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How is HLA data in the registry database being used by EBMT?

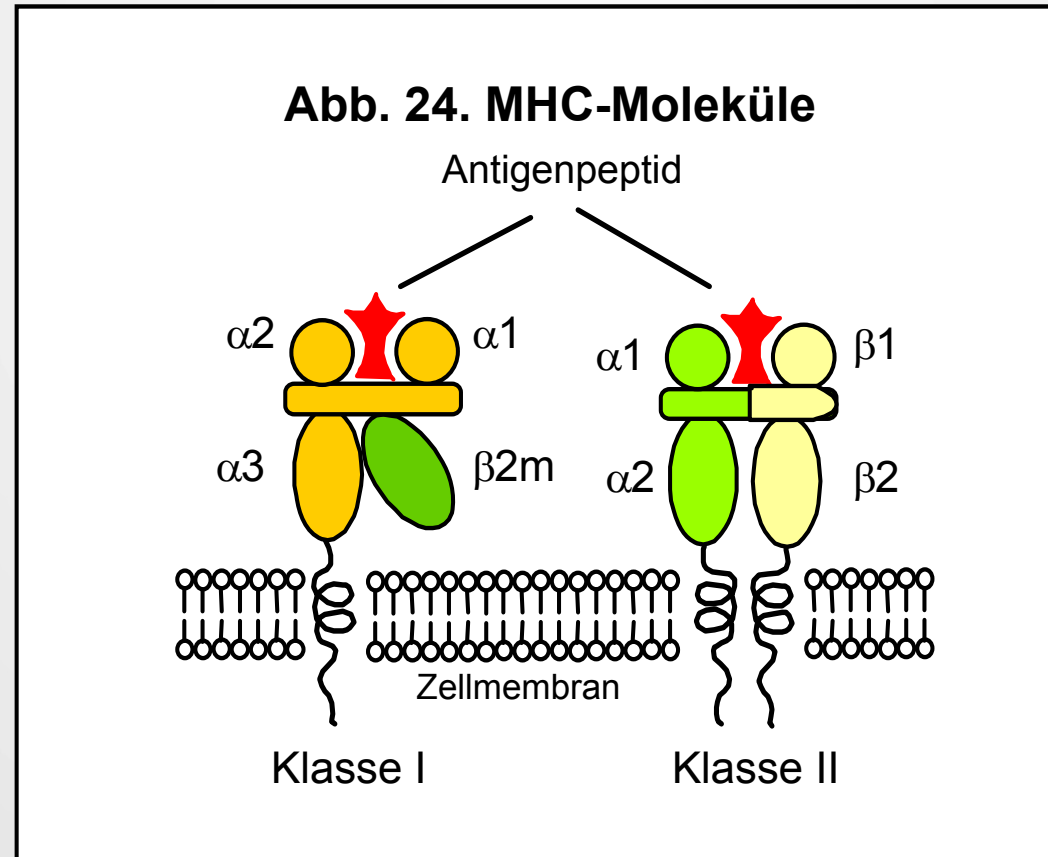
Johannes Schetelig, MD, MSc

TU Dresden Germany & DKMS Clinical Trials Unit

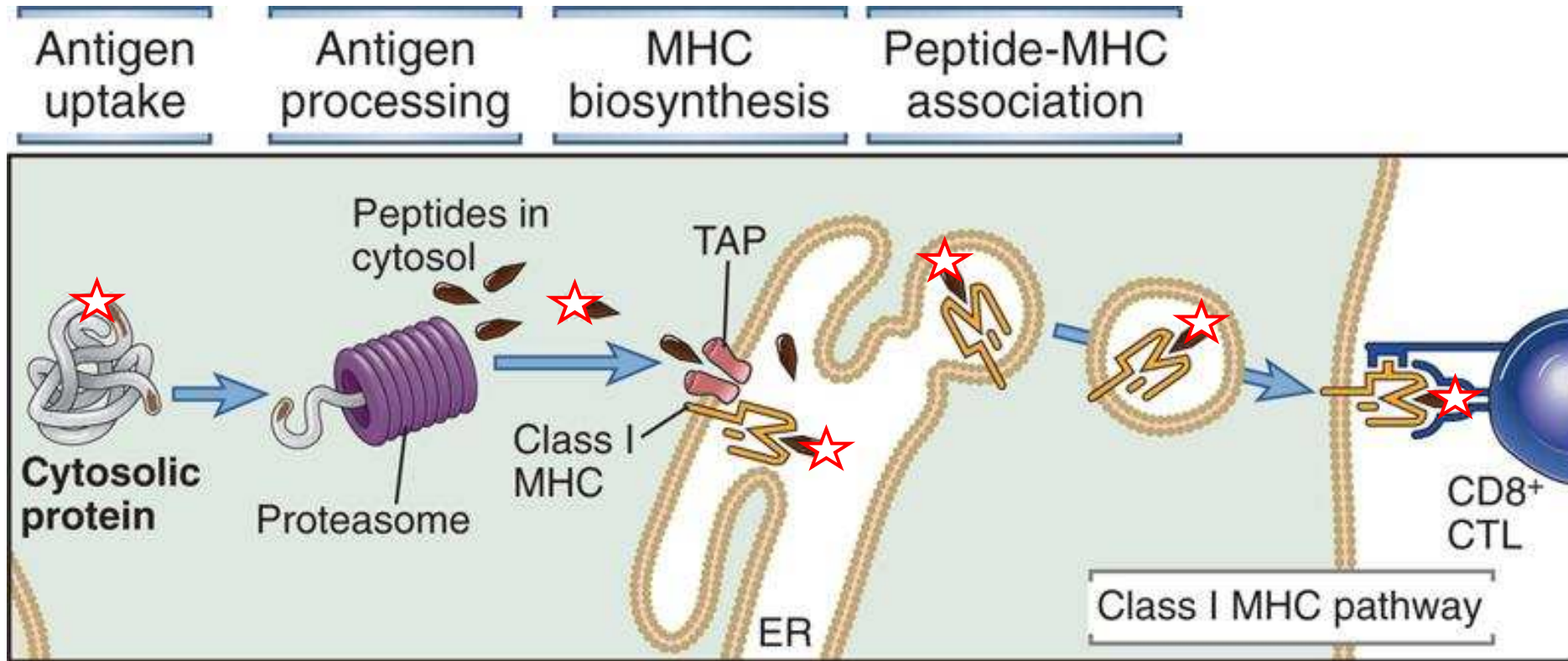
Marseille, March, 28, 2017

- What are Human Leukocyte Antigens (HLA) and why are they so important in the context of alloHCT?
- Typing methods for HLA
- Nomenclature(s)
- How is HLA data entered into the registry?
- How is HLA data used by EBMT?
- What's next?

HLA (human leukocyte antigen)-Moleküle MHC (major histocompatibility complex)



