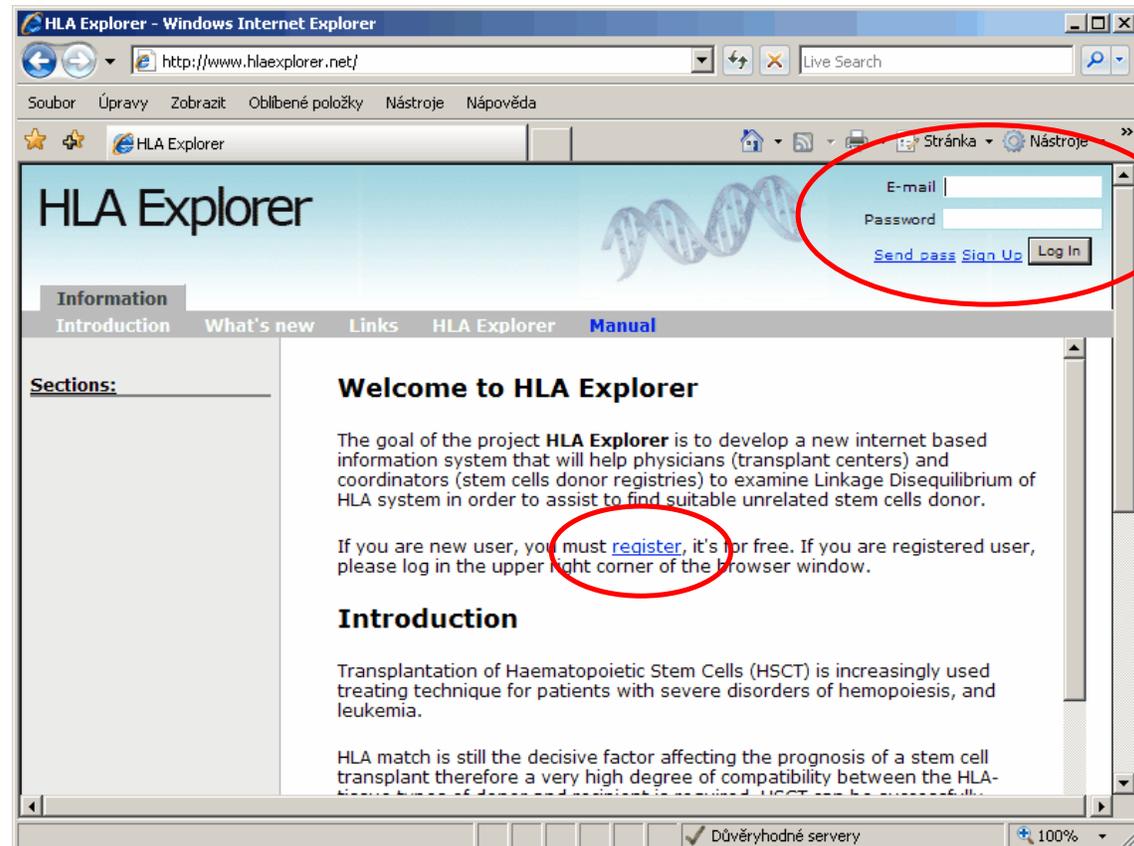


# HLA Explorer – step by step

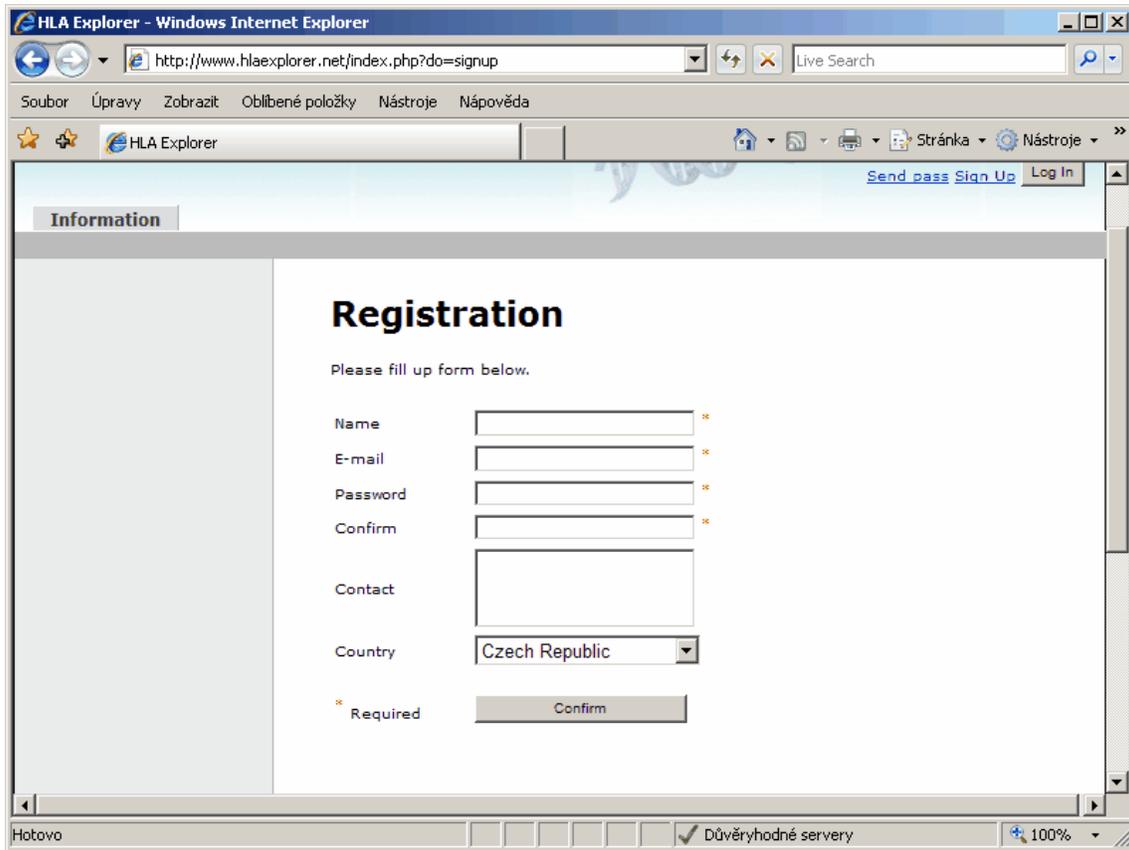
## 1. Open web page

Open your web browser and go