

The Right Match – You and Your Donor Kidney

Words to Know to Understand the Matching Process

Antibodies: Proteins produced as part of an immune response to a specific foreign substance (antigen) in order to eliminate that foreign substance from the body.

Antibodies are proteins that are produced by your body's immune system or administered to you to protect you from viruses, bacteria, or other substances that the body sees as threatening or foreign. For example, vaccines are given to give you protective antibodies- the Hepatitis B vaccine will give you antibodies to protect you from the Hepatitis B virus if you are ever exposed to this virus.

Antigens: Protein or carbohydrate molecules recognized by the body that can stimulate an immune response if considered different from one's self.

Antigens are proteins that can cause your body's immune system to produce antibodies- if the body thinks that the antigen is foreign or different from one's self. The body usually will not produce antibodies against itself or its own antigens. For example, if you are Blood Type A, you carry the A antigen on your red blood cells, therefore you can get blood from someone with Blood Type A or Blood Type O. Blood Type A has the A antigen on the red blood cells. Blood Type O does not have either the A or the B antigen, therefore you can receive blood from Type O. You cannot receive blood from Blood Type B or AB because your body would see the B antigen as foreign and destroy those B blood cells.

The diagrams below will explain who can get what blood type—this is important in transplant, too, as you can only get an organ from a compatible blood type.

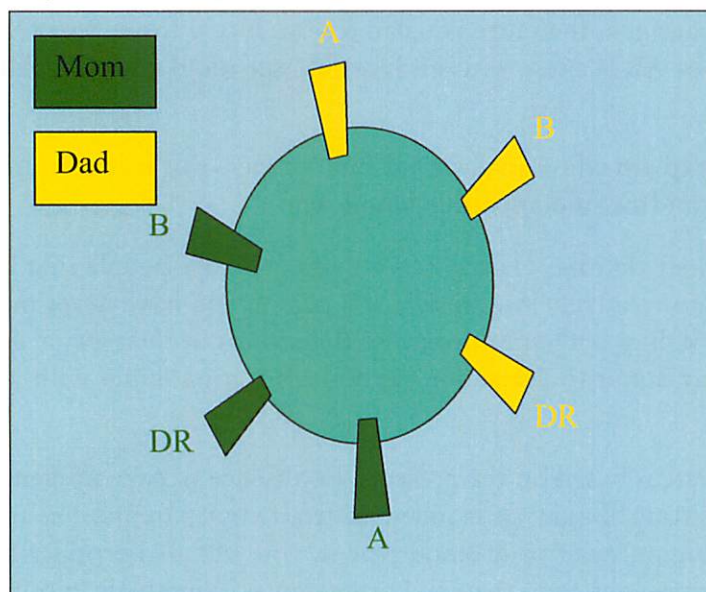
There are two types of kidney donors: 1) deceased donors, who are people that have just died and 2) living donors, who may be a relative, close friend, or a person you have never met that is donating altruistically or through a kidney exchange program. Regardless of the type of donor, blood tests are performed on you and your donor to determine the donor's compatibility with you for transplant. The tests involved are:

1) **ABO:** A blood group system based on the presence or absence of two **antigens** (A and B) on the surface of red blood cells. Your blood type is inherited from your parents. The four blood types are A, B, AB, and O. Depending on what your blood type is, you will also produce **antibodies** against at least one of the blood group antigens, A or B. For example, individuals with type A blood have the A antigen on the surface of their red cells. These individuals have antibodies against the blood group B antigen. If type B blood is introduced into their body, anti-B antibodies in their blood will recognize it as different and destroy those cells. An individual with blood type O does not have either the A or B blood group antigen on the surface of their red cells. Blood type O recipients will produce antibodies to both A and B blood group antigens. If you do not have antibodies to the antigens on the surface of your donor's red cells, then you are ABO compatible. If you have antibodies, then you are ABO incompatible. Your donor must be ABO compatible in order to donate to you. Type O individuals are universal donors and type AB individuals are universal recipients. The following table lists the blood groups and their compatibility.

		Recipient			
Blood Group		A	B	AB	O
Donor	A	Compatible	Incompatible	Compatible	Incompatible
	B	Incompatible	Compatible	Compatible	Incompatible
	AB	Incompatible	Incompatible	Compatible	Incompatible
	O	Compatible	Compatible	Compatible	Compatible

2) **HLA:** In your blood you have cells called lymphocytes. Proteins and carbohydrates are attached to these cells. Some of these are called antigens. In the field of transplantation, we specifically look at Human Leukocyte Antigens, also known as “HLA”. The three major types of HLA that we test for are the A, B and DR antigens. There are many different types of A, B and DR antigens. Each person gets one A, one B and one DR antigen from their mother and one A, one B and one DR antigen from their father (see figure 1). Your A, B, and DR antigens are compared to those of your donor to determine how many antigens the two of you share.

