



CHARACTERISTICS OF BLOOD GROUP ANTIBODIES

Blood Group System	ANTIBODY	IgG	IgM	OPTIMAL TECHNIQUE	LISS-IAT	ENZYME	COMPLEMENT BINDING	IMMUNE	NATURAL	HEMOLYTIC TRANSFUSION REACTION	HDN	Antigen frequency %		REMARKS
												CAUCASIAN	BLACK	
ABO	Anti-A	+	+	RT	+	Enhanced	+	o	+	+	Some	43	27	Frequencies do not include type AB.
	Anti-B	+	+	RT	+	Enhanced	+	o	+	+	Some	9	20	Frequencies do not include type AB.
	Anti-A ₁	Some	+	RT	Some	Enhanced	Rare	Rare	+	Some	o	33	19	Anti-A ₁ is found in 1-2% of A ₂ individuals and 25% of A ₂ B individuals.
RH	Anti-D	+	Some	IAT	+	Enhanced	Rare	+	o	+	+	85	92	Occurs frequently with Anti-C.
	Anti-C	+	+	IAT	+	Enhanced	o	+	o	+	+	68	27	Occurs frequently with Anti-D or -e.
	Anti-E	+	+	RT OR IAT	+	Enhanced	o	+	+	+	+	29	22	Occurs frequently with Anti-c, may show dosage.
	Anti-c	+	Some	IAT	+	Enhanced	o	+	o	+	+	80	98	Occurs frequently with Anti-E, may show dosage.
	Anti-e	+	Some	IAT	+	Enhanced	o	+	o	+	Rare	98	98	Occurs frequently with Anti-C, may show dosage.
	Anti-C _w	+	+	RT OR IAT	+	Enhanced	o	+	+	+	+	2	1	
Hh	Anti-H	Some	+	RT OR LOWER	o	Enhanced	Some	o	+	+	Rare	99.9	99.9	Most RBCs have some H antigen expression. O>A ₂ >B> A ₂ B>A ₁ >A ₁ B
KELL	Anti-K	+	Some	IAT	+	No Effect	Rare	+	Rare	+	+	9	2	Kell, k (cellano), and Js ^a antigen expression may be depressed by the presence of Kp ^a .
	Anti-k	+	Some	IAT	+	No Effect	o	+	o	+	+	99.8	100	
	Anti-Kp ^a	+	o	IAT	+	No Effect	o	+	o	+	+	2	< 0.01	
	Anti-Kp ^b	+	Rare	IAT	+	No Effect	o	+	o	+	+	100	100	
	Anti-Js ^a	+	Some	IAT	+	No Effect	o	+	Rare	+	+	< 0.01	20	
	Anti-Js ^b	+	o	IAT	+	Variable	o	+	o	+	+	> 99.9	99	
DUFFY	Anti-Fy ^a	+	Rare	IAT	+	Depressed	Rare	+	o	+	+	66	10	Some antibodies exhibit dosage.
	Anti-Fy ^b	+	Rare	IAT	+	Depressed	Rare	+	o	+	Rare	83	23	
LEWIS	Anti-Le ^a	Some	+	RT OR IAT	+	Enhanced	+	Some	+	Rare	o	22	23	Antibodies are frequently seen during pregnancy.
	Anti-Le ^b	Some	+	RT OR IAT	+	Enhanced	+	Some	+	o	o	72	55	
KIDD	Anti-Jk ^a	+	+	IAT	+	Enhanced	+	+	o	+	+	77	92	Some antibodies exhibit dosage, some require anti-complement for detection.
	Anti-Jk ^b	+	+	IAT	+	Enhanced	+	+	o	+	Rare	74	49	
MNS	Anti-M	+	+	RT OR IAT	Some	Depressed	o	+	+	Rare	Rare	78	74	May exhibit dosage or be pH dependent.