Presentation of antigen peptides via MHC class I molecules



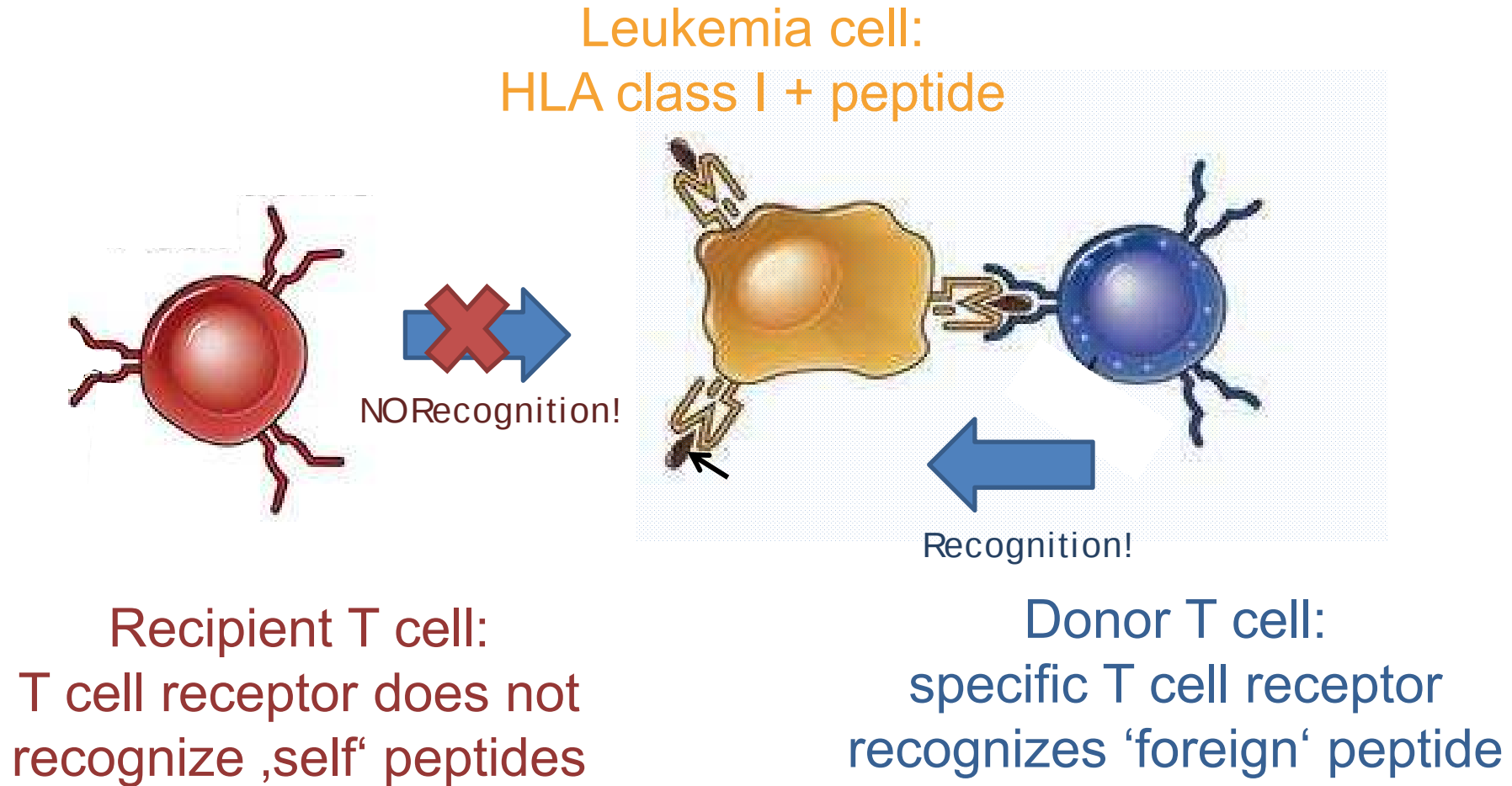
In „healthy“ individuals

- cytosolic protein might be a viral protein produced during a viral infection

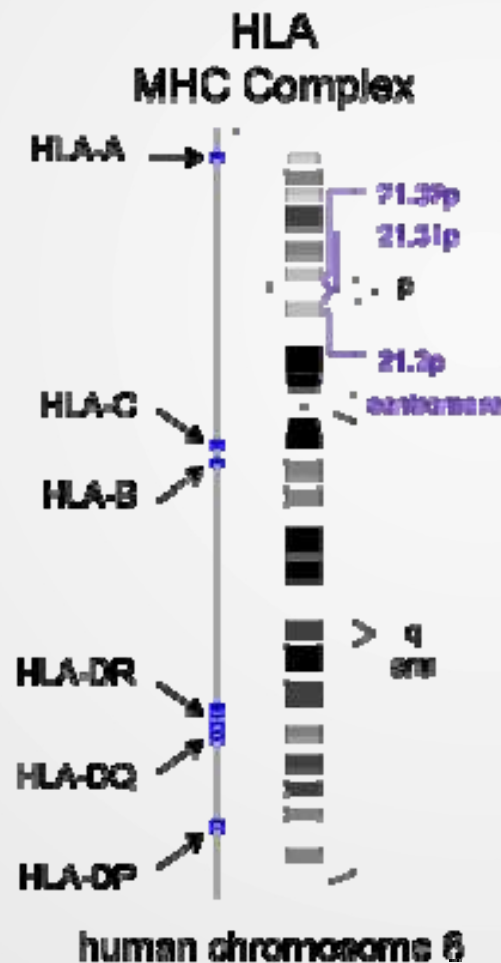
In stem cell recipients

- cytosolic protein might be a protein, that differs in the amino acid sequence ☆ between recipient and donor

Discrimination between 'self' and 'foreign'



MHC complex on Chromosome 6p21



Numbers of alleles for the respective loci:

A	3,830
B	4,647
C	3,382
DRB1	2,252
DQB1	1,054

Σ class I + II = 16,251

<http://hla.alleles.org>

source: wikipedia

Heritage of MHC Haplotypes

Haplotype	(a)	(b)	(c)	(d)
A	24:02	03:01	01:01	02:01
B	15:01	08:01	57:01	14:02
C	03:03	07:01	06:02	08:02
DRB1	13:01	03:01	07:01	01:02
DQB1	06:03	02:01	03:03	05:01

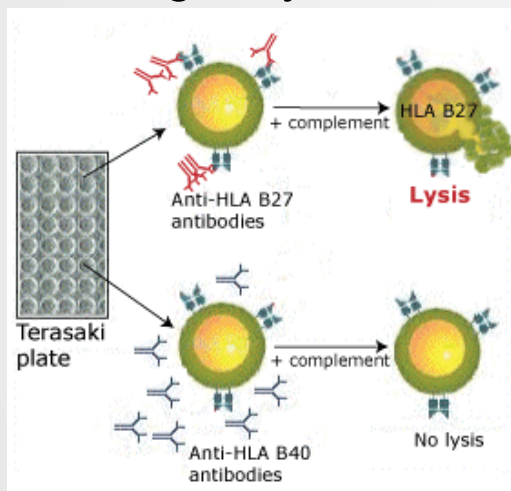
?

	Patient		Sibling 1		Sibling 2		Sibling 3		Stepbrother, -sister	
Haplotype	(a)	(c)	(b)	(c)	(a)	(c)	(a)	(d)	?	(d)
A	24:02	01:01	03:01	01:01	24:02	01:01	24:02	02:01	30:02	02:01
B	15:01	57:01	08:01	57:01	15:01	57:01	15:01	14:02	07:02	14:02
C	03:03	06:02	07:01	06:02	03:03	06:02	03:03	08:02	07:02	08:02
DRB1	13:01	07:01	03:01	07:01	13:01	07:01	13:01	01:02	15:01	01:02
DQB1	06:03	03:03	02:01	03:03	06:03	03:03	06:03	05:01	06:02	05:01
			haploident		ident		haploident			

Typing methods for HLA?

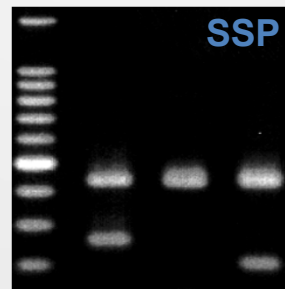
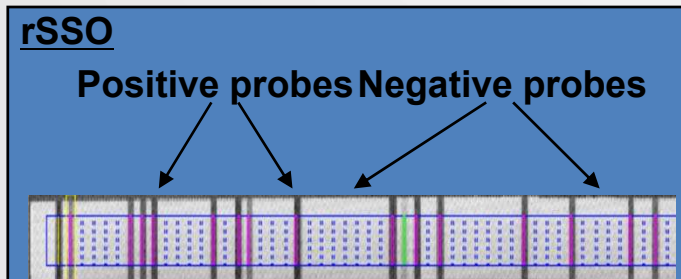
Methods for HLA-Typing

Serologically



Genetically

- PCR-SSO
- PCR-SSP
- Sequencing (Sanger or NGS)



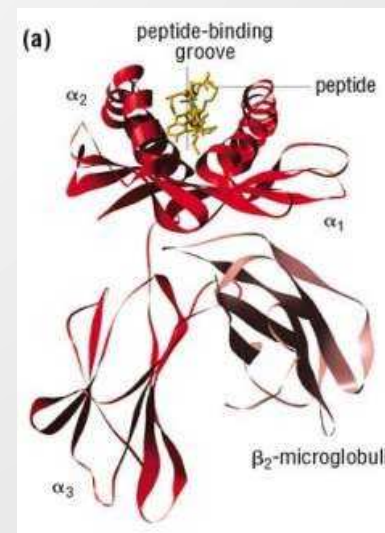
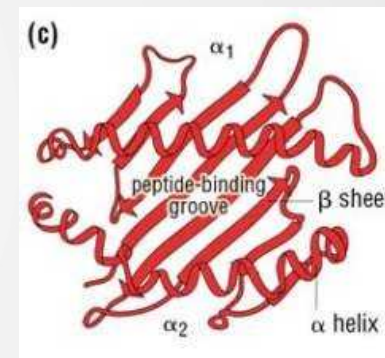
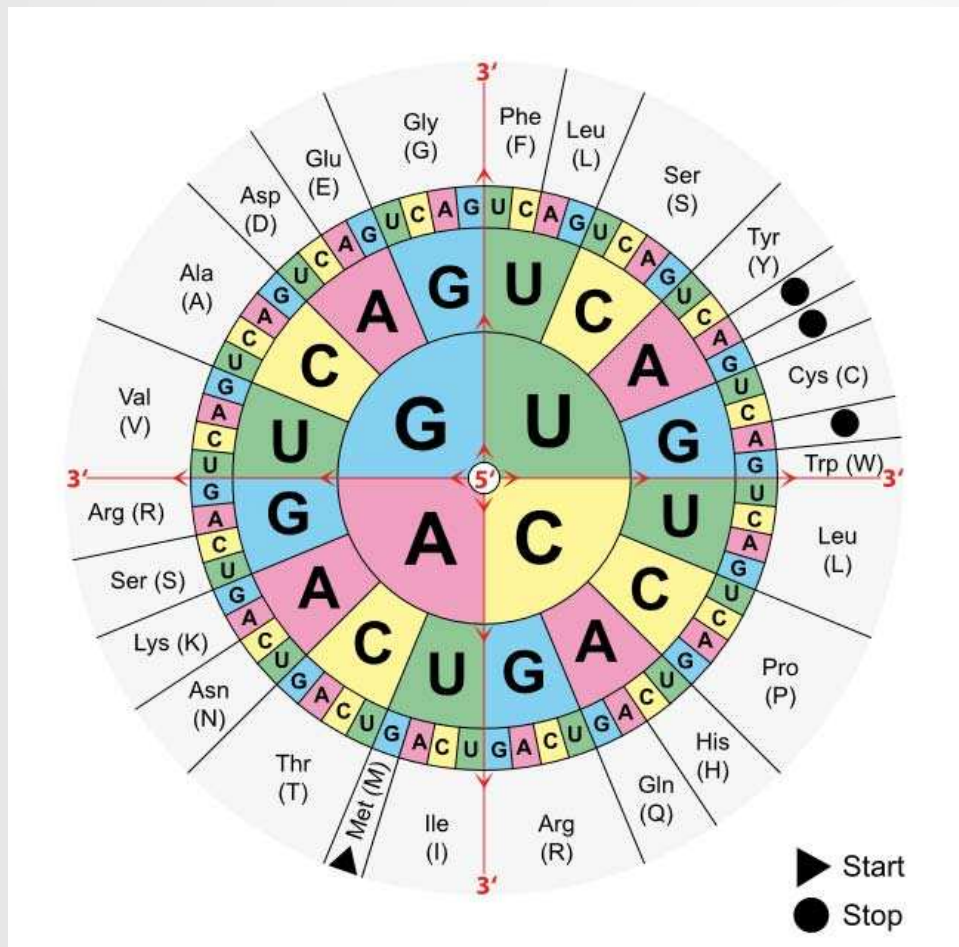
-- AGTTGGCCTAATGATTGGGCCTGACCACAT --
TCAACCGGATT^A*
TCAACCGGATT^{AC}*
TCAACCGGATT^{ACT}*
TCAACCGGATT^{ACTA}*
-- TCAACCGGATTACTAACCGGACTGGTGTA --

