

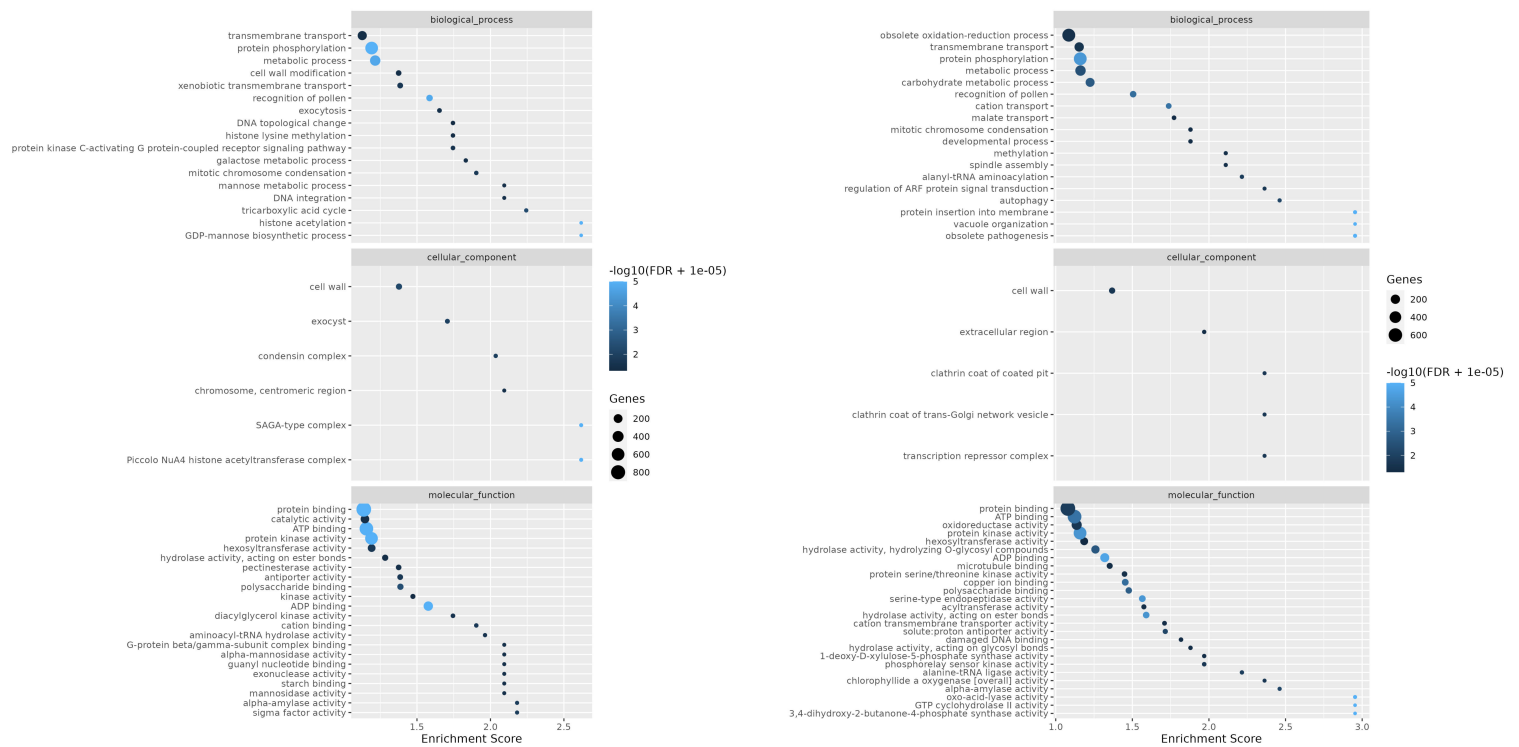


Figure S1

Gene Ontology Enrichment Analysis (GOEA) in Aglianico (left) and Falanghina (right) for genes harboring missense mutations and genes including polymorphisms altering CDS length. Enriched terms related to biological processes, cellular components and molecular functions are reported.

