

**RH (ISBT 004) Blood Group Alleles: RHCE**

The Rh blood group system consists of 55 antigens, many of which are encoded at the *RHCE* locus and also include a number encoded by hybrid *RHCE* with *RHD*. Commonly encountered antigens include C, E, c, e, f, Ce, Cw, Cx, V, VS, cE, and CE. The less common include hrs, hrB, Ew, Hr0, Hr, CG, Rh26 c-like, hrH, Rh32, Rh33, Rh35, Bea, Rh39, Rh41, Rh42, Crawford, Nou, Riv, Sec, Dav, JAL, STEM, MAR, JAHK, LOCR, CENR, CEST, CELO, CEAG, PARG, and CEVF. Antigens encoded from either *RHCE* or *RHD* loci include G, FPTT, BARC, DAK, Rh29, and HrB. The protein consists of 12 membrane-spanning domains and 417 amino acids.

Gene name: *RHCE*  
 Number of exons: 10  
 Initiation codon: within exon 1  
 Stop codon: within exon 10

Entrez Gene ID: 6006  
 NCBI RefSeq: NG\_009208 (gene)  
 NM\_020485 (mRNA)  
 NP\_065231 (protein)

Preferred: *RHCE\*01* or *RHCE\*ce*  
*RHCE\*02* or *RHCE\*Ce*  
*RHCE\*03* or *RHCE\*cE*  
*RHCE\*04* or *RHCE\*CE*

<i>RHCE</i> Phenotype	Allele name *ce=01 *Ce=02 *cE=03 *CE=04	Nucleotide	Exon	Amino Acid	rs number	Allele detail	Reported as: Or Linked to:
<b>RH:4 or c</b> <b>RH:5 or e</b> <b>RH:6 or f (ce)</b>	<b><i>RHCE*01</i> or <i>RHCE*ce</i></b> <i>RHCE*c</i> <i>RHCE*e</i>	<b>Reference nucleotides</b> c.307C c.676G	2 5	p.Pro103 p.Ala226	rs676785 rs609320		
	<b><i>RHCE*01.01</i> <i>RHCE*ce.01</i></b>	c.48G>C	1	p.Trp16Cys	rs586178	<i>RHCE*ce48C</i>	
partial e partial c	<b><i>RHCE*01.02.01</i> <i>RHCE*ce.02.01</i></b>	c.48G>C; c.1025C>T	1, 7	p.Trp16Cys; p.Thr342Ile	rs586178 rs1053374	<i>RHCE*ce48C</i> , <i>1025T</i>	<b><i>RHCE*ceTI</i></b> often linked to <i>RHD*DIVa</i>
	<b><i>RHCE*01.02.02</i> <i>RHCE*ce.02.02</i></b>	c.48G>C; c.150C>T; c.178C>A; c.201A>G; c.203A>G; c.307C>T; c.1025C>T	1, 2, 7	p.Trp16Cys; silent; p.Leu60Ile; silent; p.Asn68Ser; p.Pro103Ser; p.Thr342Ile	rs586178 rs200955066 rs181860403 rs1053343 rs1053344 rs676785 rs1053374	<i>RHCE*ce48C</i> , <i>ex2 D</i> , <i>1025T</i>	<i>RHCE*ceTI</i> ( <i>Dex2</i> ) reported with <i>RHD*DIVa</i>
partial e	<b><i>RHCE*01.03</i> <i>RHCE*ce.03</i></b>	c.1025C>T	7	p.Thr342Ile	rs1053374	<i>RHCE*ce1025T</i>	reported with DIIIa

<b>RHCE</b> Phenotype	Allele name *ce=01 *Ce=02 *cE=03 *CE=04	Nucleotide	Exon	Amino Acid	rs number	Allele detail	Reported as: Or Linked to:
RH:10,-20 (V+*VS-) RH:-19 (hrS-) partial e partial c	<b>RHCE*01.04.01</b> <b>RHCE*ce.04.01</b>	c.48G>C; c.712A>G; c.733C>G; c.787A>G; c.800T>A; c.916A>G	1, 5, 6	p.Trp16Cys; p.Met238Val; p.Leu245Val; p.Arg263Gly; p.Met267Lys; p.Ile306Val	rs586178 rs144163296 rs1053361 rs1132763 rs1132764 rs1132765	<b>RHCE*ce48C</b> , 712G, 733G, 787G, 800A, 916G	<b>RHCE*ceAR</b> often linked to <b>RHD*DAR</b>
partial e	<b>RHCE*01.04.02</b> <b>RHCE*ce.04.02</b>	c.48G>C; c.697C>G; c.712A>G; c.733C>G; c.787A>G; c.800T>A; c.916A>G	1, 5, 6	p.Trp16Cys; p.Gln233Glu; p.Met238Val; p.Leu245Val; p.Arg263Gly; p.Met267Lys; p.Ile306Val	rs586178 rs142246017 rs144163296 rs1053361 rs1132763 rs1132764 rs1132765	<b>RHCE*ce48C</b> , 697G, 712G, 733G, 787G, 800A, 916G	<b>RHCE*ceAR+6</b> <b>97G</b>
	<b>RHCE*01.04.03</b> <b>RHCE*ce.04.03</b>	c.48G>C; c.455C>A; c.712A>G; c.733C>G; c.787A>G; c.800T>A; c.916A>G	1, 3, 5, 6	p.Trp16Cys; p.Thr152Asn; p.Met238Val; p.Leu245Val; p.Arg263Gly; p.Met267Lys; p.Ile306Val	rs586178 rs35109888 rs144163296 rs1053361 rs1132763 rs1132764 rs1132765	<b>RHCE*ce48C</b> 455A ,712G,733G, 787G, 800A, 916G	<b>RHCE*ceAR+4</b> <b>55A</b>
RH:-19 (hrS-) partial e partial c	<b>RHCE*01.05.01</b> <b>RHCE*ce.05.01</b>	c.48G>C; c.712A>G; c.787A>G; c.800T>A	1, 5	p.Trp16Cys; p.Met238Val; p.Arg263Gly; p.Met267Lys	rs586178 rs144163296 rs1132763 rs1132764	<b>RHCE*ce48C</b> , 712G, 787G,800A	<b>RHCE*ceEK</b> often linked to <b>RHD*DAR</b>
RH:-59 (CEAG-) RH:-31 (hrB-) partial e	<b>RHCE*01.06.01</b> <b>RHCE*ce.06.01</b>	c.254C>G	2	p.Ala85Gly	rs57992529	<b>RHCE*ce254G</b>	<b>RHCE*ceAG</b>
Not tested V and VS not informative	<b>RHCE*01.06.02</b> <b>RHCE*ce.06.02</b>	c.254C>G; c.733C>G	2, 5	p.Ala85Gly; p.Leu245Val	rs57992529 rs1053361	<b>RHCE*ce254G</b> , 733G	<b>RHDE*ceAG.0</b> <b>2</b> <b>Cancun 2012</b> <b>poster</b> <b>ARC/Lilian</b> 733C>G also in trans
Not tested	<b>RHCE*01.06.03</b> <b>RHCE*ce.06.03</b>	c.254C>G; c.733C>G; c.941T>C	2, 5, 7	p.Ala85Gly; p.Leu245Val; p.Val314Ala	rs57992529 rs1053361 rs79321360	<b>RHCE*ce254G</b> , 733G, 941C	<b>RHCE*ceAG.0</b> <b>3</b>
	<b>RHCE*01.06.04</b> <b>RHCE*ce.06.04</b>	c.254C>G; c.697C>G	2, 5	p.Ala85Gly; p.Gln233Glu	rs57992529 rs142246017	<b>RHCE*ce254G</b> , 697G	<b>RHCE*ceAG.0</b> <b>4</b>