to <http://www.hlaexplorer.net>

## 2. Register and log in



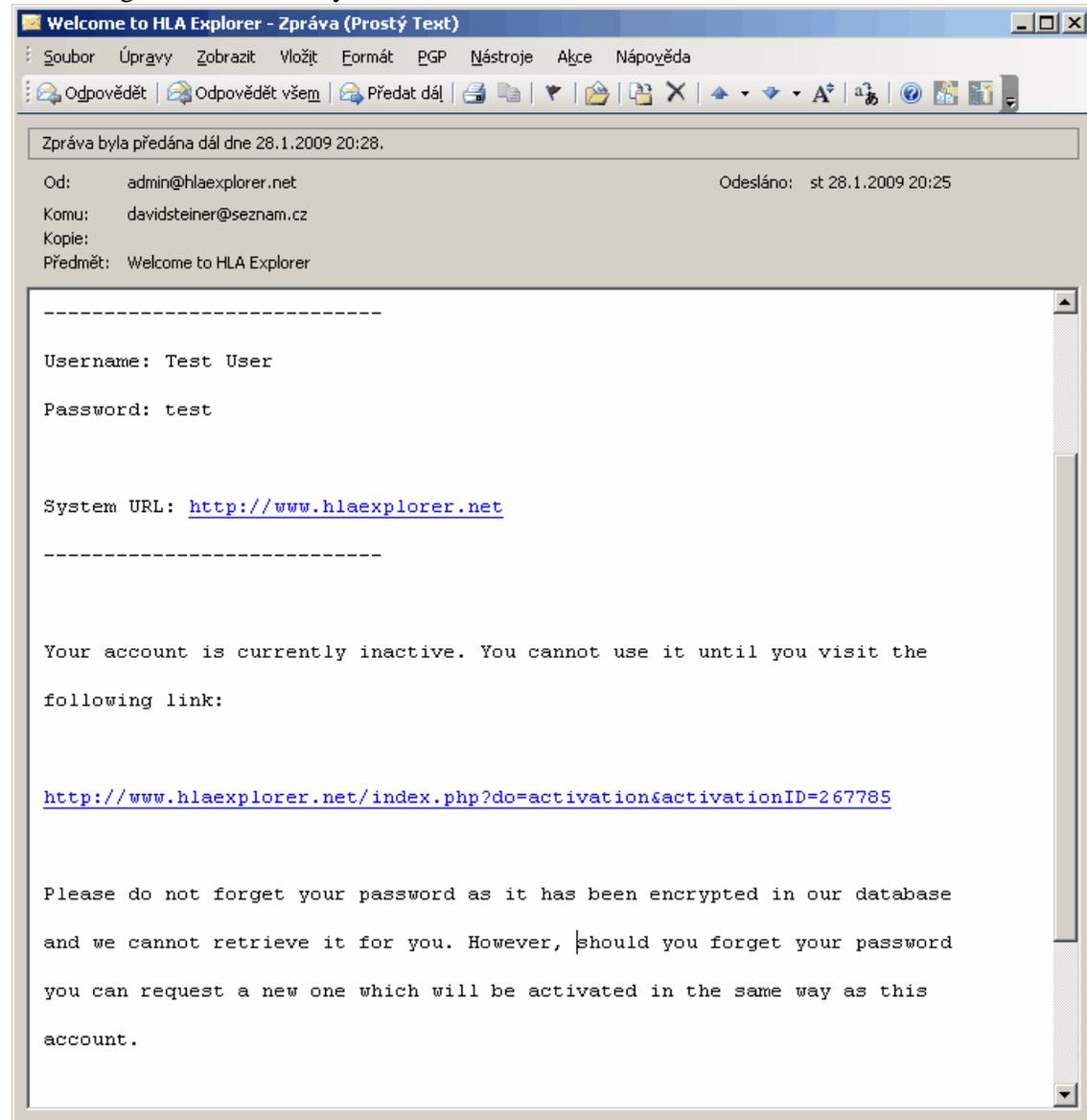
If you are not registered, click on the „register“ link.



