

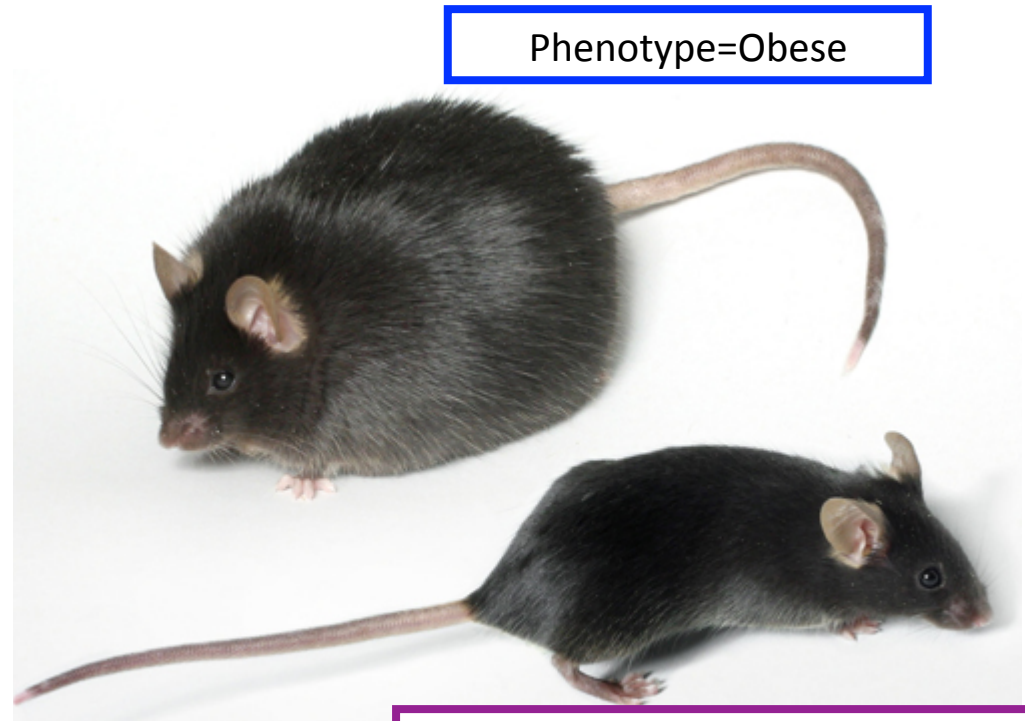
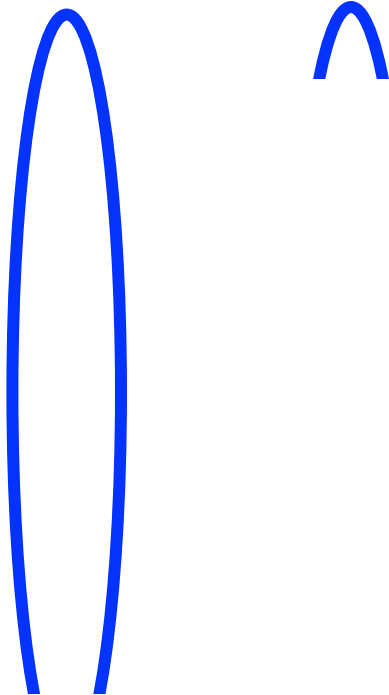


Resequencing at the JGI

Wendy Schackwitz
Joel Martin
Anna Lipzen
Nicole Johnson

What is Resequencing?

How do differences in genotype cause differences in phenotype?