<b>RHCE</b> Phenotype	Allele name *ce=01 *Ce=02 *cE=03 *CE=04	Nucleotide	Exon	Amino Acid	rs number	Allele detail	Reported as: Or Linked to:
RH:2 (partial C+) e+	<b>RHCE*01.06.05</b> <b>RHCE*ce.06.05</b>	c.254C>G; c.307C>T	2	p.Ala85Gly; p.Pro103Ser	rs57992529 rs676785	<b>RHCE*ce 254G, 307T</b>	<b>RHCE*ceAG.0 5</b> <b>AABB abstract 2013 NYBC C+ robust</b> <b>Linked to RHD pseudogene African American</b>
RH:−19 (hrS−) RH:−31 (hrB−) RH: −61 (CEVF−) partial e partial c	<b>RHCE*01.07.01</b> <b>RHCE*ce.07.01</b>	c.48G>C; c.667G>T	1,5	p.Trp16Cys; p.Val223Phe	rs586178 rs147357308	<b>RHCE*ce48C, 667T</b>	<b>RHCE*ceMO</b> often linked to <b>RHD*DAU0</b>
RH:−19 (hrS−) RH:−31 (hrB−) RH: −61 (CEVF−) partial e partial c	<b>RHCE*01.07.02</b> <b>RHCE*ce.07.02</b>	c.667G>T	5	p.Val223Phe	rs147357308	<b>RHCE*ce667T</b>	<b>RHCE*ceMO.0 2</b> without 16Cys less often seen than ceMO.01 but also often with <b>RHD*DAU0</b>
RH:−19 (hrS−) RH:49 (STEM+) e+/-	<b>RHCE*01.08</b> <b>RHCE*ce.08</b>	c.48G>C; c.712A>G; c.818C>T; c.1132C>G	1, 5, 6, 8	p.Trp16Cys; p.Met238Val; p.Ala273Val; p.Leu378Val	rs586178 rs144163296 rs147094099 rs138917454	<b>RHCE*ce48C, 712G, 818T, 1132G</b>	<b>RHCE*ceBI</b> often linked to <b>RHD*DOL</b>
RH:−19 (hrS−) Rh:49+ <sup>w</sup> (STEM+ <sup>w</sup> ) e+/-	<b>RHCE*01.09</b> <b>RHCE*ce.09</b>	c.48G>C; c.712A>G; c.818C>T	1, 5, 6	p.Trp16Cys; p.Met238Val; p.Ala273Val	rs586178 rs144163296 rs147094099	<b>RHCE*ce48C, 712G, 818T</b>	<b>RHCE*ceSM</b>
e+ <sup>w</sup> weak reactivity with some anti-D monoclonal	<b>RHCE*01.10.01</b> <b>RHCE*ce.10.01</b>	c.48G>C; c.365C>T	1, 3	p.Trp16Cys; p.Ser122Leu	rs586178 rs201407774	<b>RHCE*ce48C, 365T</b>	<b>RHCE*ceSL</b> some alleles have a silent 105C>T change
e+ <sup>w</sup>	<b>RHCE*01.10.02</b> <b>RHCE*ce.10.02</b>	c.365C>T	3	p.Ser122Leu	rs201407774	<b>RHCE*ce365T</b>	<b>RHCE*ceSL.02</b>
e+ <sup>w</sup>	<b>RHCE*01.11</b> <b>RHCE*ce.11</b>	c.461G>C	3	p.Arg154Thr	rs747471048	<b>RHCE*ce461C</b>	<b>RHCE*ceRT</b>
e+ <sup>w</sup>	<b>RHCE*01.12</b> <b>RHCE*ce.12</b>	c.48G>C; c.538G>C	1, 4	p.Trp16Cys; p.Gly180Arg	rs586178 NA	<b>RHCE*ce48C, 538C</b>	<b>RHCE*ceRA</b>