Fill in registration details and press "Confirm" button.

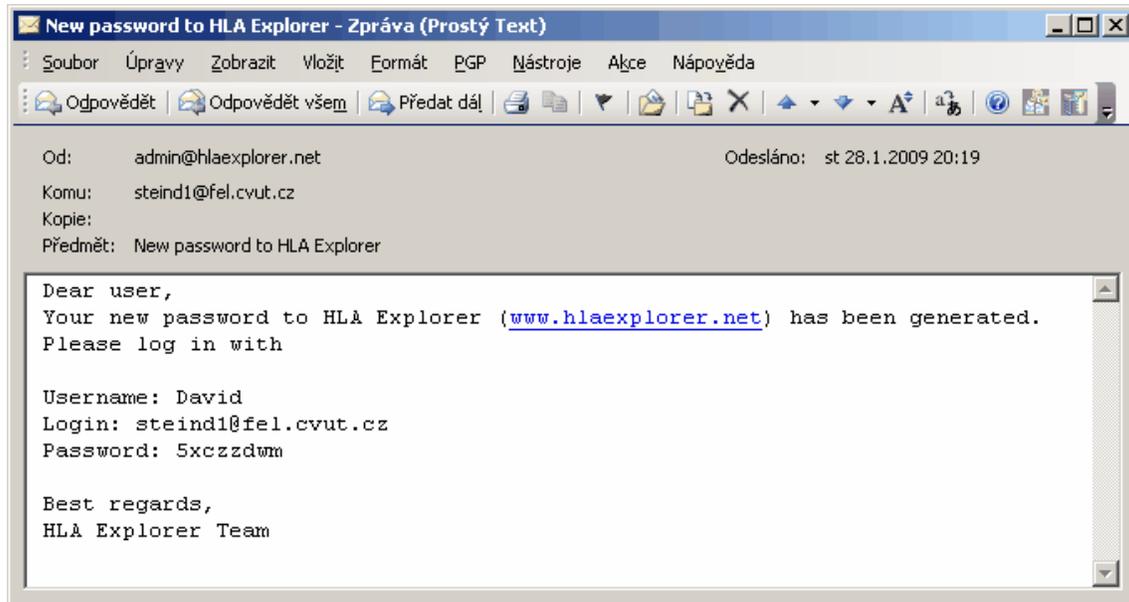


You will get confirmation by email.



Click on the link in the email to activate your account. Then log in with your username (email) and password.

If you enter your correct username (email) and you forget your password, you can click to "Send pass" link and the system will generate new password for you. You will receive this password by email.



