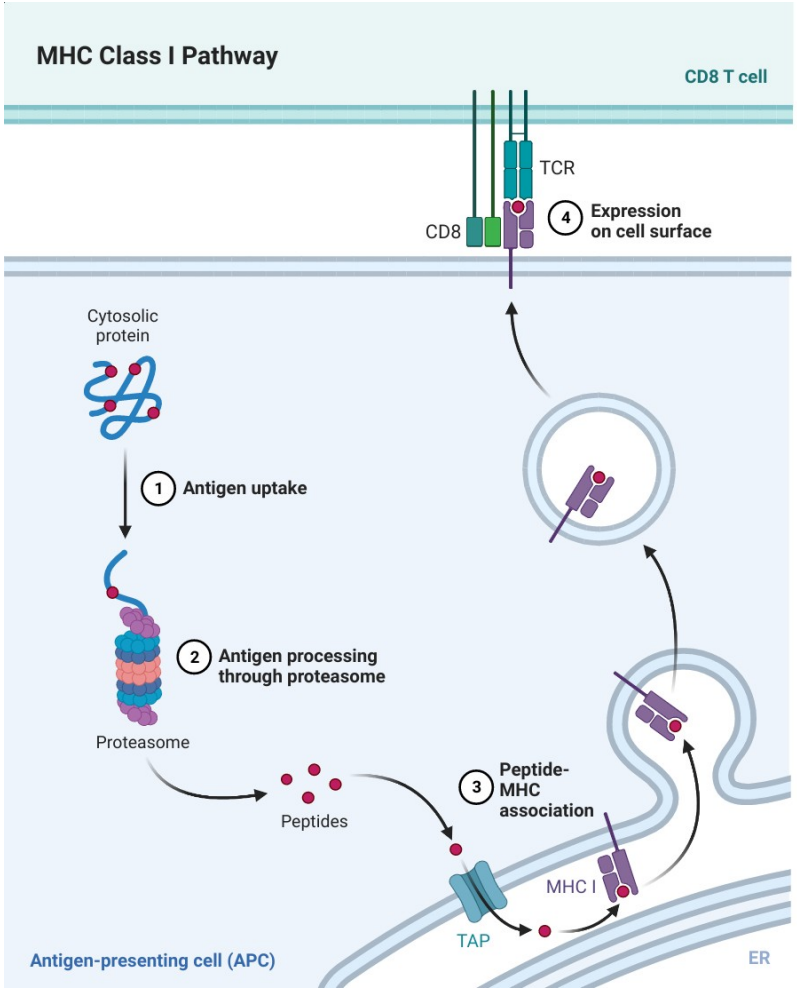
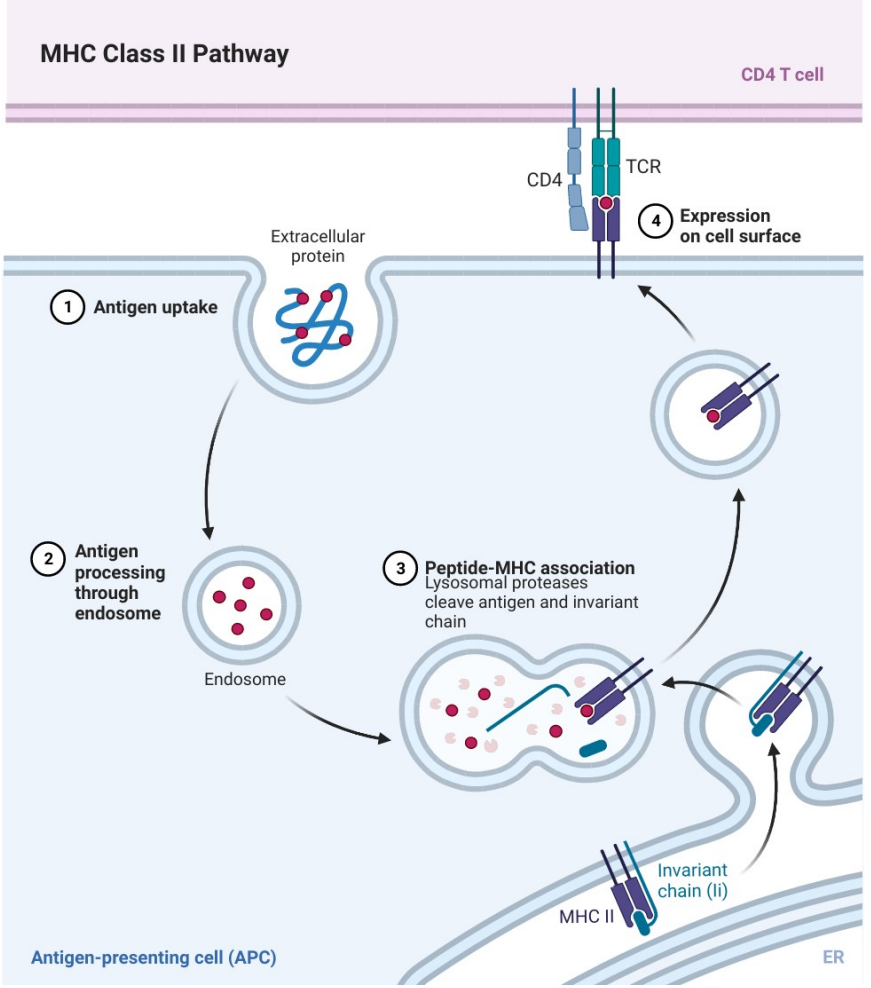
Фонд интеллект

Машинное обучение в иммунологии и медицине

Антигенпрезентация. Связывание пептидов с МНС.