<b>RHCE</b> Phenotype	Allele name *ce=01 *Ce=02 *cE=03 *CE=04	Nucleotide	Exon	Amino Acid	rs number	Allele detail	Reported as: Or Linked to:
e+ <sup>w</sup> , RH:58 (CELO+ <sup>w</sup> )	<b>RHCE*01.13</b> <b>RHCE*ce.13</b>	c.685_687del AGA	5	p.Arg229del	NA	<i>RHCE*ce(685_687del)</i>	<b>RHCE*ceBP</b>
e+ <sup>w</sup> , c+ <sup>w</sup> RH:36 (Be(a+))	<b>RHCE*01.14</b> <b>RHCE*ce.14</b>	c.662C>G	5	p.Pro221Arg	rs141398055	<i>RHCE*ce662G</i>	<b>RHCE*ceBE</b>
c+ <sup>w</sup> , e+ <sup>w</sup> RH:55 (LOCR+) RH:-26	<b>RHCE*01.15</b> <b>RHCE*ce.15</b>	c.286G>A	2	p.Gly96Ser	rs144348222	<i>RHCE*ce286A</i>	<b>RHCE*ceLOC R</b>
e+	<b>RHCE*01.16</b> <b>RHCE*ce.16</b>	c.48G>C; c.1170C>T; c.1193T>A;	1, 9	p.Trp16Cys; silent; p.Val398Glu;	rs586178 rs630931 rs630612	<i>RHCE*ce48C- D(9)-ce</i>	<b>With pseudogene</b>
partial e partial c RH:10,20 (V+VS+) RH:31 weak to neg (hrB+ <sup>vw</sup> /-)	<b>RHCE*01.20.01</b> <b>RHCE*ce.20.01</b> <b>RHCE*ceVS.01</b>	c.733C>G	5	p.Leu245Val	rs1053361	<i>RHCE*ce733G</i>	Often linked to conventional <i>RHD</i>
partial e partial c RH:10,20 (V+VS+) RH:-31 (hrB-)	<b>RHCE*01.20.02</b> <b>RHCE*ce.20.02</b> <b>RHCE*ceVS.02</b>	c.48G>C; c.733C>G	1, 5	p.Trp16Cys; p.Leu245Val	rs586178 rs1053361	<i>RHCE*ce48C, 733G</i>	Often linked to <i>RHD*D11a</i> or to weak partial <i>D</i> 4.0
partial e partial c RH:-10,20 (V-VS+) RH:-31 (hrB-)	<b>RHCE*01.20.03</b> <b>RHCE*ce.20.03</b> <b>RHCE*ceVS.03</b>	c.48G>C; c.733C>G; c.1006G>T	1, 5, 7	p.Trp16Cys; p.Leu245Val; p.Gly336Cys	rs586178 rs1053361 rs116261244	<i>RHCE*ce48C, 733G, 1006T</i>	<b>RHCE*ceS</b> Often linked to <i>RHD*D11a</i> or to hybrid <i>RHDIII- CE-D</i> as part of r'S type 1 or <i>RHD-CE-D</i> as part of type 2 haplotype
partial e RH:10,20 (V+VS+) Probable RH:-31 (hrB- )	<b>RHCE*01.20.04.01</b> <b>RHCE*ce.20.04.01</b> <b>RHCE*ceVS.04.01</b>	c.48G>C; c.733C>G; c.1025C>T	1, 5, 7	p.Trp16Cys; p.Leu245Val; p.Thr342Ile	rs586178 rs1053361 rs1053374	<i>RHCE*ce48C, 733G, 1025T</i>	ceTI type 2
	<b>RHCE*01.20.04.02</b> <b>RHCE*ce.20.04.02</b> <b>RHCE*ceVS.04.02</b>	c.48G>C; c.105C>T; c.733C>G; c.744T>C; c.1025C>T	1, 5, 7	p.Trp16Cys; silent; p.Leu245Val; silent; p.Thr342Ile	rs586178 rs142971926 rs1053361 rs149352457 rs1053374	<i>RHCE*ce48C, 105T, 733G,744T, 1025T</i>	<b>RHCE*ceTI</b> type 2-like

