hla protein Technologies Inc

PRODUCT PORTFOLIO OUTLINE

www.hlaprotein.com

hla protein

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ABOUT US

HLA Protein Technologies Inc has developed a novel and proprietary approach for producing an extensive library of soluble Class I and Class II HLA proteins, the genetic markers that lie at the center of adaptive immunity. They act as gatekeepers to T cells and are used by the body for numerous functions such as whether to accept or reject transplants.

Moreover, HLA proteins serve as the carriers of peptide epitopes which represent the minimal unit of information required by T cells to generate an immune response. Using soluble HLA (sHLA) technology, HLA Protein Technologies Inc has developed advanced assay platforms that identify critical T cell epitopes with immunogenic characteristics important to the development of vaccine, therapeutic, and diagnostic programs. HLA Protein Technologies Inc's patented technology eliminates the inherent problems of detergent cell lysate derived HLA and creates properly configured and structurally intact HLA probes through an industrialized and standardized process by delivering natively folded, endogenously loaded, recombinant, transmembrane-free proteins synthesized in mammalian cells.

HLA Protein Technologies Inc's selective sHLA technology can be used in a wide variety of applications. In our applied research, the sHLA technology has been used to create new pre- and post-transplant diagnostics and antibody removal therapies aimed at improving longevity to organ viability, minimizing the adverse effects of plasmapheresis and costly immunosuppressive treatments, and expanding the pool of eligible transplant candidates. Each unique HLA protein antigen can therefore serve as a versatile tool in both diagnostic and therapeutic formats.

The technology can also greatly assist in the design of improved vaccination and therapeutic targeting strategies, where it is critical to identify and validate epitopes that can be recognized and targeted by the immune system to prevent or treat various types of disease conditions.

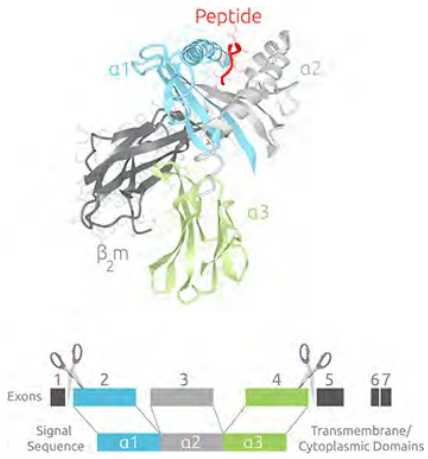
Soluble HLA Description

Class I and Class II Human Leukocyte Antigens (HLA), are multimeric molecules that are widely used in diagnostic and therapeutic applications, where structural integrity and proper functionality are essential for generating high-quality, clinically relevant data. Naturally, HLA molecules are glycoproteins where a transmembrane domain tethers the molecule to the cell surface which is considered a major obstacle for large-scale production and obtaining a product with high degree of purity. Because HLA Protein Technologies Inc.'s sHLA molecules have been truncated and lack the transmembrane domain, the sHLA proteins are not retained on the cell surface but are instead secreted into the cell culture media, from which they can be efficiently and economically isolated from the producing cells.

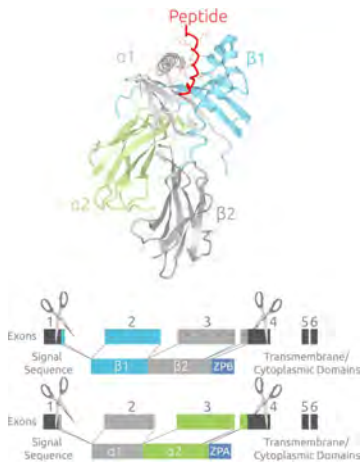
Soluble HLA Class I molecules are glycoproteins consisting of a heavy chain (comprised of α1, α2, and α3 domains), a light chain (β2m) and the peptide they present forming a trimeric complex. This trimeric protein complex is approximately 47 kDa in size with a 33 kDa heavy chain, an 11 kDa light chain, and a 1 kDa peptide (8 to 11mer) located in the molecule's groove. In addition, various sHLA alleles for Class I have an added purification tag (VLDL) at the carboxy end of the α3 domain.

Soluble HLA Class II molecules are glycoproteins as well, however, they have an α and β chain where the α1 and β1 regions of the chains come together to make a membrane-distal peptide-binding domain, while the α2 and β2 regions, the remaining extracellular parts of the chains, form a membrane-proximal immunoglobulin-like domain. The Class II trimeric protein complex is approximately 61 kDa in size consisting of a 27 kDa beta chain and a 26 kDa alpha chain with a 2 kDa peptide (15 to 24mer) in the groove. Finally, it is important to note that Class II molecules have a Leucine zipper tail at the carboxy end of the α2 and β2 region to increase stability and support assembly of the molecule within the cell.

