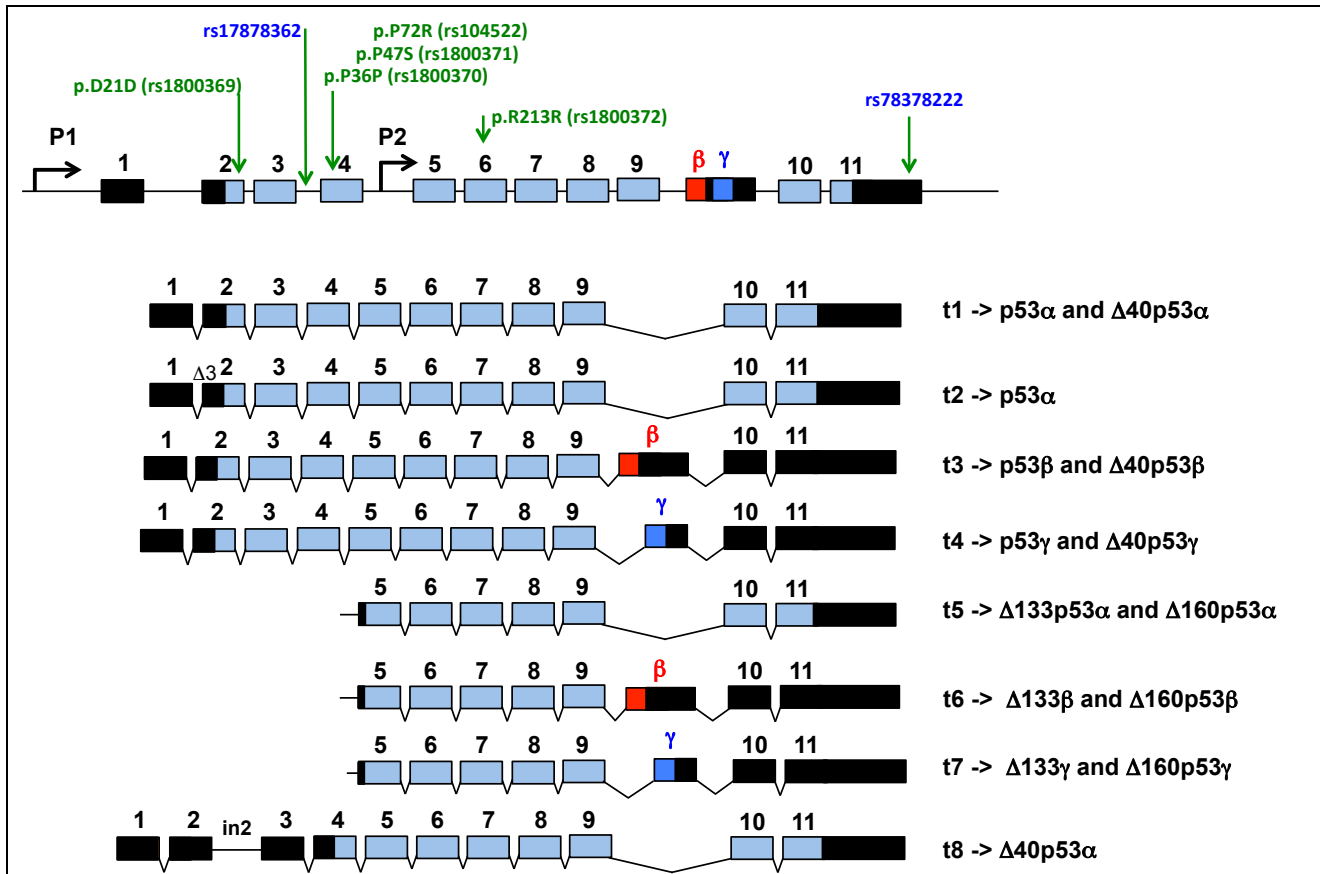


## THE TP53 GENE AT A GLANCE



***TP53* gene and p53 mRNAs.** The *TP53* gene (upper part of the figure) is transcribed into eight different mRNAs. Transcripts t1 to t4 originate from promoter P1 localized upstream from the gene. Transcripts t5 to t8 originate from promoter P2 localized in intron 4. Translated exons are shown in blue. The two translated novel exons β and γ are shown in red and blue, respectively. Untranslated regions are shown in black. For transcripts t3, t4, t6, and t7, which include exons β or γ, exons 10 and 11 are noncoding. Transcript t8 encodes only p8 (DeltaTP53α) and exons 1 to 3 are noncoding (black boxes). Proteins translated from the various transcripts are described on the right. Frequent *TP53* germline SNP are shown on the *TP53* gene with both coding (green) and non-coding (blue) snp.

This figure includes only the eight major *TP53* transcripts as reported in LRG\_321. Other transcripts have been identified, but it is currently unknown whether they are expressed in normal cells or in all cell types.

([http://www.ensembl.org/Homo\\_sapiens/Gene/Summary?db=core;g=ENSG00000141510;r=17:7661779-7687550](http://www.ensembl.org/Homo_sapiens/Gene/Summary?db=core;g=ENSG00000141510;r=17:7661779-7687550))

## THE TP53 PROTEINS AT A GLANCE

	TAD2 TAD1 Pro	DNA Binding domain	NLS Oli / C-Ter	Residues	LRG	
p53 $\alpha$	I	II III IV V		393	p1	t1 to t4 +t8
p53 $\beta$	I	II III IV V	DQTSFQKENC	341	p3	
p53 $\gamma$	I	II III IV V	MLLDLRWCYFLINSS	346	p4	
$\Delta 40$ p53 $\alpha$		II III IV V		354	p8	
$\Delta 40$ p53 $\beta$		II III IV V	DQTSFQKENC	302	p9	t5 to t7
$\Delta 40$ p53 $\gamma$		II III IV V	MLLDLRWCYFLINSS	307	p10	
$\Delta 133$ p53 $\alpha$		IIa III IV V		261	p5	
