

## **Applied Microbiology and Biotechnology**

*Pichia pastoris*



## Supplementary Materials

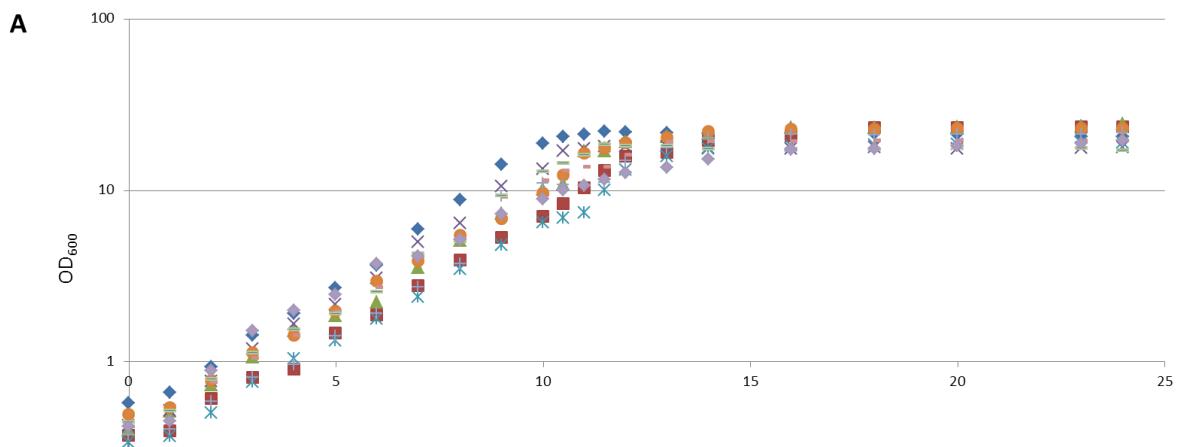
The figure displays sequence logos for two regions of the genome. The top region covers positions 460 to 540, and the bottom region covers positions 550 to 630. Each position is represented by a vertical stack of four bars, colored red, green, blue, and yellow from bottom to top, representing the probability of A, T, C, and G respectively. The height of each bar indicates the conservation of that nucleotide at that position across the different variants.