Soluble HLA Class I



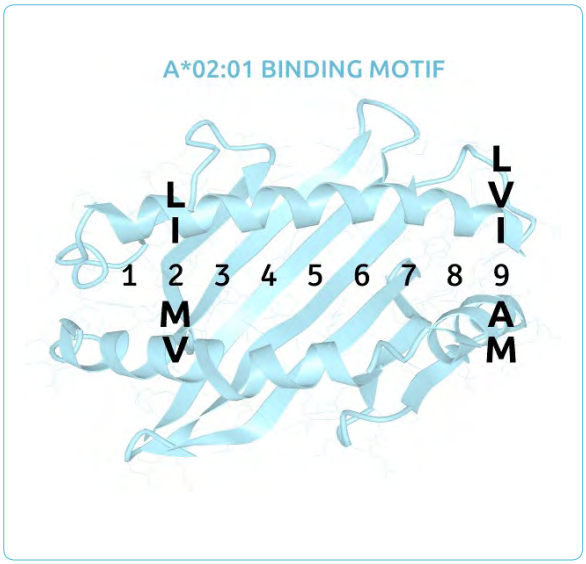
Soluble HLA Class II

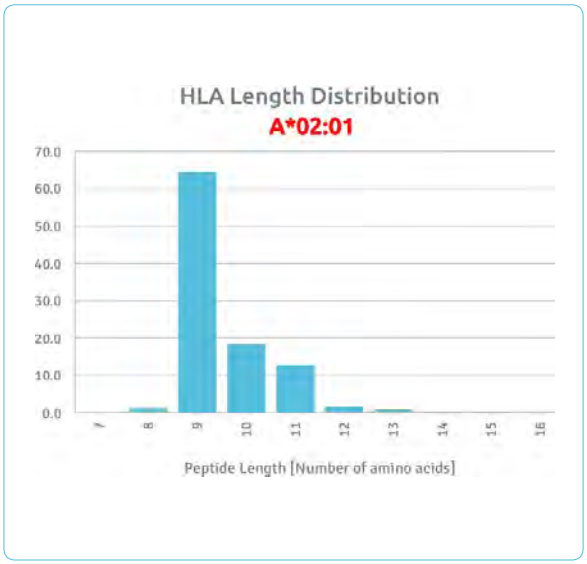


Soluble HLA Characteristics

The foundation of HLA Protein Technologies Inc's sHLA protein technology centers on the quality of the products and services we offer. All soluble HLA proteins are well characterized, proven to present native, antigenic epitopes recognized by specific antibodies, demonstrate high stability and integrity of their structures and are compliable to most application platforms as well as highly adaptable to individual needs. Forced degradation studies, executed by exposure of sHLA Class I molecules to elevated temperatures indicate that these molecules have a high tolerance for heat exposure, maintaining stability without disintegration up to 42˚C. Similar results are achieved with sHLA Class II proteins which show an immense heat tolerability of up to 50˚C. High heat stability results in better assay performance, lower amounts of protein required, the ability to work at ambient temperatures, and an extended shelf life. In addition to physical interrogations, HLA Protein Technologies Inc has tested a plethora of specific HLA antibodies, all capable of positively recognizing public and private epitopes.

As a result of the high purity of HLA Protein Technologies Inc's HLA proteins, protein sequences can be verified by using a combination of tryptic digests and mass-spectrometry analysis. Moreover, HLA Protein Technologies Inc has performed detailed mass-spectrometry analysis on all HLA Class I molecules and provides customers with accurate binding motifs and overall peptide length distributions. These data support multivariate comparisons across alleles and confirm the equivalence of sHLA to its native cell-bound counterpart.





Soluble HLA Coverage

The HLA gene complex exhibits extensive polymorphism, representing the most genetically diverse region of the human genome. This diversity, encompassing thousands of allelic variants, underpins the capacity of the adaptive immune system to discriminate and respond to a wide array of antigens with high specificity. HLA Protein Technologies Inc has developed the world's largest selection of soluble HLA proteins and included alleles across most population and transplant patient frequencies, broad ethnicity coverage, and haplotype information.

Since HLA Class II DQ and DP molecules function as dimers containing two protein subunits, the alpha chain and beta chain, four different combinations are possible. Each individual receives one set from the maternal chromosome and the other set from the paternal chromosome making such a person a double heterozygote. Naturally, that dramatically increases the number of possible protein combinations in each individual. To offer our customers a more satisfactory solution to solve this complexity, HLA Protein Technologies Inc formulated combinatorial matrices consisting of a selection of specific alpha and beta chains with the goal of providing combinations where each, alpha or beta chain are represented at least twice. However, there are factors that limit this variation. Some combinations are restricted or absent.

Furthermore, haplotypes are naturally observed where a set of variations tend to be inherited or linked together, which further reduces the combinatoric possibilities. As of 2025, HLA Protein Technologies Inc has over 280 established cell lines in inventory from which HLA proteins are produced.

