

Names for JK (ISBT 009) Blood Group Alleles

General Description: The Kidd blood group system consists of 3 antigens carried on a multipass type 3 membrane glycoprotein that functions as the primary urea transporter on RBCs. It consists of 389 amino acids and has 10 membrane-spanning domains.

Gene name: *SLC14A1*

Number of exons: 10

Initiation codon: Exon 3 at c.179

Stop codon: Exon 10 at c.1348

Entrez Gene ID: 6563

LRG: LRG 802

LRG sequence NG_011775.4 (genomic)

NM_015865.7 (transcript)

Reference allele: *JK*01* (shaded)

Acceptable: *JK*A* or *Jk^a* if inferred by hemagglutination

Reference allele JK1, JK3

*JK*01* encodes:

Antithetical antigens: [JK1 JK2]

Phenotype	Allele name	Nucleotide change	Exon Intron	Predicted amino acid change	(Reference No.) PMID	Accession number	rs number
JK:1 or Jk(a+)	<i>JK*01</i> or <i>JK*A</i>	c.838G			(1), PMID: 8647271	NG_011775.4	
JK:2 or Jk(b+)	<i>JK*02</i> or <i>JK*B</i>	c.838G>A	8	p.Asp280Asn	(1), PMID:8647271	n.a.	rs1058396
Weak <i>JK*01</i> phenotypes							
Jk(a ^w)	<i>JK*01W.01</i>	c.130G>A	3	p.Glu44Lys	(2), PMID: 21309779	MG601100	rs2298720
Jk(a ^w)	<i>JK*01W.02</i>	c.511T>C	6	p.Trp171Arg	(3), Abstract	n.a.	rs9948825
Jk(a ^w)	<i>JK*01W.03</i>	c.28G>A	3	p.Val10Met	(4), Abstract	n.a.	rs113578396
Jk(a ^w)	<i>JK*01W.04</i>	c.226G>A	4	p.Val76Ile	(4), Abstract	n.a.	rs113029149
Jk(a ^w)	<i>JK*01W.05</i>	c.742G>A	7	p.Ala248Thr	(5), Abstract (6), Abstract	JN410949	rs763095261
Jk(a ^w)	<i>JK*01W.06</i>	c.588A>G	6	p.Pro196Pro	(2), PMID: 21309779	n.a.	rs2298718
Jk(a ^w)	<i>JK*01W.07</i>	c.486T>A	6	p.Ser162Arg	(8), Abstract	n.a.	rs753809770
Jk(a ^w)	<i>JK*01W.08</i>	c.814C>T	8	p.Leu272Phe	(9), Abstract	n.a.	rs757895930
Jk(a ^w)	<i>JK*01W.09</i>	c.134T>C	3	p.Leu45Pro	(10), Abstract	n.a.	rs537028614
Jk(a ^w)	<i>JK*01W.10</i>	c.350T>C	5	p.Ile117Thr	(10), Abstract	n.a.	rs374022751
Jk(a ^w)	<i>JK*01W.11</i>	c.28G>A c.226G>A	3 4	p.Val10Met p.Val76Ile	(11), PMID: 27834480	n.a.	rs113578396 rs113029149
Weak <i>JK*02</i> phenotypes							
Jk(b ^w)	<i>JK*02W.01</i>	c.548C>T	6	p.Ala183Val	(3), Abstract	n.a.	rs367901541
Jk(b ^w)	<i>JK*02W.02</i>	c.718T>A	7	p.Trp240Arg	(12), Abstract	n.a.	rs760579000
Jk(b ^w)	<i>JK*02W.03</i>	c.588A>G	6	p.Pro196Pro	(13), PMID: 23225053	n.a.	rs2298718
Jk(b ^w)	<i>JK*02W.04</i>	c.130G>A	3	p.Glu44Lys	(14), Abstract	n.a.	rs2298720
Jk(b ^w)	<i>JK*02W.05</i>	c.277G>A	4	p.Ala93Thr	(15), Abstract	MF588960	n.a.