## Supplementary Fig. S1

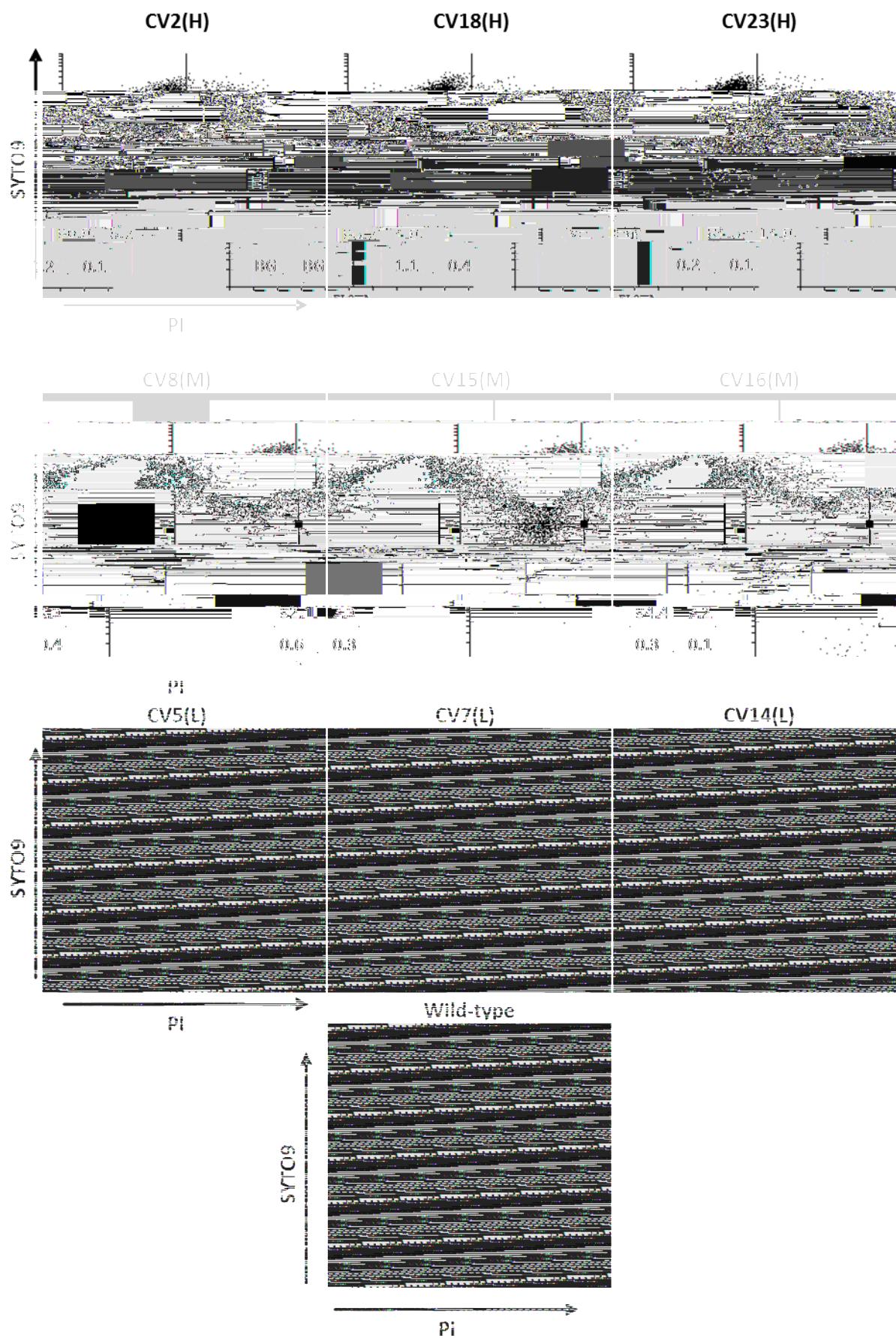
HSA

Pm

Pme

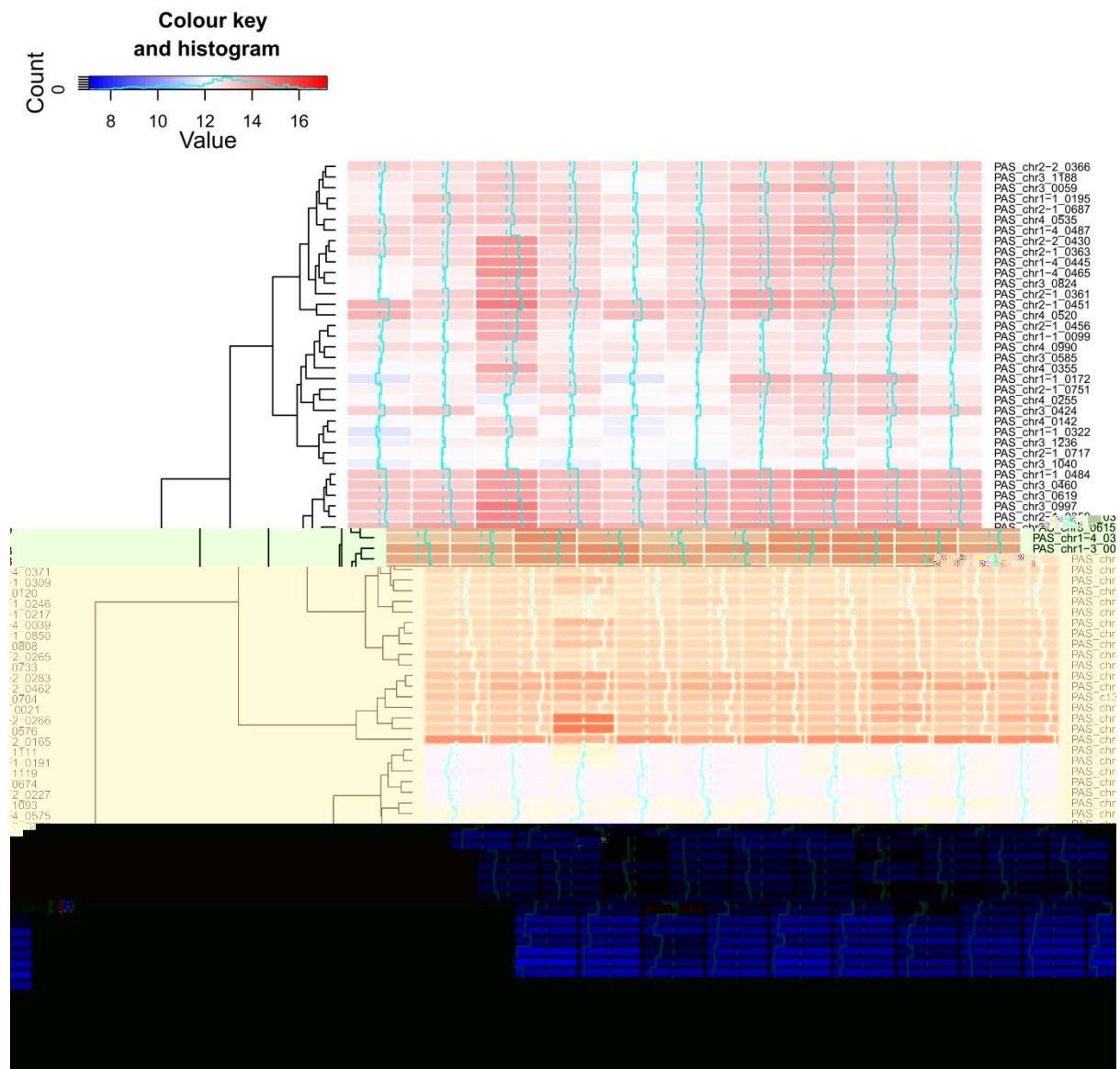


**Supplementary Fig. S2**



**Supplementary Fig. S3**





## Supplementary Fig. S5



## Supplementary Fig. S6

**Supplementary Table S1.**

CV5 (L)	CV7 (L)	CV14 (L)	CV8 (M)	CV15 (M)	CV16 (M)	CV2 (H)	CV18 (H)	CV23 (H)
Fatty acid metabolism	Alanine, aspartate and glutamate metabolism	Arginine and proline metabolism	Alanine, aspartate and glutamate metabolism			Glycerophosphorus metabolism	Basal transcription factors	Cell cycle - G1/S transition
Spliceosome	Sphingolipid metabolism	Metabolic pathways	Pyrimidine metabolism	Pentose and glucuronate interconversions	Peroxisome	Ribosome	Ribosome biogenesis in eukaryotes	RNA degradation
Intracellular signaling system	Spliceosome surveillance pathway			Pentose phosphate pathway	Porphyrin and chlorophyll metabolism		RNA transport	Phenylalanine metabolism
Ribosome biogenesis in eukaryotes		Oxidative phosphorylation	Ribosome biogenesis in eukaryotes			Ribosome	RNA polymerase	Steroid biosynthesis
RNA degradation				RNA polymerase	Phenylalanine metabolism	biogenesis in eukaryotes	RNA transport	Tyrosine metabolism
Sphingolipid metabolism			Phenylalanine metabolism	RNA transport	Porphyrin and chlorophyll metabolism			