<b>RHCE</b> Phenotype	Allele name *ce=01 *Ce=02 *cE=03 *CE=04	Nucleotide	Exon	Amino Acid	rs number	Allele detail	Reported as: Or Linked to:
partial e RH:-10,20 (V-VS+) RH:-31	<b>RHCE*01.20.05</b> <b>RHCE*ce.20.05</b> <b>RHCE*ceVS.05</b>	c.733C>G; c.1006G>T	5, 7	p.Leu245Val; p.Gly336Cys	rs1053361 rs116261244	<b>RHCE*ce733G,</b> <b>1006T</b>	
partial c partial e RH:43 (Crawford+) RH:20 (VS+) RH:-19,-31 RH:-58 (CELO-) moderate to strongly reactive with some monoclonal anti-D	<b>RHCE*01.20.06</b> <b>RHCE*ce.20.06</b> <b>RHCE*ceVS.06</b>	c.48G>C; c.697C>G; c.733C>G	1, 5	p.Trp16Cys; p.Gln233Glu; p.Leu245Val	rs586178 rs142246017 rs1053361	<b>RHCE*ce48C,</b> <b>697G, 733G</b>	<b>RHCE*ceCF</b>
partial e partial c RH:48,(JAL+) RH:-57 (CEST-) RH:20(V/VS+ <sup>w</sup> ) RH:19(hrS+ <sup>w</sup> / -) RH:31(hrB+ <sup>w</sup> / -)	<b>RHCE*01.20.07</b> <b>RHCE*ce.20.07</b> <b>RHCE*ceVS.07</b>	c.340C>T; c.733C>G	3, 5	p.Arg114Trp; p.Leu245Val	rs148487630 rs1053361	<b>RHCE*ce340T,</b> <b>733G</b>	<b>RHCE*ceJAL</b>
e+ <sup>w</sup> RH:10,20 (V+VS+) Probable RH:-31 (hrB-)	<b>RHCE*01.20.08</b> <b>RHCE*ce.20.08</b> <b>RHCE*ceVS.08</b>	c.48G>C; c.733C>G; c.748G>A	1, 5	p.Trp16Cys; p.Leu245Val; p.Val250Met	rs586178 rs1053361 NA	<b>RHCE*ce48C,</b> <b>733G, 748A</b>	
e+ <sup>w</sup> RH:-10,20 (V-VS+) RH:31 (hrB+ <sup>w</sup> )	<b>RHCE*01.20.09</b> <b>RHCE*ce.20.09</b> <b>RHCE*ceVS.09</b>	c.48G>C; c.733C>G; c.941T>C	1, 5, 7	p.Trp16Cys; p.Leu245Val; p.Val314Ala	rs586178 rs1053361 rs79321360	<b>RHCE*ce48C,</b> <b>733G, 941C</b>	
probable partial e and partial c	<b>RHCE*01.20.10</b> <b>RHCE*ce.20.10</b> <b>RHCE*ceVS.10</b>	c.48G>C; c.712A>G; c.733C>G	1, 5	p.Trp16Cys; p.Met238Val; p.Leu245Val	rs586178 rs144163296 rs1053361	<b>RHCE*ce48C,</b> <b>712G, 733G</b>	
e+ <sup>w</sup> RH:48 (JAL+)	<b>RHCE*01.21.01</b> <b>RHCE*ce.21.01</b>	c.341G>A	3	p.Arg114Gln	rs747471048	<b>RHCE*ce341A</b>	
e+ <sup>w</sup> RH:48 (JAL+)	<b>RHCE*01.21.02</b> <b>RHCE*ce.21.02</b>	c.48G>C; c.187G>C; c.341G>A	1, 2, 3	p.Trp16Cys; p.Gly63Arg; p.Arg114Gln	rs586178 NA rs747471048	<b>RHCE*ce48C,</b> <b>187C,</b> <b>341A,</b>	

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e+ <sup>w</sup> strongly D+ with some monoclonal anti-D RH:33(DHAR +) RH:50 (FPPT+)	<b>RHCE*01.22</b> <b>RHCE*ce.22</b>	c.667G>T; c.697C>G; c.712A>G; c.733C>G; c.744T>C; c.787A>G; c.800T>A	5	p.Val223Phe; p.Gln233Glu; p.Met238Val; p.Leu245Val; silent; p.Arg263Gly; p.Met267Lys	rs147357308 rs142246017 rs144163296 rs1053361 rs149352457 rs1132763 rs1132764	<b>RHCE*ce-D(5)- ce</b>	<b>DHAR</b> <b>RHCE*ceHAR</b>
e+ <sup>w</sup>	<b>RHCE*01.23</b> <b>RHCE*ce.23</b>	c.649T>C	5	p.Trp217Arg	NA	<b>RHCE*ce649C</b>	
e+ <sup>w</sup>	<b>RHCE*01.24</b> <b>RHCE*ce.24</b>	c.512A>G	4	p.His171Arg	rs781037009	<b>RHCE*ce512A</b>	
e+ <sup>w</sup>	<b>RHCE*01.25</b> <b>RHCE*ce.25</b>	c.730G>A	5	p.Ala244Thr	rs367825256	<b>RHCE*ce730A</b>	
e+ <sup>w</sup>	<b>RHCE*01.26</b> <b>RHCE*ce.26</b>	c.872C>T	6	p.Pro291Leu	rs374399829	<b>RHCE*ce872T</b>	
e+ <sup>w</sup>	<b>RHCE*01.27</b> <b>RHCE*ce.27</b>	c.1154G>C	9	p.Gly385Ala	NA	<b>RHCE*ce1154C</b>	
c+ <sup>w</sup>	<b>RHCE*01.28</b> <b>RHCE*ce.28</b>	c.1254A>C	10	p.Ter418Tyr	NA	<b>RHCE*ce1254C</b>	
c+e-	<b>RHCE*01.29</b> <b>RHCE*ce.29</b>	<i>RHD</i> exons 4-9	4-9			<b>RHCE*ce-D(4- 9)-ce</b>	<b>RHCE*ceBOL</b> haplotype(Dc- Bol)
e+ <sup>w</sup>	<b>RHCE*01.30</b> <b>RHCE*ce30</b>	c.526G>A	4	p.Ala176Thr	rs753965768	<b>RHCE*ce526A</b>	
	<b>RHCE*01.31</b> <b>RHCE*ce31</b>	c.695T>C	5	p.Ile232Thr	NA	<b>RHCE*ce695C</b>	
	<b>RHCE*01.32</b> <b>RHCE*ce32</b>	c.827C>A	6	p.Ala276Gln	NA	<b>RHCE*ce827A</b>	
partial e e+ <sup>w/-</sup> RH:-31 (hrB-)	<b>RHCE*01.33</b> <b>RHCE*ce33</b>	c.506T>C	4	p.Leu169Pro	NA	<b>RHCE*ce506C</b>	
partial c+e-	<b>RHCE*01.34</b> <b>RHCE*ce34</b>	<i>RHD</i> exons 4-7	4-7		NA	<b>RHCE*ce-D(4- 7)-ce</b>	Haplotype Dc- Made antibody to high
c+ e+	<b>RHCE*01.35</b> <b>RHCE*ce35</b>	c.202A>G	2	p.Asn68Asp	rs772058645	<b>RHCE*ce202G</b>	(ce in trans)
c-	<b>RHCE*01.36</b> <b>RHCE*ce36</b>	c.307C>T	2	p.PRo103Ser	rs676785	<b>RHCE*ce307T</b>	(C in trans)
c+ e+	<b>RHCE*01.37</b> <b>RHCE*ce37</b>	c.697C>G; c.712A>G; c.733C>G; c.744T>C	5	p.Gln233Glu; p.Met238Val; p.Leu245Val; p.Ser248Ser	rs142246017 rs144163296 rs1053361 rs149352457	<b>RHCE*ce697G, 712G, 733G, 744C</b>	Reported as weakly reactive with anti-D in absence of <i>RHD</i>