SBT



NGS

Genetic Code



HLA Typing Level

Low resolution	Intermediate resolution	High resolution, Exon 2+3 class I or Exon 2 class II
A*02 oder A2 B*44 oder B44 DRB1*04 oder DR4	A*02:01/02:09 B*44:02/44:05 DRB1*04:03/04:07 <i>NMDP B*44:BE</i>	A*02:01/ A*02:01:01:01 B*44:02/ B*44:02:01:01 DRB1*04:03/DRB1*04:03:01 <i>NMDP B*44:ENWF¹</i>
genetically or serologically	genetically	genetically
Allele groups	Alleles	Alleles

¹HLA-B*44:ENWF = B*44:02 / 44:02S / 44:19N / 44:27 / 44:66

Nomenclature(s)

High resolution HLA typing or not?

HLA-C*01:03



HLA-A*02:01:01G

HLA-A*02:ACMGD

HLA-A*02:AEGCS

HLA-DPB1*04:01:01:01

HLA-DQB1*02:01:01G

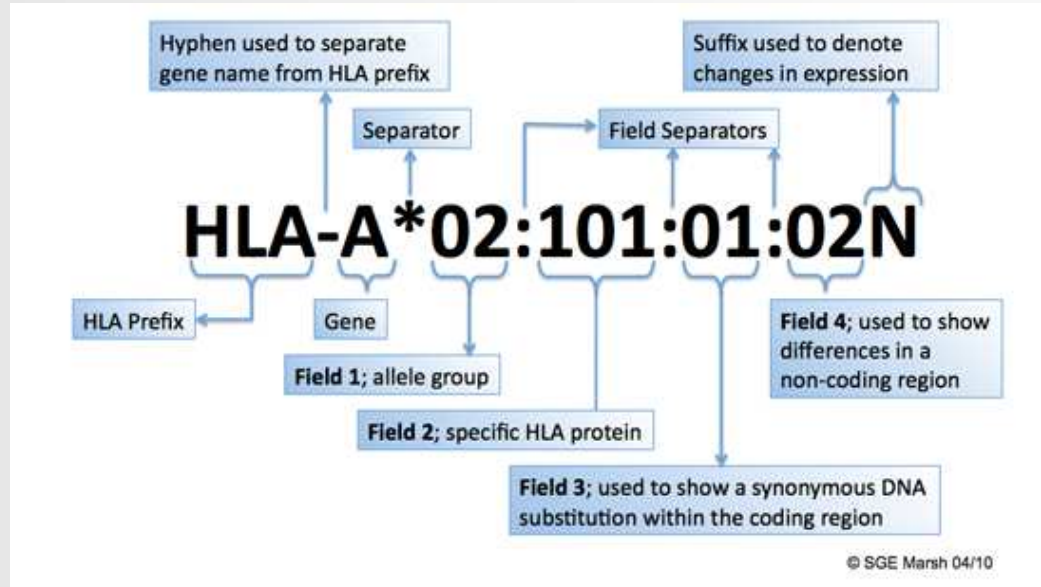
HLA-A*02:AAAUW

HLA-A*02:AEMYN

HLA-A*01:01:01:01

A*02:01P

Nomenclature of HLA Alleles



Suffix:

N = “Null” alleles

L = “Low” cell surface expression

S = soluble “Secreted” molecule

Q = “Questionable” expression

C = present in “Cytoplasm” only

A = “Aberrant” expression

G-codes for reporting of ambiguous allele typing

G-code → **identical nucleotide sequences** across exons 2 and 3 (class I) and exon 2 (class II)

A*02:01:01G

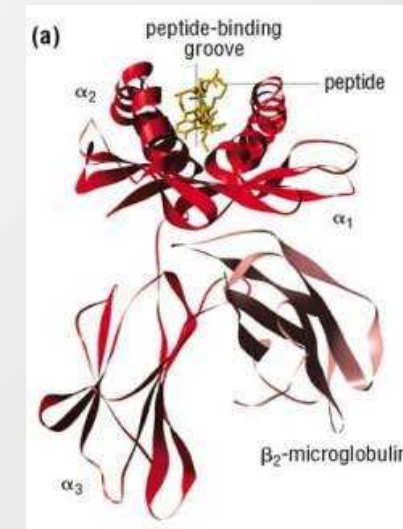
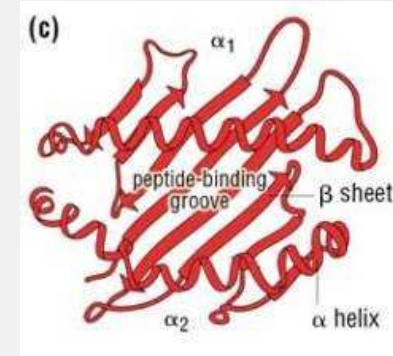
A*02:01:01:01/02:01:01:02L/02:01:01:03/02:01:08/02:01:11/02:01:14/02:01:15/
02:01:21/02:09/02:43N/02:66/02:75/02:83N/02:89/02:97/02:132/02:134/02:140

24.06.2010

A*02:01:01G

02:01:01:01/02:01:01:02L/02:01:01:03/02:01:01:04/02:01:01:05/02:01:01:06/
02:01:08/02:01:11/02:01:14Q/02:01:15/02:01:21/02:01:48/02:01:50/02:01:79/
02:01:80/02:01:89/02:01:97/02:01:98/02:01:99/02:01:104/02:09/02:43N/02:66/
02:75/02:83N/02:89/02:97:01/02:97:02/02:132/02:134/02:140/02:241/02:252/
02:256/02:266/02:291/02:294/02:305N/02:327/02:329/02:356N/02:357/02:397/
02:411/02:446/02:455/02:469/02:481/02:538/02:559

29.10.2015



Problem 1: Null alleles

Problem 2: Number of alleles varies

http://hla.alleles.org/alleles/g_groups.html

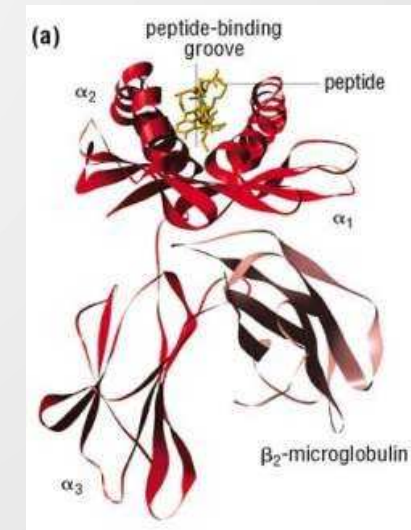
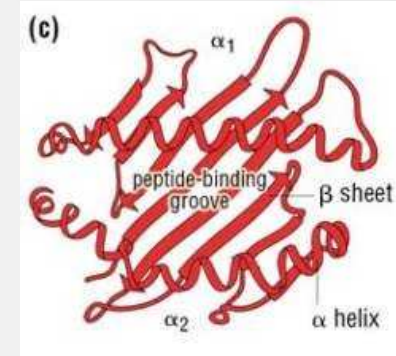
G-codes for reporting of ambiguous allele typing

G-code → **identical nucleotide sequences** across
exons 2 and 3 (class I) and exon 2 (class II)

DQB1*02:01:01G

02:01:01/02:01:08/02:02:01:01/02:02:02/02:04/02:06/02:09/02:10/02:48/02:59/02:64

Problem 3: *02:01 vs. *02:02



http://hla.alleles.org/alleles/g_groups.html

P-codes for reporting of ambiguous allele typing

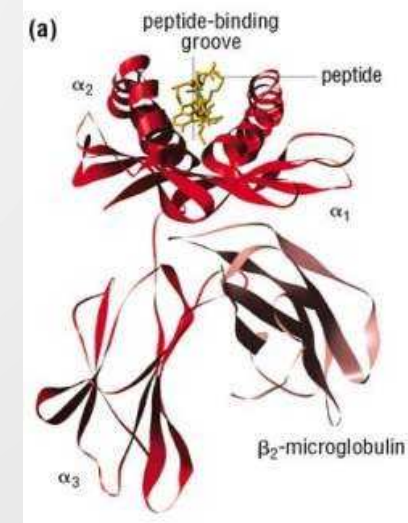
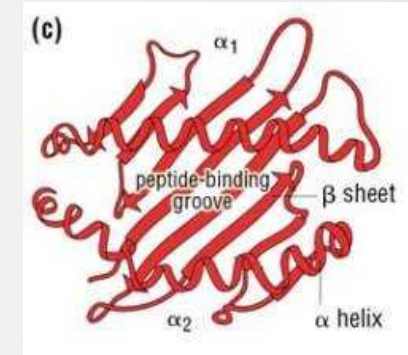
- **P-code** → **identical protein sequences** across exons 2 and 3 (class I) and exon 2 (class II)
- **But** synonymous substitutions at nucleotide level may occur

