

**HLA Typing, Crossmatching and Transplantation**  
**Frequently Asked Questions**

**Quick Definitions:**

HLA: human leukocyte antigen  
 PRA: panel reactive antibody

‘Positive’: there is a reaction – this is not good when looking at these tests  
 ‘Negative’: there is no reaction – this is good with these tests

**What is HLA?**

**HLA** stands for human leukocyte antigen. These **antigens** are proteins found on most cells in your body including on the cells of your organs. Combinations of these antigens are part of your genetic make-up and the number of possible combinations in the world is enormous. HLA is an important part of your immune system. We look at it during your assessment since it may impact the success of the transplant.

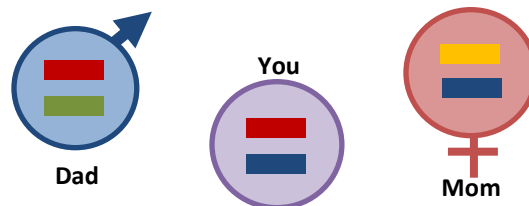
**Where does my HLA come from?**

Your HLA make-up is inherited from your parents.

Let’s look at these four blocks as four different groups of HLA antigens.

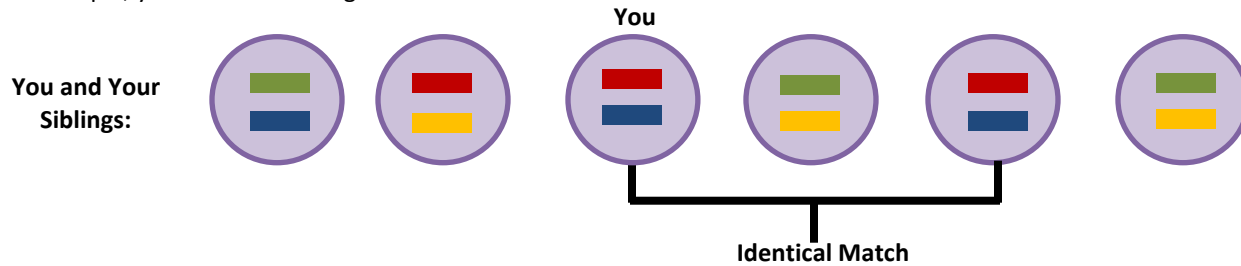


Both your mother and father will have specific groups of HLA antigens. The children will inherit one group from each parent.



**Can someone else have the same HLA as me?**

Yes. This is called an “HLA identical match” and it occurs when two children inherit the same combination of HLA antigens. In this example, you have five siblings and have an identical match with one of them.



You will **ALWAYS** have a partial match with both of your biological parents.

You have a **25%** chance of having an **identical** match with any one of your brothers or sisters.

You have a **50%** chance of having a **partial** match with any one of your brothers or sisters.

You have a **25%** chance of **not matching** at all with any one of your brothers or sisters.

When we start to compare your HLA to relatives who are more distant than your full siblings (e.g. half siblings, aunts and uncles, cousins), the chances of an identical or partial match decrease.

When we compare your HLA to the general public, your chances of an identical or partial match decrease further.

**Do I need a perfect HLA match for transplant?**

No. The closer the match between donor and recipient, the greater the chance of success. That does not mean you can only use organs from a donor with a perfect match. Most transplants are not a perfect match. Transplant recipients are closely followed after transplant. Treatment is managed by how your body reacts to the new transplanted organ.

**Can HLA identify biological relationships?**

In the case of parent/child donation, it can unexpectedly be discovered through HLA typing that the parent and the child are not biologically related. Since this information does not influence how well the transplant will do or how your transplant is managed, the Transplant Team at LHSC will not disclose this information to you.

**How does my body react to a transplanted organ?**

Your immune system will react by producing antibodies if it sees anything that doesn’t belong in your body. Antibodies are the soldiers in your body’s army protecting you from foreign invaders such as viruses. Unfortunately, the antibodies cannot tell the difference between the foreign antigens on harmful viruses and the foreign antigens (e.g. HLA) on helpful transplanted organs. We use medications or specialized treatments to reduce the immune response against the foreign HLA antigens on your transplanted organ.