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e <sup>+</sup> w	<b>RHCE*01.38</b> <b>RHCE*ce38</b>	c.1-10C>T	5'UT R	promoter region	NA	<i>RHCE*ce1-10T</i>	
C <sup>+</sup> w c <sup>-</sup>	<b>RHCE*01.39</b> <b>RHCE*ce39</b>	c.308C>T	2	p.Pro103Leu	rs747882675	<i>RHE*ce308T</i>	
Nulls							
c-e-	<b>RHCE*01N.01</b> <b>RHCE*ceN.01</b>	c.80_84delTC TTC	1	p.Tyr29Phefs* 5	NA	<i>RHCE*ce(del80_84)</i>	
c-e-	<b>RHCE*01N.02</b> <b>RHCE*ceN.02</b>	c.963delG	7	p.Iso322Phefs* 37	NA	<i>RHCE*ce963delG</i>	
c-e-	<b>RHCE*01N.03</b> <b>RHCE*ceN.03</b>	c.634+1G>T	Intron 4	Splice site	NA	<i>RHCE*ce634+1T</i>	
c-e-	<b>RHCE*01N.04</b> <b>RHCE*ceN.04</b>	c.676delG	5	p.Ala226Leu fs*2	rs609320	<i>RHCE*ce676delG</i>	
c-e-	<b>RHCE*01N.05</b> <b>RHCE*ceN.05</b>	c.335+3A>T	Intron 2	Splice site	NA	<i>RHCE*ce335+3T</i>	
<b>Ce</b> <b>RH:2 or C</b> <b>RH:5 or e</b> <b>RH:7 or</b> <b>rh<sub>i</sub>(Ce)</b>	<b>RHCE*02 or</b> <b>RHCE*Ce</b> <i>RHCE*C</i> <i>RHCE*e</i>	<b>Reference</b> <b>nucleotides</b> c.48G>C c.150C>T c.178C>A c.201A>G c.203A>G c.307C>T c.676G	1, 2, 5	p.Trp16Cys silent p.Leu60Ile silent p.Asn68Ser p.Pro103Ser p.Ala226			
C <sup>+</sup> w/- e <sup>+</sup> w RH:48(JAL+)	<b>RHCE*02.01</b> <b>RHCE*Ce.01</b>	c.340C>T	3	p.Arg114Trp	rs148487630	<i>RHCE*Ce340T</i>	<b>RHCE*CeMA</b> <b>RHCE*CeJAL</b>
C+e+	<b>RHCE*02.02</b> <b>RHCE*Ce.02</b>	c.667G>T; c.697C>G; c.712A>G	5	p.Val223Phe; p.Gln233Glu; p.Met238Val	rs147357308 rs142246017 rs144163296	<i>RHCE*Ce667T,</i> <i>697G, 712G</i>	<b>RHCE*CeFV</b>
C <sup>+</sup> w e <sup>+</sup> w RH:53(JAHK +) rG	<b>RHCE*02.03</b> <b>RHCE*Ce.03</b>	c.365C>T	3	p.Ser122Leu	rs201407774	<i>RHCE*Ce365T</i>	<b>RHCE*CeJAH</b> <b>K</b>
partial C+	<b>RHCE*02.04</b> <b>RHCE*Ce.04</b>	c.667G>T; c.697C>G; c.712A>G; c.733C>G; c.744T>C; c.787A>G; c.800T>A	5	p.Val223Phe; p.Gln233Glu; p.Mer238Val; p.Leu245Val; silent; p.Arg263Gly; p.Met267Lys	rs147357308 rs142246017 rs144163296 rs1053361 rs149352457 rs1132763 rs1132764	<i>RHCE*CE-D(5)-</i> <i>CE</i>	<b>RHCE*CeVA</b>

