

Allogeneic stem cell transplantation

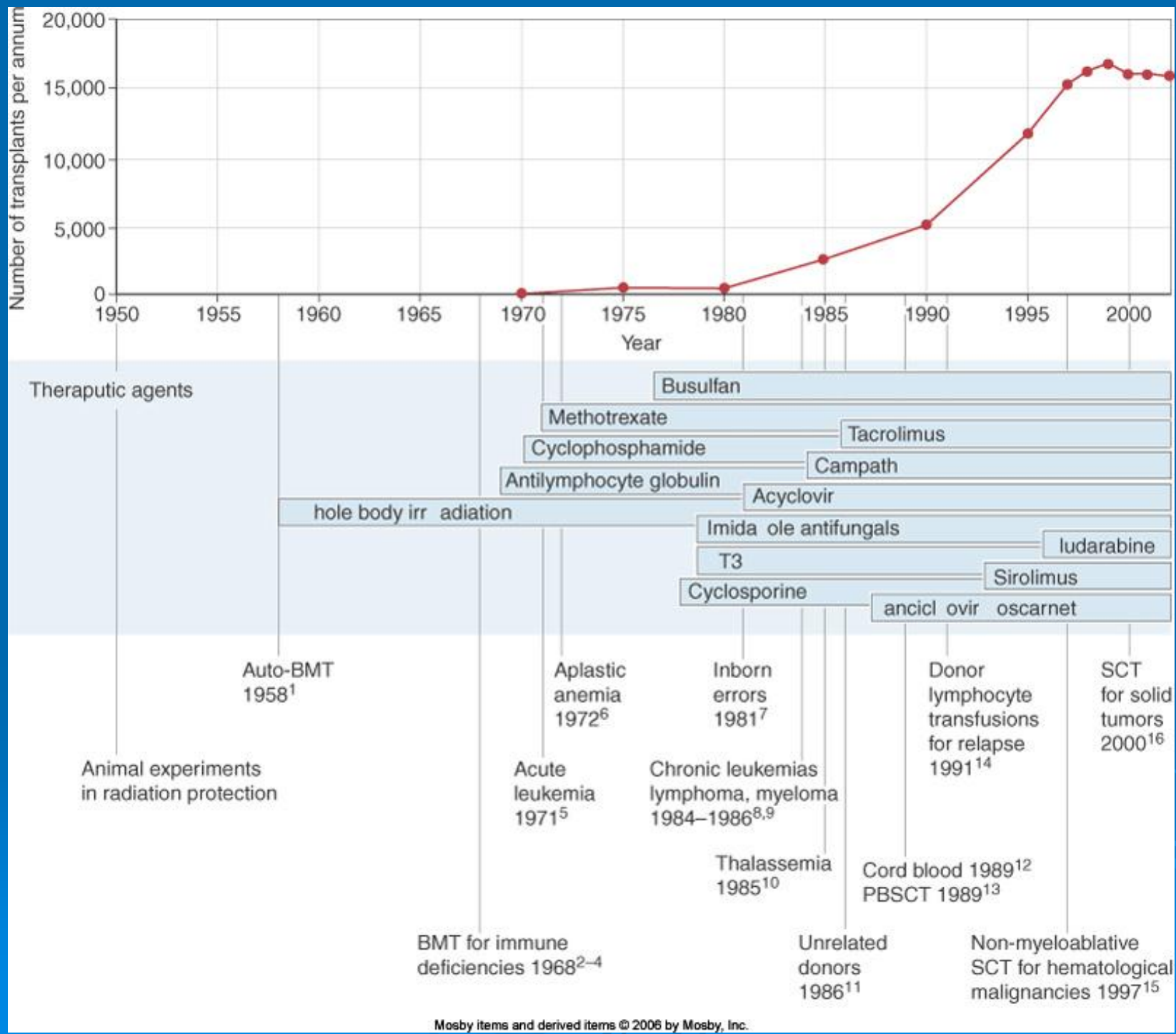
Achievements and prospects