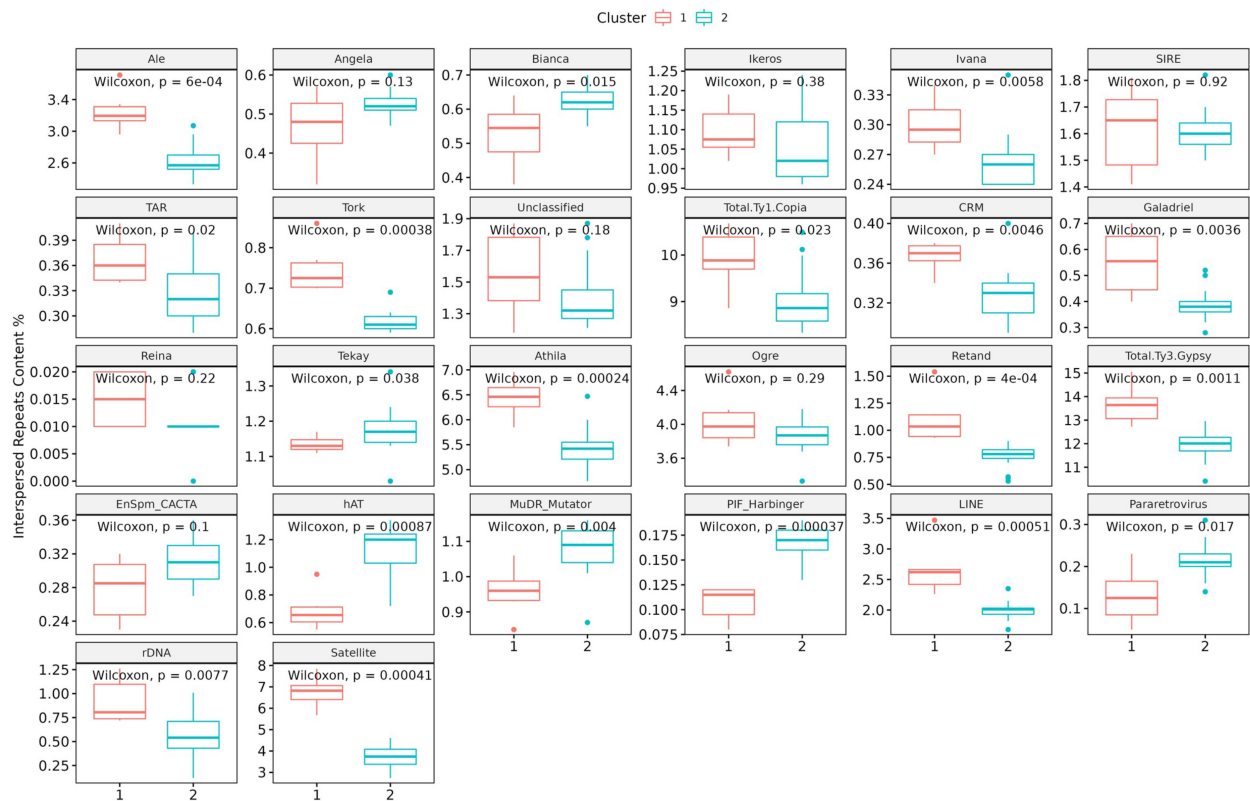


Figure S2

Boxplots showing the interspersed repeats content distribution in two clusters of grape cultivars. Wilcoxon test results are shown for each repeat class

(a)

