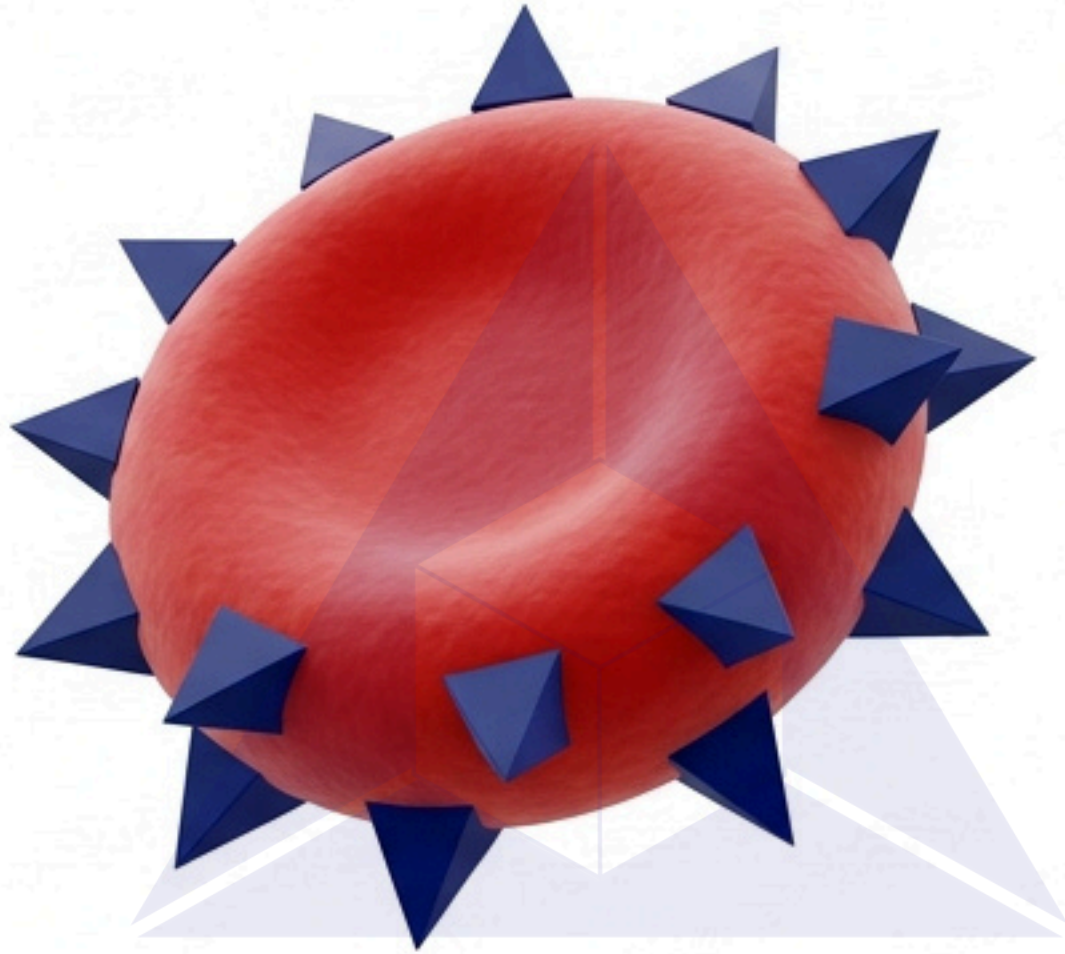


Antigens, Antibodies and Compatibility

The ABO Blood Grouping System

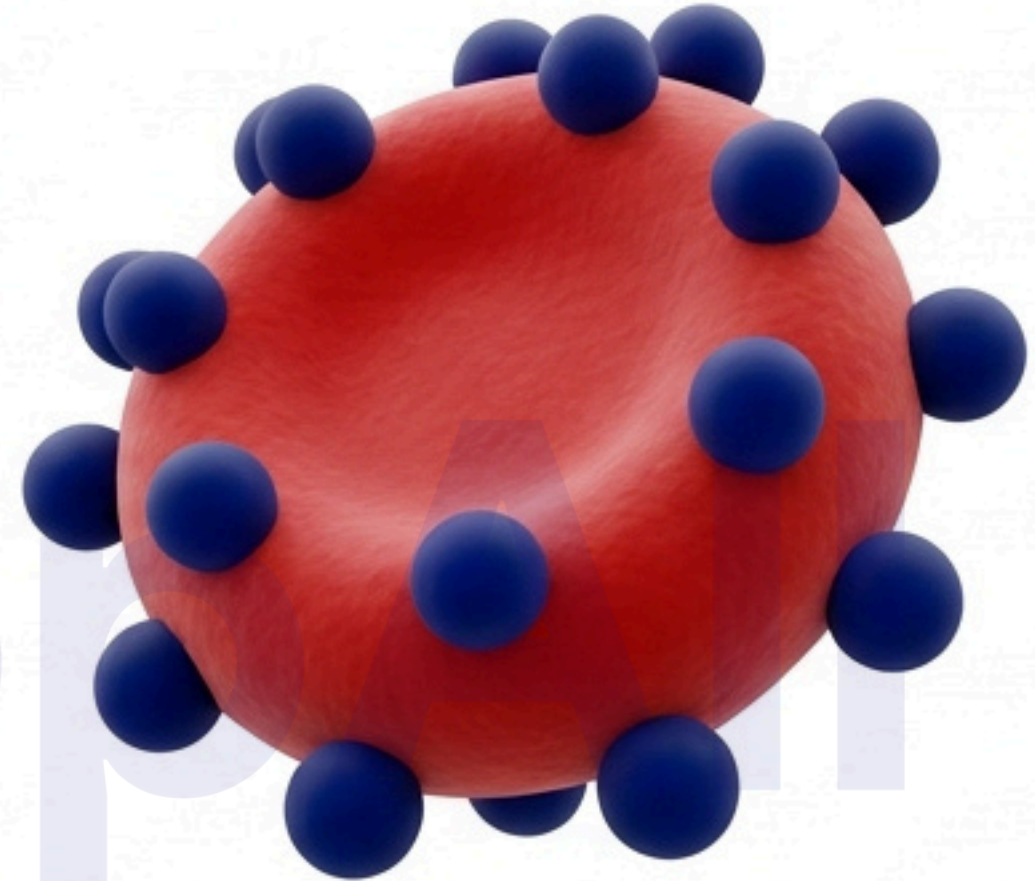
The ABO grouping system is a diagnostic framework based on the precise presence or absence of two surface chemicals on Red Blood Cells.