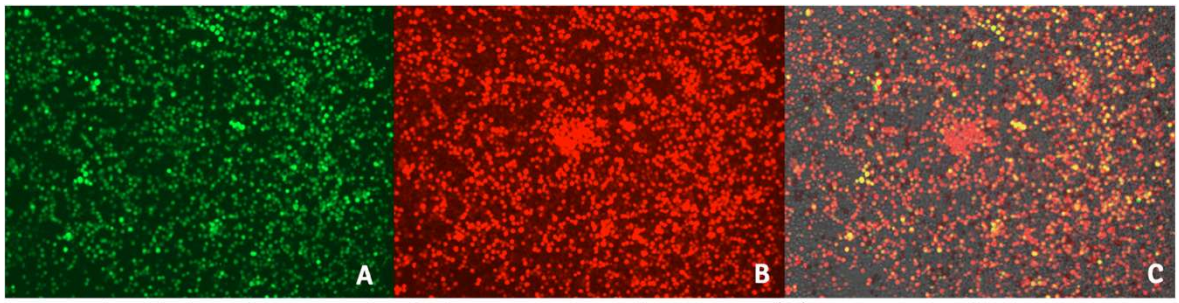


Figure A: Tracking of the Class II B chain construct indicated by the co-expression of a green fluorescence protein (gfp). Figure B: Expression of the Class II A chain construct traced by the Mcherry protein (mc) as the fluorescence marker. Figure C: The overlap of the two expression patterns where cells expressing both chains appear in yellow.

HLA Transfectant Cell Lines

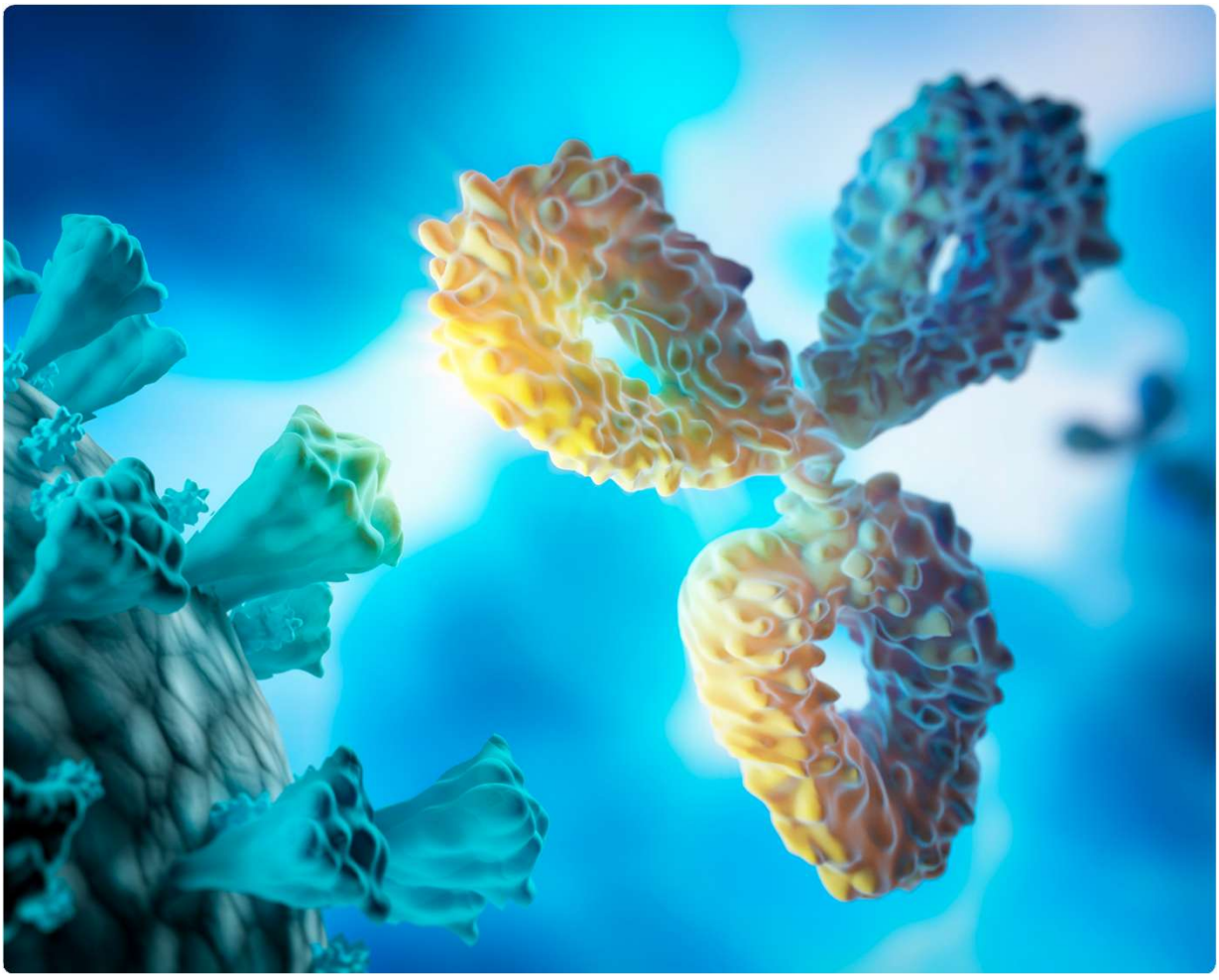
Using a proprietary transfection system, HLA Protein Technologies Inc has established a transfection pipeline to generate new sHLA secreting molecules for all subtypes to create clinically representative panels of Class I A, B, C and Class II DR, DQ and DP alleles. Class I alleles are made with a single round of transfection by using the cells capability to self-produce the b2m light chain and form the trimeric complex. Class II generation is more challenging to generate stable cell lines. As a result, the alpha (A) chain is transfected first before adding the beta (B) chain in a second work process. The transfected cell line performs the final assembly of the HLA complex by populating the HLA groove with an endogenous peptide exactly as native HLA would be loaded. As such, all peptides are derived from the cell itself and are not encoded by the construct. Regulation of the rate at which the cells produce the sHLA protein is largely dictated by the availability of peptide ligands and chaperons that support the multistep assembly of sHLA.