<b>RHCE</b> Phenotype	Allele name *ce=01 *Ce=02 *cE=03 *CE=04	Nucleotide	Exon	Amino Acid	rs number	Allele detail	Reported as: Or Linked to:
C+ <sup>w</sup> e+ <sup>w</sup>	<b>RHCE*02.04.01</b> <b>RHCE*Ce.04.01</b>	c.667G>T; c.697C>G; c.712A>G; c.733C>G; c.744T>C; c.787A>G	5	p.Val223Phe; p.Gln233Glu; p.Mer238Val; p.Leu245Val; silent; p.Arg263Gly	rs147357308 rs142246017 rs144163296 rs1053361 rs149352457 rs1132763	<i>RHCE*Ce667T</i> , <i>697G</i> , <i>712G</i> , <i>733G</i> , <i>744C</i> , <i>787G</i>	
RH:60 (PARG+)	<b>RHCE*02.05</b> <b>RHCE*Ce.05</b>	c.501G>A	4	p.Met167Ile	NA	<i>RHCE*Ce501A</i>	<b>RHCE*CePARG</b>
partial C+ RH:8 (C <sup>w</sup> +) RH:-51 (MAR-)	<b>RHCE*02.08.01</b> <b>RHCE*Ce.08.01</b>	c.122A>G	1	p.Gln41Arg	rs138268848	<i>RHCE*Ce122G</i>	<b>RHCE*CeCW</b>
RH:8 (C <sup>w</sup> +) RH:-56 (CENR-)	<b>RHCE*02.08.02</b> <b>RHCE*Ce.08.02</b>	c.122A>G; & RHD exon 6-10	1 6-10	p.Gln41Arg	rs138268848	<i>RHCE* Ce-D(6-10)</i>	<b>RHCE*CeNR</b>
partial C+ RH:9 (C <sup>x</sup> +) RH:-51 (MAR-)	<b>RHCE*02.09</b> <b>RHCE*Ce.09</b>	c.106G>A	1	p.Ala36Thr	rs145034271	<i>RHCE*Ce106A</i>	<b>RHCE*CeCX</b>
C+ <sup>w/-</sup> partial e+ <sup>w</sup> RH:32 (RN) RH:54 (DAK+) RH:-46 (Sec-)	<b>RHCE*02.10.01</b> <b>RHCE*Ce.10.01</b>	c.505C>A; c.509G>T; c.514T>A; c.544A>T; c.577A>G; c.594T>A; c.602G>C	4	p.Leu169Met; p.Arg170Met; p.Phe172Ile; p.Thr182Ser; p.Lys193Glu; p.Asn198Lys; p.Arg201Thr	rs1132761 rs1132762 rs1053349 rs1053350 NA rs1053354 rs141398055	<i>RHCE*Ce-D(4)-ce</i>	<b>RHCE*CeRN</b>
C+ <sup>w/-</sup> partial e+ <sup>w</sup> RH:32 (RN) RH:54 (DAK+) RH:-46 (Sec-)	<b>RHCE*02.10.02</b> <b>RHCE*Ce.10.02</b>	c.455C>A; c.505C>A; c.509G>T; c.514T>A; c.544A>T; c.577A>G; c.594T>A; c.602G>C	3, 4	p.Thr152Asn; p.Leu169Met; p.Arg170Met; p.Phe172Ile; p.Thr182Ser; p.Lys193Glu; p.Asn198Lys; p.Arg201Thr	<i>rs35109888</i> rs1132761 rs1132762 rs1053349 rs1053350 NA rs1053354 rs141398055	<i>RHCE*Ce-D(4)-ce + 455A</i>	<b>RHCE*CeRN.02 exists?</b>
C+ <sup>w</sup>	<b>RHCE*02.11</b> <b>RHCE*Ce.11</b>	c.286G>A	2	p.Gly96Ser	rs144348222	<i>RHCE*Ce286A</i>	
C+ <sup>w</sup>	<b>RHCE*02.12</b> <b>RHCE*Ce.12</b>	c.344T>G	3	p.Leu115Arg	NA	<i>RHCE*Ce344G</i>	
e+ <sup>w</sup>	<b>RHCE*02.13</b> <b>RHCE*Ce.13</b>	c.364T>C	3	p.Ser122Pro	NA	<i>RHCE*Ce364C</i>	
C+ <sup>w</sup>	<b>RHCE*02.14</b> <b>RHCE*Ce.14</b>	c.497A>T	4	p.His166Leu	NA	<i>RHCE*Ce497T</i>	
e+ <sup>w</sup>	<b>RHCE*02.15</b> <b>RHCE*Ce.15</b>	c.689G>C	5	p.Ser230Thr	NA	<i>RHCE*Ce689C</i>	
C+ <sup>w</sup> e+ <sup>w</sup>	<b>RHCE*02.16</b> <b>RHCE*Ce.16</b>	c.728A>G	5	p.Tyr243Cys	rs555090649	<i>RHCE*Ce728G</i>	