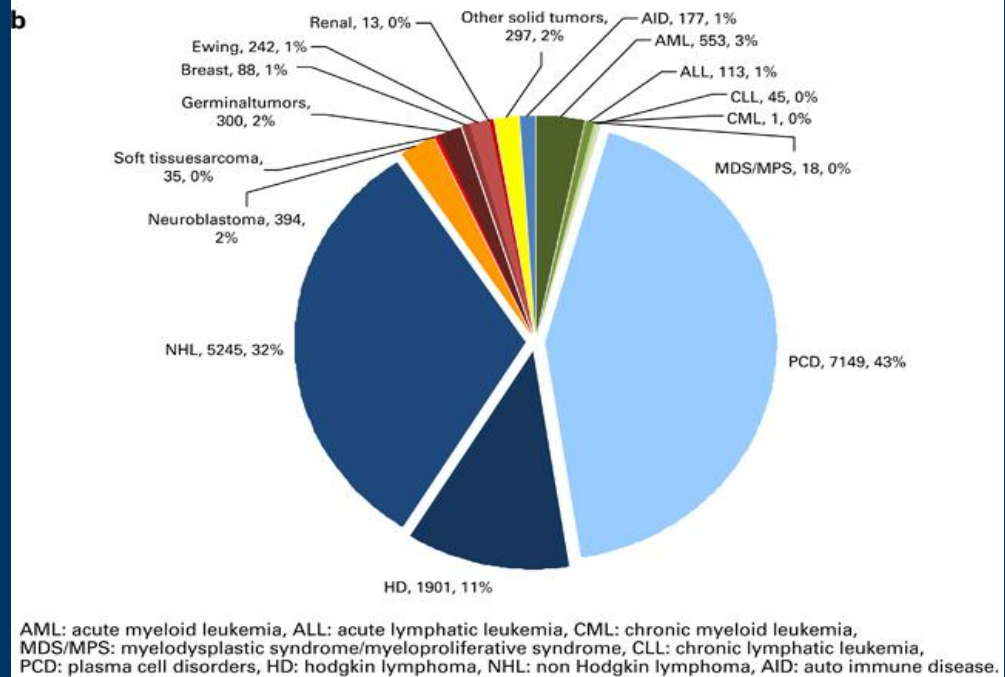
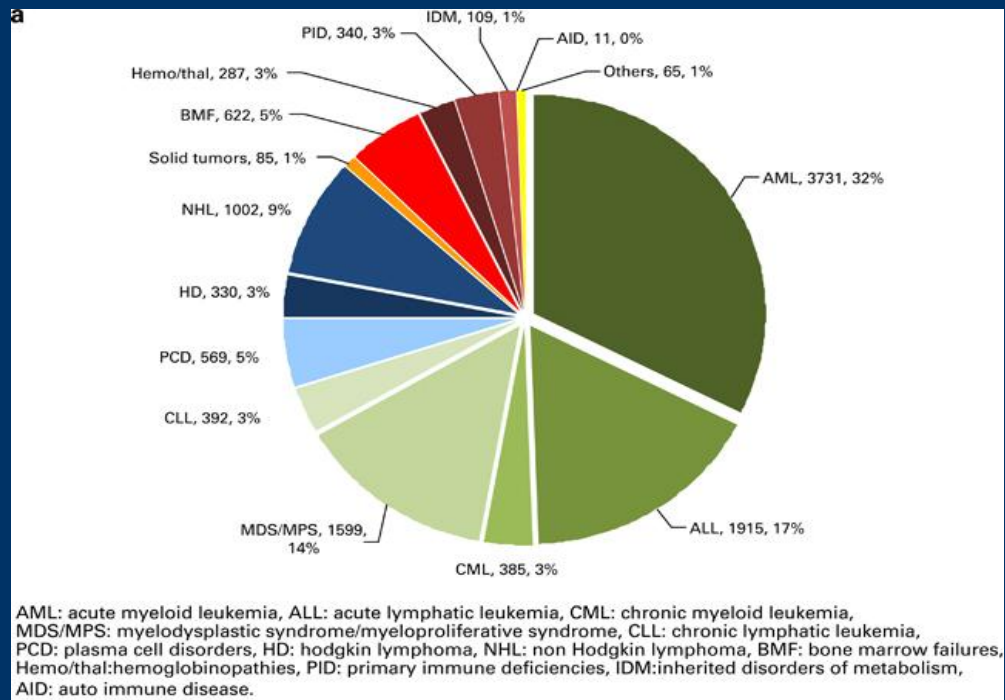
PROF.DR. COLITA DAN

