Vel Blood Group Collection

Number of antigens 2

High prevalence	Vel, ABTI

Terminology

ISBT symbol (number)	VEL (212)
History	Became a Collection in 2008 when it was recognized that ABTI– RBCs are Vel+^{W}.

Carrier molecule

Possibly a small glycoprotein (M_r SDS-PAGE ~35 kDa under non-reducing conditions, and ~20 kDa under reducing conditions)[1].

Reference

[1] Storry, J.R., et al., 2010. Investigation into the carrier molecule of the Vel blood group system [abstract]. Transfusion 50 (Suppl.), 28A.

Vel Antigen

Terminology

ISBT symbol (Number)	Vel (212001 or 212.1)
Other names	Ve^{a}; 900001
History	Reported in 1952, and named after the first antigen-negative proband who made anti-Vel.

Occurrence

Vel– RBCs have been found in 1 in ~4,000 people and 1 in ~1,700 in Norwegians and Swedes.

Expression

Cord RBCs	Weak

The Blood Group Antigen (3/e). DOI: http://dx.doi.org/10.1016/B978-0-12-415849-8.00041-7

Adult RBCs	Expression is variable; RBCs with a weak expression of the Vel antigen may be mistyped as Vel–[1]

Effect of enzymes and chemicals on Vel antigen on intact RBCs

Ficin/Papain	Resistant (markedly enhanced)
Trypsin	Resistant (markedly enhanced)
α-Chymotrypsin	Resistant (markedly enhanced)
DTT 200 mM	Sensitive or resistant[2]
Acid	Resistant

In vitro characteristics of alloanti-Vel

Immunoglobulin class	IgM and IgG (usually as a mixture)
Optimal technique	IAT; enzyme IAT
Complement binding	Yes; some hemolytic

Clinical significance of alloanti-Vel

Transfusion reaction	No to severe/hemolytic
HDFN	Positive DAT to severe[3]

Autoanti-Vel

Yes

Comments

Three of 14 anti-Vel did not react with 4 Ge:–2,–3,4 samples[4].
A disproportional number of Vel– samples have the P_2 phenotype[5].
Six of eight Vel– RBC samples were weakly reactive, and one was non-reactive with anti-ABTI[6].

References

[1] Issitt, P.D., Anstee, D.J., 1998. Applied Blood Group Serology, fourth ed. Montgomery Scientific Publications, Durham, NC.
[2] Rainer, T., et al., 2004. The effects of dithiothreitol-tested red blood cells with anti-Vel [abstract]. Transfusion 44 (Suppl.), 122A.
[3] Le Masne, A., et al., 1992. [Severe form of neonatal hemolytic disease by anti-Vel allo- immunization]. Arch Fr Pediatr 49, 899–901.
[4] Issitt, P., et al., 1994. Phenotypic association between Ge and Vel [abstract]. Transfusion 34 (Suppl.), 60S.
[5] Cedergren, B., et al., 1976. The Vel blood group in northern Sweden. Vox Sang 31, 344–355.
[6] Banks, J., et al., 2004. Two new cases of anti-ABTI showing an association between ABTI and Vel [abstract]. Vox Sang 87 (Suppl. 3), 38.

ABTI Antigen

Terminology

ISBT symbol (Number)	ABTI (212002 or 212.2)
History	Anti-ABTI reported in 1996 in three multiparous women, members of an inbred Israeli Arab family. Named after this family[1].

Occurrence

ABTI-negative phenotype found in one Israeli Arab family[1], one Bavarian, and one German[2].

Expression

Cord RBCs	Presumed expressed
Altered	Vel-negative RBCs are ABTI+^{W} (1 was ABTI–)[2]

Effect of enzymes and chemicals on ABTI antigen on intact RBCs

Ficin/Papain	Resistant
Trypsin	Resistant
α-Chymotrypsin	Resistant
DTT 200 mM	Resistant

In vitro characteristics of alloanti-ABTI

Immunoglobulin class	IgG (IgG1 plus IgG3)
Optimal technique	IAT

Clinical significance of alloanti-ABTI

Transfusion reaction	No data
HDFN	No

Comments

ABTI– RBCs have a weak expression of Vel.

References

[1] Schechter, Y., et al., 1996. ABTI (901015), a new red cell of high frequency [abstract]. Transfusion 36 (Suppl.), 25S.

[2] Banks, J., et al., 2004. Two new cases of anti-ABTI showing an association between ABTI and Vel [abstract]. Vox Sang 87 (Suppl. 3), 38.