Phenotype	Allele name	Nucleotide change	Exon Intron	Predicted amino acid change	(Reference No.) PMID	Accession number	rs number
Jk(b ^w)	<i>JK*02W.06</i>	c.998T>A c.1095T>C	10	p.VAl333Asp p.Ser365Ser	(16), Abstract	LK391765	rs774982134 rs28898897
Null phenotypes, <i>JK*01</i> alleles							
JK:–3 or Jk(a–b–)	<i>JK*01N.01</i>	c.1_341del	3 - 4	p.0	(17), PMID:11807016	AF328892	n.a.
JK:–3 or Jk(a–b–)	<i>JK*01N.02</i>	c.202C>T	4	p.Gln68Ter	(18), PMID:18028269	EF571316	rs142529927
JK:–3 or Jk(a–b–)	<i>JK*01N.03</i>	c.582C>G	6	p.Tyr194Ter	(19), PMID:11841450	AF328890	rs34756616
JK:–3 or Jk(a–b–)	<i>JK*01N.04</i>	c.956C>T	9	p.Thr319Met	(18), PMID:18028269	EF571318	rs565898944
JK:–3 or Jk(a–b–)	<i>JK*01N.05</i>	c.561C>A	6	p.Tyr187Ter	(20), PMID:22023394	JN104323	rs778172038
JK:–3 or Jk(a–b–)	<i>JK*01N.06</i>	c.342-1G>A	i4	p.Arg114Ter	(21), PMID:10924622	n.a.	rs78937798
JK:–3 or Jk(a–b–)	<i>JK*01N.07</i>	c.723delA	7	p.Gly243Alafs*20	(22), Abstract	n.a.	rs759505281
JK:–3 or Jk(a–b–)	<i>JK*01N.08</i>	c.866A>G	8	p.Asn289Ser	(23), Abstract	n.a.	n.a.
JK:–3 or Jk(a–b–)	<i>JK*01N.09</i>	c.27_50del	3	p.Val10_Arg17del	(24), Abstract	n.a.	n.a.
JK:–3 or Jk(a–b–)	<i>JK*01N.10</i>	c.811+5G>A	i7	p.Leu272Glufs*29	(25), PMID:22738189	HQ709264	rs1414947682
JK:–3 or Jk(a–b–)	<i>JK*01N.11</i>	c.130G>A c.1068insA	3 10	p.Glu44Lys p.Asp356Lysfs*11	(24), Abstract	n.a.	rs2298720 n.a.
JK:–3 or Jk(a–b–)	<i>JK*01N.12</i>	c.516_530del	6	pVal175_Pro179	(16), Abstract	n.a.	rs772726215
JK:–3 or Jk(a–b–)	<i>JK*01N.13</i>	c.327delG	4	p.Leu109Phefs*8	(26), PMID:24877238	AB845711	n.a.
JK:–3 or Jk(a–b–)	<i>JK*01N.14</i>	c.432G>A	5	p.Gly298Glu	(26), PMID:24877238	AB845712	n.a.
JK:–3 or Jk(a–b–)	<i>JK*01N.15</i>	c.757_759delTCC	7	p.Ser253del	(26), PMID:24877238	AB845716	n.a.
JK:–3 or Jk(a–b–)	<i>JK*01N.16</i>	c.893G>A	8	p.Gly298Glu	(26), PMID:24877238	AB845717	n.a.
JK:–3 or Jk(a–b–)	<i>JK*01N.17</i>	c.118G>A c.499A>G	3 6	p.Gly40Ser p.Met167Val	(27), Abstract	n.a.	rs145283450 rs2298719
JK:–3 or Jk(a–b–)	<i>JK*01N.18</i>	c.190C>T	4	p.Arg64Trp	(22), Abstract	n.a.	rs552191196
JK:–3 or Jk(a–b–)	<i>JK*01N.19</i>	c.810G>A	7	p.Ala270Ala	(28), Abstract	n.a.	rs17675299