VvSat1	30	CTCACACTGATTTCGACCCCTTTTCGGTACTCGTCCGGACAGTTTTTCGAT	79
VvSat21	1	CTCACACTTATTCAACCCCTTTTCAGATAGTCGCTAGGACAGTTTTTCGAT	50
VvSat1	80	ACTCGCACGGATTCTACCTTTTCCCGGTACTCGCCCGGATTCTACCATTT	129
VvSat21	51	ACTCGCACGGATTCTGACTTTTTCGATACTTGCTCGGATTATATCATTT	100
VvSat1	130	TTCGGTACTCACACTGATTTCGACCCCTTTTCGGTACTCGTCCGGACAGTT	179
VvSat21	101	TTCGGTACTCACACTTATTTCGACTCTTTTCTGGTACTCGCTCGCACAGTT	150
VvSat1	180	TTTCGATACTCGCACGGATTCTACCTTTTCCCGGTACTCGCCCGGATTCT	229
VvSat21	151	TTTCGATACTCACACGGATTCT-----	172
VvSat1	230	ACCATTTTTCGGTACTCACACTGATTCGACCCCTTTTCGGTACTCGTCCG	279
VvSat21	173	AACATTTTTCAGTAATCACACTTATAAGACGTTTATACAGAAGACGCCG	222
VvSat1	280	GACAGTTTTTCGATACTCGCACGGATTCTACCTTTTCCCGGTACTCGCCC	329
VvSat21	223	GACTATTTTTCGATAATAACACGTATTCTGCCATTTCTCGGTACTCCCC	272
VvSat1	330	GGATTCTACCATTTTTCGGTA	350
VvSat21	273	GAATTCTATCATTTTTCATA	293

(b)

VvSat1	25	CGGTACTCACACTGATTTCGACCCCTTTTCGGTACTCGTCCGGACAGTTTT	74
VvSat141R	2	CGGTACTCACAAGATTCTACC-TTTTCGGTACTCGCCCGGACAGTTTT	50
VvSat1	75	TCGATACTCGCACGGATTCTACCTTTTCCCGGTACTCGCCCGGATTCTAC	124
VvSat141R	51	TCGGTACTCTCACGGATTCTACATATTCCCGGCACTCGCACGGATTCTAC	100
VvSat1	125	CATTTT	130
VvSat141R	101	CGTTTT	106

(c)

VvSat1	60	CGTCCGGACAGTTTTTCGATACTCGCACGGATTCTACCTTTTCCCGGTAC	109
VvSat159	1	CGTCCGGACACTTTTTTCGGTACTCGGACGGATTCTAGCTTTTCCCGATAC	50
VvSat1	110	TCGCCCGGATTCTACCATTTTTCGGTACTCACACTGATTTCGACCCCTTTT	159
VvSat159	51	TGAACCGGATTGTACCATTTTTCGGTACTCACACTGATTGTACCCCTCTC	100
VvSat1	160	CGGTACT	166
VvSat159	101	CGATACT	107

Figure S3

Pairwise sequence alignment between consensus monomers of VvSat1 and (a) VvSat21, (b) the reverse complement of VvSat141 (VvSat141R), (c) VvSat159. Identities are shaded in light blue.