**What is crossmatching?**

Some people have antibodies to foreign HLA antigens before ever having a transplant. This can happen if you have had blood transfusions, a previous transplant or pregnancies. Before you receive a transplant, it is important to see if any of these antibodies exist in your body and if they will react against your potential donor's HLA. Crossmatch is one test that helps us to determine if you are compatible with your donor. For this, the laboratory technologists will mix a small amount of your blood with a small amount of the donor's blood.

**What does the crossmatch result mean to me?**

**If you have a negative crossmatch, you are a match to that donor.** We did not detect enough antibodies in your blood to launch a significant attack against the donor's HLA on the transplanted organ. A negative crossmatch does not guarantee that you will never reject the organ but we believe the risk of rejection is much lower.

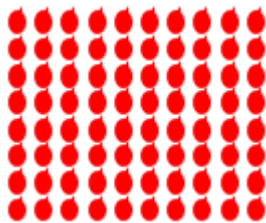
**If you have a positive crossmatch against your potential donor, you are not a match.** This means that your blood reacted to the donor's blood. This tells us there is a higher chance that your antibodies will attack the donor's HLA on the transplanted organ. When your antibodies attack the transplanted organ, this is called rejection. If the transplant team identifies a positive crossmatch with your donor, they are not likely to proceed with the transplant and you will have to wait for another donor.

**What if the positive crossmatch is with my living kidney donor?**

In Canada, we have a program called Kidney Paired Donation (KPD) run by the Canadian Blood Services. If you do not match with your potential living kidney donor, you can be registered in this program. You and your donor's HLA can be compared to other pairs in Canada for a possible match. If there is a match, your team can look at the possibility of a kidney exchange. Talk to your transplant team to see if this is an option.

**What is PRA?**

You may hear the term "**PRA**" when being assessed for transplantation. PRA stands for panel reactive antibody. It measures how many different HLA antibodies you have or how many people you likely will have a positive crossmatch against. A PRA of 0 means that we cannot detect any antibodies in you that would attack donor HLA and you can likely accept any otherwise matched donor organ. If you have a PRA of 98, you have only a 2% chance of finding a donor that is an acceptable match to you. The higher your PRA is, the more 'sensitized' you are. If your PRA is greater than 98, you are considered "highly sensitized".



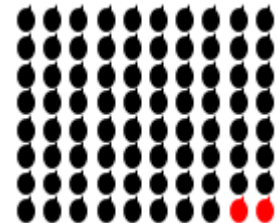
No antibodies against panel samples  
(PRA = 0%)

You shouldn't react with any donors



Antibodies against 10 panel samples  
(PRA = 10%)

10% chance of reacting to a donor  
90% chance the donor may be acceptable for you



Antibodies against 98 panel samples  
(PRA = 98%)

98% chance of reacting to a donor  
2% chance the donor may be acceptable for you

**What happens if I have a high PRA?**

If your PRA is high, unfortunately you will have a lower chance of matching with a donor. In most cases there is no treatment available to help change your PRA. If there is a treatment option for you, your transplant team will discuss this with you. To help increase your chance of finding a donor match, the Canadian Blood Services have a program called the Highly Sensitized Patient (HSP) Program. In Canada, a high PRA will give you priority across Canada on both the kidney and heart transplant waiting lists.

This means that while you have a lower chance of matching with someone in the London area, you have a greater chance of matching with someone in Canada because there are more possible donors. Each year in Canada, many organs are shared across provinces to help patients with a high PRA who are critically in need of a transplant.

**Can my antibody levels change?**

Yes. Your antibodies can increase every time you have a transfusion, transplant or pregnancy. Likewise, your antibody level may decrease with the passing of time since your last exposure (transfusion, transplant or pregnancy). The transplant team will check your PRA regularly to see what your antibody levels are. It is important that blood samples are regularly sent to the Transplant Lab (monthly for patients waiting for a kidney transplant).