Phenotype	Allele name	Nucleotide change	Exon Intron	Predicted amino acid change	(Reference No.) PMID	Accession number	rs number
JK:–3 or Jk(a–b–)	<i>JK*01N.20</i>	c.28G>A c.226G>A c.303G>A c.588A>G	3 4 4 6	p.Val10Met p.Val76Ile p.Val101Val p.Pro196Pro	(29), Abstract	n.a.	rs113578396 rs113029149 rs28994287 rs2298718
JK:–3 or Jk(a–b–)	<i>JK*01N.21</i>	c.130G>A c.220A>G	3 4	p.Glu44Lys p.Asn74Asp	(30), Abstract	n.a.	rs2298720 n.a.
Null phenotypes, <i>JK*02</i> alleles							
JK:–3 or Jk(a–b–)	<i>JK*02N.01</i>	c.342-1G>A	i4	p.Arg114Ter	(31), PMID: 9582331 (32), PMID: 10644814	n.a.	rs78937798
JK:–3 or Jk(a–b–)	<i>JK*02N.02</i>	c.342-1G>C	i4	p.Arg114Ter	(33), PMID: 16483143	n.a.	rs78937798
JK:–3 or Jk(a–b–)	<i>JK*02N.03</i>	c.222C>A	4	p.Asn74Lys	(7), PMID: 18980618 (13), PMID: 23225053	HQ834248	rs749037771
JK:–3 or Jk(a–b–)	<i>JK*02N.04</i>	c.663+1G>T	i6	p.Leu222Valfs*46	unknown	n.a.	rs77744921
JK:–3 or Jk(a–b–)	<i>JK*02N.05</i>	c.723delA	7	p.Gly243Alafs*20	(18), PMID: 18028269	EF571317	rs759505281
JK:–3 or Jk(a–b–)	<i>JK*02N.06</i>	c.871T>C	8	p.Ser291Pro	(34), PMID: 10942407	n.a.	rs78242949
JK:–3 or Jk(a–b–)	<i>JK*02N.07</i>	c.896G>A	8	p.Gly299Glu	(7), PMID: 18980618 (13), PMID: 23225053	HQ729920	rs538368217
JK:–3 or Jk(a–b–)	<i>JK*02N.08</i>	c.956C>T	9	p.Thr319Met	(18), PMID: 18028269	EF571318	rs565898944
JK:–3 or Jk(a–b–)	<i>JK*02N.09</i>	c.191G>A	4	p.Arg64Gln	(35), PMID: 24689685	JN104324	rs114362217
JK:–3 or Jk(a–b–)	<i>JK*02N.10</i>	c.194G>A	4	p.Gly65Asp	(36), PMID: 23710545		rs778150490
JK:–3 or Jk(a–b–)	<i>JK*02N.11</i>	c.499A>G c.512G>A	6 6	p.Met167Val p.Trp171*	(25), PMID: 22738189	HQ729921	rs2298719 n.a.
JK:–3 or Jk(a–b–)	<i>JK*02N.12</i>	c.437T>C c.499A>G	5 6	p.Leu146Pro p.Met167Val	(25), PMID: 22738189	HQ834246	n.a. rs2298719
JK:–3 or Jk(a–b–)	<i>JK*02N.13</i>	c.499A>G c.536C>G	6 6	p.Met167Val p.Pro179Arg	(25), PMID: 22738189	HQ834247	rs2298719 rs201612170
JK:–3 or Jk(a–b–)	<i>JK*02N.14</i>	c.1038delG	10	p.Leu347Tyrf*6	(37), PMID: 27834480	n.a.	rs746265611

Phenotype	Allele name	Nucleotide change	Exon Intron	Predicted amino acid change	(Reference No.) PMID	Accession number	rs number
JK:–3 or Jk(a–b–)	<i>JK*02N.15</i>	c.160insC	4	p.Val54Argfs*7	(24), Abstract	n.a.	rs377124382
JK:–3 or Jk(a–b–)	<i>JK*02N.16</i>	c.856delT	8	p.Trp286Glyfs*67	(15), Abstract	n.a.	rs1444093504
JK:–3 or Jk(a–b–)	<i>JK*02N.17</i>	c.810G>A	7	p.Ala270Ala	(16), Abstract	n.a.	rs17675299
JK:–3 or Jk(a–b–)	<i>JK*02N.18</i>	c.561C>A	6	p.Tyr187Ter	(26), PMID: 24877238	AB845713	rs778172038
JK:–3 or Jk(a–b–)	<i>JK*02N.19</i>	c.719G>A	7	p.Trp240Ter	(26), PMID: 24877238	AB845715	n.a.
JK:–3 or Jk(a–b–)	<i>JK*02N.20</i>	c.647_648delAC	6	p.Asp216Alafs*21	(26), PMID: 24877238	AB845714	rs1223735153
JK:–3 or Jk(a–b–)	<i>JK*02N.21</i>	c.118G>A	3	p.Gly40Ser	(11), PMID: 27834480	n.a.	n.a.
JK:–3 or Jk(a–b–)	<i>JK*02N.22</i>	c.157_166del	4	p.Pro53Serfs77	(38), PMID: 33539287	n.a.	n.a.