Using a special color tracking system, the presence of the Class II constructs can be confirmed by monitoring the co-expression of a green fluorescence protein (gfp) for the B chain and Mcherry protein (mc) for the A chain. These colored proteins are co-produced within the transfectant cells, but are not part of the final sHLA molecule, nor are they secreted.

HLA Manufacturing Process

Currently, reliable alternative strategies to obtain large quantities of sHLA molecules do not exist which makes HLA Protein Technologies Inc's core technology highly differentiated in comparison to other production processes. HLA Protein Technologies Inc manufactures all sHLA proteins at its facility in Oklahoma City, OK. In doing so, the company has retained complete control over the entire production pipeline and all quality testing processes so that only quality-controlled products are released.

A manufacturing process has been implemented to guide and document production, affinity purification and quality control of sHLA Class I and II molecules. The production process is initiated by thawing out established cell lines and growing them up to density. To assure the cell lines carry the correct allele, HLA Protein Technologies Inc. has established a standardized authentication procedure which is based on sequence-based typing (SBT). Secreted products are separated from the cell material by centrifugation and affinity purified from the generated harvests. Each production run is tested against QC standards for biological potency, identity, structural integrity and purity.

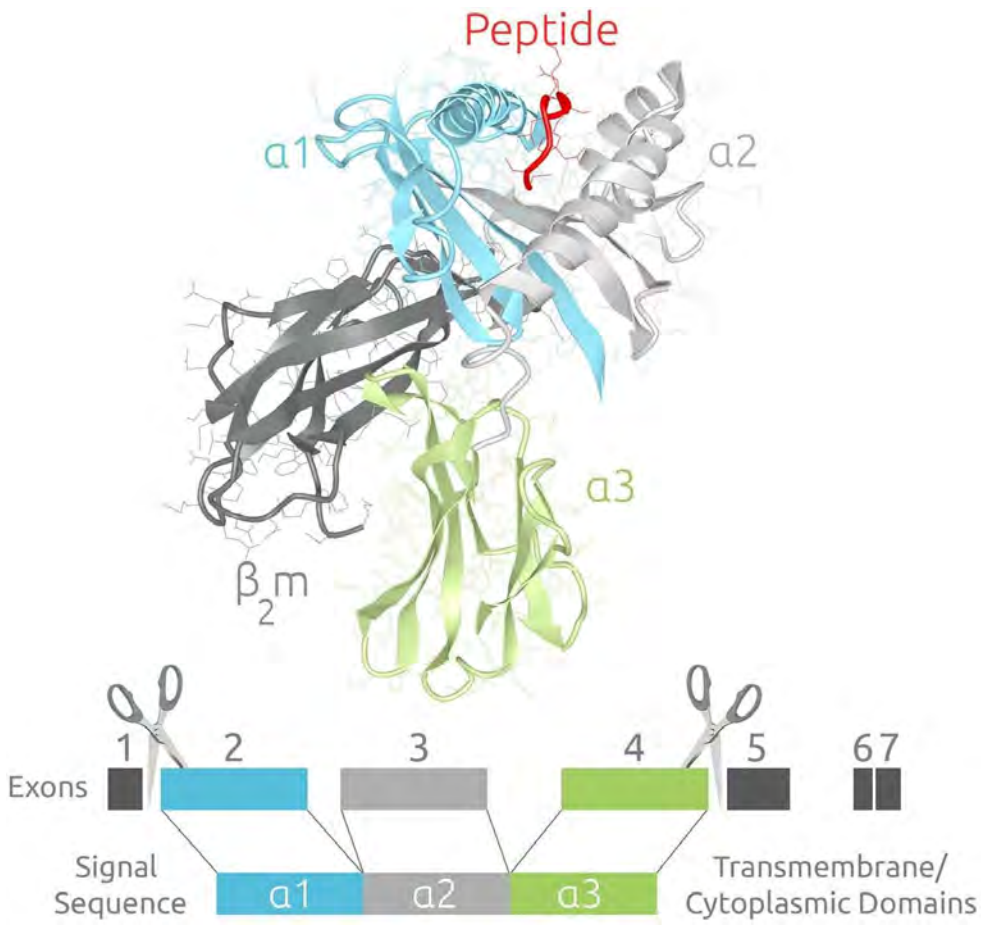


HLA Class I Basics

Soluble HLA (sHLA) molecules are recombinant, endogenously loaded and naturally folded glycoproteins. Using proprietary technology, HLA Protein Technologies Inc truncates these proteins that are normally attached to the surface of the cell membrane, just before the trans-membrane and cytoplasmic domain, allowing them to be secreted and easily purified without associated cell membranes.