	Anti-N	+	+	RT OR IAT	Some	Depressed	o	Rare	+	o	o	72	75	
	Anti-S	+	+	RT OR IAT	+	Variable	Some	+	Some	Rare	Rare	55	31	
	Anti-s	+	+	RT OR IAT	+	Variable	Rare	+	o	Rare	Rare	89	93	
Anti-U	+	o	IAT	+	No Effect	o	+	o	+	+	99.9	99		
LUTHERAN	Anti-Lu ^a	+	+	RT OR IAT	+	Variable	Rare	+	+	o	Rare	8	5	Antigen expression is variable.
	Anti-Lu ^b	+	+	RT OR IAT	+	Variable	Rare	+	o	+	+	99.8	99.8	
P-1PK	Anti-P ₁	Some	+	RT OR LOWER	Some	Enhanced	Rare	Some	+	Some	o	79	94	Antigen expression is variable.
	Anti-PP ₁ Pk	+	+	RT OR IAT	+	No Effect	+	o	+	+	+	> 99.9	> 99.9	Antibody is naturally occurring in individuals with the p phenotype.
I/i Collection	Anti-I	Rare	+	RT OR LOWER	Rare	Enhanced	+	o	+	o	o	> 99	> 99	Typically seen as a cold auto antibody. Allo anti-I is rare.
	Anti-i	Rare	+	RT OR LOWER	Rare	Enhanced	+	o	+	o	Rare	100	100	Anti-i are considered to be auto antibodies.
XG	Anti-Xg ^a	+	Some	RT OR IAT	+	Depressed	Some	+	Some	o	o	89 Females 66 Males		Inheritance by an X-linked gene.
COLTON	Anti-Co ^a	+	Rare	IAT	+	No Effect	Some	+	o	+	+	99.5	99.5	
	Anti-Co ^b	+	o	IAT	+	Enhanced	Rare	+	o	+	+	10	10	
DIEGO	Anti-Di ^a	+	o	IAT	+	No Effect	Some	+	Some	+	+	0.01	0.01	Di ^a antigen frequency highest in South American Indians, Japanese, Chippewa Indians
	Anti-Di ^b	+	o	IAT	+	No Effect	o	+	o	+	+	100	100	
	Anti-Wr ^a	+	+	RT OR IAT	+	No Effect	o	+	+	+	+	< 0.01	< 0.01	Anti-Wr ^a is often naturally occurring and can be found in the serum of 1-2% of blood donors.
DOMBROCK	Anti-Do ^a	+	o	IAT	+	Enhanced	o	+	o	+	o	67	55	Anti-Do ^a is rarely found as a single specificity.
	Anti-Do ^b	+	o	IAT	+	Enhanced	o	+	o	+	o	82	89	
	Anti-Gy ^a	+	o	IAT	+	Enhanced	o	+	o	+	o	100	> 99.9	
	Anti-Hy	+	o	IAT	+	Enhanced	o	+	o	+	o	100	> 99	
CARTWRIGHT	Anti-Yt ^a	+	o	IAT	+	Variable	Some	+	o	Some	o	> 99.8	> 99.8	
	Anti-Yt ^b	+	o	IAT	+	Variable	o	+	o	o	o	8	8	Anti-Yt ^b is rare; usually seen with other antibodies.
CHIDO/ROGERS/KNOPS	Anti-Ch1	+	o	IAT	+	Depressed	o	+	o	o	o	96	96	
	Anti-Rg1	+	o	IAT	+	Depressed	o	+	o	o	o	> 98	> 98	
	Anti-Kn ^a	+	o	IAT	+	Depressed	o	+	o	o	o	94.5	99.9	
	Anti-McC ^a	+	o	IAT	+	Depressed	o	+	o	o	o	98	94	
	Anti-Yk ^a	+	o	IAT	+	Depressed	o	+	o	o	o	92	98	
VEL COLLECTION	Anti-Vel	+	+	IAT	+	Enhanced	+	+	o	+	+	> 99	> 99	Vel antigen expression is variable on adult RBCs.