



SNS COLLEGE OF TECHNOLOGY **(AN AUTONOMOUS INSTITUTION)**

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Department of Biomedical Engineering

Course Name: 19BMT201 Anatomy & Physiology

II Year : III Semester

Unit III- Cardiovascular System

Topic : Blood Grouping & Compatability



BLOOD GROUPING SYSTEM

- ABO Blood Group System.
- Rh Blood Group System



ABO Blood group system

- The basis of ABO grouping is of two antigens- Antigen A and Antigen B.
- The ABO grouping system is classified into four types based on the presence or absence of antigens on the red blood cells surface and plasma antibodies.



- **Group A** – contains antigen A and antibody B.
- **Group B** –contains antigen B and antibody A.
- **Group AB** –contains both A and B antigen and no antibodies (neither A nor B).
- **Group O** – contains neither A nor B antigen and both antibodies A and B.



- The ABO group system is important during blood donation or blood transfusion as mismatching of blood group can lead to clumping of red blood cells with various disorders.
- It is important for the [blood cells](#) to match while transfusing i.e. donor-recipient compatibility is necessary.
- For example, a person of blood group A can receive blood either from group A or O as there are no antibodies for A and O in blood group A.



Individuals of blood group O are called as universal donors, whereas individuals of blood group AB are universal recipients.

	Group A	Group B	Group AB	Group O
Red blood cell type				
Antibodies in plasma	 Anti-B	 Anti-A	None	 Anti-A and Anti-B
Antigens in red blood cell	 A antigen	 B antigen	 A and B antigens	None

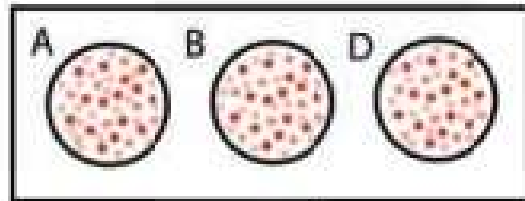


Rh Blood Group System

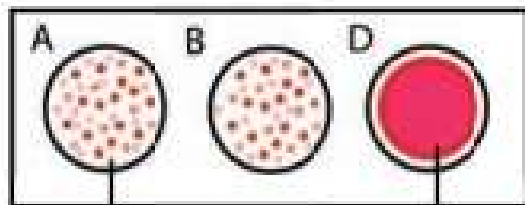
- The other prominent one is the Rh blood group system.
- About two-thirds of the population contains the third antigen on the surface of their red blood cells known as Rh factor or Rh antigen; this decides whether the blood group is positive or negative.
- If the Rh factor is present, an individual is rhesus positive (Rh+ve).
- if an Rh factor is absent individual is rhesus negative (Rh-ve) as they produce Rh antibodies.
- Therefore, compatibility between donor and individual is crucial in this case as



Blood groups



AB⁺

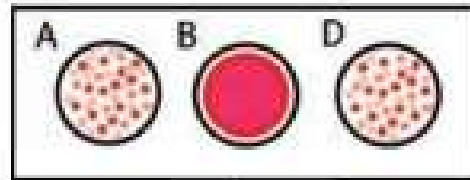


AB⁻

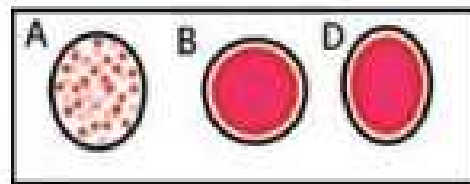
Agglutination

No Agglutination

Blood groups

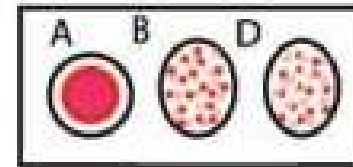


A⁺

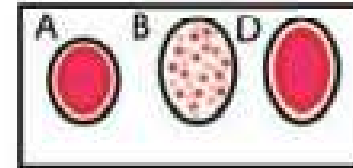


A⁻

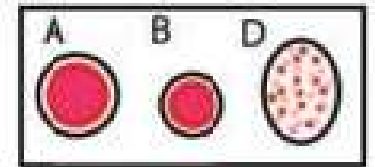
Blood groups



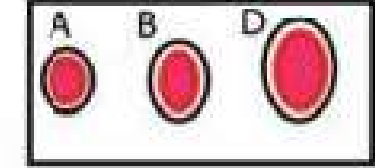
B⁺



B⁻



O⁺









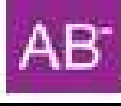

O⁻



COMPATIBILITY OF BLOOD TYPES

		DONOR							
		O-	O+	B-	B+	A-	A+	AB-	AB+
RECIPIENT	AB+	✓	✓	✓	✓	✓	✓	✓	✓
	AB-	✓		✓		✓		✓	
	A+	✓	✓			✓	✓		
	A-	✓				✓			
	B+	✓	✓	✓	✓				
	B-	✓		✓					
	O+	✓	✓						
	O-	✓							



Blood Group	Gives to these groups	Receives from the
	All	O- only
	AB+, A+, B+, O+	O- and O+
	AB-, AB+, A+, A-	O- and A-
	AB+ and A+	O-, O+, A-, A+
	B-, B+, AB-, AB+	O- and B-
	B+ and AB+	O-, O+, B-, B+
	AB- and AB+	O-, A-, B-, AB-
	AB+ only	All



THANKYOU