You will have 4 tests that will determine how compatible you are with a potential donor.

This chapter describes those tests and how the results are used.

Tissue Matching
For your kidney/pancreas transplant

What does “donor compatibility” mean?

Every body is unique, and each one has a built-in immune system that recognizes and protects the body against substances that could harm it. The main job of the immune system is to prevent infections.

Your immune system is programmed by your genes, or DNA, to recognize or react against things that are different from or foreign to your body. Since the transplanted organ came from another person’s body, your immune system would recognize it as something foreign to you and would try to destroy it. You will receive immune suppressant medications to help prevent your immune system from reacting against or rejecting a transplanted organ.

As part of your evaluation for transplantation, you will have blood tests, including tissue matching, to evaluate aspects of your immune system. These tests are done to see whether or not you and a potential donor are compatible (similar). The more compatible you are to a potential donor, the lower the chance your body will reject an organ from that donor.

Three components of your immune system are tested to determine whether a certain donor is compatible to you:

- Blood type
- Blood antibodies that may react against the donor organ
- Tissue type

Compatibility Tests

You will have 4 tests to check for compatibility with your potential donor. They are:

Blood Type (ABO) Compatibility

Blood samples from both you and the potential donor are tested to make sure the blood types are compatible. The chart on page 5-2 shows which blood types are usually compatible for receiving from and donating to other blood types.
Guide to Your Kidney/Pancreas Transplant
Tissue Matching

<table>
<thead>
<tr>
<th>Blood Type</th>
<th>Can Receive From</th>
<th>Can Donate To</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>O, A2</td>
<td>O, A, B, AB</td>
</tr>
<tr>
<td>A</td>
<td>A, O</td>
<td>A, AB</td>
</tr>
<tr>
<td>B</td>
<td>B, O, A2</td>
<td>B, AB</td>
</tr>
<tr>
<td>AB</td>
<td>O, A, B, AB</td>
<td>AB</td>
</tr>
</tbody>
</table>

Blood type O is compatible to donate to all other blood types. It is called the “universal donor.” Blood type AB is compatible to receive from all other blood types. It is called the “universal recipient.”

Some people with blood type A have slightly different proteins on their red blood cells that make their blood look like blood type O to the immune system. This is called an “A2 subtype.” People with A2 blood subtype may be able to donate to people with blood types O and A.

The Rh factor of the blood (listed as negative or positive) does not need to match for the donor to be compatible.

**Antibody Testing**

Antibodies are proteins in the blood that identify and react against a foreign object in your body. These foreign objects are usually proteins called *antigens*.

Antibodies that react against human tissue, as with a transplant, are usually directed against human leukocyte antigens (HLAs). Your body usually does not make antibodies against HLA unless your immune system has been exposed to them before. Events that can cause your body to produce these types of antibodies include pregnancies, blood transfusions, infections, or a previous organ transplant.

There are 2 types of tests to find out if you make antibodies against HLA:

**Panel Reactive Antibody (PRA) Test**

The PRA test compares your blood to the “tissue” (in this case, the white blood cells) of people who have donated blood. This shows how reactive (sensitive) your immune system is against HLA.

The more people you react against, the higher chance you may have of rejection when you do get a transplant, and the more immune suppressant medication you may need. It may also be more difficult to match you with a donor, and this may make your wait for a transplant longer.

Pregnancy, blood transfusions, and infections can make your immune system more sensitive to HLA. If you become pregnant or have a blood transfusion or infection after you have completed your PRA test, contact your transplant nurse coordinator. You may need to have another PRA test done.
Cross Matching

The second test for antibodies against HLA is called cross matching. Instead of testing against many people in a random sample, this test compares your blood to a specific donor. This can be a living donor or a deceased donor.

With a living donor, cross matching is done early in the evaluation process to see if that donor is compatible with you. With a deceased donor, your blood is tested against the donor’s blood at the time an organ becomes available to you.

If you have antibodies in your blood that react against the donor’s blood, this is called a “positive cross match.” A positive cross match usually means you cannot receive an organ from that donor since the antibodies in your blood would cause rejection of the donor organ right away.

In some cases, a treatment can be done to remove the antibodies and keep more of them from forming. This treatment may allow organ transplant from a specific living donor. This option will be discussed with you if it applies to your situation. But even with this treatment, the antibodies may return, making the risk of organ rejection higher than if the antibodies were never present.

Tissue Typing: Human Leukocyte Antigen (HLA)

HLAs are antigens (proteins) found on human tissue or cells. They are recognized by the immune system and can cause a reaction, which can lead to organ rejection.

Antigens are coded by your genes and are unique for every person. In general, the more closely related you are to someone, the fewer genetic differences you have and the more similar your antigens are. This means your immune system is more likely to accept an organ from a donor who is related to you.

HLA is coded for by chromosome 6, which is part of your DNA. Each chromosome has 2 parts, called haplotypes. A person inherits 1 haplotype from each parent, so you can think of yourself as a “half match” with each parent. Each part of chromosome 6 has 3 types of HLA genes: A, B, and DR. Since there are 2 parts of the chromosome, there are a total of 6 HLA antigens coded in for every person.

HLA matching was more important in the early days of transplant surgery because strong anti-rejection medications were not available. Today, we have much stronger anti-rejection medications, making HLA matching less of a factor in how well someone does after transplantation, especially in the short term. HLA does matter in the long term and is also related to the amount of immunosuppression medications needed to prevent rejection.
Questions?

Your questions are important. Call your doctor or health care provider if you have questions or concerns. UWMC clinic staff are also available to help.

Transplant Services:
206-598-8881

A “perfect match” would seem ideal when receiving an organ from a deceased or non-relative donor, but there is not a large difference in transplant outcomes between matches that are perfect and those that are not. If a donor is related to you, there is an advantage even if the match is not perfect, since you may have other genes in common that are not measured. These genes may make your transplant more successful.