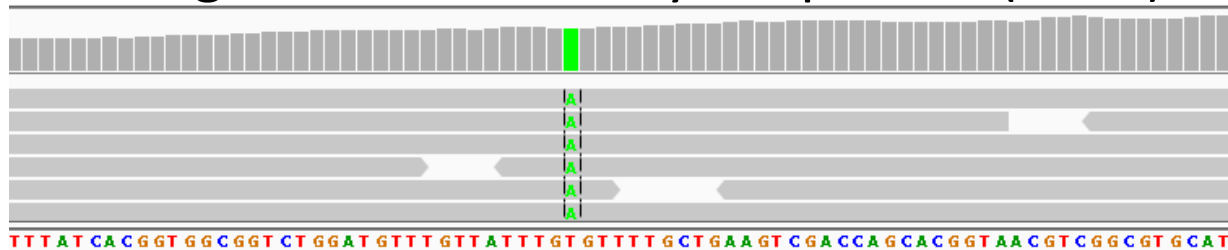


Phenotype=Obese

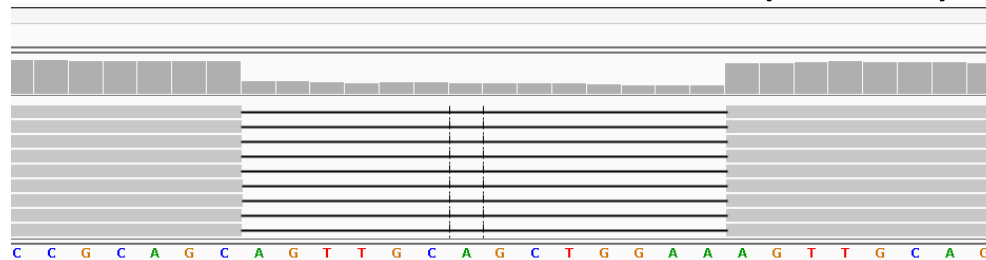
Phenotype=normal weight

Types of differences

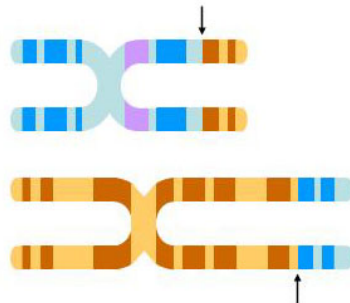
Single Nucleotide Polymorphisms (SNPs)