$\Delta 133$ p53 $\beta$		IIa III IV V	DQTSFQKENC	209	p6	
$\Delta 133$ p53 $\gamma$		IIa III IV V	MLLDLRWCYFLINSS	217	p7	t5 to t7
$\Delta 160$ p53 $\alpha$		IV V		234	p11	
$\Delta 160$ p53 $\beta$		IV V	DQTSFQKENC	182	p12	
$\Delta 160$ p53 $\gamma$		IV V	MLLDLRWCYFLINSS	187	p13	

**Domains in the various TP53 isoforms.** TAD1: transactivation domain 1; TAD2: transactivation domain 2; Pro: proline- rich domain; NES: nuclear exclusion signal; NLS: nuclear localization signal; Oli: oligomerization do- main; C-ter: carboxy-terminus domain.

The LRG nomenclature used for TP53 protein (p1 to p13) and RNA (t1 to t8) is also shown on the right.

At least, 12 TP53 isoforms are expressed but the full-length protein (TP53 p1 or TP53 $\alpha$ ) is always the major species detected in every tissue.

The p1 protein contains from N-term to C-term, two transactivation domains (TAD1, 1-40 and TAD2, 41-61), a proline rich domain (63-97), a specific DNA binding domain (102-292), 3 nuclear localization signals (305-322), a tetramerization domain that includes a nuclear export signal (325-355) and a negative regulatory domain (360-393).

Shorter C-terminal TP53 isoforms do not contain either the tetramerization domain or the negative regulatory domain.

Shorter N-terminal TP53 isoforms do not contain TAD1 ( $\Delta 40$  TP53 isoforms), TAD1, TAD2 and the proline rich domain ( $\Delta 133$ ) or TAD1, TAD2, the proline rich domain and part of the DNA binding domain ( $\Delta 160$ )

TP53 is modified by numerous post-translational modifications phosphorylation, acetylation, ubiquitination, sumoylation, neddylation, methylation, ADP ribosylation, and glycosylation. Acetylation of multiple residues is essential for TP53 activation and DNA transcriptional activity.