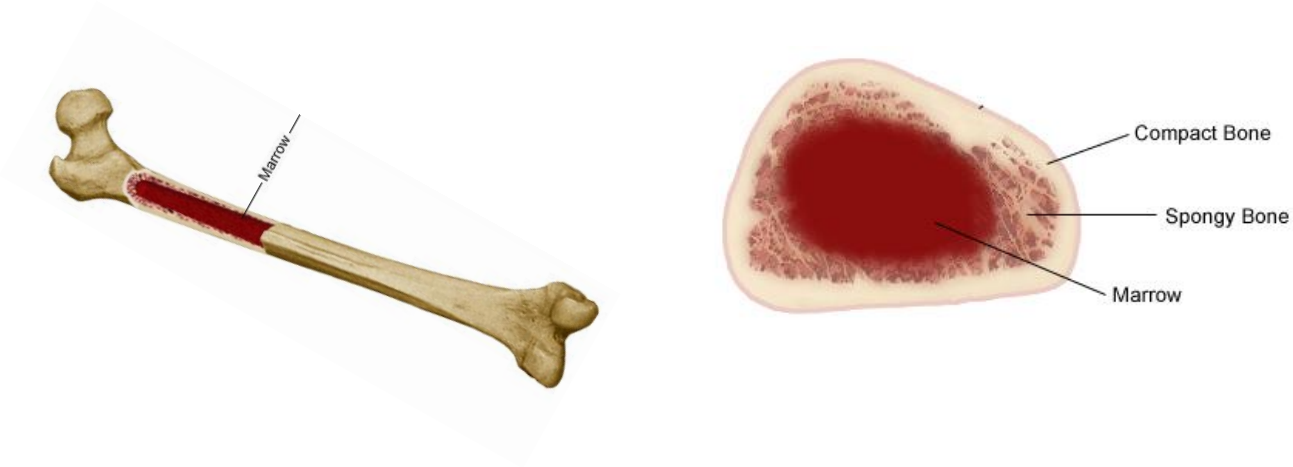
What Donors Need to Know About Human Leukocyte Antigens (HLA) Typing



What are Stem Cells?

Stem cells are immature cells that develop into mature blood cells. Most often stem cells are found in the bone marrow. Bone marrow is a sponge-like material found inside our bones (see the pictures above). Stem cells can also be found in the in the blood stream or umbilical cord. Stem cells are used for bone marrow transplant (also known as stem cell transplant) and can be collected from the bone marrow, blood steam, or umbilical cord.

What is HLA (Human Leukocyte Antigens)?

People have different sets of proteins found on the surface of their cells. These proteins are called HLA and are inherited from parents. Antigens help the immune system mark which cells belong in the body and which do not.

What is HLA Typing?

HLA typing is a special blood test used to identify human leukocyte antigens. The donor's and the patient's HLA types need to be known before the patient can have a bone marrow transplant. We do this by taking a sample of your blood or other body tissue cells. Transplanted stem cells from the donor need to match a patient's own stem cells as closely as possible in order to decrease side effects recipients may have from a bone marrow transplant.

Finding the Best Match

It is important in bone marrow transplant to see how closely your HLA type matches the HLA type of the transplant patient. There are more than 2500 different HLA that exist. The HLA match is the number of HLA that any two people have in common for bone marrow transplant. HLA matching is most often based on ten HLA. The more antigens two people share, the better the match. A good match means the two immune systems will not see each other as foreign and are less likely to attack each other.

Full siblings (that is, brothers and sisters who have the same mother and same father) are most likely to be HLA-matched. If two siblings inherit the very same HLA from both parents, they are said to be a HLA identical match.

You have a 25% (one in four) chance of being a HLA identical match with your sibling. Why? There is a basic rule in HLA inheritance. You have a:

- 25% chance of inheriting the **same** HLA as your sibling
- 25% chance of inheriting **none** of the same HLA as your sibling
- 50% chance of inheriting **half** of the same HLA as your sibling.

When a doctor decides that a transplant is the best treatment for a patient, the patient, and each of his or her eligible siblings will have samples collected for HLA typing. If one of the family members is a HLA match, the lab will do further testing to be sure that they are the best match possible.

If none of the siblings are a good HLA match, the doctor will sometimes ask to have more family members tested. Since HLA type is inherited from parents and passed on to children, parents and children have the next best chance of being closely HLA matched. If there are no close HLA matches within the patient's family, a search can be started to find an unrelated donor with the same HLA as the patient. Although it is less likely, it is possible that the patient could have some of the same HLA as someone not related to them.

Any family member HLA tested may incur a fee.

The information above is adapted from The Seattle Cancer Care Alliance Web site.