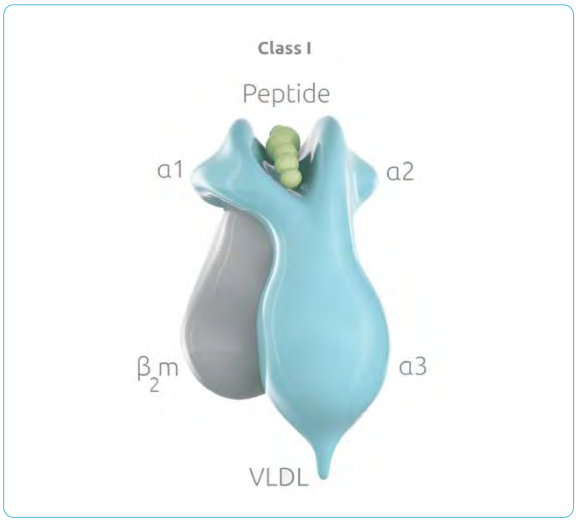
Structurally, sHLA Class I proteins consist of a heavy chain (comprised of a1, a2, and a3 domains), a light chain (b2m) and the peptide they present forming a trimeric complex. Various sHLA alleles have an added purification tag (VLDL) at the carboxy end of the α3 domain.

Soluble HLA Class I



Protein Characteristics

HLA Class I genes are highly polymorphic, representing the genetically most variable gene region by encoding thousands of different alleles. HLA Protein Technologies Inc offers a wide selection of single-specificity HLA proteins with broad population coverage. Since sHLA molecules lack the transmembrane portion, these proteins are not retained on the cell surface but readily secreted allowing economic production and purification thereby eliminating the inherent problems of detergent cell lysates.



Soluble Class I proteins are well characterized, proven to present native, antigenic epitopes recognized by specific antibodies, demonstrate high stability and integrity of their structures over time and are compliable on many application platforms as well as adaptable for individual needs.

HLA-A

Choose from more than 35 HLA-A alleles to detect, profile, or monitor antigen-specific immune responses from antibodies to immune cell populations

HLA-C

Discover a selection of over 20 HLA-C alleles, the dominant ligand for KIR on NK cells for your immunological research

HLA-B

Select from a pool of over 65 HLA-B alleles to drive your immunological research to identify antibody immune responses or visualize antigen-specific immune cells

HLA-G

Explore our HLA-G portfolio—designed for true-to-biology structure, verified function, and cross-disciplinary immunological discovery.