RBC_SAMPLE_01



ANTIGEN_A

RBC_SAMPLE_02

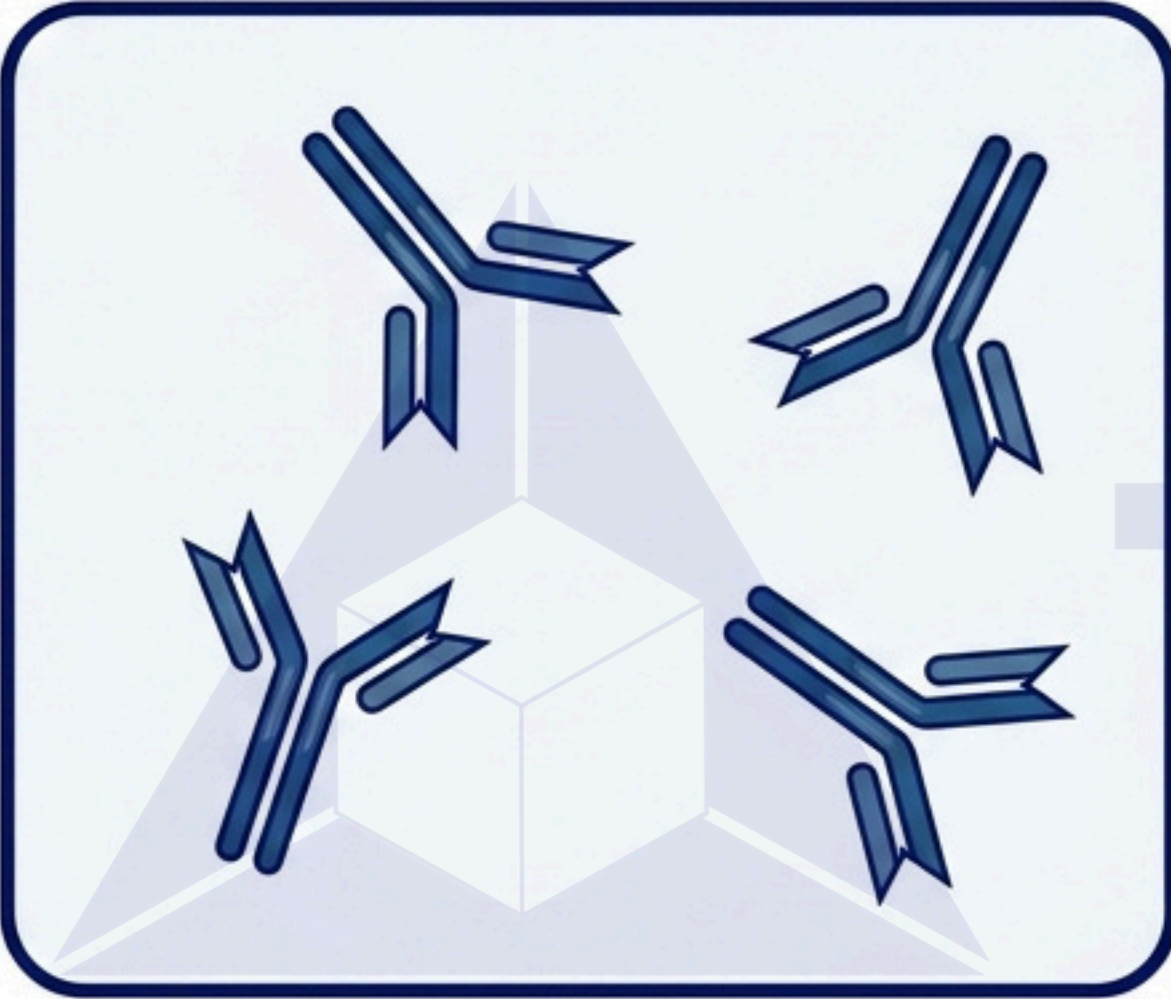


ANTIGEN_B

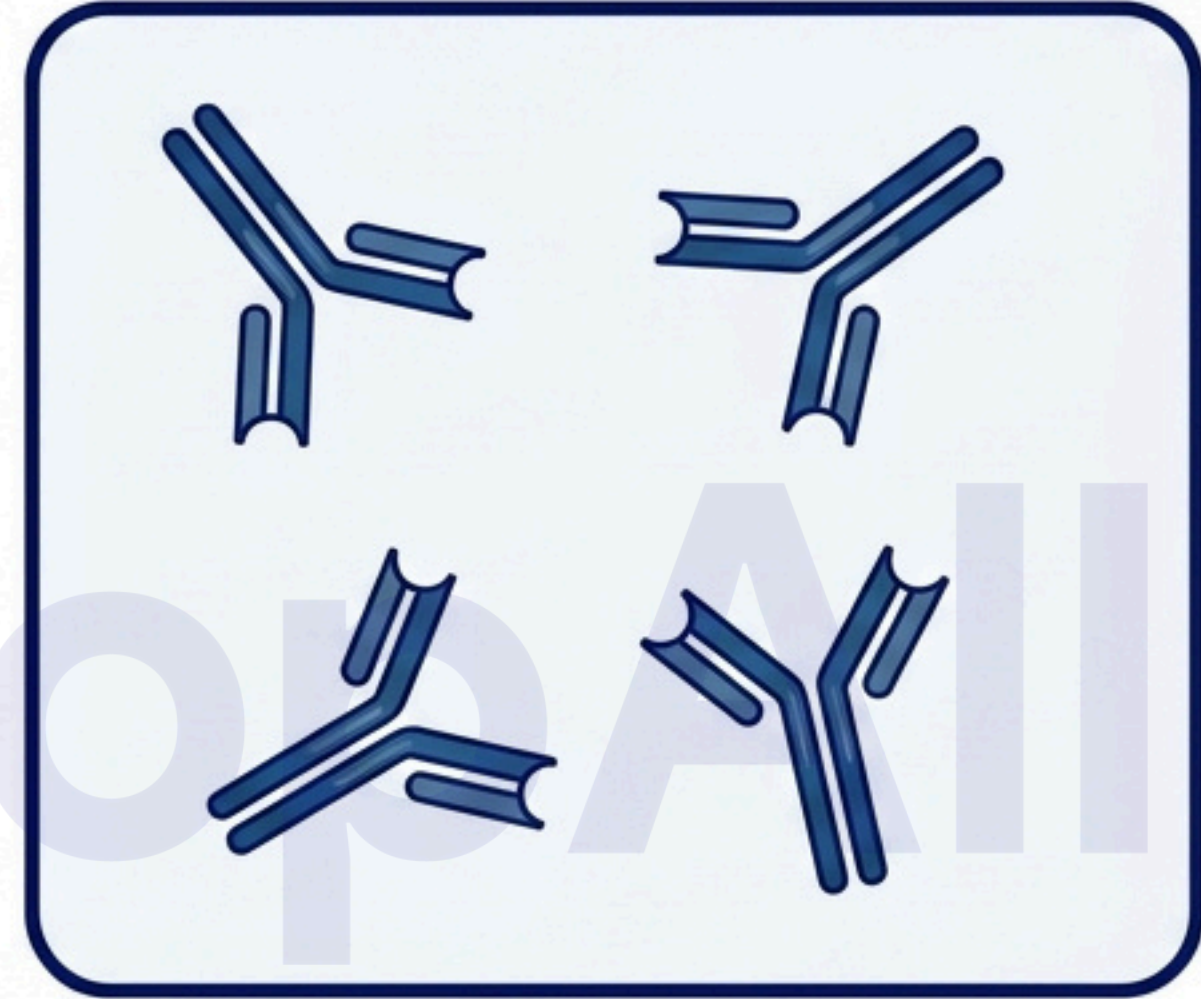


Antigens are chemicals on the RBC surface that can induce an immune response.