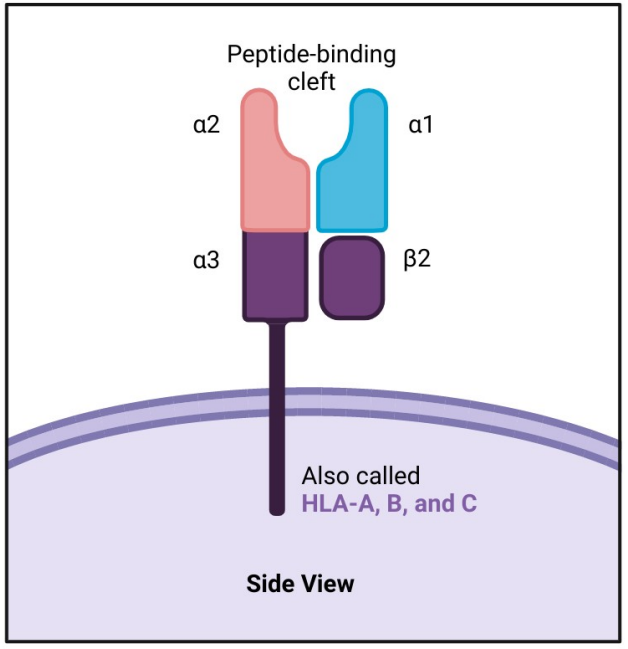
Пути захвата антигена



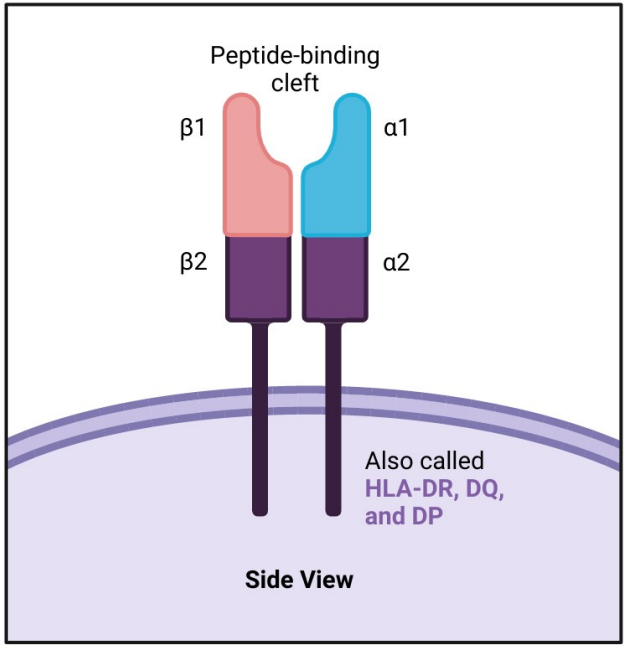


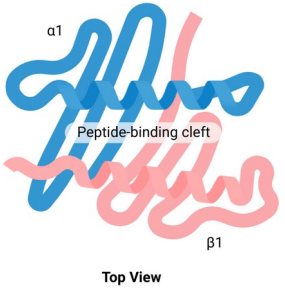
Строение MHC

MHC class I

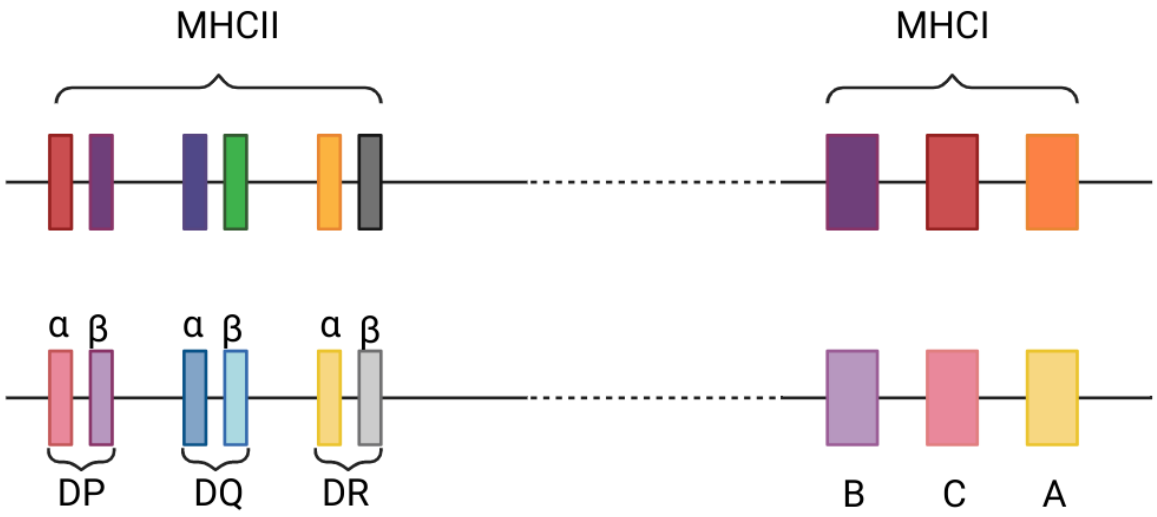


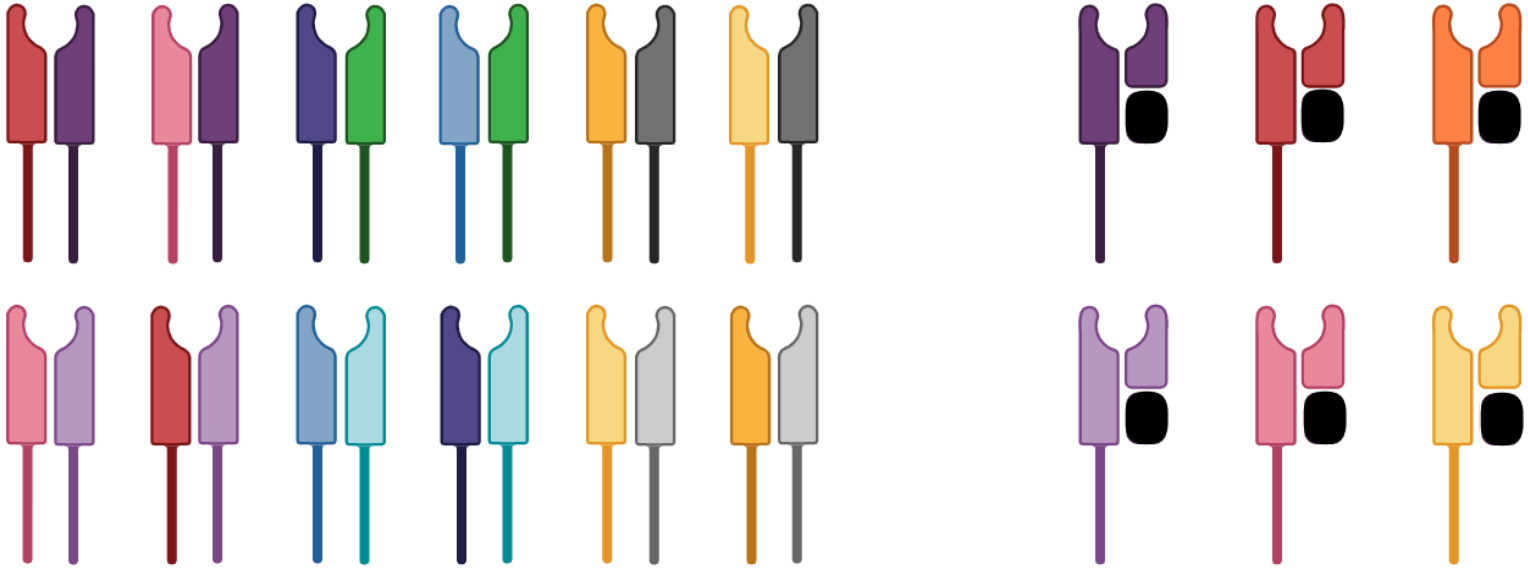
MHC class II