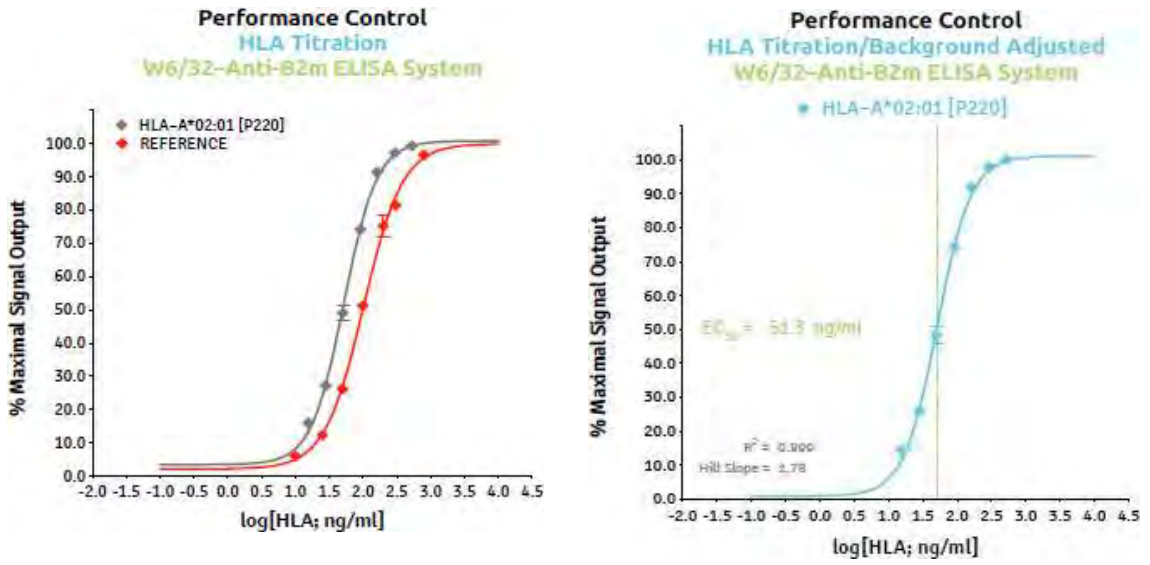
Quality Control: Test Parameters

Product Name	HLA-A*02:01
Test Lot#	P220
Titration Reference Number	HLA1ELISA1477
Test System	W6/32 - Anti-B2m ELISA System
Coating Antibody	W6/32 / L717820A2 [12.5 µg/ml]
1° Antibody	Anti-b2m (Bio) (NHS005-A0072) [2.46 µg/ml]
Visualization System	ABC/OPD
Titration Range	16 - 951 ng/ml
Method of Analysis	Non-linear Regression Analysis [Sigmoidal dose-response (variable slope)]

Quality Control: Test Parameters

Half Maximal Effective Concentration				
EC50 [ng/ml]	51.3	PASS/FAIL THRESHOLD: <	250	Pass
Reference Deviation				
LogEC50 Reference Shift	0.289	PASS/FAIL THRESHOLD: >	-0.200	Pass
Goodness of Fit				
R^2	0.9994	PASS/FAIL THRESHOLD: >	0.900	Pass
QC Status	Pass			
Optimal Effective Concentration				
EC90 [ng/ml]	180.0	[at 90% Saturation]		

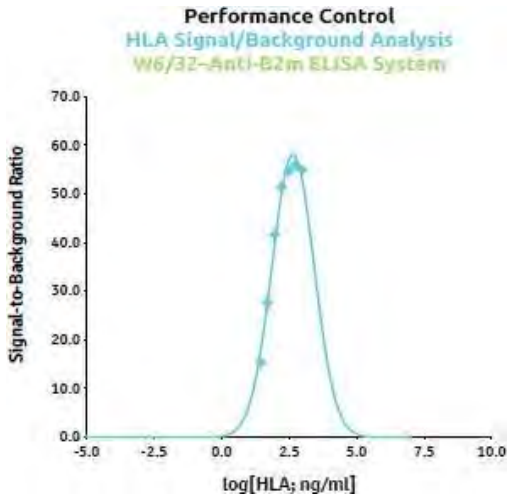
Performance Graph



Quality Control: Signal-to-Background Analysis

Gaussian S/B Ratio Amplitude				
S/B Ratio	58.2	PASS/FAIL THRESHOLD: <	10	Pass
Optimal S/B Concentration [ng/ml]	443.6			

Performance Graph



SKU	NAME	SERO-LOGICAL NAME	ALLELE FRE-QUENCY %	HLA SPECIES	HOST CELL LINE SPECIES	PEPTIDE SOURCE	CONFIGU-RATION	STORAGE TEMPERA-TURE	GRADE
A0101	HLA–A*01:01	A1	7%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A0201	HLA–A*02:01	A2	12%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A0202	HLA–A*02:02	A2	2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A0203	HLA–A*02:03	A203	3%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A0205	HLA–A*02:05	A2	2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A0206	HLA–A*02:06	A2	3%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A0207	HLA–A*02:07	A2	4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A0301	HLA–A*03:01	A3	5%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A1101	HLA–A*11:01	A11	11%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A1102	HLA–A*11:02	A11	1.6%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A2301	HLA–A*23:01	A23	4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A2302	HLA–A*23:02	A23	0.1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A2402	HLA–A*24:02	A24	13%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A2403	HLA–A*24:03	A2403	0.7%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A2407	HLA–A*24:07	A24	2.9%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A2501	HLA–A*25:01	A25	1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A2601	HLA–A*26:01	A26	3.5%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A2901	HLA–A*29:01	A29	1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]

SKU	NAME	SERO-LOGICAL NAME	ALLELE FRE-QUENCY %	HLA SPECIES	HOST CELL LINE SPECIES	PEPTIDE SOURCE	CONFIGU-RATION	STORAGE TEMPERA-TURE	GRADE
A2902	HLA–A*29:02	A29	2.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A3001	HLA–A*30:01	A30	2.7%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A3002	HLA–A*30:02	A30	2.2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A3101	HLA–A*31:01	A31	4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A3201	HLA–A*32:01	A32	2.6%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A3204	HLA–A*32:04	A32	0.1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A3301	HLA–A*33:01	A33	1.8%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A3303	HLA–A*33:03	A33	4.5%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A3401	HLA–A*34:01	A34	3.8%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A3402	HLA–A*34:02	A34	1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A3601	HLA–A*36:01	A36	1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A4301	HLA–A*43:01	A43	0%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A6601	HLA–A*66:01	A66	1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A6602	HLA–A*66:02	A66	0%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A6801	HLA–A*68:01	A68	3%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A6802	HLA–A*68:02	A68	2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A6901	HLA–A*69:01	A69	1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A7401	HLA–A*74:01	A74	1.6%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
A8001	HLA–A*80:01	A80	0.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]