References

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Track of changes			from version	to version
1	Version		v5.1 190123	v6.0 25-FEB-2020
2	Author	created:	Greg Denomme, v5.1 190123	Greg Denomme February 15, 2020
3	Reviewer	reviewed:	n.a.	Peter Ligthart, February 2020
4	General		Last word version published on ISBT website	First Excel map version. Spread-sheets "Intro", "Allele Table", "References", and "Versioning" created.
5	Intro	Text changed	The Kidd blood group system consists of 3 antigens carried on a multipass type 3 membrane glycoprotein that functions as the primary urea transporter on RBCs. It consists of 389 amino acids and has 10 membrane-	The Kidd blood group system consists of 3 antigens carried on a multipass type 3 membrane glycoprotein that functions as the primary urea transporter on RBCs. It consists of 389 amino acids and has 10 membrane-spanning domains.
6	Intro	LRG ID line added:	n.a.	LRG_802
7	Intro	Reference allele line moved from Allele Table to Intro:	n.a.	Reference allele JK*01 encodes JK1, JK3
8	Intro	Antithetical Antigens line created in Intro:	n.a.	Antithetical antigens: [JK1, JK2]
9	Allele Table			Table columns "(Reference No.) PMID", "Accession number" and "rs-number" added, content added.
10	Allele Table	Text change: Line moved to Intro:	n.a.	see above
11	Allele Table	Text change:	JK*01 made the reference allele to coincide with LRG; exons changed to match LRG	Added to Table: <i>JK*01W.06 - JK*01W.11; JK*02W.03 - JK*02W.06; JK*01N.11 - JK*01N.21; JK*02N.15 - JK*02N.20</i>

1	Version		v5.1 190123	v6.0 25-FEB-2020
12	Reference	Renumbered References:	Original numbering: 1. Whorley T et al. Transfusion 2009;49(Suppl):48A. 2. Deal, T et al. Transfusion 011;51(Suppl):24- 25A 3. St-Louis, M et al Transfusion 2012 :52(Suppl) :160-161A . 4. Crews, WS et al. Transfusion 2013;53(Suppl):164A 5. Moulds JM. Personal communication 2012- 08-22	New numbering: 3. Whorley T et al. Transfusion 2009;49(Suppl):48A. 4. Deal, T et al. Transfusion 011;51(Suppl):24-25A 12. St-Louis, M et al Transfusion 2012 :52(Suppl) :160-161A . 22. Crews, WS et al. Transfusion 2013;53(Suppl):164A 23. Moulds JM. Personal communication 2012-08-22
13	Allele Table	Antigen/allele added:	n.a. n.a.	JK1 weak phenotypes: <i>JK*01W.06</i> to <i>JK*01W.11</i> References: 7 - 11
14	Allele Table	Antigen/allele added:	n.a. n.a.	JK2 weak phenotypes: <i>JK*02W.03</i> to <i>JK*02W.06</i> References: 2, 13 - 16
15	Allele Table	Antigen/allele added:	n.a. n.a.	JK1 null phenotypes: <i>JK*01N.11</i> to <i>JK*01N.21</i> References: 16, 22, 24, 26 - 30
16	Allele Table	Antigen/allele added:	n.a. n.a.	JK2 null phenotypes: <i>JK*02N.15</i> to <i>JK*02N.20</i> References: 11, 15, 16, 24, 26
17		New References:	n.a.	New references added see above
18	End Version		v5.1 190123	v6.0 25-FEB-2020

	Track of changes	from version	to version
1	Version	v6.0 25-FEB-2020	v7.0 30-JUN-2021
2	Author	created: Greg Denomme, v5.1 190123	Greg Denomme February 15, 2020
3	Reviewer	reviewed: n.a.	Nuria Nogues, June 2021
4			LU*A changed to JK*A on the front page Jk(a+w) changed to Jk(a+ ^w) Jk(b+w) changed to Jk(b+ ^w) Reference for JK*01W.6 corrected to reference 2 Reference 13 removed from JK*02W.03 Reference for JK*01N.03 corrected; Duplicate JK*02N.20 renumbered; Second allele from reference 11 added
5	End Version	v6.0 25-FEB-2020	v7.0 30-JUN-2021