<b>RHCE</b> Phenotype	Allele name *ce=01 *Ce=02 *cE=03 *CE=04	Nucleotide	Exon	Amino Acid	rs number	Allele detail	Reported as: Or Linked to:
e+ <sup>w</sup>	<b>RHCE*02.17</b> <b>RHCE*Ce.17</b>	c.800T>A	5	p.Met267Lys	rs1132764	<b>RHCE*Ce800A</b>	
C+ <sup>w</sup> e+ <sup>w</sup>	<b>RHCE*02.18</b> <b>RHCE*Ce.18</b>	c.890T>C	6	p.Leu297Pro	rs763017817	<b>RHCE*Ce890C</b>	
e+ <sup>w</sup>	<b>RHCE*02.19</b> <b>RHCE*Ce.19</b>	c.464T>G; c.1118C>T	3 8	p.Met155Arg; p.Ala373Val	NA NA	<b>RHCE*Ce464G</b> , <b>1118T</b>	
C+ <sup>w</sup> e+ <sup>w</sup>	<b>RHCE*02.20</b> <b>RHCE*Ce.20</b>	c.79_81delCT C	1	p.Leu27del	NA	<b>RHCE*Ce(79_81del)</b>	
C+ <sup>w</sup>	<b>RHCE*02.21</b> <b>RHCE*Ce.21</b>	c.527C>T	4	p.Ala176Val	NA	<b>RHCE*Ce527T</b>	
Partial e+ <sup>w</sup> C+ <sup>w</sup>	<b>RHCE*02.22</b> <b>RHCE*Ce.22</b>	c.667G>T	5	p.Val223Phe	rs147357308	<b>RHCE*Ce667T</b>	
C+ <sup>w</sup>	<b>RHCE*02.23</b> <b>RHCE*Ce.23</b>	c.941T>C	7	p.Val314Ala	rs79321360	<b>RHCE*Ce941C</b>	
C+ <sup>w</sup> e+ <sup>w</sup>	<b>RHCE*02.24</b> <b>RHCE*Ce.24</b>	c.1007G>A	7	p.Gly336Asp	rs760319839	<b>RHCE*Ce1007A</b>	
C+ <sup>w</sup>	<b>RHCE*02.25</b> <b>RHCE*Ce.25</b>	c.1007G>T	7	p.Gly336Val	rs760319839	<b>RHCE*Ce1007T</b>	
C+ <sup>w</sup> e+ <sup>w</sup>	<b>RHCE*02.26</b> <b>RHCE*Ce.26</b>	c.460A>G	3	p.Arg154Gly	rs755299894	<b>RHCE*Ce460G</b>	
C+ <sup>w</sup> e+ <sup>w</sup>	<b>RHCE*02.27</b> <b>RHCE*Ce.27</b>	c.375C>G	3	p.Ile125Met	rs143715642	<b>RHCE*Ce375G</b>	
C+ e+ RH:9	<b>RHCE*02.28</b> <b>RHCE*Ce.28</b>	c.919G>A	6	p.Gly307Arg	rs200950594	<b>RHCE*Ce919A</b>	Made antibody to high in Rh
C+ e+ E+/-	<b>RHCE*02.29</b> <b>RHCE*Ce.29</b>	c.674C>G	5	p.Ser225Cys	rs200087488	<b>RHCE*Ce674G</b>	E: 0-4+ depending on reagent in absence of c.676C
C+ e+ V+VS+	<b>RHCE*02.30</b> <b>RHCE*Ce.30</b>	c.733C>G	5	p.Leu245Val	rs1053361	<b>RHCE*Ce733G</b>	
C <sup>w+</sup> e <sup>w+</sup>	<b>RHCE*02.31</b> <b>RHCE*Ce.31</b>	c.487-5T>G	Intron 3	Splice site	NA	<b>RHCE*Ce487-5G</b>	
C <sup>w+</sup>	<b>RHCE*02.32</b> <b>RHCE*Ce.32</b>	c.1228-2A>G	Intron 9	Splice site	NA	<b>RHCE*Ce1228-2G</b>	
Nulls							
C-e-	<b>RHCE*02N.01</b> <b>RHCE*CeN.01</b>	c.966_969del TCAC	7	p.His323Thrfs*75	NA	<b>RHCE*Ce(966_969del)</b>	
C-e-	<b>RHCE*02N.02</b> <b>RHCE*CeN.02</b>	c.659G>A	5	p.Trp220Ter	NA	<b>RHCE*Ce659A</b>	
C-e-	<b>RHCE*02N.03</b> <b>RHCE*CeN.03</b>	c.486+1G>A	Intron 3	Splice site	rs753832633	<b>RHCE*Ce486+1A</b>	
C-e-	<b>RHCE*02N.04</b> <b>RHCE*CeN.04</b>	c.93_94insT	1	p.Thr32Tyrfs*3	NA	<b>RHCE*Ce(93_94insT)</b>	

<b>RHCE</b> Phenotype	Allele name *ce=01 *Ce=02 *cE=03 *CE=04	Nucleotide	Exon	Amino Acid	rs number	Allele detail	Reported as: Or Linked to:
C-e-	<b>RHCE*02N.05</b> <b>RHCE*CeN.05</b>	c.377C>G	3	p.Ser126Ter	NA	<b>RHCE*Ce377G</b>	
<b>cE</b> <b>RH:4 or c</b> <b>RH:3 or E</b> <b>RH:27 (cE)</b>	<b>RHCE*03 or</b> <b>RHCE*cE</b> <i>RHCE*c</i> <i>RHCE*E</i>	<b>Reference</b> <b>nucleotides</b> c.307C c.676G>C	2, 5	p.Pro103 p.Ala226Pro		<b>RHCE*cE</b>	
partial E RH:11 (E <sup>w</sup> +) E type I	<b>RHCE*03.01</b> <b>RHCE*cE.01</b>	c.500T>A	4	p.Met167Lys	rs140421430	<b>RHCE*cE500A</b>	<b>RHCE*cEEW</b>
partial E c <sup>+w/-</sup> E <sup>+w/-</sup> E type II	<b>RHCE*03.02</b> <b>RHCE*cE.02</b>	D(1-3)-cE	1-3		NA	<b>RHCE*D(1-3)-</b> <b>cE</b>	<b>RHCE*cEKK</b>
partial E E <sup>+w</sup> or E <sup>+/-</sup> E type III	<b>RHCE*03.03</b> <b>RHCE*cE.03</b>	c.697C>G; c.712A>G	5	p.Gln233Glu; p.Met238Val	rs142246017 rs144163296	<b>RHCE*cE697G,</b> <b>712G</b>	<b>RHCE*cEFM</b>
partial E E <sup>+/-</sup>	<b>RHCE*03.03.02</b> <b>RHCE*cE.03.02</b>	c.697C>G; c.712A>G; c.733C>G; c.744T>C	5	p.Gln233Glu; p.Met238Val; p.Leu245Val; silent	rs142246017 rs144163296 rs1053361 rs149352457	<b>RHCE*cE697G,</b> <b>712G, 733G,</b> <b>744C</b>	
partial E E <sup>+w</sup> or E <sup>+/-</sup> c <sup>+w</sup> E type IV	<b>RHCE*03.04</b> <b>RHCE*cE.04</b>	c.602G>C	4	p.Arg201Thr	rs141398055	<b>RHCE*cE602C</b>	<b>RHCE*cEIV</b>
partial E E <sup>+w</sup> or E <sup>+/-</sup> c <sup>+w</sup> E type V	<b>RHCE*03.05</b> <b>RHCE*cE.05</b>	c.461G>C	3	p.Arg154Thr	rs747471048	<b>RHCE*cE461C</b>	<b>RHCE*cEKH</b>
E <sup>+w</sup> c <sup>+w</sup>	<b>RHCE*03.06</b> <b>RHCE*cE.06</b>	c.28C>T	1	p.Arg10Trp	rs749601047	<b>RHCE*cE28T</b>	
E <sup>+w</sup>	<b>RHCE*03.07</b> <b>RHCE*cE.07</b>	c.344T>C	3	p.Leu115Pro	NA	<b>RHCE*cE344C</b>	
E <sup>+w</sup>	<b>RHCE*03.08</b> <b>RHCE*cE.08</b>	c.356G>A	3	p.Ser119Asn	rs777819701	<b>RHCE*cE356A</b>	
E <sup>+w</sup> c <sup>+w</sup>	<b>RHCE*03.09</b> <b>RHCE*cE.09</b>	c.374T>A	3	p.Ile125Asn	NA	<b>RHCE*cE374A</b>	
E <sup>+w</sup>	<b>RHCE*03.10</b> <b>RHCE*cE.10</b>	c.506T>A	4	p.Leu169Gln	NA	<b>RHCE*cE506A</b>	
E <sup>+w</sup> c <sup>+w</sup>	<b>RHCE*03.11</b> <b>RHCE*cE.11</b>	c.908T>A	6	p.Leu303Gln	NA	<b>RHCE*cE908A</b>	
E <sup>+w</sup>	<b>RHCE*03.12</b> <b>RHCE*cE.12</b>	c.464T>G; c.477T>G	3	p.Met155Arg; p.Asn159Lys	NA NA	<b>RHCE*cE464G,</b> <b>477G</b>	
E <sup>+w</sup> c <sup>+w</sup>	<b>RHCE*03.13</b> <b>RHCE*cE.13</b>	c.728A>G	5	p.Tyr243Cys	rs555090649	<b>RHCE*cE728G</b>	
c <sup>+w</sup> E <sup>-/+<sup>VW</sup></sup>	<b>RHCE*03.14</b> <b>RHCE*cE.14</b>	c.734T>C	5	p.Leu245Pro	NA	<b>RHCE*cE734C</b>	