Location: Blood Plasma



ANTI-A



ANTI-B

Antibodies are natural proteins produced in response to antigens, present in the blood plasma.



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$$E=mc^2$$



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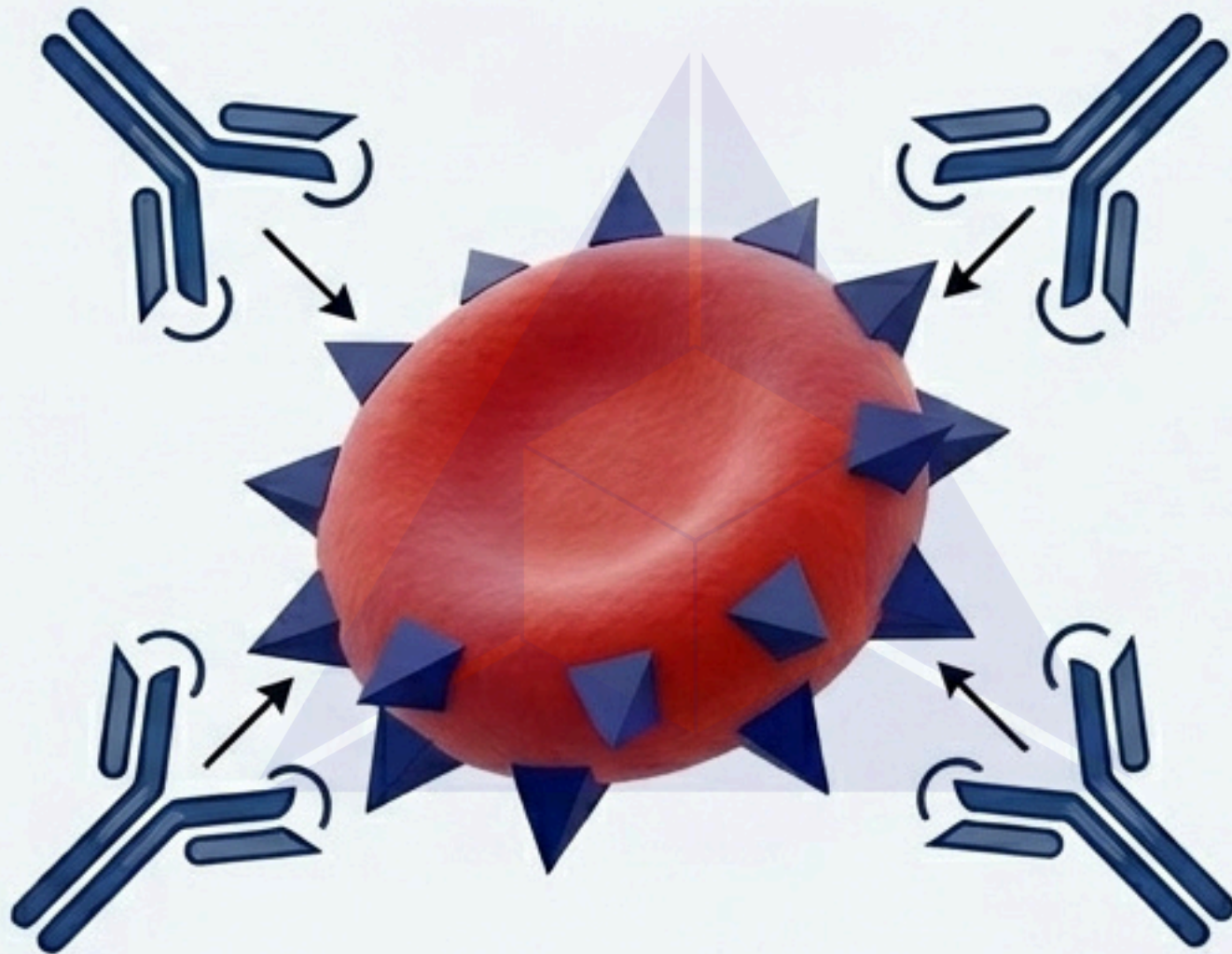
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Key Highlights