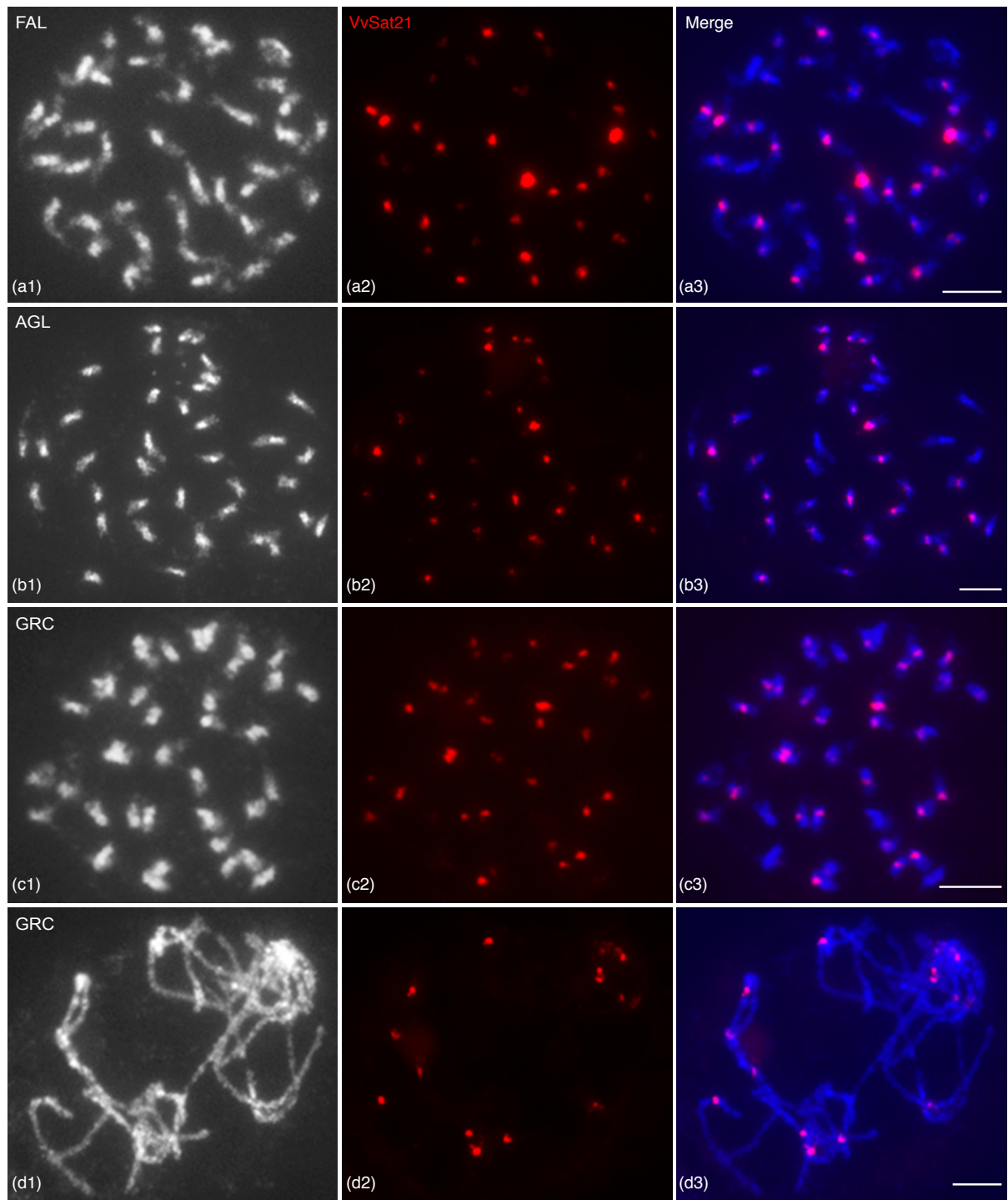


Figure S4

FISH localization of VvSat1-related repeats (VvSat21) on the grape chromosomes. First column: Somatic metaphase chromosomes of Falanghina (FAL, a1), Aglianico (AGL, b1), and Greco Bianco (GRC, c1), and meiotic pachytene chromosomes of Greco Bianco (GRC, d1). Middle column: FISH signals derived from VvSat21. Third column: Merged images of the chromosome spreads (first column) and their related FISH signals (middle column). Scale bars = 5 μ m.