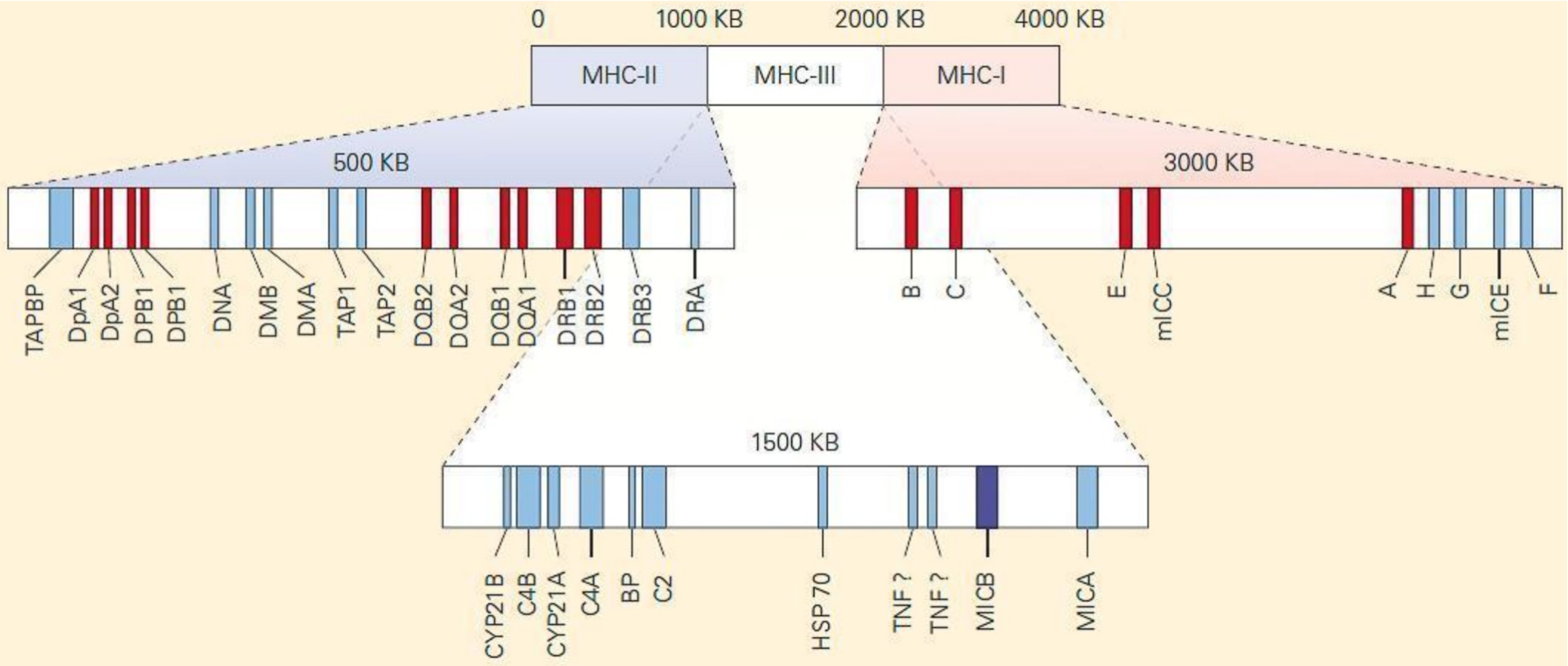


Разнообразие МНС

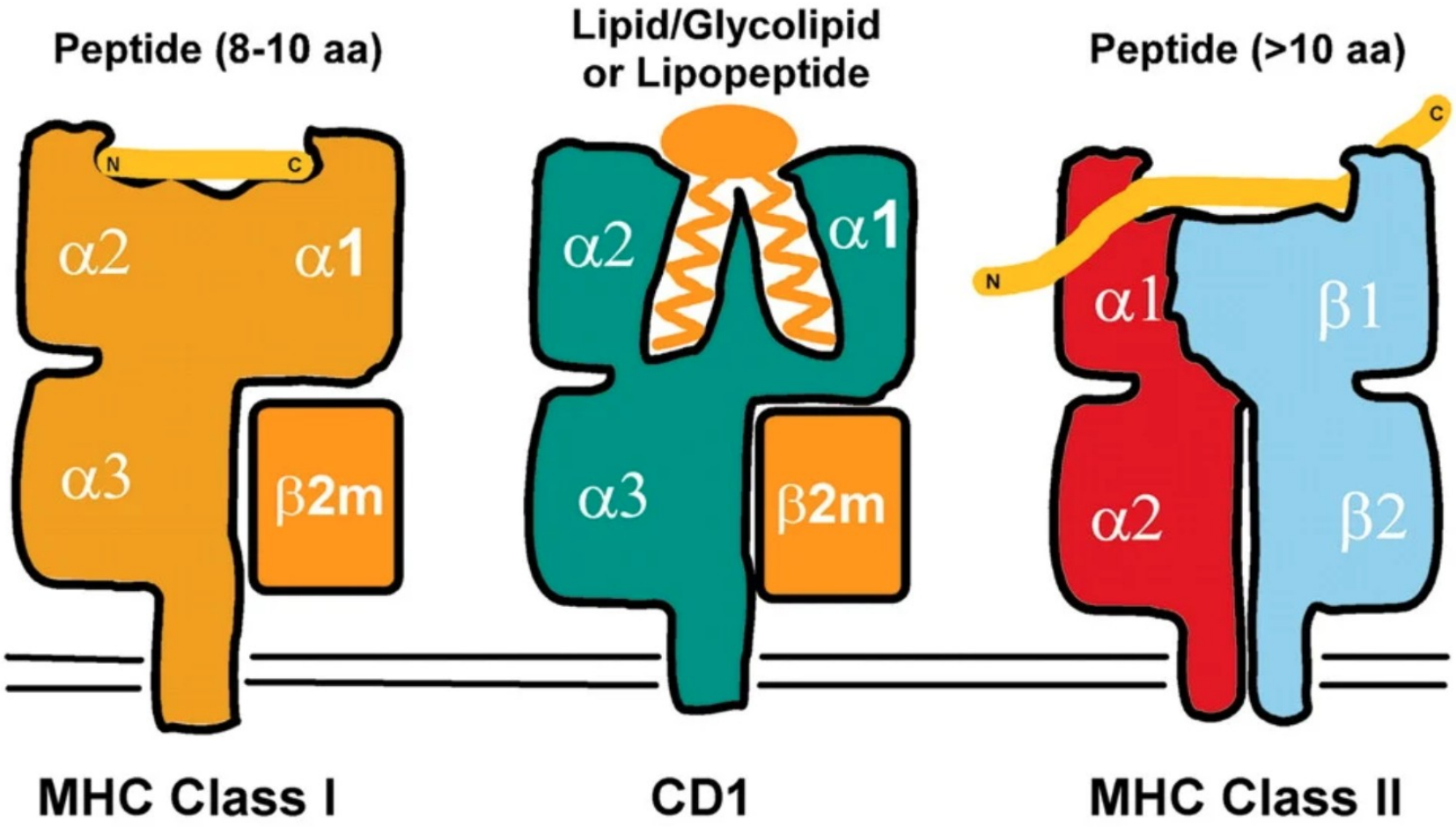




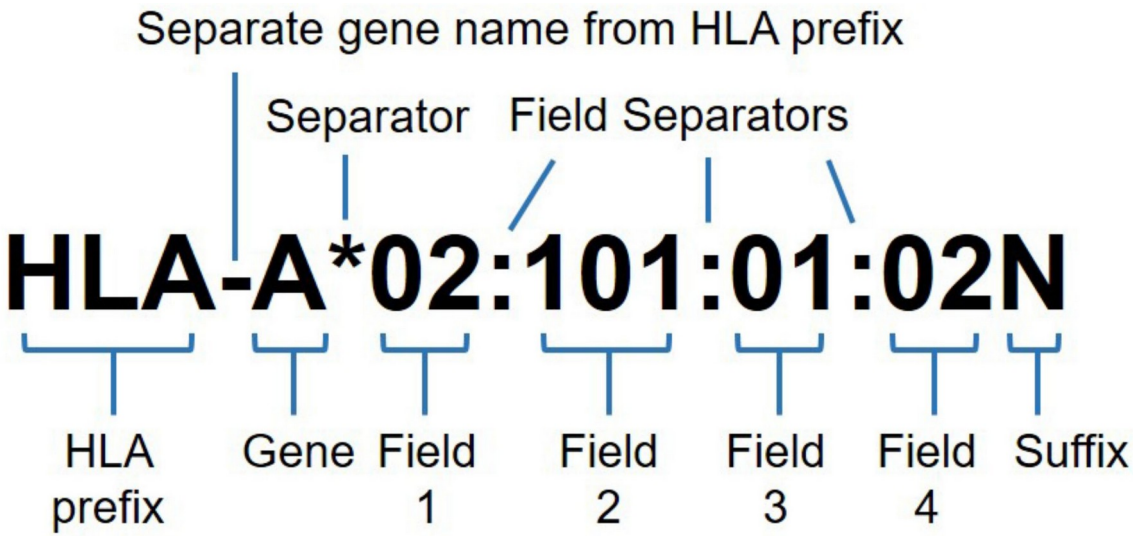
Детальное строение МНС генов



Презентация антигенов



HLA-типирование



Field 1: Allele group

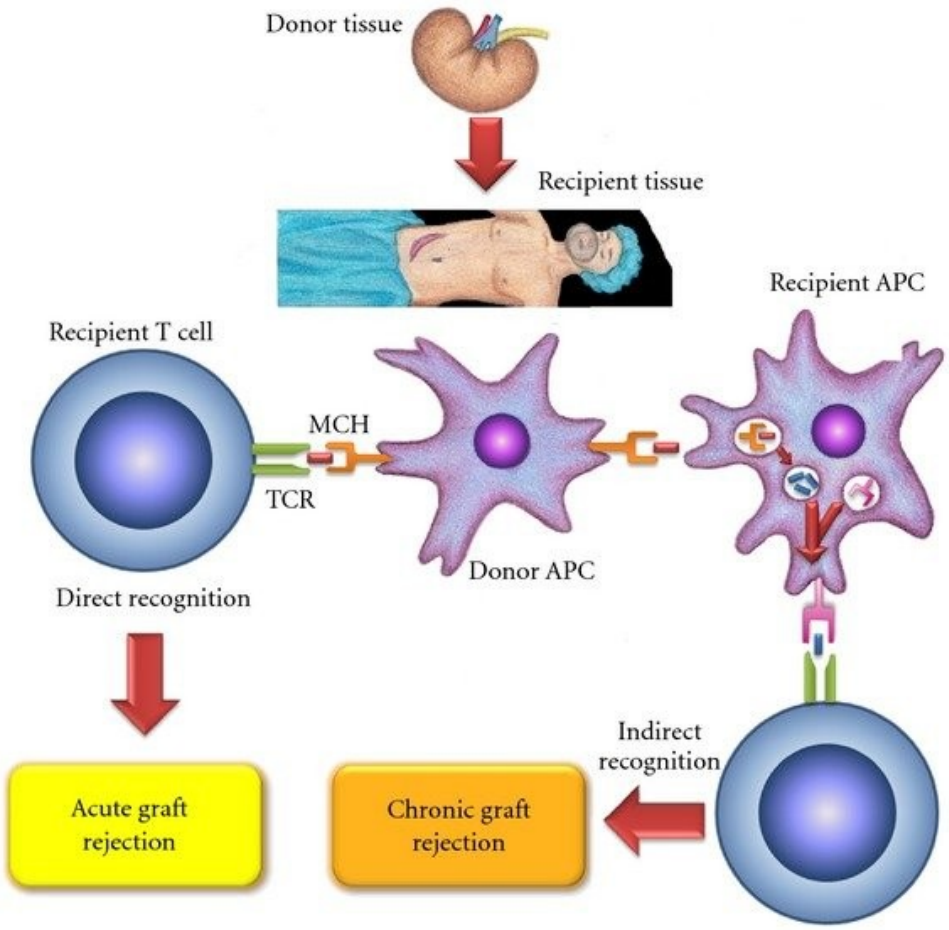