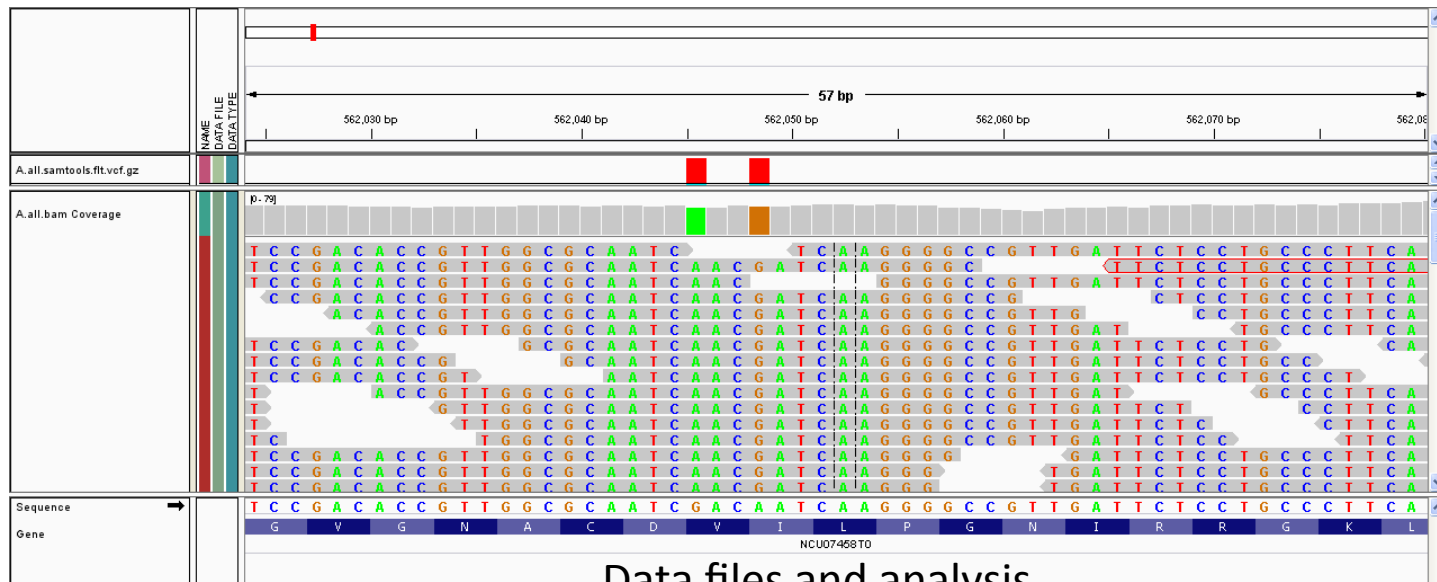
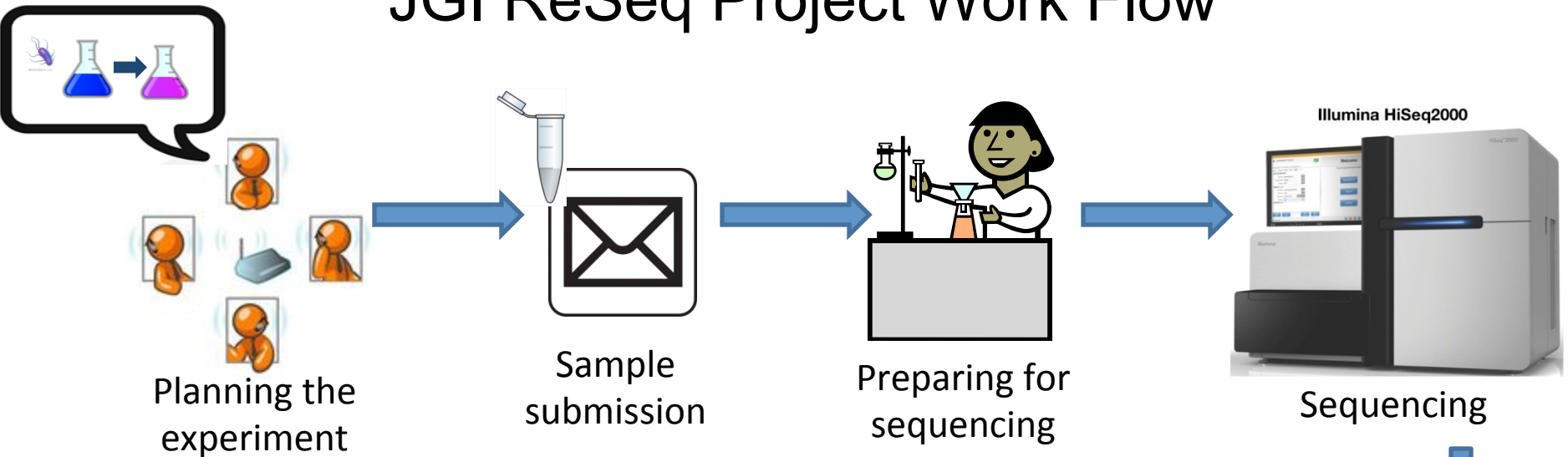
Insertion Deletion Events (InDels)



Structural Variation (Inversions, Translocations, Duplications)