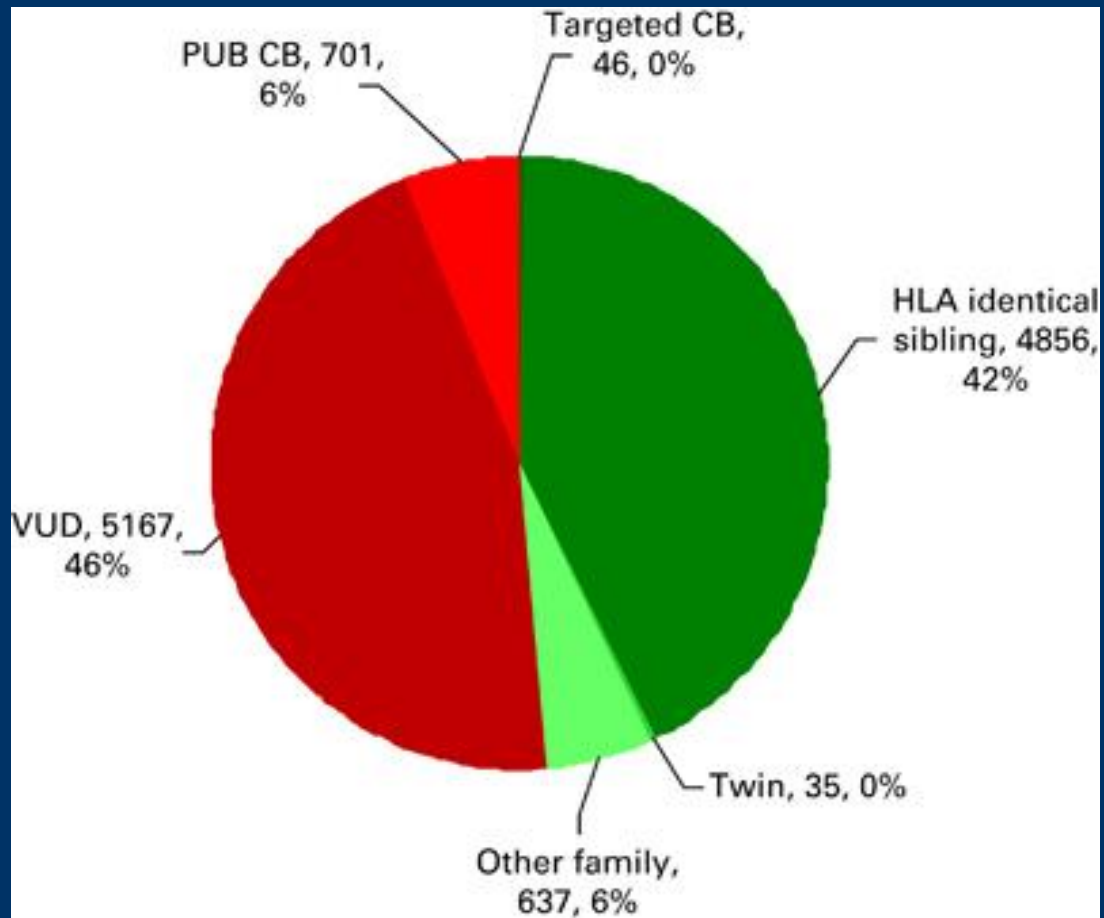
* Center of Bone Marrow Transplantation, Fundeni Clinical Institute, Bucharest, Romania