Field 2: Specific HLA protein

Field 3: Synonymous DNA substitution in coding region

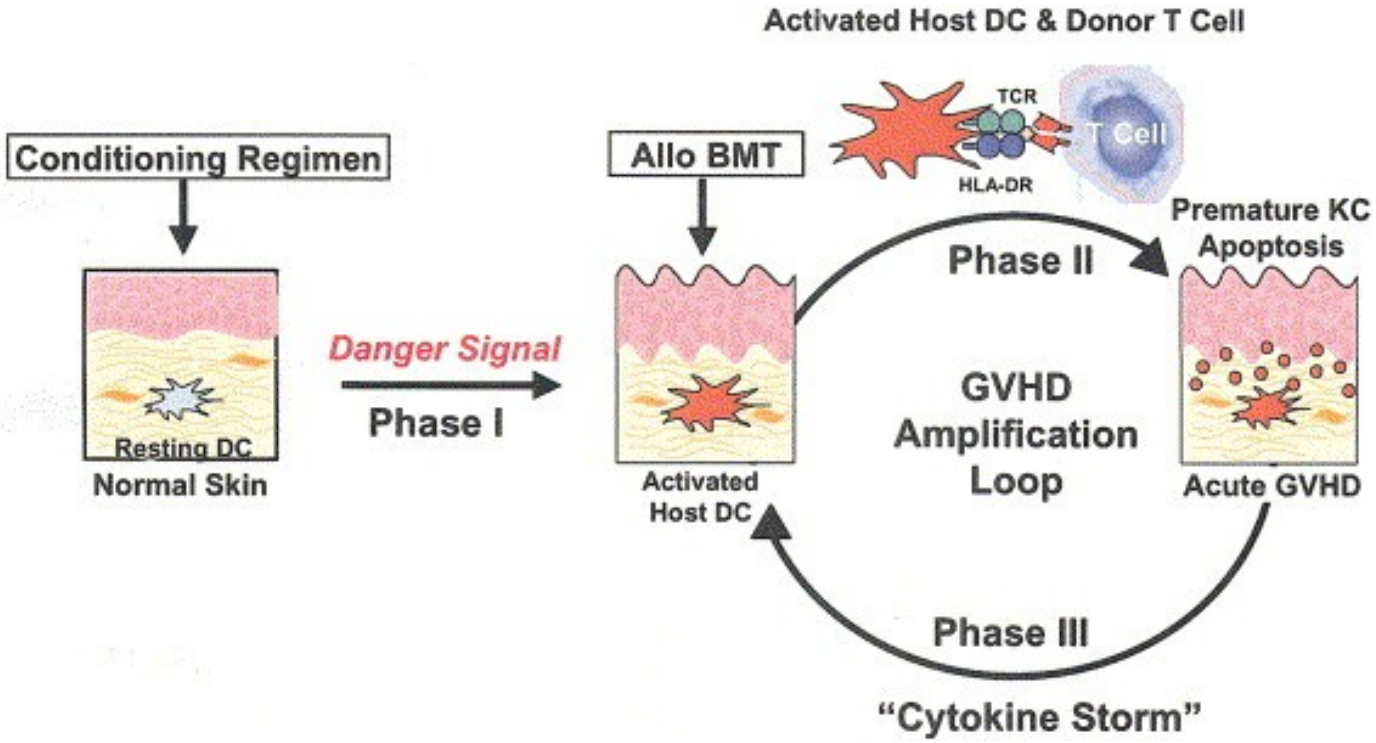
Field 4: Changes in non-coding region

Suffix: Denoted changes in expression

Отторжение органов

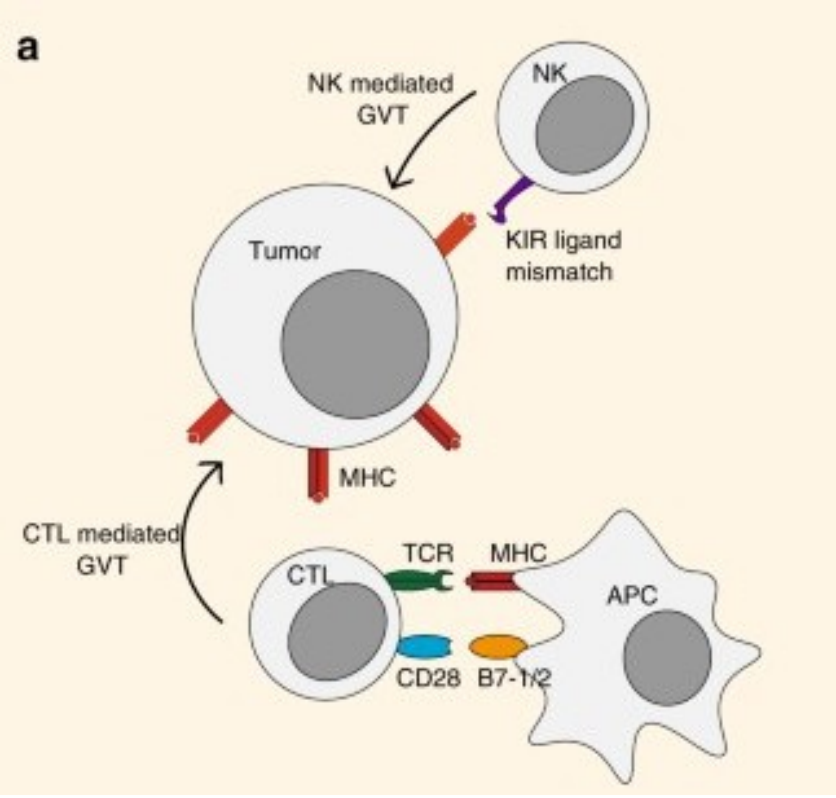