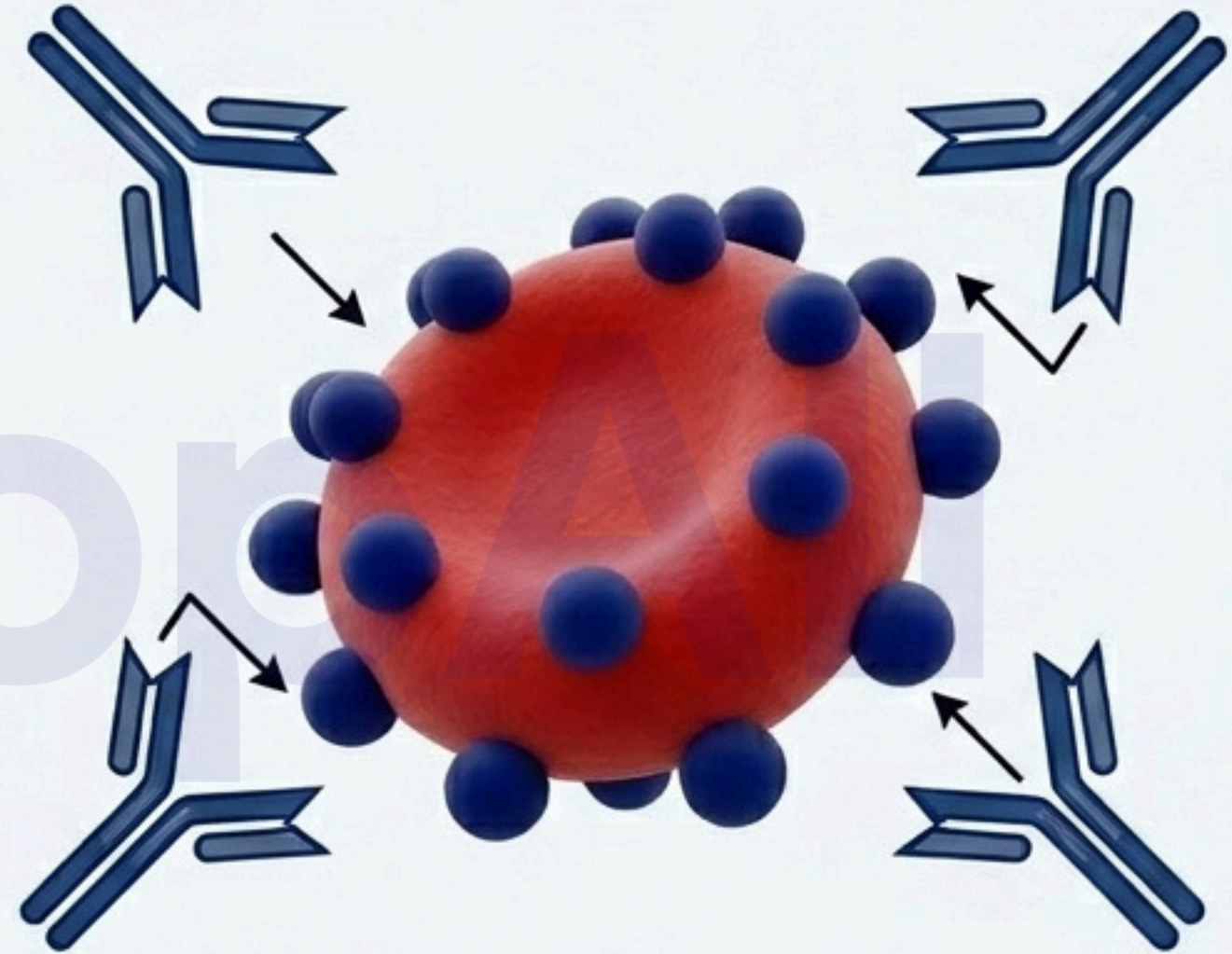
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GROUP A

