Table 1 Complement deficiencies

Disease	Functional defects	Associated features	Inheritance	Genetic defects	OMIM	HGNC symbol	HGNC ID(s)	ENSEMBL ID
C1q deficiency	Absent C hemolytic activity, defective MAC*; faulty dissolution of immune complexes; faulty clearance of apoptotic cells	SLE-like syndrome, rheumatoid disease, infections	AR	C1q	120550; 601269;	*C1QA*	1241	ENSG00000173372
					120575	*C1QC*	1245	ENSG00000159189
C1r deficiency[I]	Absent C hemolytic activity, defective MAC; faulty dissolution of immune complexes	SLE-like syndrome, rheumatoid disease, infections	AR	C1r*	216950	*C1R*	1246	ENSG00000159403
C1s deficiency	Absent CH50 hemolytic activity	SLE-like syndrome; multiple autoimmune diseases	AR	C1s	216950, 613783	*C1S*	1247	
C4 deficiency	Absent C hemolytic activity, defective MAC; faulty dissolution of immune complexes; defective humoral immune response	SLE-like syndrome, rheumatoid disease, infections	AR	C4	120810; 120820	*C4A*	1323	ENSG00000244207
						C4B	1324	ENSG00000228267
C2 deficiency[II]	Absent C hemolytic activity, defective MAC; faulty dissolution of immune complexes	SLE-like syndrome, vasculitis, polymyositis, pyogenic infections	AR	C2[i]	217000, 613927	*C2*	1248	*multiple*
C3 deficiency	Absent C hemolytic activity, defective MAC; defective bactericidal activity; defective humoral immune response	Recurrent pyogenic infections	AR	C3	120700	*C3*	1318	ENSG00000125730
C5 deficiency	Absent C hemolytic activity, defective MAC; defective bactericidal activity	Neisserial infections, SLE	AR	C5	120900	*C5*	1331	ENSG00000106804
C6 deficiency	Absent C hemolytic activity, defective MAC; defective bactericidal activity	Neisserial infections, SLE	AR	C6	217050	*C6*	1339	ENSG00000039537
C7 deficiency	Absent C hemolytic activity, defective MAC; defective bactericidal activity	Neisserial infections, SLE, vasculitis	AR	C7	217070	*C7*	1346	ENSG00000112936
C8a deficiency[III]	Absent C hemolytic activity, defective MAC; defective bactericidal activity	Neisserial infections, SLE	AR	C8α	120950	*C8A*	1352	ENSG00000157131
C8b deficiency	Absent C hemolytic activity, defective MAC; defective bactericidal activity	Neisserial infections, SLE	AR	C8β	120960	*C8B*	1353	ENSG00000021852
C9 deficiency	Reduced C hemolytic activity, defective MAC; defective bactericidal activity	Neisserial infections[IV]	AR	C9	613825	*C9*	1358	ENSG00000113600
C1 inhibitor deficiency	Spontaneous activation of the complement pathway with consumption of C4/C2; spontaneous activation of the contact system with generation of bradykinin from high-molecular-weight kininogen	Hereditary angioedema	AD	C1 inhibitor	601269	*C1QBP*	1243	ENSG00000108561
Factor I deficiency	Spontaneous activation of the alternative complement pathway with consumption of C3	Recurrent pyogenic infections	AR	Factor I	138470	*CFB*	1037	ENSG00000239754
Factor H deficiency	Spontaneous activation of the alternative complement pathway with consumption of C3	Hemolytic-uremic syndrome, membranoproliferative glomerulonephritis	AR	Factor H	609814	*CFH*	4883	ENSG00000000971
Factor D deficiency	Absent hemolytic activity by the alternate pathway	Neisserial infection	AR	Factor D	134350	*CFD*	2771	ENSG00000197766
Properdin deficiency	Absent hemolytic activity by the alternate pathway	Neisserial infection	XL	Properdin	312060	*CFP*	8864	ENSG00000126759