A*02:01P

A*02:01:01:01/A*02:01:01:02L/A*02:01:01:03/A*02:01:01:04/A*02:01:01:05/A*02:01:01:06/A*02:01:02/A*02:01:03/
A*02:01:04/A*02:01:05/A*02:01:06/A*02:01:07/A*02:01:08/A*02:01:09/A*02:01:10/A*02:01:11/A*02:01:12/A*02:01:13/
A*02:01:14Q/A*02:01:15/A*02:01:17/A*02:01:18/A*02:01:19/A*02:01:21/A*02:01:22/A*02:01:23/A*02:01:24/A*02:01:25/
A*02:01:26/A*02:01:27/A*02:01:28/A*02:01:29/A*02:01:30/A*02:01:31/A*02:01:32/A*02:01:33/A*02:01:34/A*02:01:35/
A*02:01:36/A*02:01:37/A*02:01:38/A*02:01:39/A*02:01:40/A*02:01:41/A*02:01:42/A*02:01:43/A*02:01:44/A*02:01:45/
A*02:01:46/A*02:01:47/A*02:01:48/A*02:01:49/A*02:01:50/A*02:01:51/A*02:01:52/A*02:01:53/A*02:01:54/A*02:01:55/
A*02:01:56/A*02:01:57/A*02:01:58/A*02:01:59/A*02:01:60/A*02:01:61/A*02:01:62/A*02:01:63/A*02:01:64/A*02:01:65/
A*02:01:66/A*02:01:67/A*02:01:68/A*02:01:69/A*02:01:70/A*02:01:71/A*02:01:72/A*02:01:73/A*02:01:74/A*02:01:75/
A*02:01:76/A*02:01:77/A*02:01:78/A*02:01:79/A*02:01:80/A*02:01:81/A*02:01:83/A*02:01:84/A*02:01:85/A*02:01:86/
A*02:01:87/A*02:01:88/A*02:01:89/A*02:01:90/A*02:01:91/A*02:01:92/A*02:01:93/A*02:01:94/A*02:01:95/A*02:01:96/
A*02:01:97/A*02:01:98/A*02:01:99/A*02:01:100/A*02:01:101/A*02:01:102/A*02:01:103/A*02:01:104/A*02:01:105/
A*02:01:106/A*02:01:107/A*02:01:108/A*02:01:109/A*02:01:110/A*02:01:111/A*02:01:112/A*02:01:113/A*02:01:114/
A*02:01:115/A*02:01:116/A*02:01:117/A*02:01:118/A*02:01:119/A*02:01:120/A*02:09/A*02:66/A*02:75/A*02:89/
A*02:97:01/A*02:97:02/A*02:132/A*02:134/A*02:140/A*02:241/A*02:252/A*02:256/A*02:266/A*02:291/A*02:294/
A*02:327/A*02:329/A*02:357/A*02:397/A*02:411/A*02:446/A*02:455/A*02:469/A*02:481/A*02:538/A*02:559

Benefit: **no** null alleles included

Necessary requirements: whole exon amplification or typing by serology



http://hla.alleles.org/alleles/p_groups.html

MAC-codes (NMDP-codes) for reporting of ambiguous allele typing

- **MAC** code denotes **Multi Allele Code**, equivalent to former **NMDP**-code
- short hand alphabetic notation to **capture DNA based allele combinations**
- No information about resolution of the HLA typing immediately apparent

A*02:ACMGD

02:01/02:01L/02:01Q/02:09/02:43N/02:66/02:75/02:83N/02:89/02:97/02:132/02:134/02:140/02:241/
02:252/02:256/02:266/02:291/02:294/02:305N/02:327/02:329/02:356N/02:357/02:397/02:411/02:446/
02:455/02:469/02:481/02:538

A*02:01:01G

02:01:01:01/02:01:01:02L/02:01:01:03/02:01:01:04/02:01:01:05/02:01:01:06/02:01:08/02:01:11/02:01:14Q/
02:01:15/02:01:21/02:01:48/02:01:50/02:01:79/02:01:80/02:01:89/02:01:97/02:01:98/02:01:99/02:01:104/
02:09/02:43N/02:66/02:75/02:83N/02:89/02:97:01/02:97:02/02:132/02:134/02:140/02:241/02:252/02:256/
02:266/02:291/02:294/02:305N/02:327/02:329/02:356N/02:357/02:397/02:411/02:446/02:455/02:469/02:481/
02:538/ 02:559

<http://www.marlow-donor.org/cgi-bin/DNA/dnatyp.pl>

Useful links to web-resources

Link to MAC-codes

<https://hml.nmdp.org/MacUI/>

Link to „G- und P-Nomenclature“

http://hla.alleles.org/alleles/g_groups.html

How is HLA data entered into the registry?

Browser address: https://www2.clinicalresearch.nl/PROMISE/S/HEIT/S_O_EBMT_C_NEW_MEDAB/_U_LINK

Page title: MEDAB (MAIN ENTRY TO PRO...)

Navigation: Datei Bearbeiten Ansicht Favoriten Extras

Search: Vorgeschlagene Sites Google

Menu: Data Entry Report Export Help Filter MEDAB -- [808][PRODUCTION][Dresden]

Instructions: Resume with the **first** item in the **current** section by pressing **Tab** (or click on any other item)

Buttons: Data Entry Browser/S

Index Editor Overview DynFil:20:Acute leukaemia

Donor	value	label
CIC	808	808
Patient	999999	999999
Treatment date	2016/07/07 00:00	2016/07/07 00:00:00
Donor	1	1
Donor		
Donor ID and order of infusion		
Identification of donor or CBU unit used by centre		
Number in the infusion order		
HLA relation and donor registry		
HLA match	6	Mismatched relative
Degree of mismatch in related donors		
ION code for the Donor Registry or Cord Blood Bank		
WMDA / BMDW code for the Donor Registry		
Name of the Donor registry		
Donor centre name		
Identification of donor or CBU given by donor registry		
Identification of patient given by donor registry	235845	235845
Number of mismatches		
Number of antigenic mismatches: A		
Number of antigenic mismatches: B		
Number of antigenic mismatches: C		
Number of antigenic mismatches: DRB1		
Number of antigenic mismatches: DQB1		
Number of antigenic mismatches: DPB1		

Actions

- Form about to be...
- Med-B over Med-A
- UPN
- Date of birth
- Are you adding M...

Degree of mismatch in related donors

1	1 HLA locus mismatch
2	>=2 HLA loci mismatch
99	unknown

HLA match

- Identical sibling
- Syngeneic
- Matched other relative
- **Mismatched relative**
 - 1 HLA locus mismatch
 - ≥2 HLA loci mismatch unknown

Browser window: https://www2.clinicalresearch.nl/PROMISE/S/HEIT/S_O_EBMT_C_NEW_MEDAB/_U_LINK...

Page Title: MEDAB (MAIN ENTRY TO PRO... MEDAB[NEW][EBMT][S][b...

Menu: Data Entry | Report | Export | Help | Filter

Resume with the **first** item in the **current** section by pressing **Tab** (or click on any other item)

Index | Editor | Overview

DynFil:20:Acute leukaemia

Donor	value	label
CIC	808	808
Patient	999999	999999
Treatment date	2016/07/07 00:00	2016/07/07 00:00:00
Donor	1	1

Donor

Donor ID and order of infusion

Identification of donor or CBU unit used by centre

Number in the infusion order

HLA relation and donor registry

HLA match

Degree of mismatch in related donors

ION code for the Donor Registry or Cord Blood Bank

WMDA / BMDW code for the Donor Registry

Name of the Donor registry

Donor centre name

Identification of donor or CBU given by donor registry

Identification of patient given by donor registry

Number of mismatches

Number of **antigenic** mismatches: A

Number of **antigenic** mismatches: B

Number of **antigenic** mismatches: C

Number of **antigenic** mismatches: DRB1

Number of **antigenic** mismatches: DQB1

Number of **antigenic** mismatches: DPB1

Number of **allelic** mismatches: A

Number of **allelic** mismatches: B

Number of **allelic** mismatches: C

Number of **allelic** mismatches: DRB1

Number of **allelic** mismatches: DQB1

Number of **allelic** mismatches: DPB1

Donor details

WMDA / BMDW code for the Donor Registry

A	Austrian Bone Marrow Donors (A)
ACB	Austrian Cord Blood Registry (ACB)
ACCB	StemCyte, Inc. (ACCB)
AE	Emirates Bone Marrow Donor Registry (AE)
AM	Armenian Bone Marrow Donor Registry Charitable Trust (AM)
AOCB	University of Colorado Cord Blood Bank (AOCB)
AR	Argentine CPH Donors Registry (AR)
ARCB	Argentina National Cord Blood Bank (ARCB)
ATCB	Hellenic Cord Blood Bank (ATCB)
AUCB	Australian Cord Blood Registry (AUCB)
AUS	Australian Bone Marrow Donor Registry (AUS)
B	Marrow Donor Program Belgium (B)
BACB	Thai National Cord Blood Bank (BACB)
BCB	Belgium Cord Blood Registry (BCB)

This is an alphanumeric code, with a maximum length of 4 characters, unique for each Donor Registry or Cord Blood Bank

Actions

Form about to be... Med-A: Day 0

Med-B over Med-A null

UPN 999999

Date of birth 1965/07/07

Record Locator

Patient [808] 999999

Diagn 2011/01/01

Asse1 2011/01/01

Invol 3

Asse1 2016/07/07

Warning: Please, fax the HLA laboratory results to the EBMT Data Office or National Registry Data Office. Add the UIC of the patient to the results before faxing

Unrelated donor

Donor registry

Identification of donor in registry

Identification of patient in registry

Give allway full string code!