Реакция «трансплантат против хозяина» (РТПХ)/graft versus host



https://www.sciencedirect.com/science/article/pii/S1083879104001788

Реакция «трансплантат против опухоли» (РТПО)/graft versus tumor



https://www.nature.com/articles/s41409-018-0244-z

МНС и предрасположенность к заболеваниям

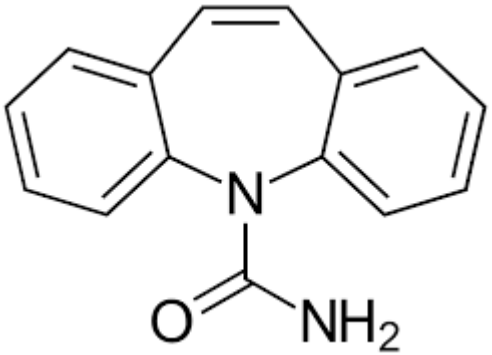
HLA Class I	
A	
HLA-A3	Hemochromatosis
B	
HLA-B08	Graves' disease
HLA-B16	Multiple sclerosis
HLA-B18	Type I diabetes mellitus
HLA-B27	Ankylosing spondylitis, psoriatic arthritis, arthritis of inflammatory bowel disease, reactive arthritis
HLA-B35	Lymphoid leukemia

