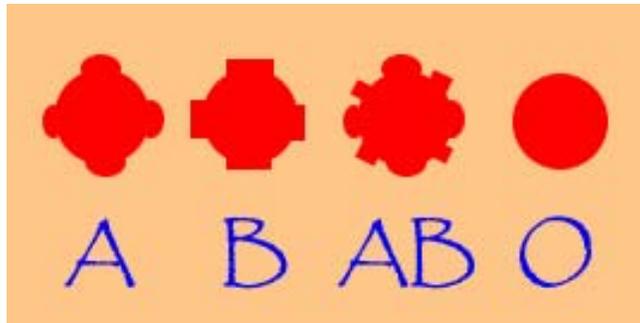


Blood Grouping and Typing

Introduction

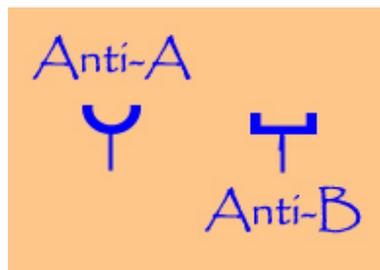
Not all red blood cells are created equally. On the surface of red blood cells (RBC) are glycoproteins. Glycoproteins (GLY koe PRO teens; a combination of carbohydrate and protein) are the compounds used for cell recognition or cell identification. One use of glycoproteins by the body has been as antigens on the surfaces of red blood cells. These antigens are called blood groups: note that I wrote "groups". The blood groups are A, B, AB and O. RBC that are of the Group A persuasion have only that glycoprotein on their surfaces; those with Group B have only the Group B glycoprotein; those that are Group AB, have both glycoproteins; those with Group O lack both glycoproteins. The following graphic illustrates in an elementary manner that these different glycoproteins provide RBC's with unique identifying markers.



The “half-rounds” represent the group A antigen and the “half-boxes” represent the group B antigens.

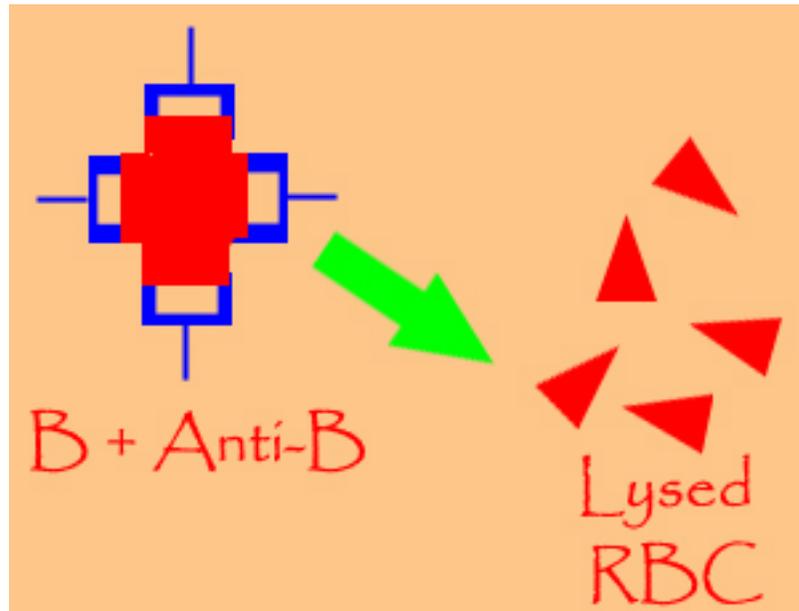
In addition, it is estimated that at least 85% of the population secretes soluble blood group substances in saliva, gastric juice, milk, seminal fluid, urine, ovarian cyst fluid and amniotic fluid. Indeed, before the invention of DNA testing, it was by these substances that people were determined to be at the scene of a crime.

In the plasma of someone with Group A blood are antibodies (the “two-pronged forks” in the graphic) to Group B; the converse is equally true in those with Group B blood.



Group A blood has anti-B in the plasma; Group B blood has anti-A in the plasma; Group AB blood has neither antibody; Group O blood has both antibodies in that plasma.