Never drop initials!

https://www2.clinicalresearch.nl/PROMISE/S/HEIT/S_O_EBMT_C_NEW_MEDAB/_U_LINK_ MEDAB (MAIN ENTRY TO

Datei Bearbeiten Ansicht Favoriten Extras

Vorgeschlagene Sites Google

Data Entry Report Export Help Filter MEDAB -- [808][PRODUCTION][Dresden]

Resume with the **first** item in the **current** section by pressing **Tab** (or click on any other item)

Index **Editor** Overview DynFil:20:Acute leukaemia

Assessment(1)	value	label
CIC	808	808
Patient	999999	999999
Assessment date	2016/07/07 00:00	2016/07/07 00:00:00
Patient HLA: DNA results		
DNA typing done		
HLA: DNA typing done	2	Yes
Type A		
HLA A: DNA in allele 1 of the patient		
HLA A: MAC code for allele 1 in the patient		
HLA A: DNA in allele 2 of the patient		
HLA A: MAC code for allele 2 in the patient		
Type B		
HLA B: DNA in allele 1 of the patient		
HLA B: MAC code for allele 1 in the patient		
HLA B: DNA in allele 2 of the patient		
HLA B: MAC code for allele 2 in the patient		
Type C		
HLA C: DNA in allele 1 of the patient		
HLA C: MAC code for allele 1 in the patient		
HLA C: DNA in allele 2 of the patient		
HLA C: MAC code for allele 2 in the patient		
Type DRB1		
HLA DRB1: DNA in allele 1 of the patient		

HLA A: DNA in allele 1 of the patient	
A*01	A*01
A*01:01	A*01:01
A*01:01:01	A*01:01:01
A*01:01:01:01	A*01:01:01:01
A*01:01:01:02N	A*01:01:01:02N
A*01:01:01:03	A*01:01:01:03
A*01:01:01:04	A*01:01:01:04
A*01:01:01G	A*01:01:01G
A*01:01:02	A*01:01:02
A*01:01:03	A*01:01:03
A*01:01:04	A*01:01:04
A*01:01:05	A*01:01:05

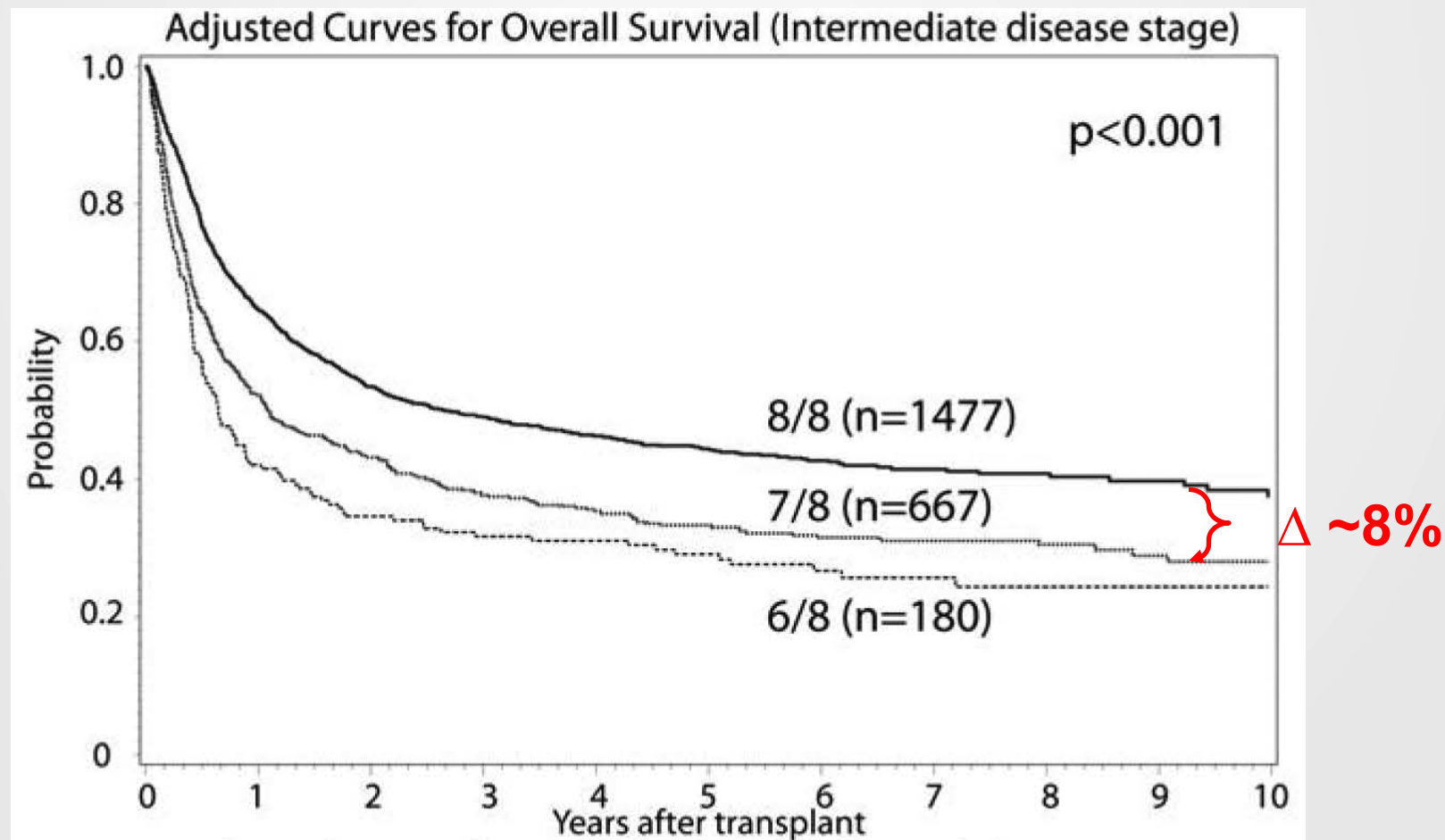
HLA DNA typing

Report the whole string code!

Don't drop letters!

How is HLA data used by EBMT?

HLA-compatibility is a Risk Factor

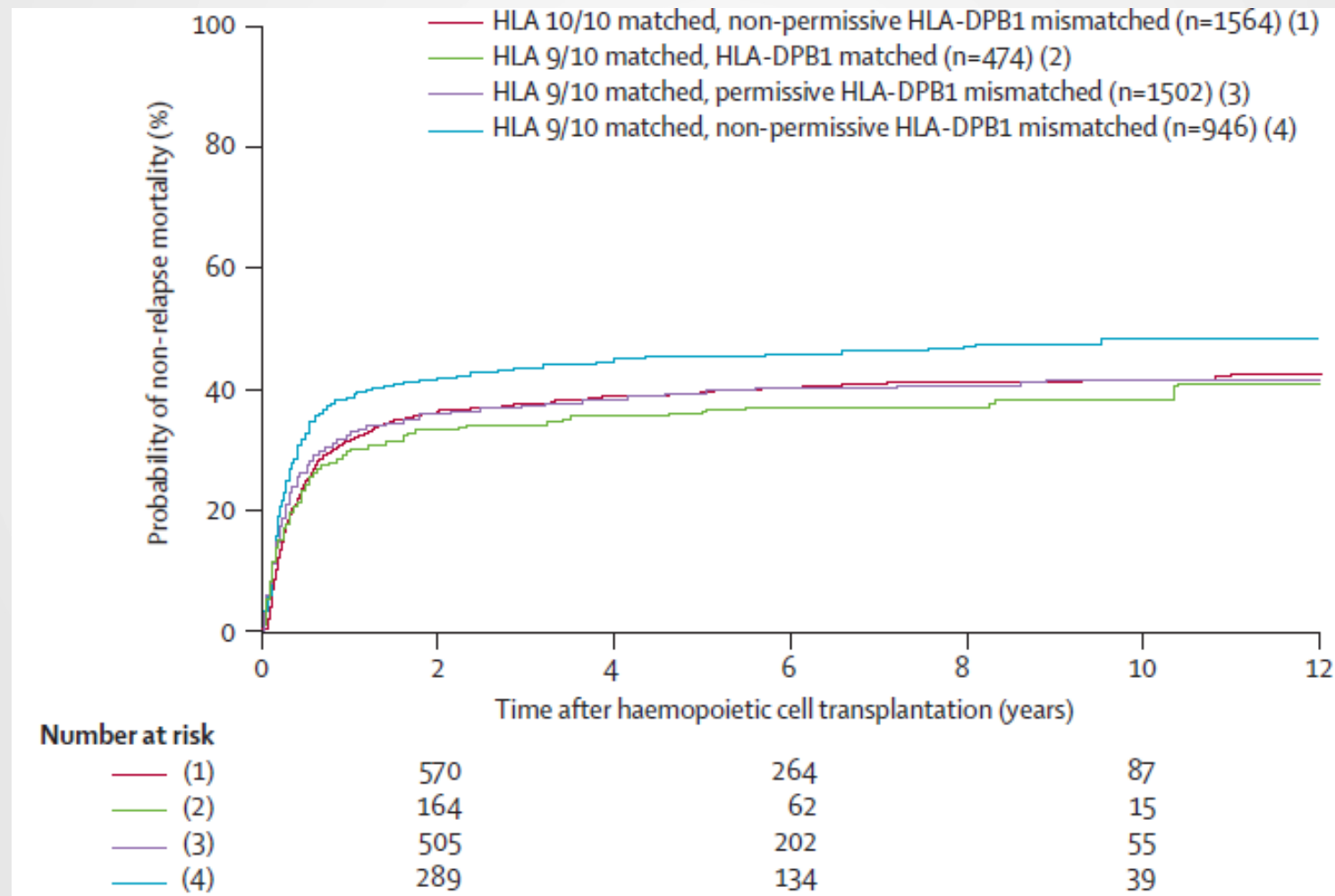


Pidala et al. Blood 2014

HLA-compatibility is a Risk Factor ...