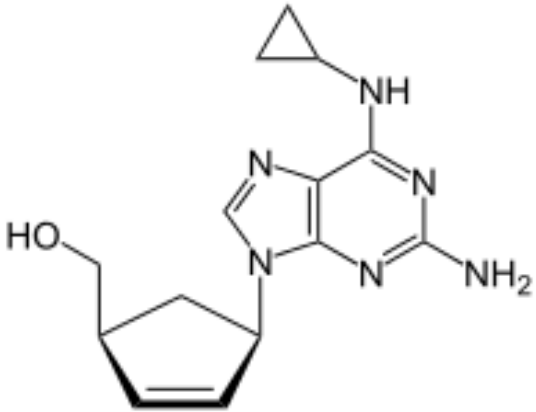
HLA Class II	
D	
HLA-DQ1	Narcolepsy
HLA-DQ2	Celiac disease
HLA-DQ8	Celiac disease
HLA-DR1	Myasthenia gravis, rheumatoid arthritis, schizophrenia,
HLA-DR2	Multiple sclerosis, hay fever, systemic lupus erythematosus, Goodpasture syndrome, narcolepsy
HLA-DR3	Addison's disease, myasthenia gravis, systemic lupus erythematosus, Graves' disease, type I diabetes mellitus
HLA-DR4	Type I diabetes mellitus, rheumatoid arthritis
HLA-DR5	Type I diabetes mellitus, Hashimoto's thyroiditis, pernicious anemia, rheumatoid arthritis, alopecia areata, antiphospholipid syndrome
HLA-DR7	Steroid-responsive nephrotic syndrome

Disease	HLA-associated allele	Position	Amino acid	Pocket	Reference
Ankylosing spondylitis	HLA-B*27	116	Asp	F	(16)
Psoriasis	HLA-C*06	156	Trp	F	(28)
Chronic beryllium disease	HLA-DPB1	69	Glu	P4	(4)
Rheumatoid arthritis	HLA-DRB1	11, 13, 71, 74	Val, His, Lys, Ala	P4	(9)
Celiac disease	HLA-DQB1	71	Lys	P4	(34)
Type 1 diabetes	HLA-DQB1	57	Non-Asp	P9	(35)
Multiple sclerosis	HLA-DRB1*1501	71, 74, 57	Ala, Ala, Asp	P9	(36)

https://www.frontiersin.org/articles/10.3389/fimmu.2017.01475/full

Связывание малых молекул с поверхностью МНС





there is a strong association in Han Chinese between a genetic marker, the human leukocyte antigen HLA–B*1502, and Stevens–Johnson syndrome induced by carbamazepine.

https://www.nature.com/articles/428486a

HLA-B*5701 Screening for Hypersensitivity to Abacavir

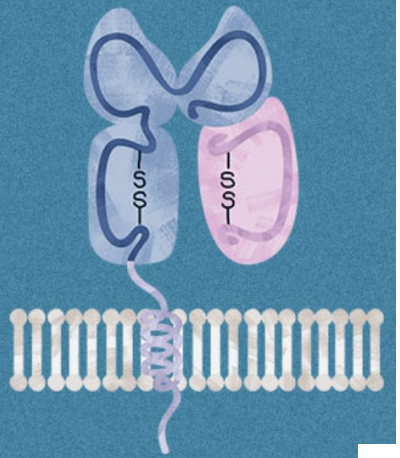
https://www.nejm.org/doi/10.1056/NEJMoa0706135?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200www.ncbi.nlm.nih.gov

Проверка специфичности TCR

KACTUS HOME PRODUCTS RESOURCES COMPANY Search Product

MHC-I Complexes

Check out our line of mammalian cell-derived MHC-I complexes including biotinylated and tetramer complexes.



T-Lymphocyte Activation by MHC

T lymphocytes, key mediators of the adaptive immune response, are activated when their T-cell receptors (TCRs) interact with cognate antigenic peptides displayed by major histocompatibility complex molecules (MHC).

Mammalian Expression

E. coli expression and *in vitro* protein refolding is a common method to produce MHC-I complexes. However, using our SAMS™ technology platform, KACTUS succeeded in expressing biotinylated MHC-I complex in the mammalian cell line Expi293.

High affinity, low endotoxin

The resulting MHC-I complexes show high affinities with benchmark antibodies and have low endotoxin levels – ideal for endotoxin sensitive cell-based assays. KACTUS also provides MHC tetramer complexes which have a greater avidity to T cells and more stable binding.

Service Features

- Professional MHC-peptide complex R&D technology platform
- HEK 293 expression systems
- Various types of MHC I and antigens are available
- Monomer/Tetramer forms
- FITC/PE/APC/Biotin-labeled are optional
- Mature bioactivity verification platform: SPR/ELISA/FACS and more