### 3. Main menu



HLA Explorer has three main modules:

- **NMDP Explorer** – based on DNA data from NMDP  
Maiers, M., Gragert, L., Klitz, W. High resolution HLA alleles and haplotypes in the US population. Human Immunology (2007) 68, 779-788.  
[http://bioinformatics.nmdp.org/HLA/hla\\_res\\_idx.html](http://bioinformatics.nmdp.org/HLA/hla_res_idx.html)
- **DNA Explorer** – based on DNA data from Derek Middleton  
<http://www.allelefreqencies.net/test/beta.asp>
- **Serology Explorer** – based on data from participating stem cells donor registries.

## 4. Filter

Population  
- ALL -

First locus  
A 0201

Second locus  
B 35

Third locus  
C

Fourth locus  
- none -

Fifth locus  
- none -

Search Clear

Use filter tool on the left side to enter conditions you are interested in.

**Population:** If you select “ALL” you will get comparison of all populations in the database.

**Loci:** Select loci you want to see in the result. In “NMDP Explorer”, you can enter up to 5 loci. In “DNA Explorer” and “Serology Explorer” you can enter up to 3 loci.

**Allele code:** If you leave the field blank, you will get all alleles. You can enter allele group (e.g. 02) or 4 digit allele code (e.g. 0201). NMDP multiple-allele codes are not supported.

**Search:** Press this button to apply the filter.

**Clear:** Press this button to reset the filter conditions.

## 5. Result

You will see results in the middle of the web browser window. You switch between different **Views** that allow you to see the results in different outputs.

View: [Table](#) [List](#) [Graph](#)

## 6. List view

This is basic output format.

Population	A	B	C	Probability	LD
USA - HIS	0201g	3512	0401g	0.01264	0.012
USA - HIS	0201g	3501g	0401g	0.00826	0.00645
USA - EUR	0201g	3501g	0401g	0.00650	0.00473
USA - HIS	0201g	3517	0401g	0.00558	0.0052
USA - AFA	0201g	3501g	0401g	0.00480	0.00344
USA - EUR	0201g	3503	0401g	0.00341	0.00293
USA - API	0201g	3501g	0303g	0.00319	0.00299
USA - AFA	0201g	3501g	1601	0.00285	0.00211
USA - HIS	0201g	3503	0401g	0.00281	0.00229
USA - HIS	0201g	3508	0401g	0.00165	0.00133
USA - HIS	0201g	3501g	0304	0.00094	0.00018
USA - EUR	0201g	3502	0401g	0.00092	0.00058
USA - AFA	0201g	3503	0401g	0.00088	0.00076
USA - API	0201g	3501g	0801	0.00088	0.00056
USA - API	0201g	3503	0401g	0.00066	0.00048
USA - EUR	0201g	3503	1203	0.00060	0.00038
USA - EUR	0201g	3508	0401g	0.00052	0.00041
USA - HIS	0201g	3516	0401g	0.00047	0.00046
USA - HIS	0201g	3501g	1601	0.00047	-0.0001
USA - HIS	0201g	3543g	0102	0.00047	0.00037



You can sort the table according to any column if you click to small arrow in the header of the column.

**0201g** means

A\*0201,A\*0201L,A\*0209,A\*0243N,A\*0266,A\*0275,A\*0283N,A\*0289,A\*0297,A\*9232,A\*9234

Definition of all multiple defined alleles occurring within a single antigen binding domain category can be found at

[http://bioinformatics.nmdp.org/HLA/Haplotype\\_Frequencies/DOCS/Table1.pdf](http://bioinformatics.nmdp.org/HLA/Haplotype_Frequencies/DOCS/Table1.pdf)

**LD** is Linkage Disequilibrium. The alleles of HLA system at different loci can occur together at very much higher frequencies than would be expected from their respective gene frequencies.