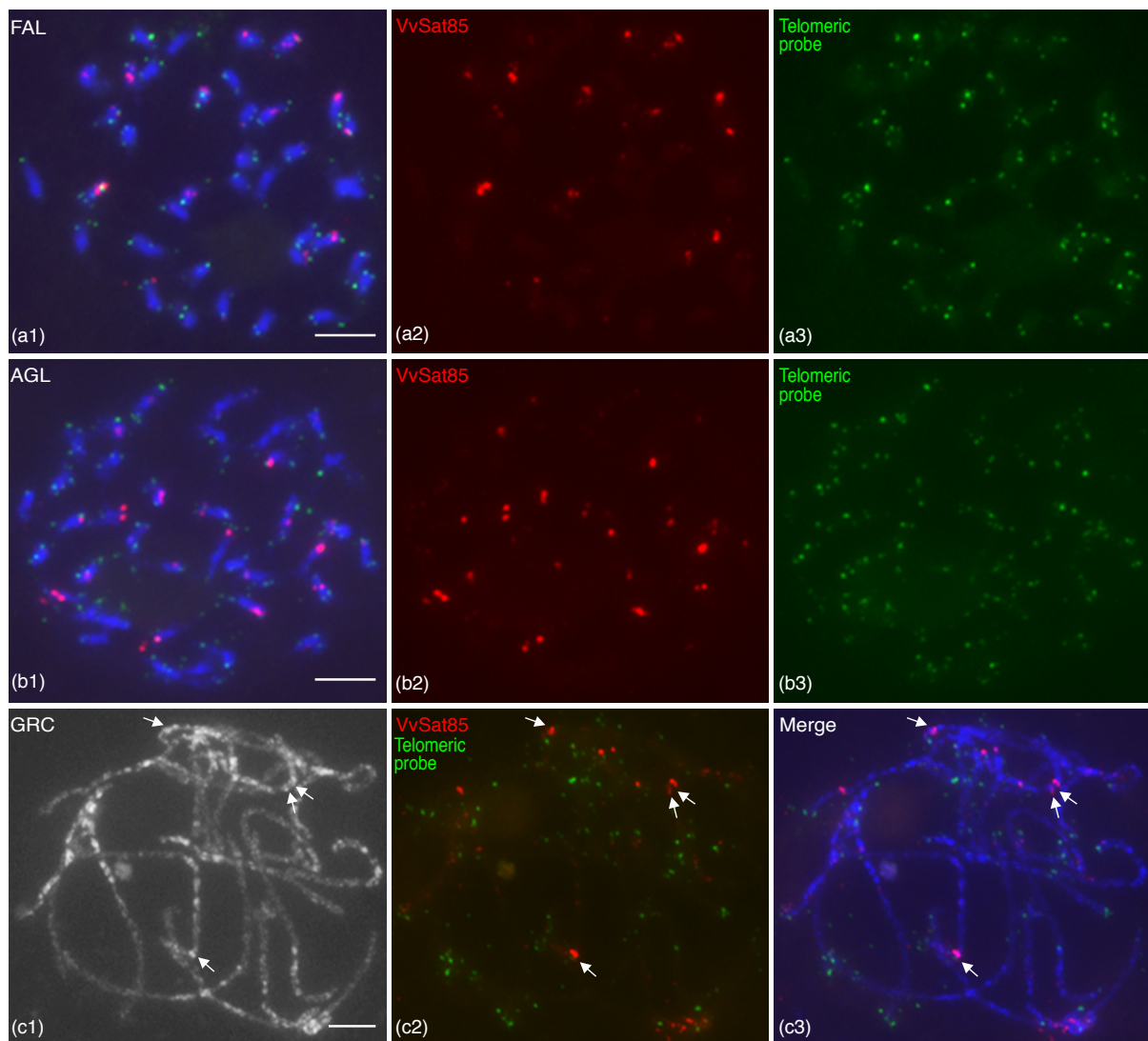


Figure S5

FISH mapping of VvSat85 (red) and a telomeric repeat (TTTAGGG)₄ probe (green) on the mitotic chromosomes of Falanghina (FAL, a1-a3) and Aglianico (AGL, b1-b3), and on the pachytene chromosomes of Greco Bianco (GRC, c1-c3). (c1) Greco Bianco pachytene chromosomes are shown as a black-and-white image to enhance the visualization of heterochromatin. Arrows in c1 point to the heterochromatic domains that are overlapped by VvSat85 signals. Scale bars = 5 μ m.