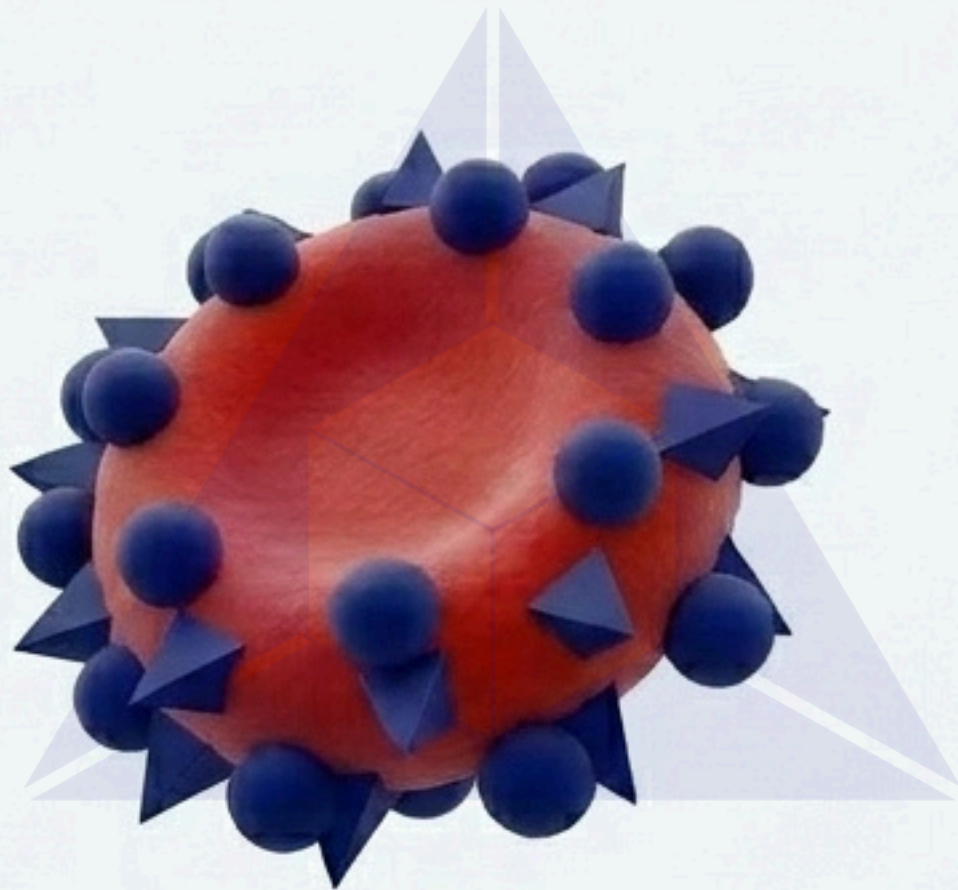


GROUP B



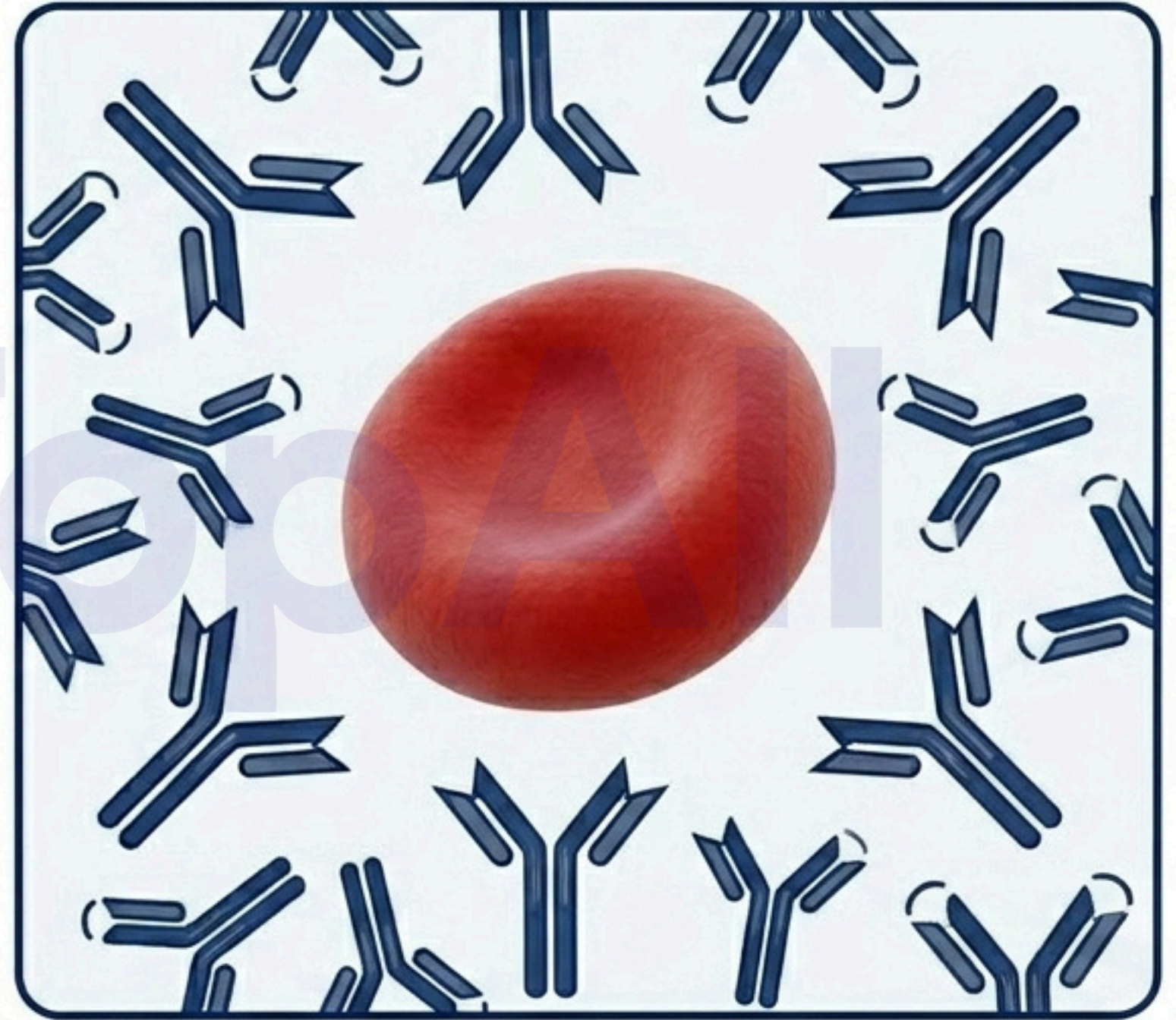
The plasma always contains the opposite antibody.
This ensures the body's natural defense system
does not attack its own cells.

