

## Donor & Compatibility

### • Criteria

#### Matching transplantation barriers

- Best results with **HLA-matched** (identical or compatible for the HLA antigens) identification of the most compatible donor by HLA typing is the first priority
- Incompatible blood groups antigens do not represent a transplantation barrier in HSCT.
- minor histocompatibility antigens are not taken into account because the number of minor histocompatible antigens is too high to expect that some donors will be better matched than others and to date, there is little evidence that being mismatched for a particular minor antigen is less favorable than being mismatched for another.
- Other criteria as such viral status, age, gender, ... are only taken into account when several HLA-identical donors are available

#### -HLA typing: analysis of HLA class I and II genes expressed

Serological typing is performed with sera of multiparous women or of immunized blood donors. the antibodies do not discriminate all the existing HLA-alleles (**low resolution typing**). These hidden differences are recognized by allogeneic T cells and can be at the origin of post transplant complications.

#### Molecular typing (genomic DNA typing techniques)

- **High resolution typing** reveals virtually all incompatibilities through analysis of the sequences (PCR) of the HLA-genes

### • Search for a histocompatible donor

- The first search is done within the family (the chance that a sibling is HLA compatible is 25% owed to the inheritance of HLA genes in haplotypes)
- when no compatible family donor is identified, a search for an unrelated donor can be performed; the donor registries contain the HLA data of more than 5 million individuals, the chance of finding a donor matched for HLA A, B, C, DR and DQ is approximately 40%

Complications in transplants with HSC of matched unrelated donors are more severe than with HSC of HLA-matched sibling transplants.

### • Sources of HSC

- HSC can be harvested by aspiration from the bone marrow
- To date, most transplantation are performed with HSC from the peripheral blood (peripheral blood stem cells or PBSC) after recruitment from the marrow by injecting a recombinant growth factor (G-CSF)
- Umbilical cord blood may be an alternative source of HSC in a situation where no HLA-matched donor is available. Cord bloods are seldom HLA-matched but these incompatibilities cause less GVHD

## Recipient & Transplantation

- Hematopoiesis
- Type of transplant
- Indications
- **Decision to treat**
- Conditioning
- Transplantation

## Transplantation barriers

- Structures recognized
  - MHC
  - mHC
- Allorecognition
  - T cells
  - B cells
  - NK cells

## Immunosuppression

- Immunosuppressive drugs
- T cell depletion

## Complications

- Graft rejection
- GVHD
- Infections
- Side effects
- Relapse

## Reconstitution

- Engraftment
- Myeloid cells
- T cells
- B cells
- Chimerism

## LERANING OBJECTIVES

- Levels of histoincompatibilities