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 *GYPC*, or *GE* if analysis is to predict a blood group antigen.

Gene name: *GYPC*

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

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

† Nucleotide changes are based on the *GYPC* transcript
‡ An^{a} is only expressed by GPD

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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