SKU	NAME	SERO-LOGICAL NAME	ALLELE FRE-QUENCY %	HLA SPECIES	HOST CELL LINE SPECIES	PEPTIDE SOURCE	CONFIGU-RATION	STORAGE TEMPERA-TURE	GRADE
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B0703	HLA–B*07:03	B703	0.1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B0801	HLA–B*08:01	B8	4.2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1301	HLA–B*13:01	B13	4.1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1302	HLA–B*13:02	B13	2.3%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1401	HLA–B*14:01	B64	0.8%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1402	HLA–B*14:02	B65	2.7%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1405	HLA–B*14:05	B14	0.2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1406	HLA–B*14:06	B14	0.1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1501	HLA–B*15:01	B62	3.3%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1502	HLA–B*15:02	B75	2.8%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1503	HLA–B*15:03	B72	1.5%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1508	HLA–B*15:08	B75	0.2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1510	HLA–B*15:10	B71	0.7%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1511	HLA–B*15:11	B75	0.3%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1512	HLA–B*15:12	B76	0.2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1513	HLA–B*15:13	B77	0.9%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1516	HLA–B*15:16	B63	0.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B1518	HLA–B*15:18	B71	0.5%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]

SKU	NAME	SERO-LOGICAL NAME	ALLELE FRE-QUENCY %	HLA SPECIES	HOST CELL LINE SPECIES	PEPTIDE SOURCE	CONFIGU-RATION	STORAGE TEMPERA-TURE	GRADE
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B1801	HLA–B*18:01	B18	3.9%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B2701	HLA–B*27:01	B27	0.1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B2702	HLA–B*27:02	B27	0.7%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
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B2704	HLA–B*27:04	B27	1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B2705	HLA–B*27:05	B27	1.6%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B2706	HLA–B*27:06	B27	1.6%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B2708	HLA–B*27:08	B2708	0.1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B3501	HLA–B*35:01	B35	5.1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B3505	HLA–B*35:05	B35	2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B3508	HLA–B*35:08	B35	1.6%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B3701	HLA–B*37:01	B37	1.5%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B3801	HLA–B*38:01	B38	2.1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B3901	HLA–B*39:01	B3901	2.6%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B3905	HLA–B*39:05	B39	1.6%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B4001	HLA–B*40:01	B60	4.5%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B4002	HLA–B*40:02	B61	5%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B4006	HLA–B*40:06	B61	2.1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]

SKU	NAME	SERO-LOGICAL NAME	ALLELE FRE-QUENCY %	HLA SPECIES	HOST CELL LINE SPECIES	PEPTIDE SOURCE	CONFIGU-RATION	STORAGE TEMPERA-TURE	GRADE
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B4201	HLA–B*42:01	B42	1.6%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B4202	HLA–B*42:02	B42	0.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B4402	HLA–B*44:02	B44	3.2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B4403	HLA–B*44:03	B44	3.7%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B4405	HLA–B*44:05	B44	3.7%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B4501	HLA–B*45:01	B45	1.5%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B4601	HLA–B*46:01	B46	4.6%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B4701	HLA–B*47:01	B47	0.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B4801	HLA–B*48:01	B48	2.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B4901	HLA–B*49:01	B49	2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5001	HLA–B*50:01	B50	2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5101	HLA–B*51:01	B51	4.5%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5102	HLA–B*51:02	B5102	1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5201	HLA–B*52:01	B52	2.5%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5301	HLA–B*53:01	B53	2.7%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5401	HLA–B*54:01	B54	1.5%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5501	HLA–B*55:01	B55	1.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]