Spliceosome			Phenylalanine, tyrosine and tryptophan biosynthesis	Ubiquinone and other terpenoid-quinone biosynthesis	Purine metabolism	Sulfur metabolism		
Ubiquinone and other terpenoid-quinone biosynthesis			Ribosome		Ribosome biogenesis in eukaryotes	Ubiquinone and other terpenoid-quinone biosynthesis		
				Sulfur metabolism		Spliceosome		
				Terpenoid backbone biosynthesis				
				Tyrosine metabolism				
				Ubiquinone and other terpenoid-quinone biosynthesis				
				Vallino, leucine and isoleucine biosynthesis				

## Supplementary Table S2

CV5 (L)	CV7 (L)	CV14 (L)	CV8 (M)	CV15 (M)	CV16 (M)	CV2 (H)	CV18 (H)	CV23 (H)
Aminoacyl-tRNA biosynthesis	Basal transcription factors	Amino sugar and nucleotide sugar metabolism	Cell cycle - yeast	Basal transcription factors	Aminoacyl-tRNA biosynthesis	Alanine, aspartate and glutamate metabolism	Alanine, aspartate and glutamate metabolism	Basal transcription factors
Fatty acid biosynthesis	Base excision repair	Basal transcription factors	MAPK signaling pathway - yeast	Non-homologous end-joining	Cyanoamino acid metabolism	Cell cycle - yeast	Amino sugar and nucleotide sugar metabolism	Endocytosis
Glutathione metabolism	Cell cycle - yeast	Cell cycle - yeast	Mismatch repair pool by folate	One carbon metabolism	Endocytosis	Fatty acid biosynthesis	Aminoacyl-tRNA biosynthesis	Protein processing in endoplasmic reticulum