JGI ReSeq Project Work Flow

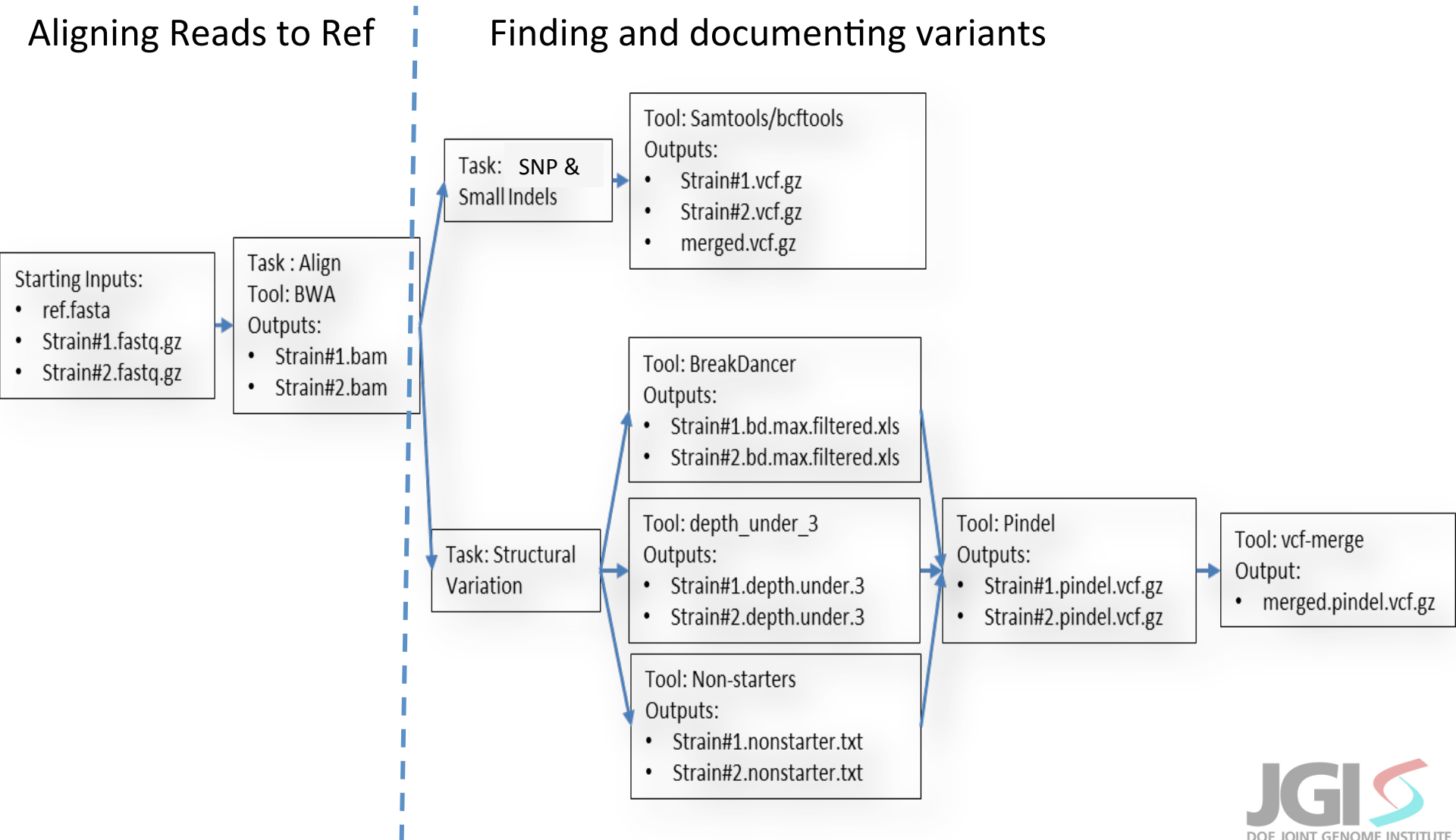


Data files and analysis

Resequencing Pipeline

Aligning Reads to Ref

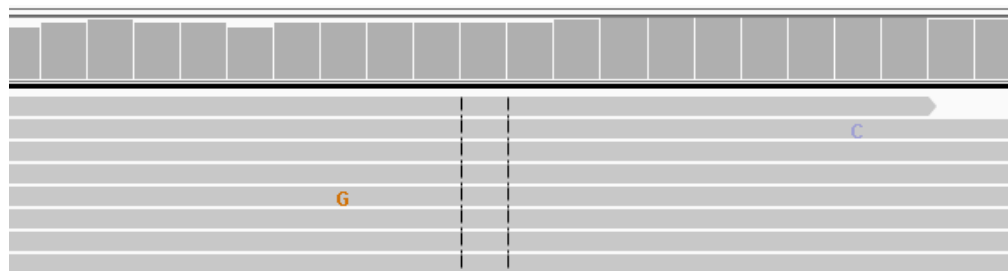
Finding and documenting variants



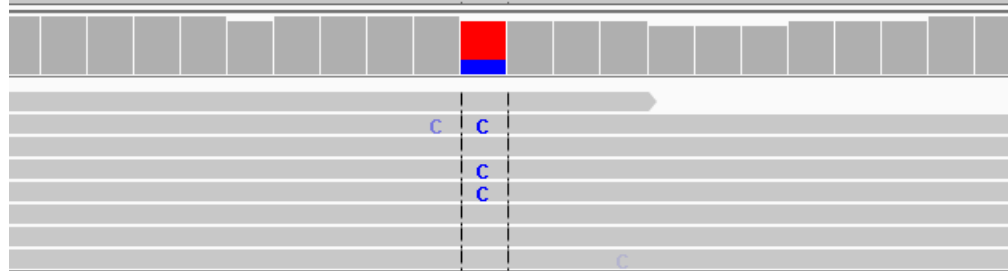
Documenting Variation: Variant Call Format (vcf) reports

