



### DATs & Eluates, Rh nomenclature

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### **New York** Blood Center Enterprises

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### 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.

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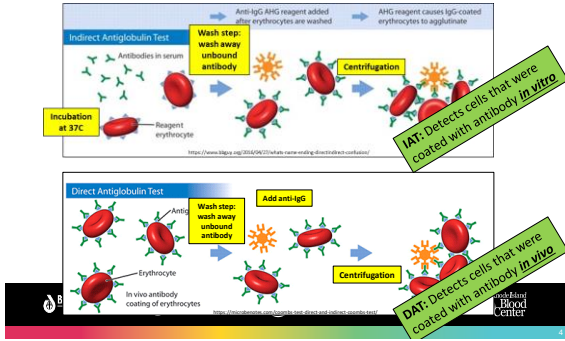
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## IAT vs DAT



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## 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

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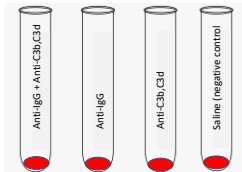
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## DAT testing

- "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



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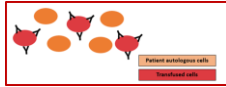
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# What causes a positive DAT?

Positive DAT ≠ hemolysis

- 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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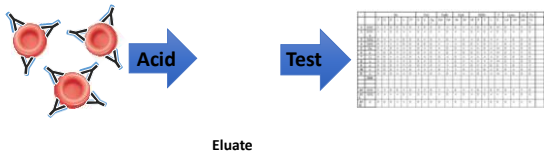
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# Investigating positive DATs

- Elution: Harvest antibody bound to RBCs




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## 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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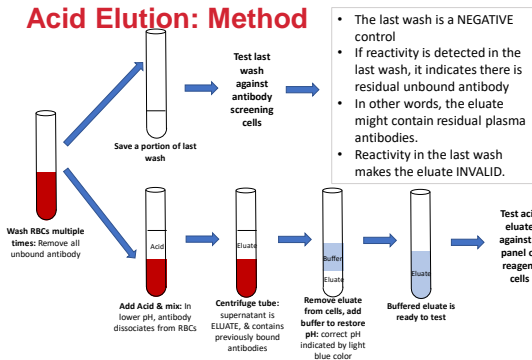
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### Acid Elution: Method




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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

	Haplotype Fisher-Race nomenclature	Haplotype Weiner nomenclature
Rh (D) positive	DCe	R <sub>1</sub>
	DcE	R <sub>2</sub>
	Dce	R <sub>0</sub>
	DCE	R <sub>Z</sub>
Rh (D) negative	dce	r
	dCe	r'
	dCe	r''
	dCE	r <sup>Y</sup>

Weiner nomenclature: used to discuss RBC units or patient phenotypes

You need to know these!

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## Rh phenotypes and genotypes

	Haplotype Fisher-Race nomenclature	Haplotype Weiner nomenclature
Rh (D) positive	DCe	R <sub>1</sub>
	DcE	R <sub>2</sub>
	Dce	R <sub>0</sub>
	DCE	R <sub>Z</sub>
Rh (D) negative	dce	r
	dCe	r'
	dCe	r''
	dCE	r <sup>Y</sup>

The prevalence of these haplotypes varies according to ethnicity.

What are the most common haplotypes?

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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:
  - $R_1, R_2, r$
  - What antigens are negative for each haplotype?
    - $R_1 = E-, c-$
    - $R_2 = C-, e-$
    - $rr = D-, C-, E-$

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