Definition

- Replacement of malignant hematopoiesis with normal hematopoiesis from healthy donor, by transplanting hematopoietic progenitor cells which have the ability to proliferate and repopulate the marrow spaces.
 - “Conditioning” regimen with two roles: myeloablation (creating “space”) and immunosuppression (acceptance of the graft)
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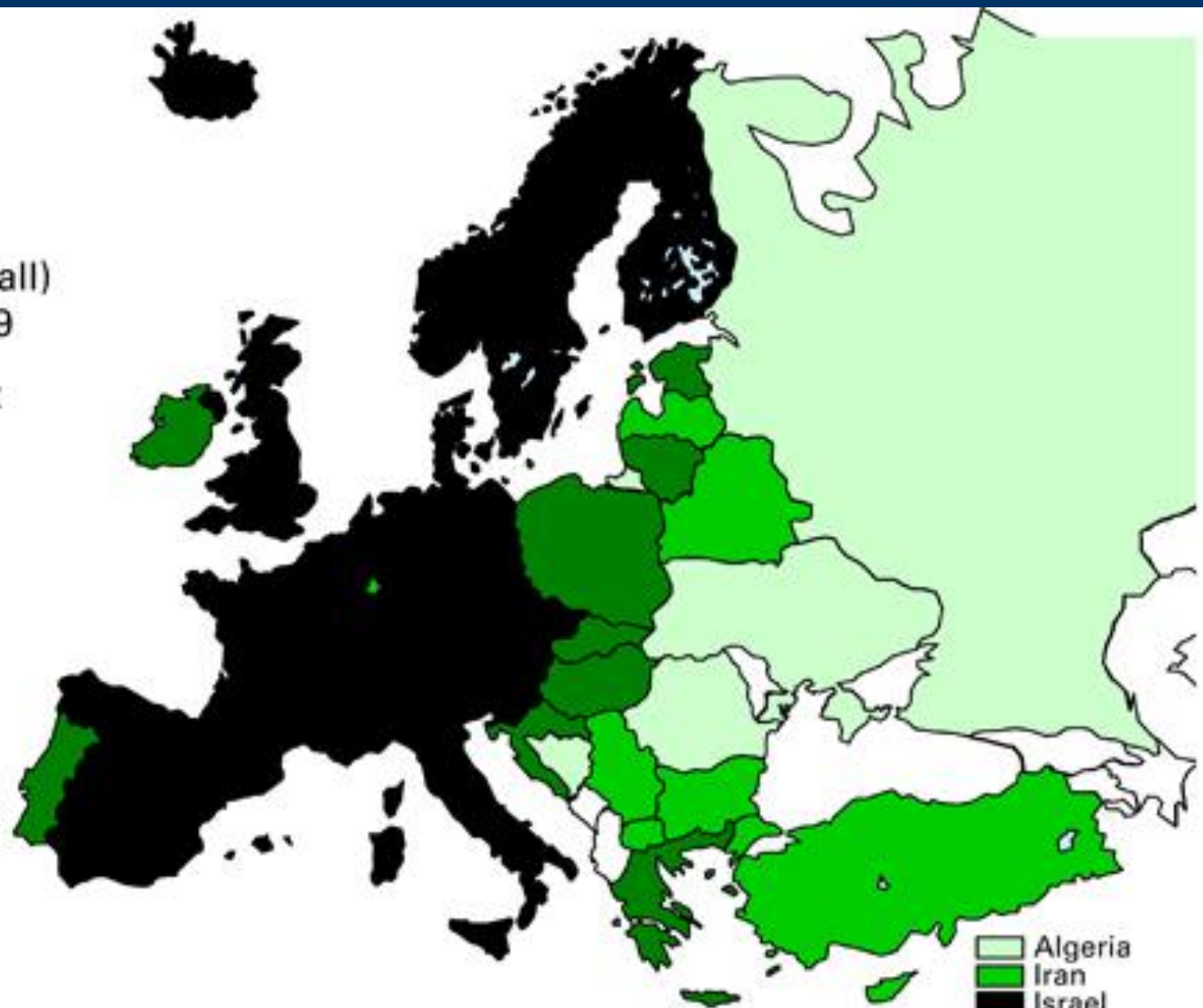
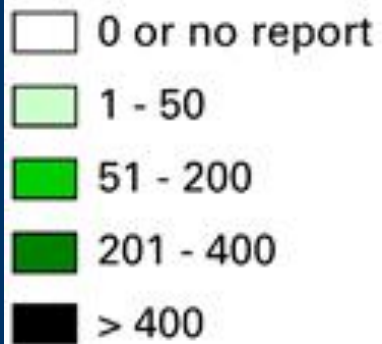






Proportion of donor types for allogeneic HSCT in 2009.

Total transplants (all)
per 10 million 2009



EBMT 2009

ALLOGENEIC STEM CELL TRANSPLANTATION

Which purpose ?

Eradicate the disease



Control the host immune system's ability to
reject the transplant

Allogeneic transplants

1. Advantages:

- graft free from disease
- graft versus leukemia (GvL)
- graft versus tumor (GvT)

2. Disadvantages:

- compatibility with the donor
 - graft versus host disease (GVHD)
 - infectious disease transmission
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Cell types for transplantation

- Bone marrow:
 - collected from the iliac crest under GA
 - advantages:
 - = large number of cells
 - = few red blood cells
 - = few lymphoid cells
 - disadvantages:
 - = surgical procedure
 - = general anesthesia
 - = pain during recovery
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Cell types for transplantation

- Peripheral blood stem cells:
 - collected by apheresis following hematopoietic growth factor “mobilization”
 - advantages:
 - = large number of cells
 - = easy to collect, multiple collection possible
 - = no general anesthesia, no surgical procedure
 - = approved growth factors (G, GM-CSF, Epo)
 - disadvantages:
 - = pre-treatment with HGF (risks)
 - = bone pain
 - = central venous access
 - = possible failures
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Cell types for transplantation

- Cord blood stem cells:
 - advantages:
 - = collection has no risk for mother or infant
 - = readily available, anonymous banks
 - disadvantages:
 - = low cell dosage may limit to small recipients
 - = multiple collection impossible

