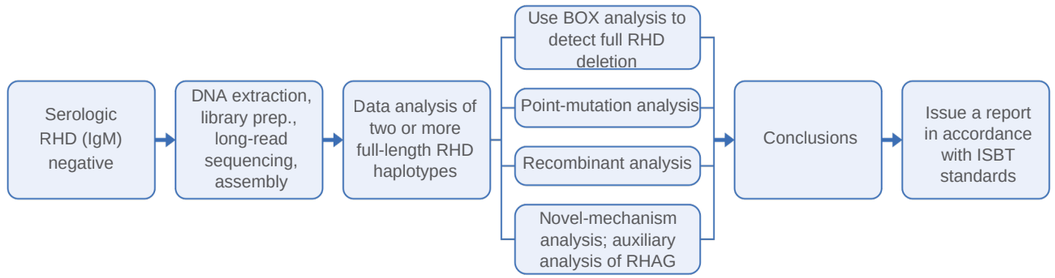
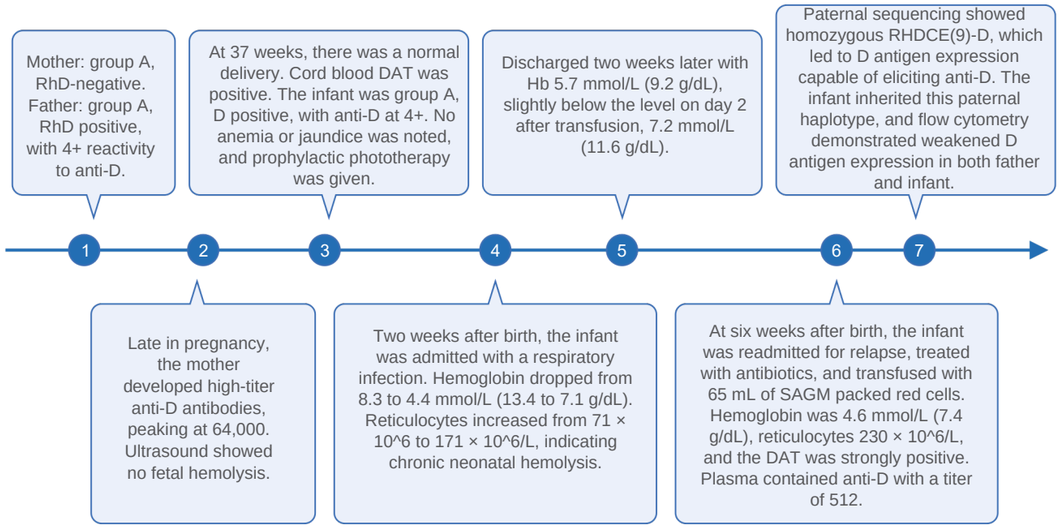
Comprehensive Rh blood group genetic analysis workflow



Case: chronic neonatal hemolysis caused by a D variant



Reference: Jakobsen MA, *Transfusion*. 2014

Relevant kits packaged for diverse typing needs:

- **ABO+H -** Full-length *ABO*, *FUT1*, and *FUT2* genes
- **Rh -** Full-length *RHD*, *RHCE*, and *RHAG* genes
- **RHD -** Full-length *RHD* gene
- **RHCE -** Full-length *RHCE* gene
- **PANEL2 (ABO, Rh, MNS, Kidd, Duffy) -** Full-length or key regions of *ABO*, *RHD*, *RHCE*, *GYPA*, *GYPB*, *SLC14A1*, and *ACKR1* genes
- **PANEL3 (ABO, Rh, MNS, Kidd, Duffy, P1PK, Kell, Lewis, Diego) -** Full-length or key regions of *ABO*, *RHD*, *RHCE*, *GYPA*, *GYPB*, *SLC14A1*, *ACKR1*, *A4GALT*, *KEL*, *FUT2*, *FUT3*, and *SLC4A1* genes

*24/48/96/192 reactions per kit. All products are for research use only.

Authorized Distributor

XCELOM

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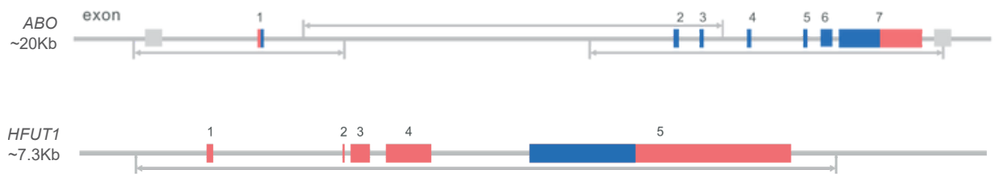
Long-read sequencing for blood typing