Customized Product List

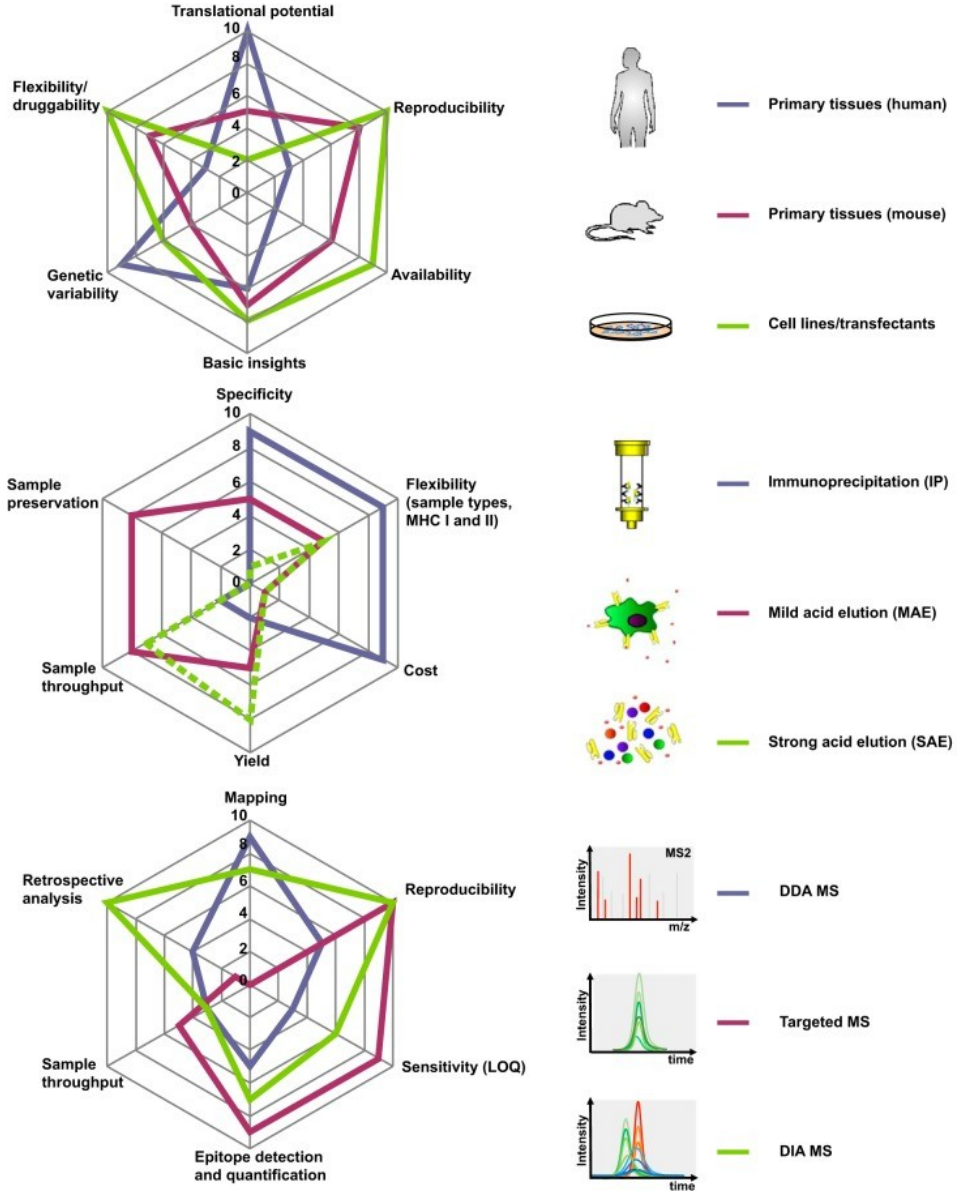
MHC Allele				Target			
HLA-A*0101	HLA-A*0201	HLA-A*0301	HLA-A*1101	NY-ESO-1	GP-100	MSLN	AFP
HLA-A*2402	HLA-A*3303	HLA-B*1501	HLA-B*1525	WT1	MAGE-A1	HPV	HBV
HLA-B*3802	HLA-B*4601	HLA-B*0702	.....	HIV	EBV	PRAME	.....

Click to Customize

Recommended Products

Исследование пептидома

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4762616/



Не защищено | zhang-lab.org/caatlas/

caAtlas

Search below or check out the cancer-associated antigen list, CT antigen list and PTM antigen list. The data can also be downloaded from here.

Uniprot ID, gene symbol or protein name... Search

Search peptide... Search HLA type, e.g. HLA-A(

9	5,973,379	5,370,239
Cancer Types	HLA Class I PSMs	HLA Class II PSMs

231,766	55,710	229,099	92,203
Class I Non-modified Peptides	Class I Modified Peptides	Class II Non-modified Peptides	Class II Modified Peptides

The IEDB has just launched its updated 3D viewers! Learn more via ou

Welcome

The Immune Epitope Database (IEDB) is a freely available resource funded by NIAID. It catalogs experimental data on antibody and T cell epitopes studied in humans, non-human primates, and other animal species in the context of infectious disease, allergy, autoimmunity and transplantation. The IEDB also hosts tools to assist in the prediction and analysis of epitopes.

Learn More

Upcoming Events & News

Virtual User Workshop — Oct 26-28
* view recordings here
Antibody Engineering & Therapeutics Exhibitor Booth — Dec 4-8

IEDB SARS-CoV-2 Epitope Analysis Videos

Summary Metrics

Peptidic Epitopes	1,550,521

START YOUR SEARCH HERE

Epitope

- Any
- Linear peptide
- Exact — Ex: SIINFEKL
- Discontinuous
- Non-peptidic

Assay

- T Cell
- B Cell
- MHC Ligand

Ex: neutralization — Find

Outcome: Positive Negative

Epitope Source

Organism

Ex: influenza, peanut — Find

Antigen

Ex: core, capsid, myos — Find

MHC Restriction

- Any
- Class I
- Class II
- Non-classical
- Ex: HLA-A*02:01 — Find

Host

- Any

Disease

- Any

Analysis Resource

Epitope Prediction

Scan an antigen sequence for amino a patterns indicative of:

- MHC I Binding
- MHC II Binding
- MHC I Processing (Proteasome,
- MHC I Immunogenicity

B Cell Epitope Prediction

Predict linear B cell epitopes using:

- Antigen Sequence Properties

Predict discontinuous B cell epitopes antigen structure via:

- Discotope
- ElliPro

Epitope Analysis Tools