in three valleys



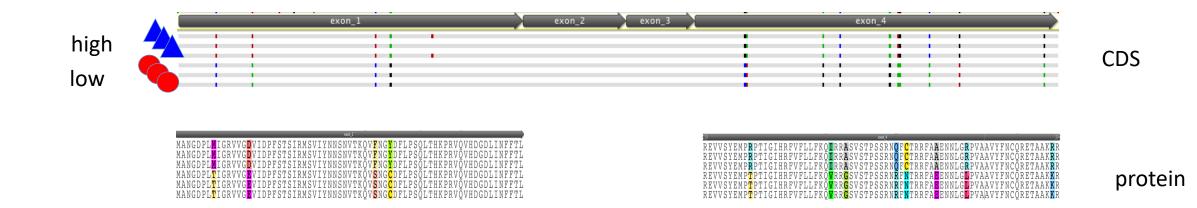
Genome scan show flowering gene that is under selection between low and high altitudinal population

Method: Correlation between phenotype and going of genotype (GWAS)



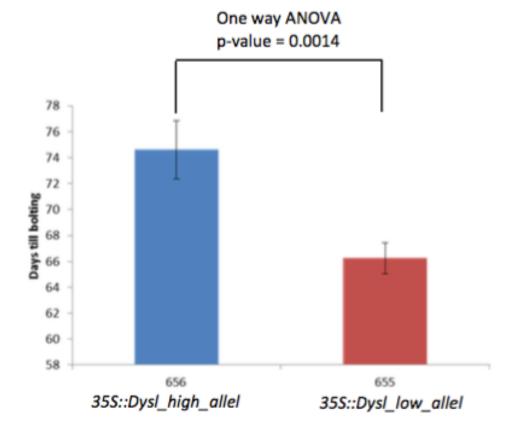
Variation in the flowering gene is highly correlated with differences in flowering time.

GDC Method: SNPs in CDS and protein translation



Fixed differences between the low and high altitudinal allele.

Method: Phenotypic effects of the two alleles



The two alleles induce different phenotypes in A. thaliana.