

△ New York Blood Center Enterprises

EXPANDING OUR ORGANIZATION TO MEET CLINICAL, CELLULAR AND TRANSFUSION PRODUCT AND SERVICE NEEDS FOR PATIENTS. NOW PROVIDING ALMOST ONE MILLION BLOOD PRODUCTS, OVER 450,000 LABORATORY AND MULTI-ASSAY INFECTIOUS DISEASE TESTS AND OVER 12,500 SPECIALTY CLINICAL PROCEDURES ANNUALLY TO HOSPITALS NATIONWIDE.







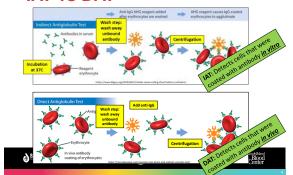


Objectives

- Describe the direct antiglobulin test (DAT), and list reasons why an individual might have a positive DAT.
- Discuss how an eluate is prepared, and how the results of eluate testing can help determine what's causing a patient's positive DAT.
- · Review Rh haplotypes and nomenclature.



IAT vs DAT



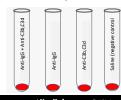
DAT testing

- Are the patient's cells coated with antibody (or complement components)?
- Complement components?
 - C3b/C3d
 - · Some antibodies can fix complement
 - Complement components coating cells may indicate hemolytic process



DAT testing

- "Polyspecific" reagent contains both anti-IgG and anti-complement components
 - Screening reagent
- If polyspecific reagent is positive, test monospecific reagents
 - Anti-IgG
 - · Anti-C3b/C3d
- Final tube is saline control
 - Negative control













What causes a positive DAT?

- HDFN positive DAT on newborn RBCs
- Transfusion reaction positive DAT on transfused cells
- Warm autoantibody
- · Drug antibodies
 - Warm autoantibodies
 - · Antibodies to drug-coated RBCs
 - · Antibodies that react in the presence of drug
- Unknown cause



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Investigating positive DATs

• Elution: Harvest antibody bound to RBCs



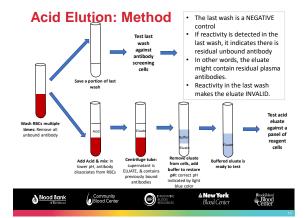
Eluate



Investigating positive DATs

Cause of positive DAT	Reactivity of the Eluate	
Transfusion Reaction	Alloantibody	
Hemolytic disease of the fetus/newborn	Alloantibody	
Warm autoantibody	Panreactive, reactive with autologous cells	
Drug-induced antibody	Usually negative	





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Rh phenotypes and genotypes

- Rh antigens inherited as haplotypes (example: DCe).
- One paternal haplotype and one maternal haplotype (example: DCe/DCe)

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Rh phenotypes and genotypes roman genotypes and genotypes and genotypes we haplotype Haplotype Haplotype Haplotype Weiner of discuss to discuss the phenotypes to discuss the phenotypes watern to the phenotypes to discuss the phenotypes to discuss the phenotypes to discuss the phenotypes and genotypes and geno patient phenotypes Fisher-Race Weiner nomenclature nomenclature DCe Rh (D) DcE You R_2 \overline{R}_{0} positive Dce need DCE $R_{\rm Z}$ to dce know Rh (D) dCe negative dcE these! dCE ry Blood Bank Rivele Bland Blood Center BR INNOVATIVE BLOCK RESOURCE

Rh phenotypes and genotypes

	Haplotype Fisher-Race nomenclature	Haplotype Weiner nomenclature
	DCe	R_1
Rh (D)	DcE	R_2
positive	Dce	$R_{\rm O}$
	DCE	R_{z}
	dce	r
Rh (D)	dCe	r
negative	dcE	r"
	dCE	r ^y

The prevalence of these haplotypes varies according to ethnicity.

What are the most common haplotypes?

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Inheritance of haplotypes DCe DCe So, if you inherit **DCe** from mom, and **DCe** from dad, your genotype (using Fisher-Race nomenclature) would be: DCe/DCe In Weiner nomenclature, your genotype would be R_1R_1 The common Rh antigens expressed on your cells would be... D, C, & e The common Rh antigens NOT expressed on your cells would be... E & C Blood Bank Community Blood Center **®** Blood Center We say this is the "Probable" genotype <u>"probable"</u> genotype By knowing the reactivity of RBCs with common because R₁ and r arrive at the probable genotype: haplotypes are more common than r' or R_o Anti Anti Anti Anti Anti Probable genotype -C -E -D -c -е 0 DCe/dce R_1r + + + + You might notice that there are a number of haplotypes that could lead to these reactions. Example(s): $R_0r' = Dce/dCe = D+,C+,c+,e+ \& E R_1R_0 = DCe/Dce = D+, C+, c+, e+ & E-$ Blood Center Blood Bank Community Blood Cente One example of how many genotypes can lead to the same antigens expressed on RBCs (phenotype) Anti- Anti- Anti- Anti- Anti-Probable genotype D С С + + $R_1R_2 = DCe/DcE = D+C+E+c+e+$ + + Phenotype (what's expressed Possible Genotype We say this is on RBCs) probable, because (R_1R_2) DCe/DcE R₁ and R₂ = DCe/dcE haplotypes are very common. All the $R_2 r' = DcE/dCe$ D+C+E+c+e+ other possibilities $R_z R_o = DCE/Dce$

include less

haplotypes

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 $R_{7}r = DCE/dce$ $R_0 r^y = Dce/dCE$

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Moving forward

- Discuss adsorption studies of warm autoantibody samples
- Choose adsorbing cells based on antigen types
- Will need to have a basic understanding of Rh haplotypes:
 - R₁, R₂, r
 - What antigens are negative for each haplotype?
 - R₁ = E-,c-
 - R₂ = C-,e-
 - rr = D-,C-,E-

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