Redefining the gold standard for blood typing

HAORUI GENOMICS 浩瑞基因 XCELOM

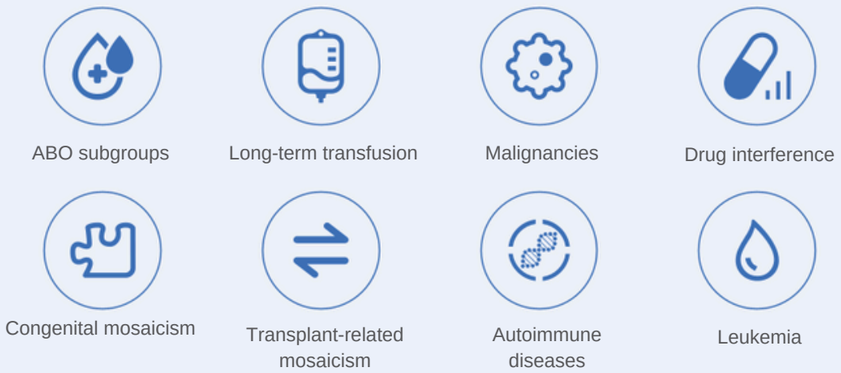
INT_LRSABORhv1

Long-read sequencing for ABO genotyping



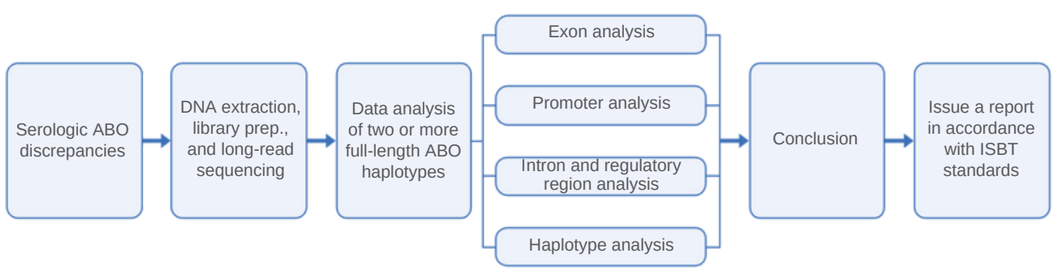
- Full-length *ABO* and *FUT1* sequencing via targeted amplification and long-read sequencing platforms ensures comprehensive variant detection and confident genotyping.

Causes of forward/reverse ABO discrepancy and scenarios for genotyping

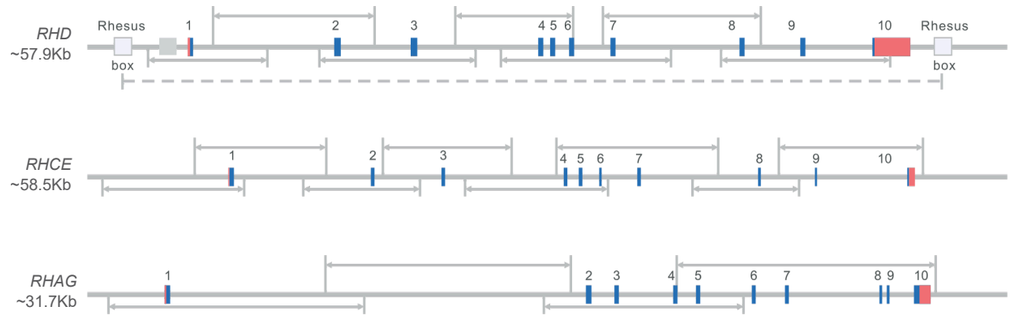


- In these scenarios, ABO genotyping is recommended to overcome serological test limitations and deliver accurate, definitive results.

Comprehensive ABO gene analysis workflow



RH blood group genotyping



Serologic identification of RHD weak D, partial D, and DEL phenotypes is difficult and sensitive to variables such as reagent performance and operator technique, which can lead to misclassification or missed detections. Conventional short-read sequencing also struggles to resolve recombinant alleles and often requires multiple assays for interpretation. Long-read sequencing addresses these limitations by delivering contiguous, haplotype-resolved coverage of the entire RHD locus, enabling clear detection of all recombination types.

Differences in RHD antigens and current transfusion strategies

Phenotype	Category	Hotspot	Antigen	Transfusion strategy
	RhD-negative	RHD E1-10del RHD*D-CE(2-9)-D RHD*711delC	Not present	RhD-negative individuals transfused with RhD-positive blood will produce anti-D antibodies. RhD-negative pregnant women carrying an RhD-positive fetus will produce anti-D antibodies.
	RhD-positive	-		RhD-positive individuals can routinely receive D-positive blood.
	DEL	1227G>A		RhD-negative recipients who receive red cells from DEL donors are at risk of forming anti-D. Many publications suggest that DEL recipients can be transfused with D-positive donor blood without forming anti-D. Pregnant women with the DEL type carrying an RhD-positive fetus will not develop anti-D antibodies; RhIG prophylaxis and anti-D monitoring during pregnancy can be discontinued.
	Weak D	c.845G>A c.520G>A		It is generally believed that recipients with partial D or weak D should receive RhD-negative donor red cells. However, given the relative antigen integrity of weak D, transfusion of RhD-positive blood to weak D recipients may be feasible, though robust clinical evidence is currently lacking.
	Partial D	RHD*D-CE(3-6)-D RHD*D-CE(5)-D RHD*D-CE(9)-D		

References:

Ji Y L. *ISBT Science Series*. 2016

XU H, et al. *Chin J Blood Transfusion*. 2010

Shao CP. *N Engl J Med*. 2010

Ji Y. *Blood*. 2023

Wang QP, et al. *Blood Transfus*. 2014