

ANTI-D DISCREPANCY
Prenatal Case Study
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Background: Variations in *RH* genes can create discrepancies in the laboratory when typing RhD. The *RHD* and *RHCE* genes, located on chromosome 1 encode for the Rh proteins RhD, and RhCE. These 2 genes have many identical regions and are in close proximity on the same chromosome sometimes resulting in amino acid exchanges. These exchanges form new polymorphic proteins that are responsible for the many antigens in the Rh blood group system. The weak D phenotype is caused by amino acid exchange in the transmembrane and cytoplasm of the RBC. Partial D phenotype is caused by altered or missing parts of *RHD* that are replaced by portions of *RHCE*. Amino acid changes on partial D are usually located in the extracellular regions of RhD. In addition to genetic variations there are differences in reactivity between anti-D reagents.

Case study: A prenatal workup was ordered for a 25 year old pregnant woman at a local clinic. The results were as follow: ABO: A, anti-D 0, Rh control 0, D IAT W, IAT control 0. The technologist was uncomfortable with the weak results with the Anti-D reagent and the decision was made to send the specimen to the Immunohematology Reference Laboratory (IRL) for weak D confirmation.

IRL initial results: ABO A, anti-D 3, Rh control 0, D IAT 3, IAT control 0. Repeat anti-D 3. Because of the discrepancy between the two laboratories a panel of anti-D reagents were run using human (polyclonal), monoclonal blend, and monoclonal.

IRL Anti-D panel

	IS	IAT	Exp Date
5F559 ImmucorGamma (human)	0	3	6/23/07
D241-1 Gamma (human)	w	3	2/11/05
DMB62-5 ImmucorGamma (MonoBlend)	0	4	3/01/08
504660 Immucor-Series 4(Mono)	0	2	8/20/05
505530 Immucor-Series 5 (Mono)	0	3	3/19/05
NDMG01504 Dominion Biological (Mono)	2	4	6/27/02
DMM14-1 ImmucorGamma IgM (Mono)	w		6/11/04
504693 ImmucorGamma Series 4 (Mono)	w	1	1/23/09
DB258A Ortho (Mono)	0	3	3/14/08

Conclusion: The ImmucorGamma (Atlanta, GA) MonoclonalBlend used in the initial IRL testing (DMB67-3) reacted strong at IS (3+) while the one used in the panel was negative at IS. The difference in reactivity was most likely due to the age of the reagent. Differences in the RhD typing are due to: reagent used (monoclonal vs. polyclonal), age of the monoclonal antisera, individual antigen expression (weak D or Partial D), and method used. It is difficult to determine if this patient will make anti-D. Further genetic studies (not available in U.S.) would be needed to fully answer this question.

Reference: Immunohematology, Volume 21, Number 4, 2005
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