#CHROM	POS	ID	REF	ALT	QUAL	FILTER	INFO	FORMAT	Sample 1	Sample 2	Sample 3
Chr01	32172.		T	C	999	PASS	DP=409;...	GT:PL....	0/0:...	0/1:....	1/1:....
Chr01	33744.		G	A	999	PASS	DP=474;	GT:PL....	1/1:...	1/1:....	0/0:....
Chr01	33909.		GCACAC	GCACACAC	999	PASS	INDEL....	GT:PL....	1/1:....	1/1:....	1/1:....

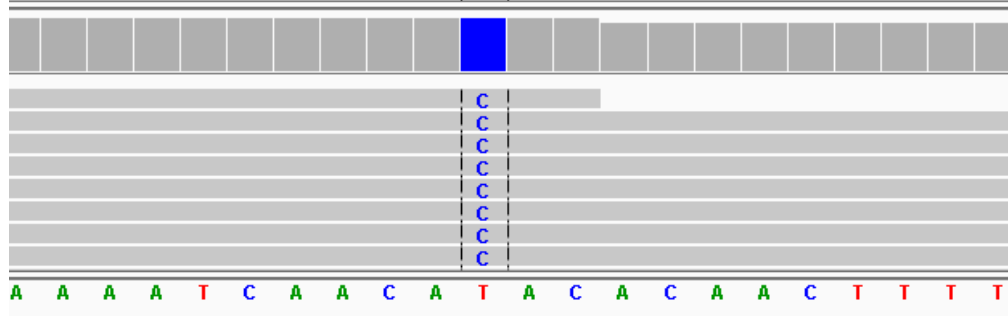
Genotype 0/0



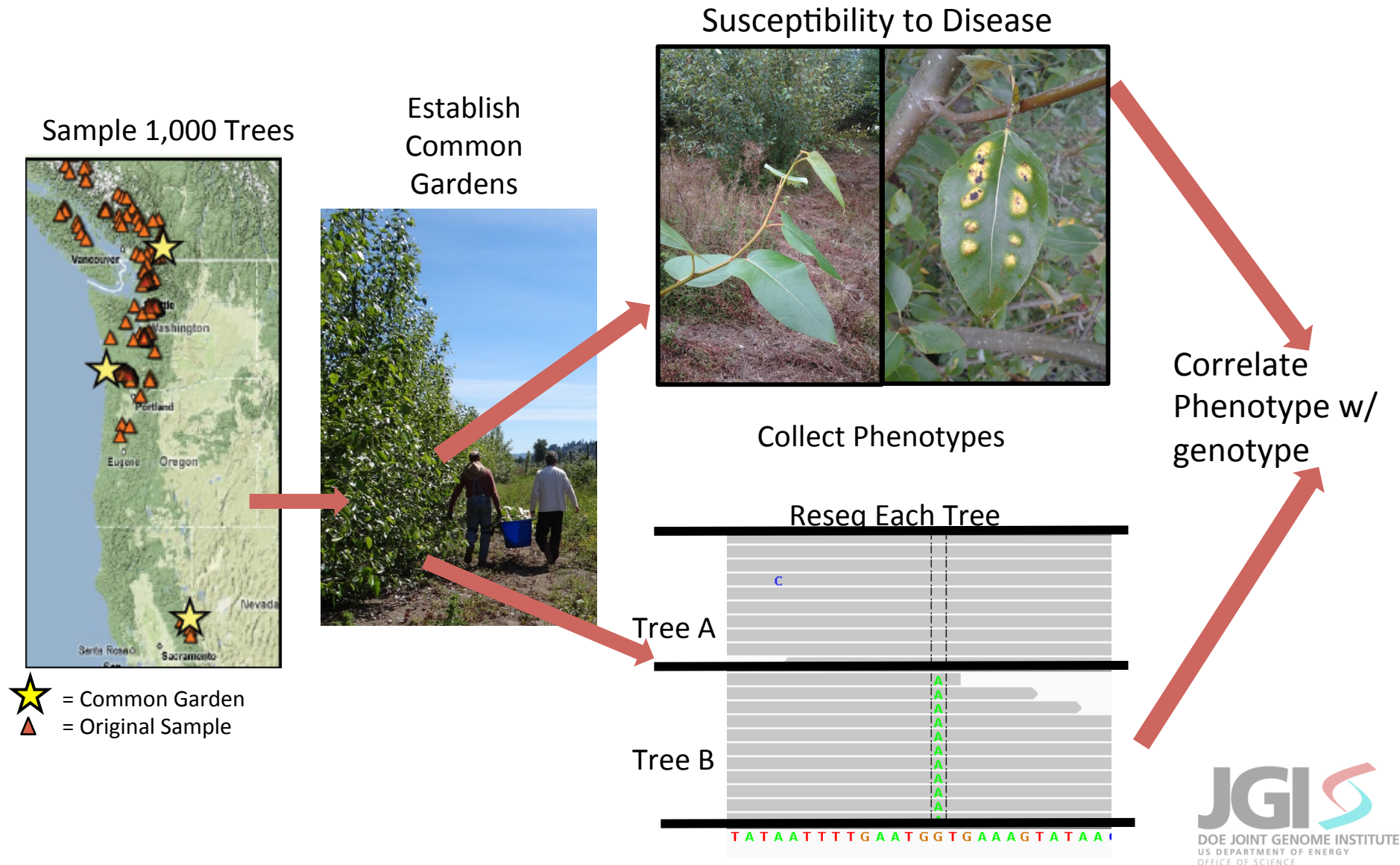
Genotype 0/1



Genotype 1/1



Genetic Diversity in Wild Poplar



Poplar and Laccaria

A ReSeq success story



Not all poplar can interact w/ Laccaria

- *Populus trichocarpa* <->
