

Names for GE (ISBT 020) Blood Group Alleles

General description: The Gerbich blood group system consists of 11 antigens carried on a single pass type I membrane glycoprotein with called glycophorin C (GPC) and/or glycophorin D (GPD). GPC consists of 128 amino acids and GPD, the shorter isoform, has 107 amino acids. The glycoproteins are encoded by *GYP*C, or *GE* if analysis is to predict a blood group antigen.

Gene name: *GYP*C
 Number of exons: 4
 Initiation codon: Within exon 1 for GPC and within exon 2 for GPD
 Stop codon: Within exon 4
 Entrez Gene ID: 2995
 LRG sequence: NG_007479.1 (genomic)
 NM_002101.4 (transcript)
 Reference allele: *GE*01* (shaded)
 Acceptable: *Ge* if inferred by haemagglutination

Reference allele <i>GE*01</i> encodes GE2, GE3, GE4, GELP, GEAT, GETI				
Phenotype	Allele name	Nucleotide change †	Exon	Predicted amino acid change
GE:2,3,4	<i>GE*01</i>			
Ge:–2,3,4 or Yus type	<i>GE*01.–02</i>	del Exon 2	2	in frame deletion [7]
GE:–2,–3,4 or Gerbich type	<i>GE*01.–03</i>	del Exon 3	3	in frame deletion [7]
GE:5 or Wb+	<i>GE*01.05</i>	c.23A>G	1	p.Asn8Ser in GPC [2]
GE:6 or Ls(a+)	<i>GE*01.06.01</i>	Duplicated Exon 3	3	in frame duplication [3]
GE:6 or Ls(a+)	<i>GE*01.06.02</i>	Triplicated Exon 3	3	in frame triplication
GE:7 or An(a+)	<i>GE*01.07</i>	c.67G>T	2	p.Ala23Ser in GPC [4] p.Ala2Ser in GPD ‡
GE:8 or Dh(a+)	<i>GE*01.08</i>	c.40C>T	1	p.Leu14Phe in GPC [5]
GE:9 or GEIS+	<i>GE*01.09</i>	c.95C>A	2	p.Thr32Asn in GPC [6] p.Thr11Asn in GPD
GE:–10 or GEPL–	<i>GE*01.–10</i>	c.134C>T	3	p.Pro45Leu in GPC [1] p.Pro24Leu in GPD
GE :–11 or GEAT–	<i>GE*01.–11</i>	c.56A>T	2	p.Asp19Val in GPC [1]

GE:-12 or GETI-	<i>GE*01.-12</i>	c.80C>T	2	p.Thr27Ile in GPC [1] p.Thr6Ile in GPD
Null phenotypes				
Ge:-2,-3,-4 Leach type (PL)	<i>GE*01N.01</i>	del Exons 3 & 4	3, 4	
Ge:-2,-3,-4 Leach type (LN)	<i>GE*01N.02</i>	c.131G>T; c.134delC	3	p.Trp44Leu; [9] p.Pro45Argfs*12 [8]

† Nucleotide changes are based on the *GYP C* transcript

‡ An^a is only expressed by GPD

1. Poole J et al. *Vox Sang.* 2008;95(Suppl. 1):181
2. Telen et al. *Am J Hematol.* 1999;37:51
3. Reid M et al. *Transfusion* 1994;34:966
4. Daniels G et al. *Blood.* 1993;82:3198
5. King et al. *Vox Sang.* 1992;62:56
6. Yabe R et al. *Vox Sang.* 2004;87(Suppl. 3)
7. Chang S et al. *Blood.* 1991;77:644
8. Telen et al. *Blood* 1991;78:1603
9. High S et al. *Biochem J* 1989;262:47