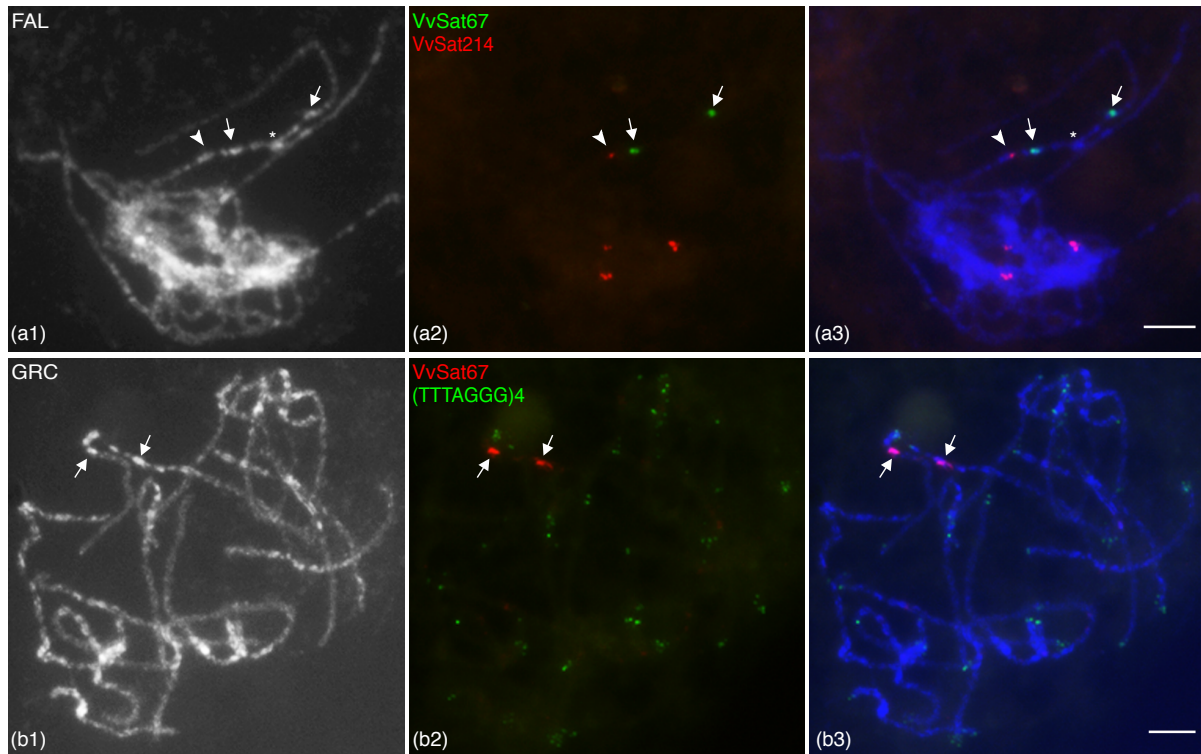


Figure S6

FISH localization of VvSat67 repeats in the pericentric heterochromatin of two chromosome pairs of grapevine. (a1) Pachytene chromosomes of Falanghina (FAL) shown as a black and white image to enhance the visualization of the heterochromatin; (a2) FISH signals derived from VvSat67 (green) and VvSat214 (red) repeats; (a3) merged image from (a1) and (a2). (b1) Pachytene chromosomes of Greco Bianco (GRC) grape; (b2) FISH signals derived from VvSat67 (red) and a telomeric repeat (TTTAGGG)₄ probe (green); (b3) Merged image of (b1) and (b2). Arrows point to the heterochromatic domains overlapped by VvSat67 signals; the arrowhead in (a1-3) indicates the VvSat214 site co-located on the same chromosome carrying a VvSat67 site (possibly grape chr. 15); the asterisk in (a1, a3) indicates the overlapping ends between the chromosomes carrying VvSat67 sites. Scale bars = 5 μm.