- *Populus deltoides* X nope



scaffold_29:126053-329836

Potri.T022200

Nisqually-1

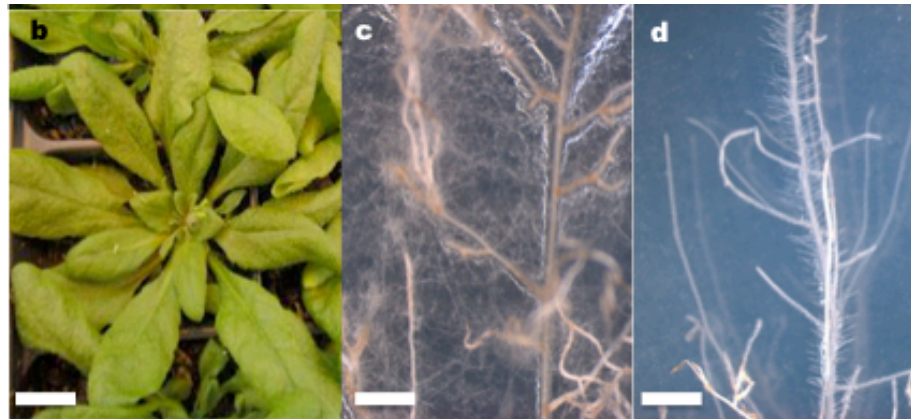


93-968



Proving Causative Variant

- Arabidopsis
 - does not have gene,
 - cannot interact with Laccaria
- Inserted gene Potri.T022200 into Arabidopsis and Viola!



Conclusion



scaffold_29:126053-329836

Potri.T022200



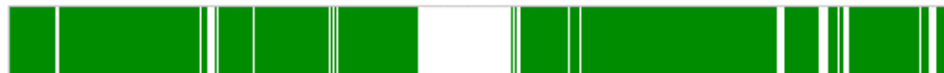
Nisqually-1



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ILL-101



D124



Acknowledgements

- ReSeq team
 - Joel Martin
 - Anna Lipzen
 - Nicole Johnson
- Poplar Team
 - Jerry Tuskan et al