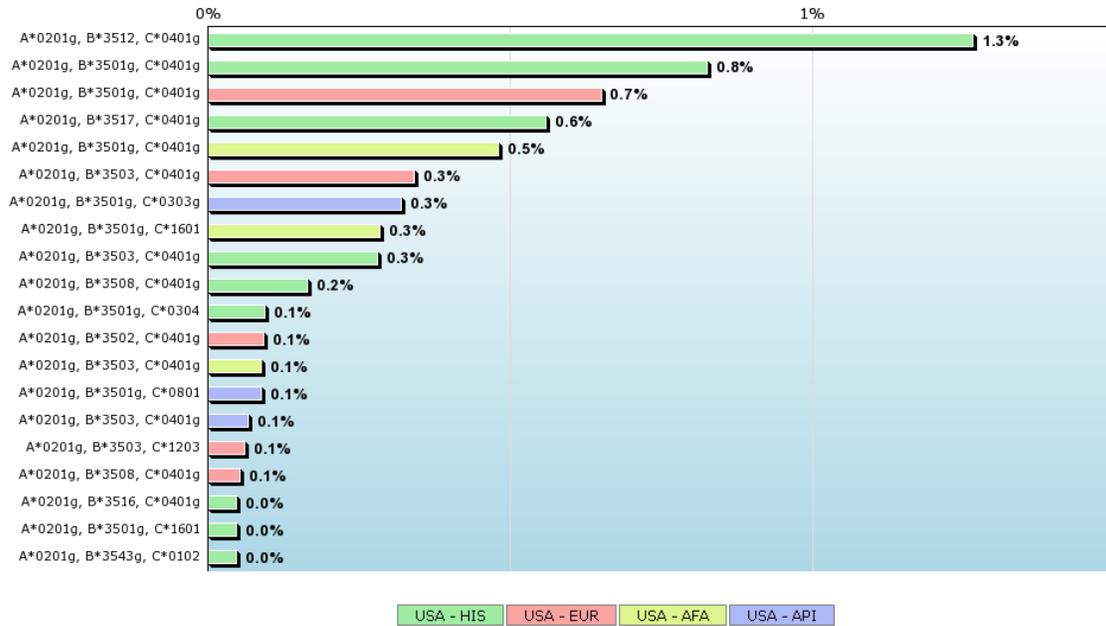
Example (USA-EUR population): allele frequency of DRB1\*1501 is 0.14415 and allele frequency of DQB1\*0602 is 0.14233. But haplotype frequency is not multiplication of these two numbers ( $0.14415 * 0.14233 = 0.02052$ ), it is much more **higher** (0.14138). Therefore  $LD = 0.14138 - 0.02052 = 0.12086$ .

Example (USA-EUR population): allele frequency of A\* 0201g is 0.29569 and allele frequency of B\*0801g is 0.12513. But haplotype frequency is not multiplication of these two numbers ( $0.29569 * 0.12513 = 0.037$ ), it is **lower** (0.01112).

Therefore  $LD = 0.01112 - 0.037 = -0.02588$ . LD has negative value.

## 7. Graph view

In Graph view, you will see the same result as in List view, but in graphical output format.



## 8. Table view

In Table view, you can show relation of **TWO** loci.

Example 1:

Relation between A\*0201 and B\*35XX in USA - EUR population.

A	% in group	B association in %									
		3501g	3502	3503	3505	3508	3512	3516	3517	3527	3543g
0201g	100%	55%	8%	31%		5%			<1%	<1%	

Example 2:

Relation between A\*02XX and B\*35XX in USA - EUR population.

A	% in group	B association in %												
		3501g	3502	3503	3505	3508	3510	3512	3514	3516	3517	3522	3527	3543g
0201g	96%	55%	8%	31%		5%					<1%		<1%	
0205	3%	67%	33%											
0206	1%	50%					50%							

Example 3:

Relation between A\* and B\*35XX in USA - EUR population.

A	% in group	B association in %												
		3501g	3502	3503	3505	3508	3512	3516	3517	3520	3522	3527	3528	3543g
0101g	17%	39%	37%	17%		7%								
0201g	30%	55%	8%	31%		5%			<1%		<1%			
0205	1%	67%	33%											
0301g	14%	82%	3%	15%		1%								
1101g	6%	96%		3%		1%								
2301g	2%	31%	10%	31%		29%								
2402g	9%	32%	41%	16%	1%	10%	1%							
2501	2%	77%		14%		9%								
2601g	3%	72%	10%	15%		4%								
2902	3%	89%		11%										
3001	1%	42%	42%	16%										
3002	1%	72%		28%										
3101	2%	39%	32%	16%		9%	3%							
3201	3%	61%	10%	24%		6%								
3301	1%	33%	33%	33%										
6801g	2%	21%	4%	72%		4%								
6802	1%													

“% in group” – what is the probability of the allele within the group of all A\* alleles shown in the table. E.g. there is a change of 17% that someone from USA-EUR population will have A\*0101g.

“B association in %” – probability distribution of associations of B alleles to specific A\* allele. E.g. if someone from USA-EUR has A\*0301g, there is a 82% probability that he/she will have B\*3501g.

## **9. Feedback**

If you find any problem or you have ideas how to improve the HLA Explorer, please write us to the email address:

steiner (at) hlaexplorer.net

HLA Explorer Team