Compatibility

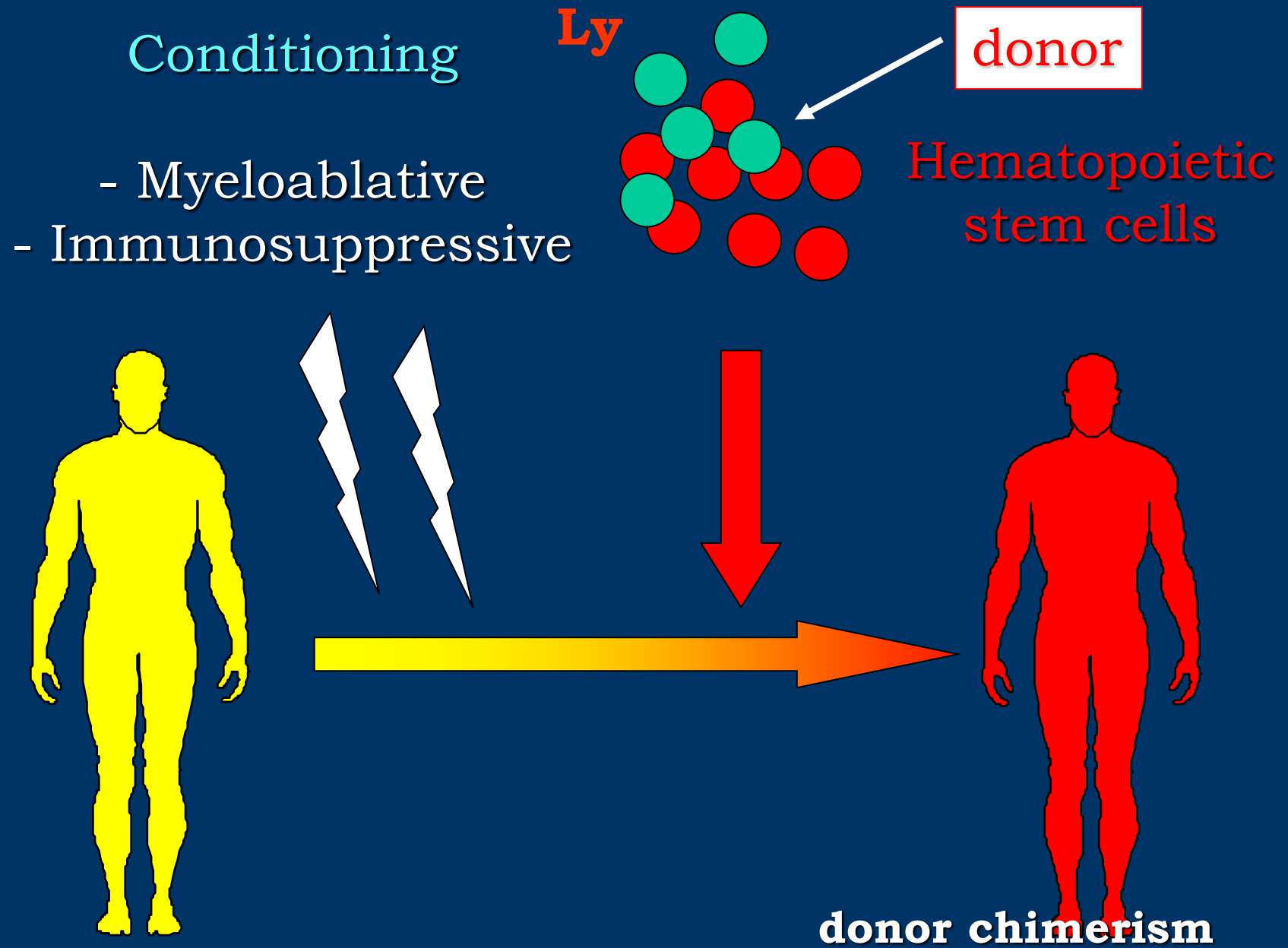
- Determination of HLA polymorphism represents the basis of compatible donor search for solid organ and stem cell transplantation for a certain patient with a certain HLA type.
 - First step is searching of donors in the family (brothers, sisters). If no sibling donor the search will continue within international donor registries.
 - 10/10 loci in A, B, Cw, DR si DQ
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Allogeneic stem cell transplant -donor / matching-

- HLA matched sibling
- HLA matched unrelated donor (MUD)
- HLA mismatched related donor (9/ 10; haploidentical donor)
- HLA mismatched unrelated donor



Allogeneic stem cell transplantation



STEM CELL TRANSPLANTATION (adults):

Standard of care !