- Thus due to its strong impact on GVHD and survival HLA-compatibility is an almost universal confounder (alike comorbidity & disease risk) and needs to be considered in almost any statistical analysis comprising unrelated donor transplantation.
- To specify partial matches is most relevant in unrelated donor transplantation.
- Due to the Mendelian laws, siblings are either HLA-identical (i.e. share two haplotypes) or haploidentical (i.e. share one haplotype) or non-ident but only rarely (<2%) partially matched.

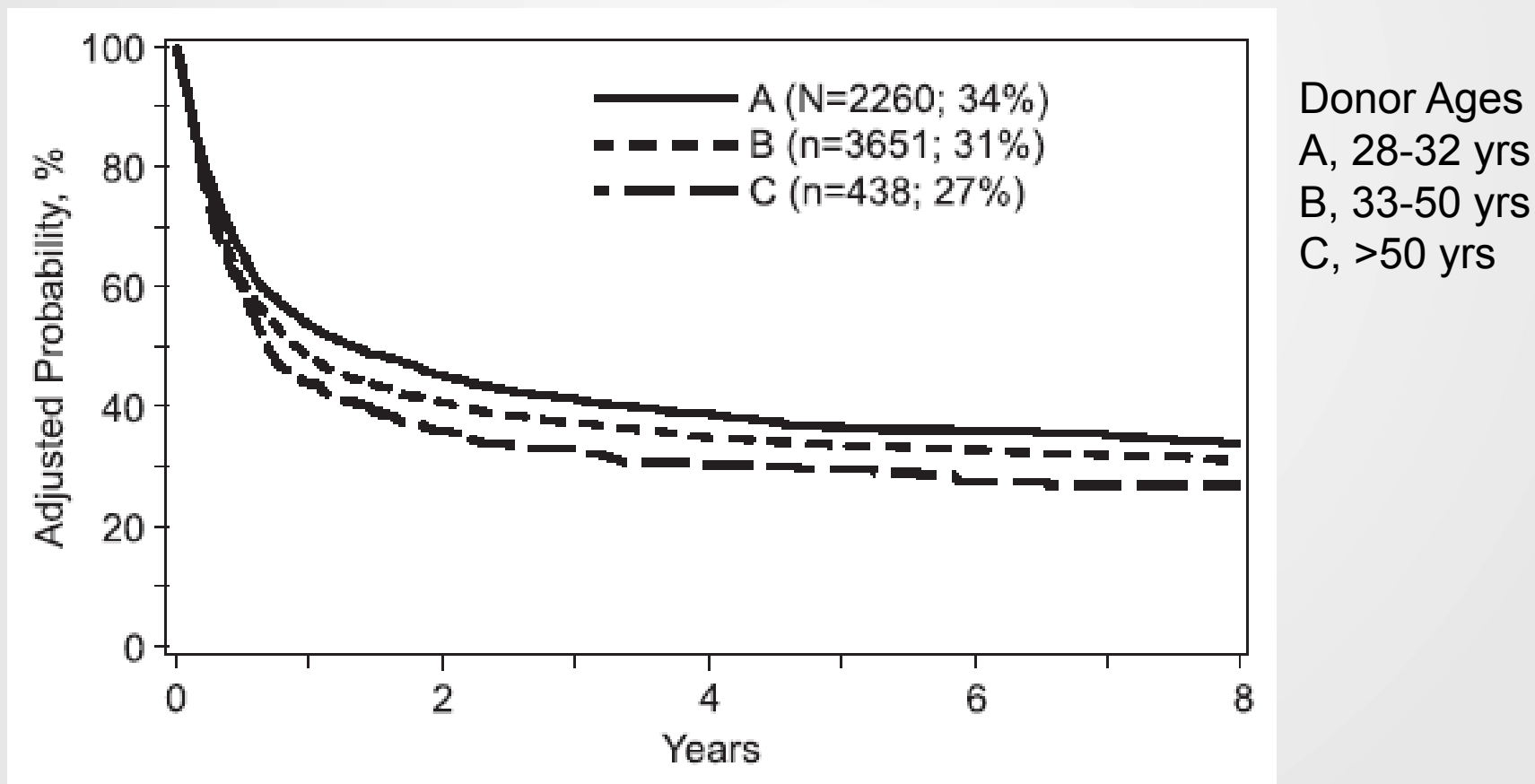
HLA is key to improve donor selection



Fleischhauer et al, Lancet Oncol 2012

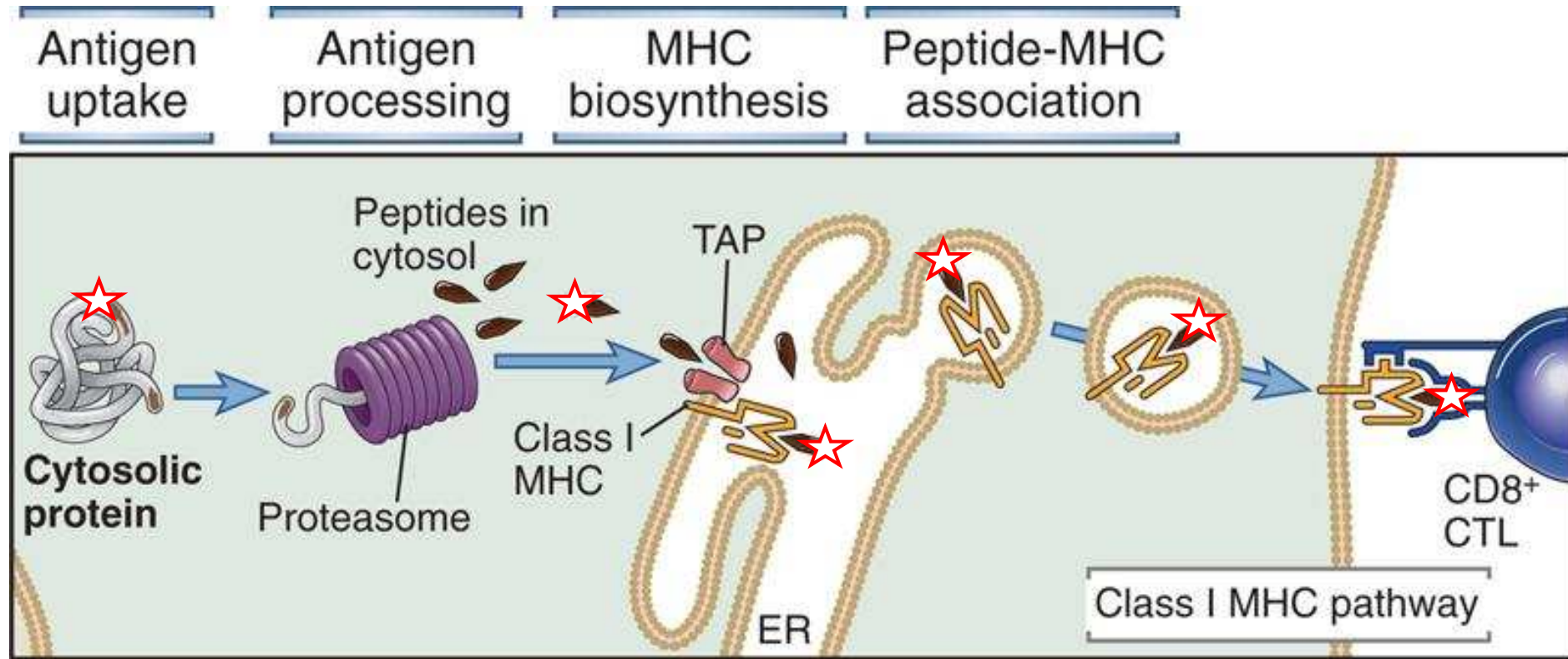
HLA is key to improve donor selection ...