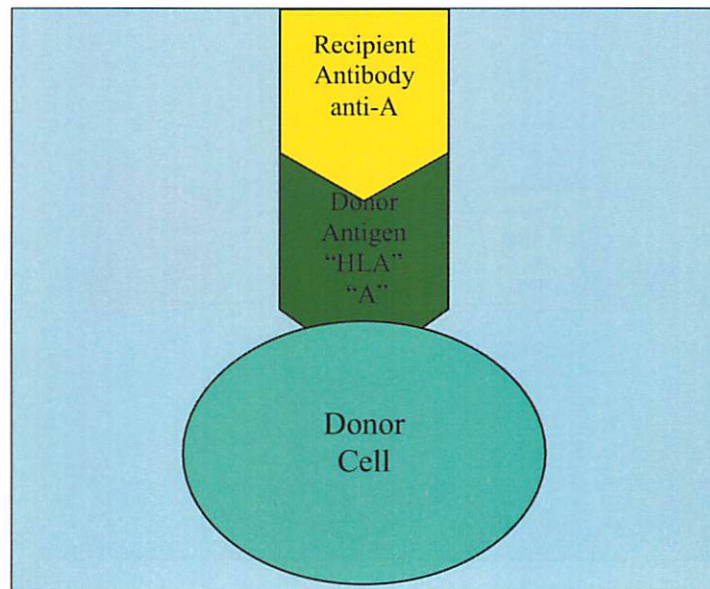
Figure 1: Antigens “HLA” on the surface of a cell



3) **PRA:** When your body sees something that is different from itself, it wants to get rid of it. The body produces proteins called antibodies to what is different. These antibodies attach to antigens (see figure 2). An antibody attached to an antigen on the surface of a cell may cause cell death; this is known as an immune response. There are three reasons you might have antibodies in your blood: a blood transfusion, a pregnancy, or a previous transplant. Tests are performed to screen for the presence of antibodies in your blood. The result of this test is reported as the Panel Reactive Antibody, also known as PRA. This reflects the amount of antibody present in your blood. The higher the percentage the more antibodies you have in your blood. If antibodies are present in your blood, then the antigens that they react with should be avoided when considering your donor.

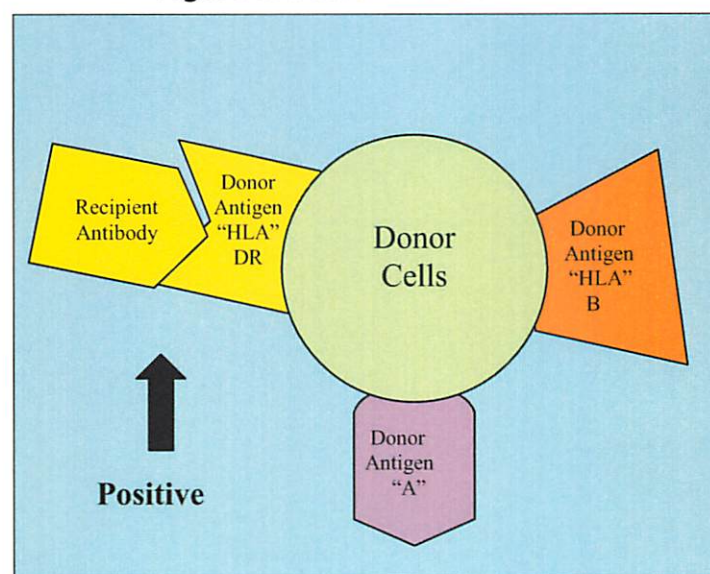
This test is performed regularly while you wait for your kidney transplant because the amount of antibodies in your blood can change over time.

Figure 2: Recipient antibody attaching to donor antigen on the surface of a cell



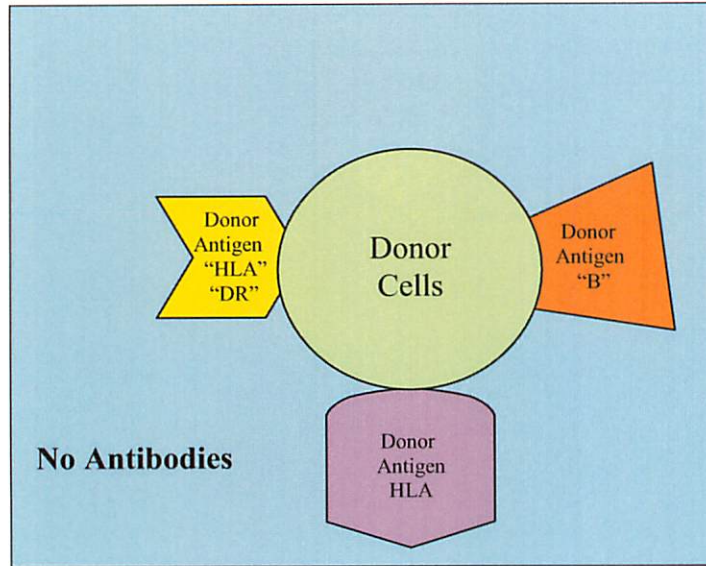
4) **Crossmatch:** Your blood may contain antibodies to your donor's antigens. We perform a test that determines if you have antibodies in your blood that are directed against the antigens on the surface of the donor cells. This test is called a crossmatch. This is the most important test to determine if you and your donor are compatible. If you have antibodies against your donor, the crossmatch will be "positive" (see figure 3). A positive crossmatch means that the donor is not a match for you.

Figure 3: Positive Crossmatch



If you do not have antibodies against your donor, the crossmatch will be “negative” (see figure 4). A negative crossmatch means that you and your donor are compatible.

Figure 4: Negative Crossmatch



All recipient-donor pairs are crossmatched with blood samples obtained just prior to transplant. This is done to minimize the risk of an immune response by your body to the donated kidney. Your transplant team uses these tests and many others to decide if a donor kidney is appropriate for you.