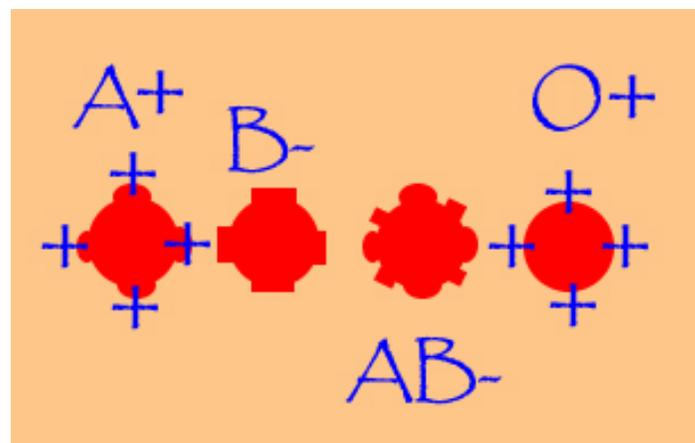
The next graphic shows why it is that those with Group A blood (and, hence, who have anti-B in their blood) can not receive Group B blood [and vice versa].



If a person receives group B blood and they have Group A blood, they will have a transfusion reaction and may die if it's not caught quickly enough. The RBC react with the antibodies and agglutinate. Following agglutination, they lyse and are phagocytized by eosinophils.

Nowadays, packed RBC (pRBC) are given instead of whole blood to minimize other reactions. By doing this, reactions are minimized and may be treated with a higher degree of success.

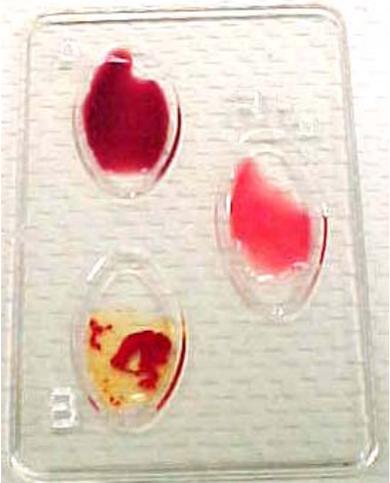
Blood type -- note: "type" -- indicates the presence or absence of the Rh factor, following graphic.



The "+" says that the cell is positive for the Rh factor ("type").

Hence, when someone orders a "type and crossmatch", what they are indicating is that they want to know what the Rh factor is and if other blood will be compatible with it. Tragically, this is not what those ordering that test really want. This has been the ultimate in codependent thinking in medicine: what is really ordered with the phrase "type and crossmatch" is to "group, type and crossmatch"; by virtue of dropping the "group", those who write the orders are asking you to guess what it is they really want even though they haven't been clear in their order, i.e., it's a "mind reading" game designed to trip people up. That's where the communication screw-ups begin and they do not end, which is why all branches of health care are in the states of turmoil and disorganization they are today.

The graphics, below, illustrate some real results for you to examine prior to completing this experiment.

Sample #1: Group A; Type negative – A-	Sample #2: Group B; Type negative – B-	Sample #3: another B-
		

Sample #4: Group O; Type negative – O- (read too soon)	Sample #5 (same as #4 – read a little later): Group O; Type positive (weakly) – O+
	

Experimental

Obtain a lancet, alcohol prep pad, cotton ball, gloves, paper towel, special grouping/typing trays, anti-A, anti-B and anti-D (for type – Rh) and toothpicks. Put one drop of anti-A in the A cup; one drop anti-B in the B cup; and one drop anti-D in the Rho cup. Perform the fingerstick as directed by your instructor. Do this experiment in conjunction with the hematocrit experiment to limit the number of times you get your finger stuck.

After you get to bleeding, put a drop of blood in each cup. Have your lab partner mix the blood with the 3 different anti-sera while you fill your hematocrit tube. When you have completed the hematocrit portion, go back and determine your group and type of your blood – please keep in mind that this may not be 100% accurate: we do not use a plate warmer for the anti-D portion, so you may get a false negative result.

Results

Record your results below:

Blood Group:	Blood Type:	Final Result (e.g., A+):