... even when it is about secondary factors



Kollman et al, Blood 2016

Presentation of 'mutated' peptides

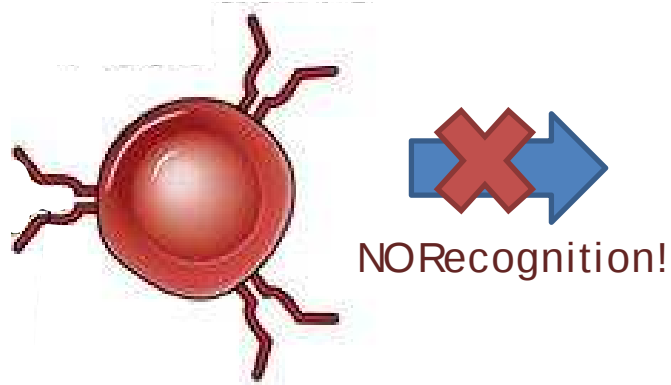


In patients with NPM1-mutated AML the cytosolic protein might be a leukemia-specific protein

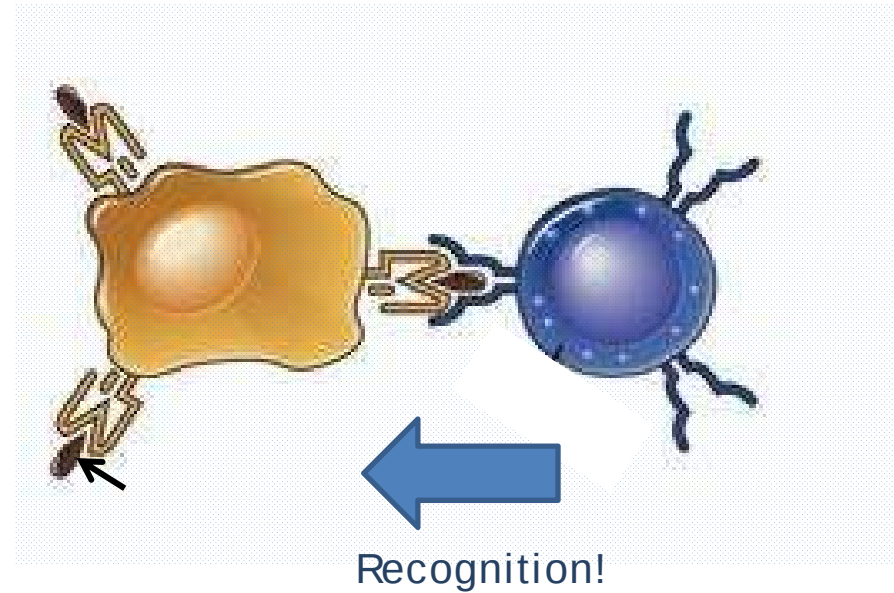
While the patient immune system did not recognize this mutated protein the donor immune system could be capable.

Discrimination between 'self' and 'foreign'

Leukemia cell:
HLA -B + mutated NPM1



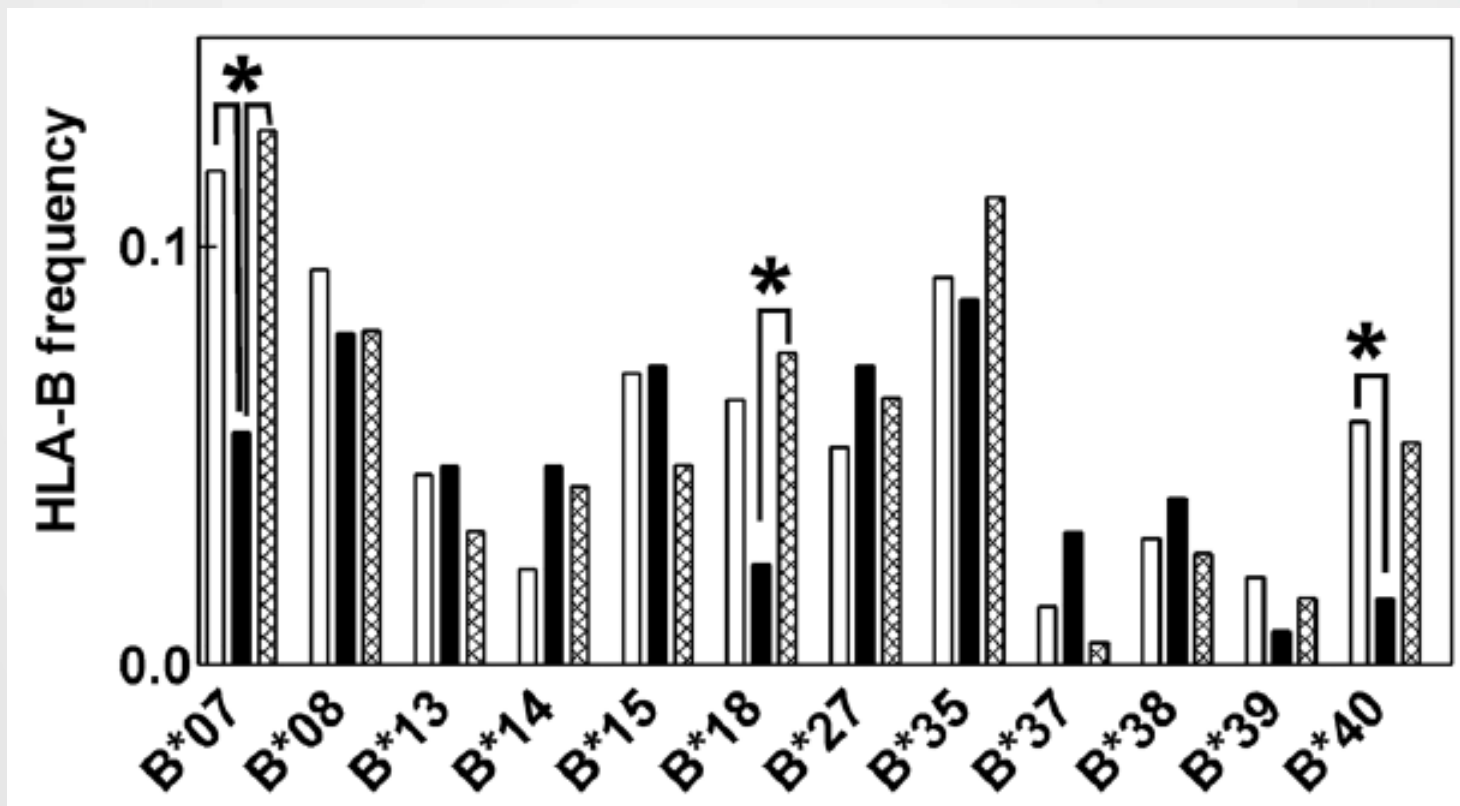
Recipient T cell:
T cell receptor does not
recognize 'self' peptides



Donor T cell:
specific T cell receptor
recognizes 'mutated' peptide

HLA and Disease associations

... here NPM1_{mut} AML

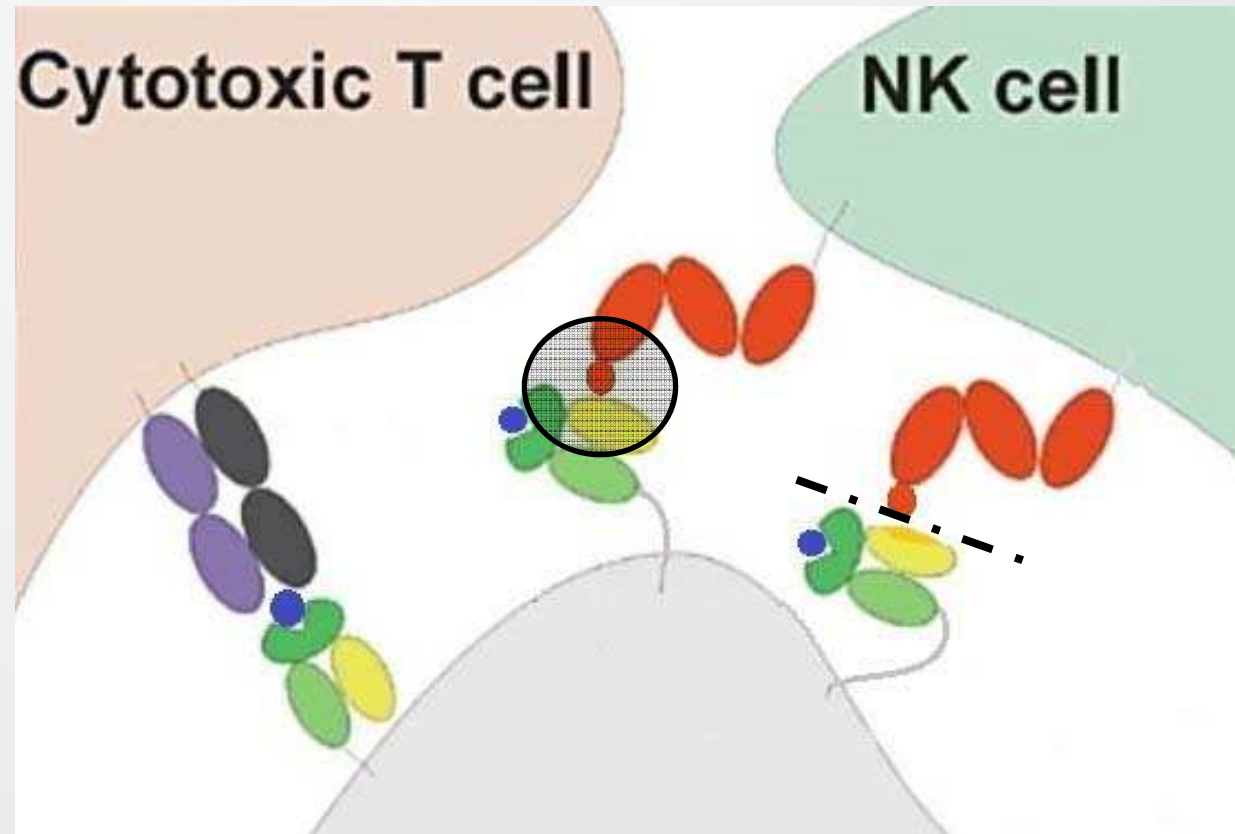


Kuzelova, PLOSOne 2015

Natural Killer Cell (NK) Immunoglobulin-like Receptors (KIR)

Facettes of HLA interactions:

- KIRs interact with groups of HLA alleles (e.g. C alleles can be divided into C1 and C2)
- NK cells are potent mediators of disease control



modified from: Jones et. al, Nature Immunology 2001

- HLA data is key to any high quality publication on allogeneic stem cell transplantation
- Ask your immunogeneticist or your doctor when you are uncertain what you should report
- Donor and patient may be HLA compatible even when the string code or number code differ. The statement on HLA-compatibility on the report of the immunogeneticist is binding.
- Don't drop letters (G-, P-, L-, ...) from the HLA-codes.
- Don't change the donor ID and the patient ID from the number or string code.