ALLO-SCT

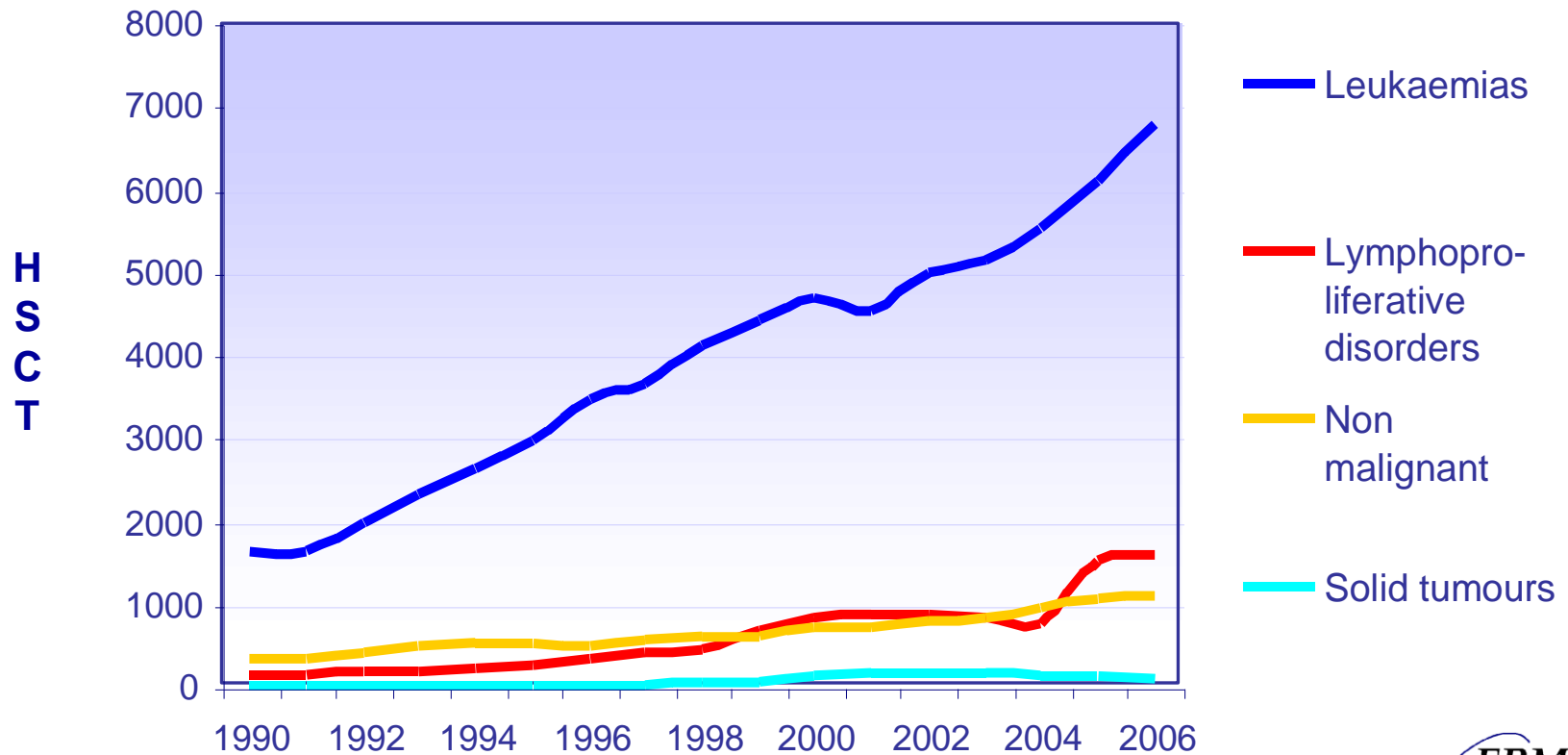
AUTO-SCT

AML – CR1 ir/hr
AML – CR2, CR3
ALL – CR1 hr/CR2
MDS
HD/NHL
MM
CML>1CP, AP
SAA
PNH
Autoimmune
Renal carcinoma