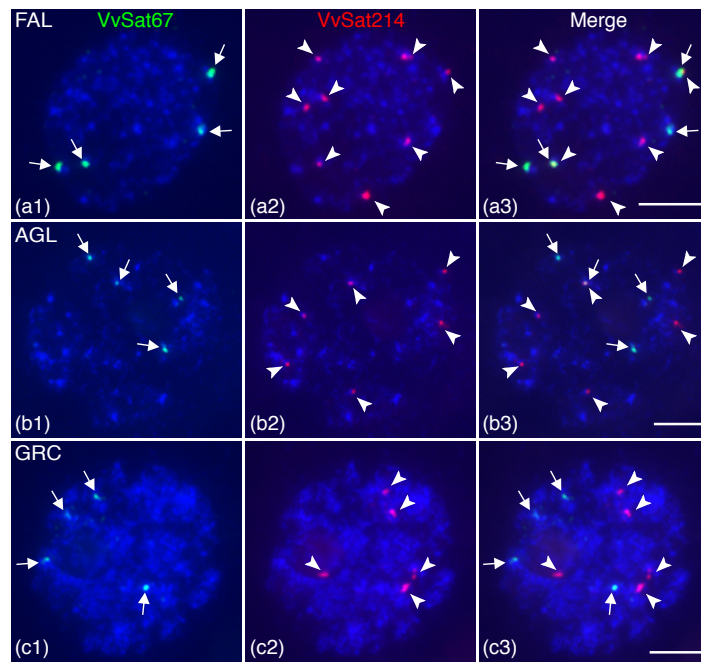


Figure S7

FISH using VvSat67 (green signals, arrows) and VvSat214 repeats (red, arrowheads) on the nuclei of the grapes Falanghina (FAL, a1-3), Aglianico (AGL, b1-3) and Greco Bianco (GRC, c1-3). Scale bars = 5 μ m.

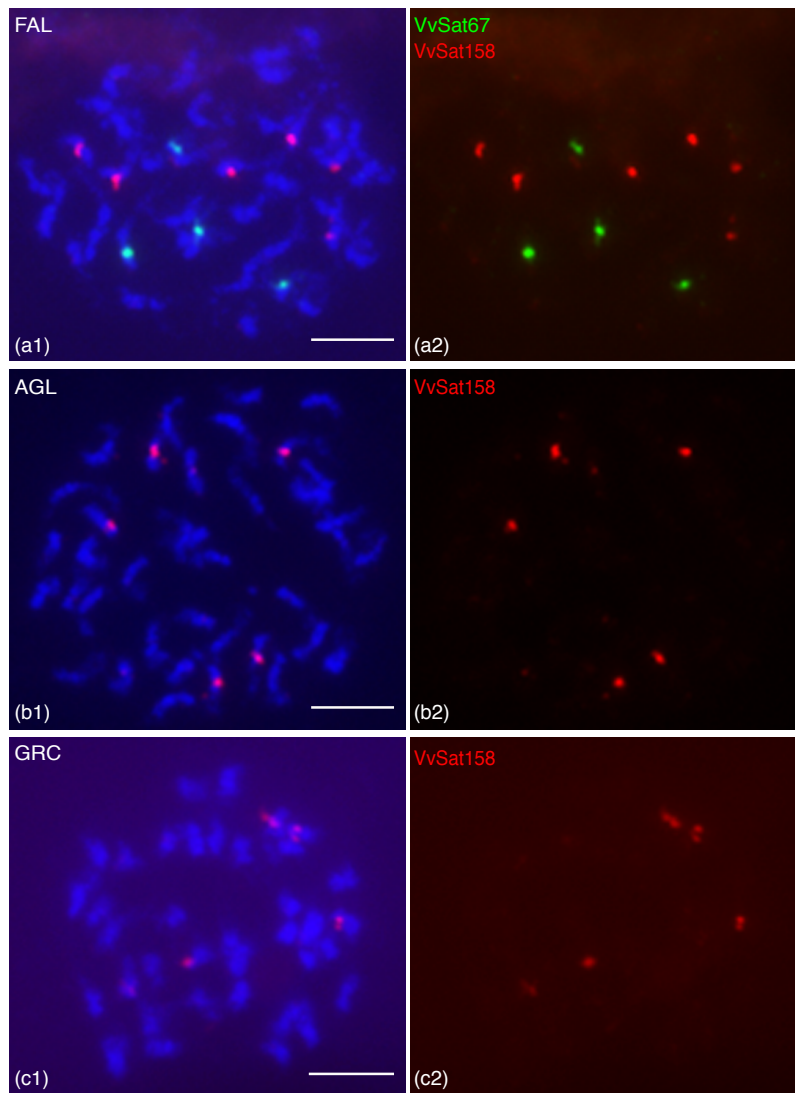


Figure S8

Localization of VvSat158 repeats (red signals) on the mitotic chromosomes of the grapes Falanghina (FAL, a1), Aglianico (AGL, b1) and Greco Bianco (GRC, c1) by FISH. (a1-a2) FISH signals generated by VvSat158 (red) and VvSat67 (green) repeats in FAL. None of the VvSat158 signals co-localized with VvSat67. (b2-c2) FISH signals generated by VvSat158 (red) in AGL (b2) and GRC (c2). Scale bars = 5 μ m.