Acknowledgements

- Thank you to the Leiden data office Team and members of the Chronic Malignancies Working Party!
- Monika Füssel, DKMS Life Science Lab
- Falk Heidenreich, Sarah Wendler, Susanne Hänsel, DKMS CTU, Catrin Theuser, TUD



Thank you for your attention!



HLA DNA typing – patient

HLA A
HLA B
HLA C
HLA DRB1
HLA DQB1
HLA DPB1

https://www2.clinicalresearch.nl/PROMISE/S/HEIT/S_O_EBMT_C_NEW_MEDAB/_U_LINK_ MEDAB (MAIN ENTRY TO P)

Datei Bearbeiten Ansicht Favoriten Extras

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Data Entry Report Export Help Filter MEDAB -- [808][PRODUCTION][Dresden]

Resume with the **first** item in the **current** section by pressing **Tab** (or click on any other item)

Index Editor Overview DynFill:20:Acute leukaemia Data Entry

Assessment(1)	value	label
CIC	808	808
Patient	999999	999999
Assessment date	2016/07/07 00:00	2016/07/07 00:00:00
Patient HLA: DNA results		
DNA typing done		
HLA: DNA typing done		
Type A		
HLA A: DNA in allele 1 of the patient		
HLA A: MAC code for allele 1 in the patient		
HLA A: DNA in allele 2 of the patient		
HLA A: MAC code for allele 2 in the patient		
Type B		
HLA B: DNA in allele 1 of the patient		
HLA B: MAC code for allele 1 in the patient		
HLA B: DNA in allele 2 of the patient		
HLA B: MAC code for allele 2 in the patient		
Type C		
HLA C: DNA in allele 1 of the patient		
HLA C: MAC code for allele 1 in the patient		
HLA C: DNA in allele 2 of the patient		
HLA C: MAC code for allele 2 in the patient		
Type DRB1		
HLA DRB1: DNA in allele 1 of the patient		
HLA DRB1: MAC code for allele 1 in the patient		
HLA DRB1: DNA in allele 2 of the patient		
HLA DRB1: MAC code for allele 2 in the patient		
Type DQB1		
HLA DQB1: DNA in allele 1 of the patient		
HLA DQB1: MAC code for allele 1 in the patient		
HLA DQB1: DNA in allele 2 of the patient		
HLA DQB1: MAC code for allele 2 in the patient		
Type DPB1		
HLA DPB1: DNA in allele 1 of the patient		
HLA DPB1: MAC code for allele 1 in the patient		
HLA DPB1: DNA in allele 2 of the patient		
HLA DPB1: MAC code for allele 2 in the patient		

Note: Enter the HLA typing results for the patient

HLA: DNA typing done

1 No
2 Yes
99 unknown

+ Acti
Form at
Med-B c
UPN
Date of
Are you

https://www2.clinicalresearch.nl/PROMISE/S/HEIT/S_O_EBMT_C_NEW_MEDAB/_U_LINK_ MEDAB

Datei Bearbeiten Ansicht Favoriten Extras

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Data Entry Report Export Help Filter MEDAB -- [808][PRODUCTION][Dresden]

Resume with the **first** item in the **current** section by pressing **Tab** (or click on any other item)

Index **Editor** Overview DynFill:20:Acute leukaemia

Assessment(1)	value	label
CIC	808	808
Patient	999999	999999
Assessment date	2016/07/07 00:00	2016/07/07 00:00:00
Patient HLA: serology results		
HLA: serology typing done		
Serology HLA typing done		
Type A		
HLA A: serology in the patient 1		
HLA A: serology in the patient 2		
Type B		
HLA B: serology in the patient 1		
HLA B: serology in the patient 2		
Type C		
HLA C: serology in the patient 1		
HLA C: serology in the patient 2		
Type DRB1		
HLA DRB1: serology in the patient 1		
HLA DRB1: serology in the patient 2		
Type DQB1		
HLA DQB1: serology in the patient 1		
HLA DQB1: serology in the patient 2		
Type DPB1		
HLA DPB1: serology in the patient 1		
HLA DPB1: serology in the patient 2		

☐ ☒ ☐

Serology HLA typing done
1 No
2 Yes
99 unknown

HLA serology typing – patient

HLA A
HLA B
HLA C
HLA DRB1
HLA DQB1
HLA DPB1

https://www2.clinicalresearch.nl/PROMISE/S/HEIT/S_O_EBMT_C_NEW_MEDAB/_U_LINK_ MEDAB (MAIN ENTRY)

Datei Bearbeiten Ansicht Favoriten Extras

Vorgeschlagene Sites: Google

Data Entry Report Export Help Filter MEDAB -- [808][PRODUCTION][Dresden]

Resume with the **first** item in the **current** section by pressing **Tab** (or click on any other item)

Index Editor Overview DynFil:20;Acute leukaemia

Donor	value	label
CIC	808	808
Patient	999999	999999
Treatment date	2016/07/07 00:00	2016/07/07 00:00:00
Donor	1	1

Donor HLA: DNA results ✔ Note: Enter the HLA typing results for this donor

HLA: DNA typing done

DNA HLA typing done ☐

Type A

HLA A: DNA in allele 1 of the donor

HLA A: MAC code for allele 1 in the donor

HLA A: DNA in allele 2 of the donor

HLA A: MAC code for allele 2 in the donor

Type B

HLA B: DNA in allele 1 of the donor

HLA B: MAC code for allele 1 in the donor

HLA B: DNA in allele 2 of the donor

HLA B: MAC code for allele 2 in the donor

Type C

HLA C: DNA in allele 1 of the donor

HLA C: MAC code for allele 1 in the donor

HLA C: DNA in allele 2 of the donor

HLA C: MAC code for allele 2 in the donor

Type DRB1

HLA DRB1: DNA in allele 1 of the donor

HLA DRB1: MAC code for allele 1 in the donor

HLA DRB1: DNA in allele 2 of the donor

HLA DRB1: MAC code for allele 2 in the donor

Type DQB1

HLA DQB1: DNA in allele 1 of the donor

HLA DQB1: MAC code for allele 1 in the donor

HLA DQB1: DNA in allele 2 of the donor

HLA DQB1: MAC code for allele 2 in the donor

Type DPB1

HLA DPB1: DNA in allele 1 of the donor

HLA DPB1: MAC code for allele 1 in the donor

HLA DPB1: DNA in allele 2 of the donor

HLA DPB1: MAC code for allele 2 in the donor

DNA HLA typing done

1 No

2 Yes

3 Yes, identical. Copy results from patient

99 unknown

HLA DNA typing – donor

HLA A
HLA B
HLA C
HLA DRB1
HLA DQB1
HLA DPB1

Browser address: https://www2.clinicalresearch.nl/PROMISE/S/HEIT/S_O_EBMT_C_NEW_MEDAB/_U_LINK_

Menu: Datei Bearbeiten Ansicht Favoriten Extras

Vorgeschlagene Sites: Google

Navigation: Data Entry Report Export Help Filter MEDAB -- [808][PRODUCTION][Dresden]

Instruction: Resume with the **first** item in the **current** section by pressing **Tab** (or click on any other item)

Index Editor Overview DynFil:20:Acute leukaemia

Donor	value	label
CIC	808	808
Patient	999999	999999
Treatment date	2016/07/07 00:00	2016/07/07 00:00:00
Donor	1	1
Donor HLA: serology results		
HLA: serology typing done		
Serology HLA typing done		
Type A		
HLA A: serology in the donor 1		
HLA A: serology in the donor 2		
Type B		
HLA B: serology in the donor 1		
HLA B: serology in the donor 2		
Type C		
HLA C: serology in the donor 1		
HLA C: serology in the donor 2		
Type DRB1		
HLA DRB1: serology in the donor 1		
HLA DRB1: serology in the donor 2		
Type DQB1		
HLA DQB1: serology in the donor 1		
HLA DQB1: serology in the donor 2		
Type DPB1		
HLA DPB1: serology in the donor 1		
HLA DPB1: serology in the donor 2		

Serology HLA typing done

1	No
2	Yes
3	Yes, identical. Copy results from patient
99	unknown

HLA serology typing – donor

HLA A
HLA B
HLA C
HLA DRB1
HLA DQB1
HLA DPB1