MASP1 deficiency	Potential loss of embryonic cell migration signals. Mutationsin *MASP*1 leading to impaired complement pathway through the mannan-binding lectin serine proteases	A developmental syndrome of facial dysmorphism, cleft lip, and/or palate, craniosynostosis, learning disability and genital, limb and vesico renal anomalies	AR	MASP1	600521	*MASP1*	6901	ENSG00000127241
3MC syndrome **COLEC11 deficiency**	Potential loss of embryonic cell migration signals. Gene product CL-K1, a C-type lectin that may serveas a chemoattractant	A developmental syndrome of facial dysmorphism, cleft lip and/or palate, craniosynostosis, learning disability and genital, limb and vesico renal anomalies	AR		612502	*COLEC11*	17213	ENSG00000118004
Mannose Binding Lectin (MBL)deficiency	Defective mannose recognition; defective hemolytic activity by the lectin pathway	Pyogenic infections with very low penetrance, mostly asymptomatic	AR	SNP variation in *MBL2*	154545	*MBL2*	6922	ENSG00000165471
MASP2 deficiency[V]	Absent hemolytic activity by the lectin pathway	SLE syndrome, pyogenic infection	AR	*MASP2*	605102	*MASP2*	6902	ENSG00000009724
Complement receptor 3(CR3) deficiency		See LAD1	AR	*INTGB2*	116920	*ITGB2*	6155	ENSG00000160255
Membrane cofactorprotein (CD46) deficiency	Inhibitor of complement alternate pathway, decreased C3b binding	Glomerulonephritis, atypical hemolytic-uremic syndrome; selected SNPs: severe pre-eclampsia	AD	Mutations in *MCP* leading to loss of the cofactor activity needed for the factor I-dependent cleavage of C3B and C4B	120920	*CD46*	6953	ENSG00000117335
Membrane attack complex inhibitor (CD59) deficiency	Erythrocytes highly susceptible to complement-mediated lysis	Hemolytic anemia, thrombosis	AR	Mutations in *CD*59 leading to loss of this membrane inhibitor of the membrane attack complexes	107271	*CD59*	1689	ENSG00000085063
Paroxysmal nocturnal hemoglobinuria	Complement-mediated hemolysis	Recurrent hemolysis; hemoglobinuria, abdominal pain, smooth muscle dystonias, fatigue, and thrombosis	Acquired XL	*Expansion of hematopoietic clones with PIGA*, loss of biosynthesis of glycosylphosphatidylinositol (GPI) a moiety that attaches proteins to the cell surface.	300818	*PIGA*	8957	ENSG00000165195
Immunodeficiency associated with Ficolin 3 deficiency	Absence of complement activation by the Ficolin3 pathway.	Recurrent severe pyogenic infections mainly in the lungs; necrotizing enterocolitis in infancy; selective antibody defect to pneumococcal polysaccharides	AR	Mutations in *FCN*3, leadingto impaired complement deposition	604973	*FCN3*	3625	ENSG00000142748

MAC, Membrane attack complex; *SLE*, systemic lupus erythematosus; *AR*, autosomal recessive inheritance; *AD*, autosomal dominant inheritance; *XL*, X-linked inheritance; *MBL*, mannose-binding lectin; SNP, single nucleotide polymorphism; *MASP2*, mannose-binding protein–associated serine protease 2.

I C1r deficiency in most cases is associated with C1s deficiency. The gene for C1s also maps to chromosome 12 pter.

II Type 1 C2 deficiency is in linkage disequilibrium with HLA-A25, HLA-B18, and HLA-DR2 and complotype SO42 (slow variant of Factor B, absent C2, type 4 C4A, type 2 C4B) and is common in white subjects. It results from a 28-bp deletion in the C2 gene; C2 is synthesized but not secreted. Type 2 C2 deficiency is very rare and involves gene defects other than that found in type 1 C2 deficiency and a failure of C2 synthesis.

III C8a deficiency is always associated with C8 g deficiency. The gene encoding C8 g maps to chromosome 9 and is normal, but C8 g covalently binds to C8a.

[IV] Association is weaker than with C5, C6, C7, and C8 deficiencies.
[V] A single patient.