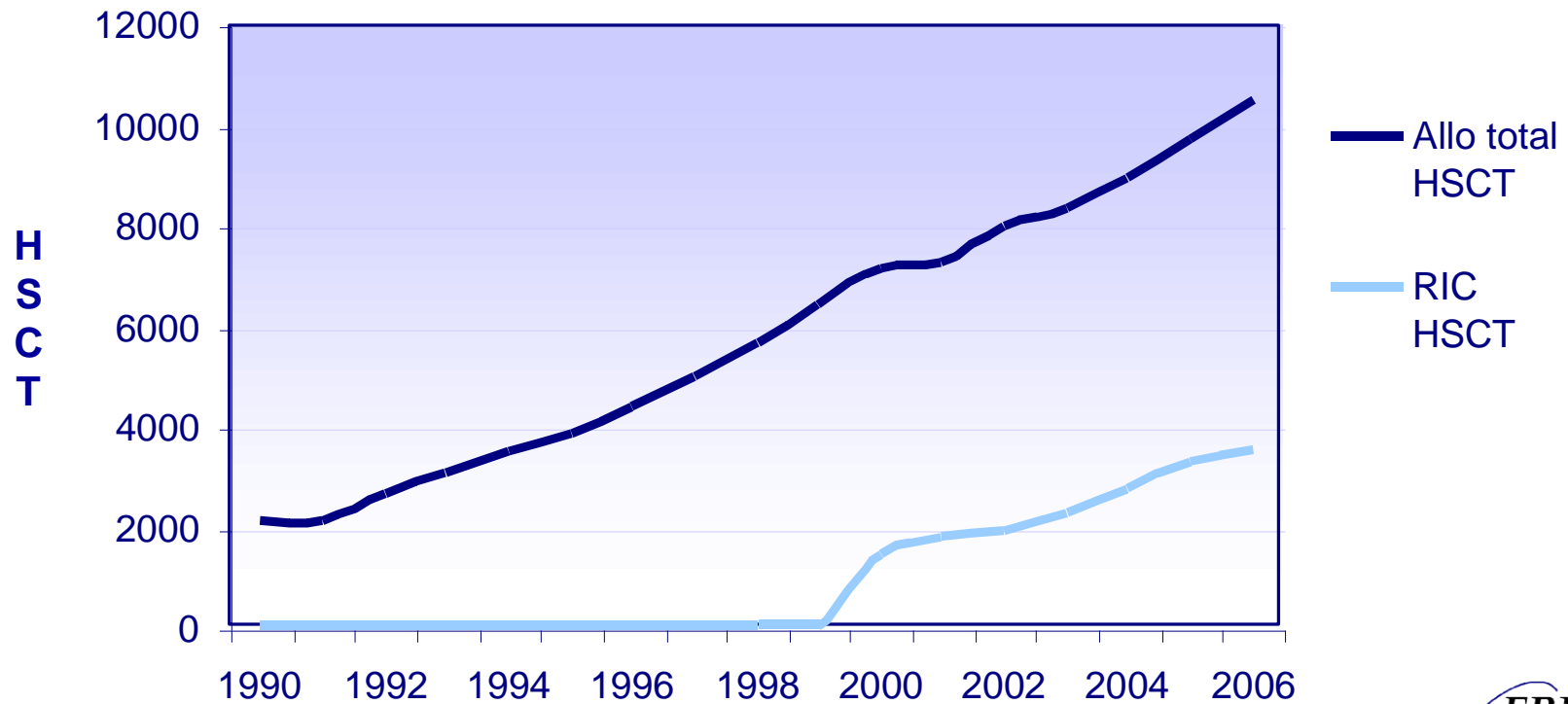
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EBMT Activity survey on HSCT 1990 – 2006: allogeneic



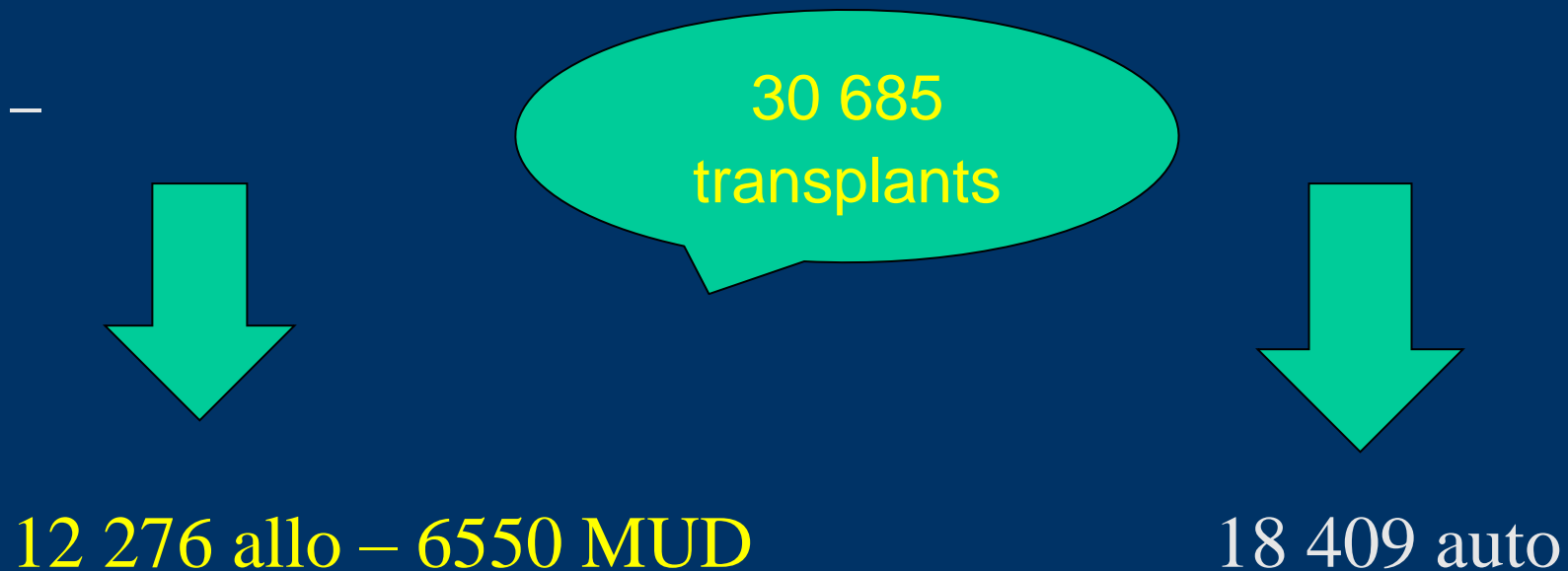
Evolution of RIC allogeneic HSCT in Europe 1990-2006