GROUP AB



Antibodies: nil

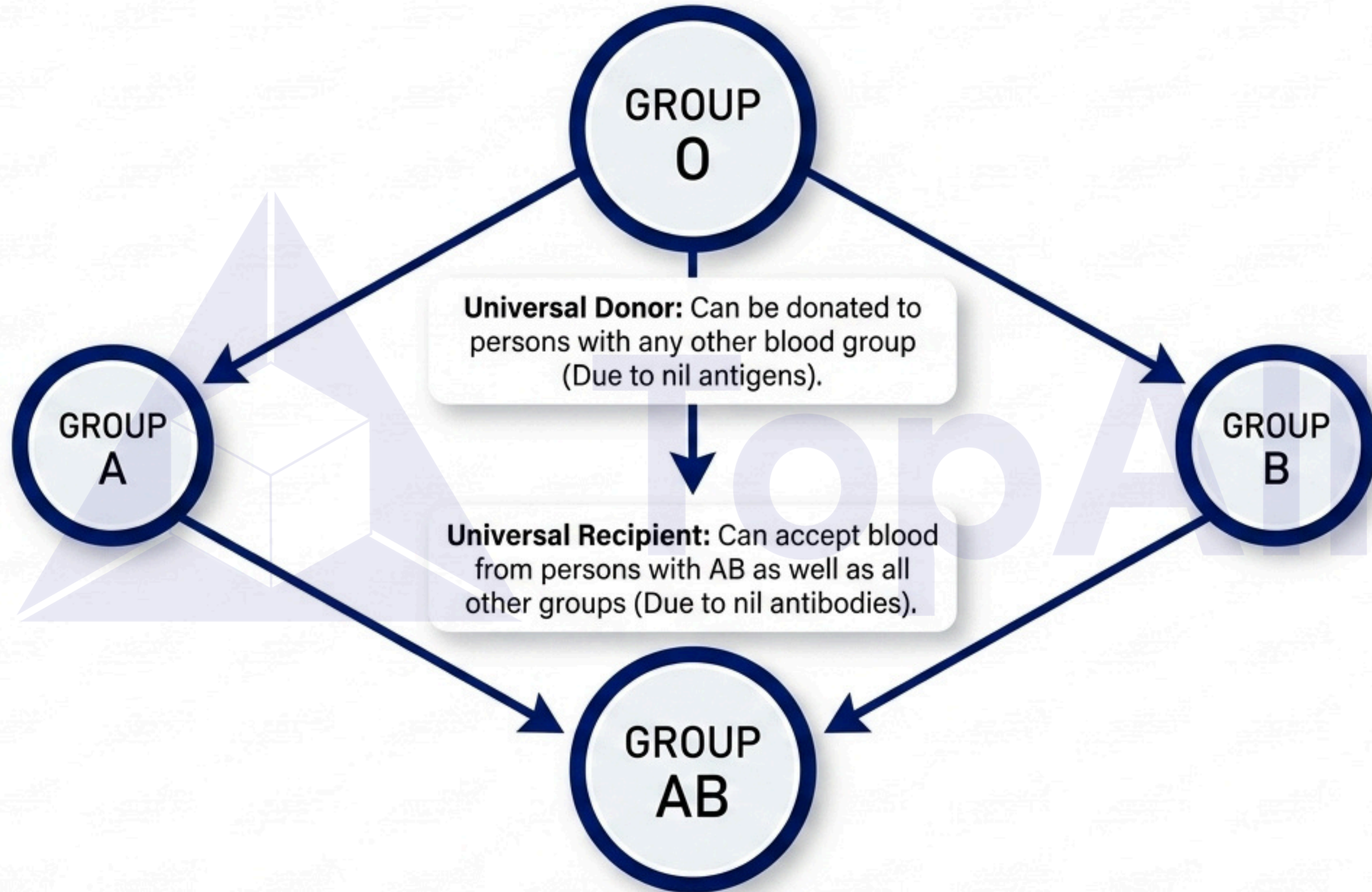
GROUP O



Antigens: nil

Blood Group	Antigens on RBCs	Antibodies in Plasma	Donor's Group
A	A	anti-B	A, 0
B	B	anti-A	B, 0
AB	A, B	nil	AB, A, B, 0
0	nil	anti-A, B	0

Table 15.1: Blood Groups and Donor Compatibility



Blood transfusion requires careful matching of donor and recipient blood to avoid clumping (destruction of RBCs).

The ABO grouping relies on the precise interplay between RBC surface antigens and plasma antibodies to ensure safe, life-saving compatibility.





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