<b>RHCE</b> Phenotype	Allele name *ce=01 *Ce=02 *cE=03 *CE=04	Nucleotide	Exon	Amino Acid	rs number	Allele detail	Reported as: Or Linked to:
E+ <sup>w</sup>	<b>RHCE*03.15.01</b> <b>RHCE*cE.15.01</b>	c.380C>T; c.383G>A	3	p.Ala127Val; p.Gly128Asp	rs1053346 rs1053347	<b>RHCE*cE380T</b> , 383A	<b>RHCE*cE BA</b>
E+ <sup>w</sup>	<b>RHCE*03.15.02</b> <b>RHCE*cE.15.02</b>	c.361A>T; c.380C>T; c.383G>A	3	p.Met121Leu; p.Ala127Val; p.Gly128Asp	rs1053345 rs1053346 rs1053347	<b>RHCE*cE361T</b> , 380T, 383A	<b>RHCE*cE JU</b>
c+ <sup>w</sup>	<b>RHCE*03.16</b> <b>RHCE*cE.16</b>	c.94A>G	1	p.Thr32Ala	rs760999674	<b>RHCE*cE94G</b>	<b>RHCE*cE TA</b> anti-c clone 951 non- reactive
partial E	<b>RHCE*03.17</b> <b>RHCE*cE.17</b>	c.520G>A	4	p.Val174Met	rs146306079	<b>RHCE*cE520A</b>	
c+ E+	<b>RHCE*03.18</b> <b>RHCE*cE.18</b>	c.48G>C	1	p.Trp16Cys	rs586178	<b>RHE*cE48C</b>	
c+ <sup>w/-</sup> E+ <sup>w/-</sup>	<b>RHCE*03.19</b> <b>RHCE*cE.19</b>	c.84C>A	1	p.Phe28Leu	NA	<b>RHCE*cE84A</b>	c: 0 to 3+, E: 0 to 1+ depending on reagent
c+ <sup>w</sup> E <sup>w+/-</sup>	<b>RHCE*03.20</b> <b>RHCE*cE.20</b>	c.149-1G>A	Intro n 1	Splice site	NA	<b>RHCE*cE149- 1A</b>	
Nulls							
c-E-	<b>RHCE*03N.01</b> <b>RHCE*cEN.01</b>	c.350_358del CCATGAGT G	3	p.Arg120_ Ser122del	NA	<b>RHCE*cE(350_ 358del)</b>	<b>RHCE*cEMI</b>
c-E-	<b>RHCE*03N.02</b> <b>RHCE*cEN.02</b>	c.907delC	6	p.Leu303Ter	rs747976226	<b>RHCE*cE907de IC</b>	
c-E-	<b>RHCE*03N.03</b> <b>RHCE*cEN.03</b>	c.554G>A	4	p.Trp185Ter	NA	<b>RHCE*cE554A</b>	
<b>CE</b> <b>RH:2 or C</b> <b>RH:3 or E</b> <b>RH:22 or CE</b>	<b>RHCE*CE or</b> <b>RHCE*04</b> <b>RHCE*C</b> <b>RHCE*E</b>	<b>Reference</b> <b>nucleotides</b> c.48G>C c.150C>T c.178C>A c.201A>G c.203A>G c.307C>T c.676G>C	1, 2, 5	p.Trp16Cys silent p.Leu60Ile silent p.Asn68Ser p.Pro103Ser p.Ala226Pro			
C+ <sup>w</sup> E+/-	<b>RHCE*04.01</b> <b>RHCE*CE.01</b>	c.722C>T	5	p.Thr241Ile	rs751751505	<b>RHCE*CE722T</b>	