Final data

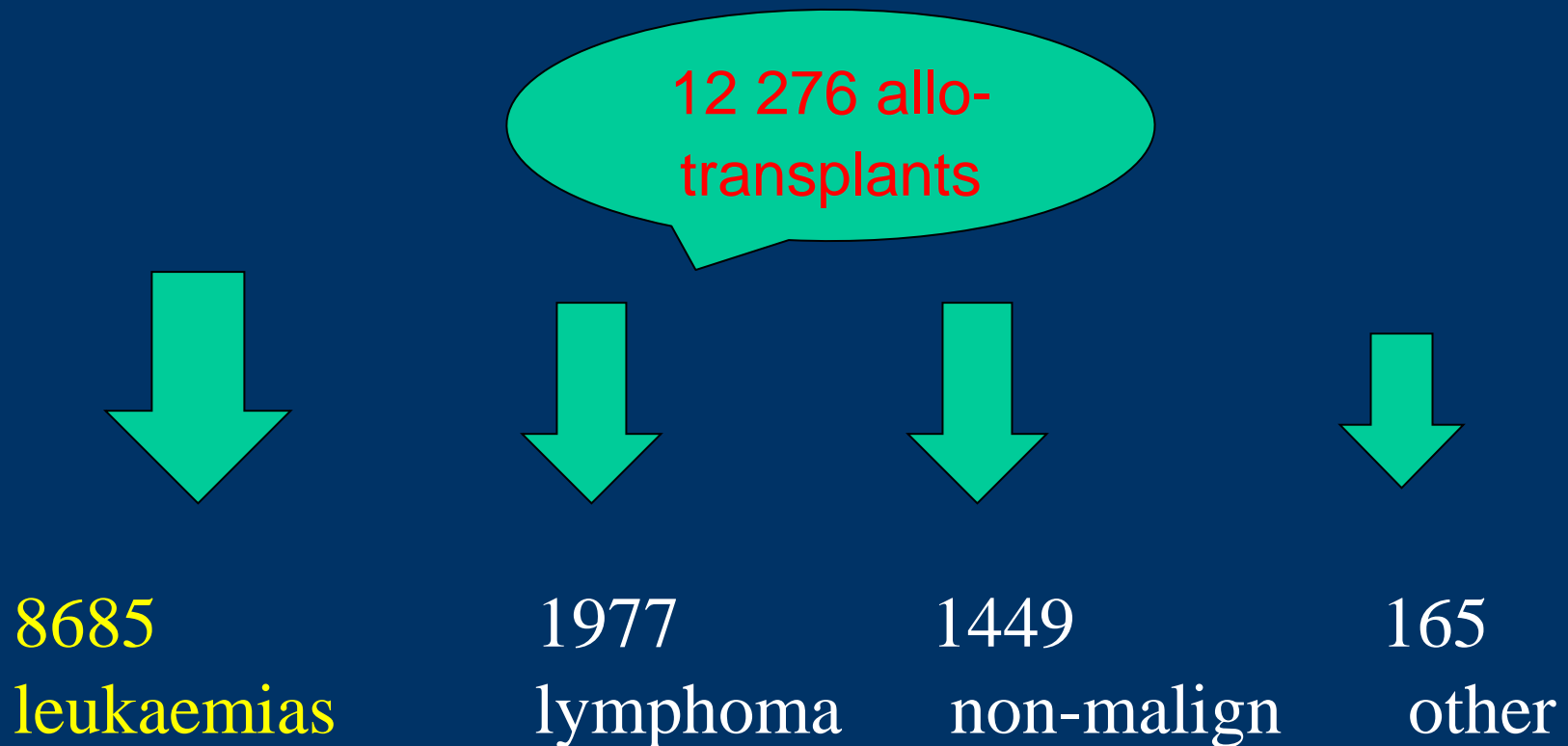
EBMT – European Blood and Marrow Transplantation

- Data from 2011:
 - 624 teams from 58 countries with 4042 members



EBMT – European Blood and Marrow Transplantation

- Data from 2011:



ALLOGENEIC STEM CELL TRANSPLANTATION

What is necessary ?

1. Adequate amount of allogeneic stem cell procedures.
 2. Development of Romanian Stem Cell Donor Registry.
 3. European accreditation (JACIE) of stem cell transplant teams.
 4. Adequate structure for medical care.
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