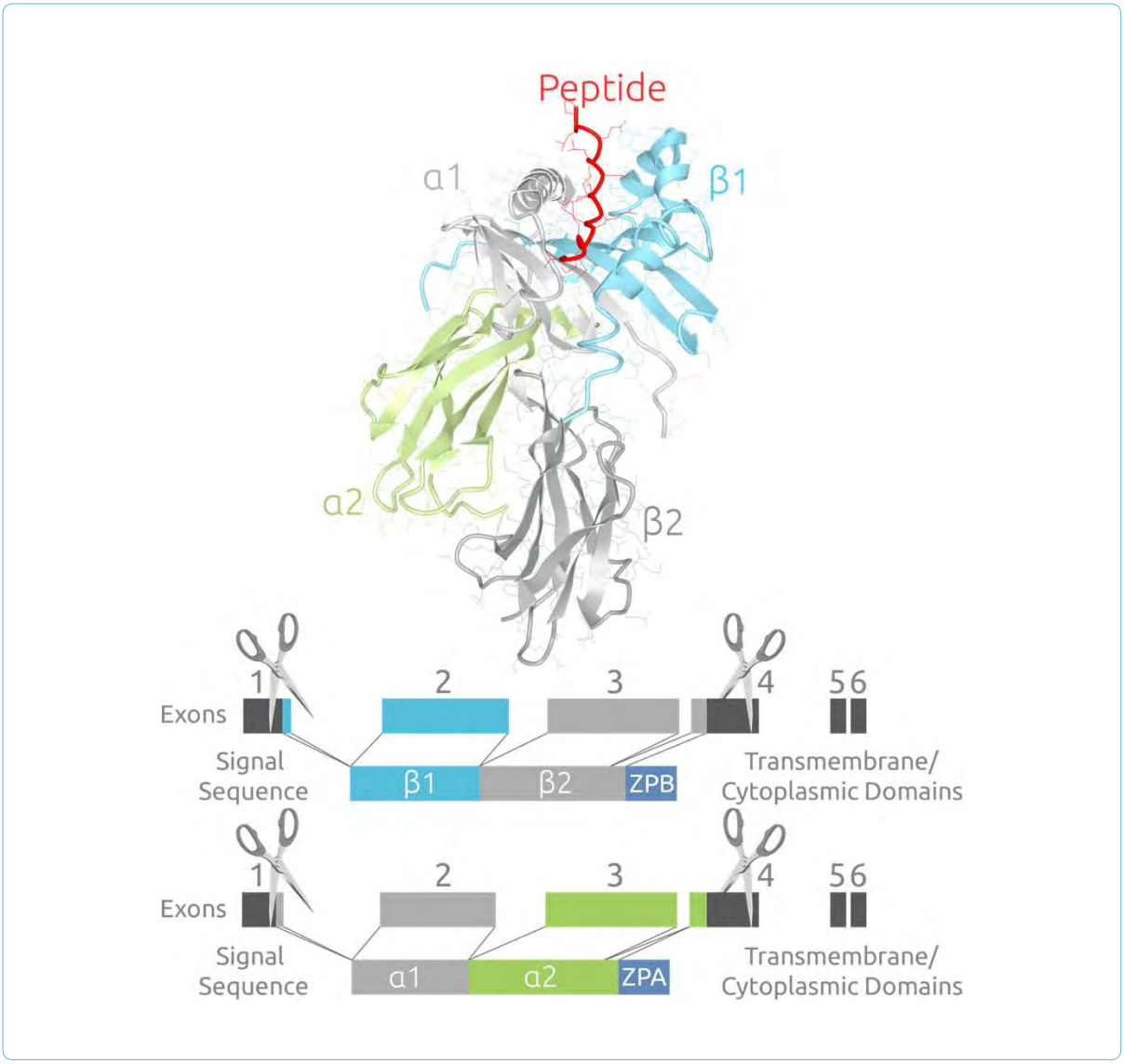
SKU	NAME	SERO-LOGICAL NAME	ALLELE FRE-QUENCY %	HLA SPECIES	HOST CELL LINE SPECIES	PEPTIDE SOURCE	CONFIGU-RATION	STORAGE TEMPERA-TURE	GRADE
B5601	HLA–B*56:01	B56	1.9%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5602	HLA–B*56:02	B56	1.8%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5604	HLA–B*56:04	B56	0.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5701	HLA–B*57:01	B57	2.2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5702	HLA–B*57:02	B57	0.3%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5703	HLA–B*57:03	B57	0.9%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5801	HLA–B*58:01	B58	3.6%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5802	HLA–B*58:02	B58	1.9%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B5901	HLA–B*59:01	B59	0.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B6701	HLA–B*67:01	B67	0.3%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B7301	HLA–B*73:01	B73	0.2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B7801	HLA–B*78:01	B78	0.7%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B8101	HLA–B*81:01	B81	0.9%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
B8201	HLA–B*82:01	B82	0.2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C0102	HLA–C*01:02	Cw1	8.2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C0202	HLA–C*02:02	Cw2	3.1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C0302	HLA–C*03:02	Cw10	2.7%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C0303	HLA–C*03:03	Cw9	4.2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C0304	HLA–C*03:04	Cw10	7.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]

SKU	NAME	SERO-LOGICAL NAME	ALLELE FRE-QUENCY %	HLA SPECIES	HOST CELL LINE SPECIES	PEPTIDE SOURCE	CONFIGU-RATION	STORAGE TEMPERA-TURE	GRADE
C0401	HLA–C*04:01	Cw4	10.9%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C0403	HLA–C*04:03	Cw4	3.6%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C0501	HLA–C*05:01	Cw5	3.8%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C0602	HLA–C*06:02	Cw6	8%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C0701	HLA–C*07:01	Cw7	7.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C0702	HLA–C*07:02	Cw7	11.8%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C0704	HLA–C*07:04	Cw7	1.5%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C0801	HLA–C*08:01	Cw8	5.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C0802	HLA–C*08:02	Cw8	2.7%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C1202	HLA–C*12:02	–	2.8%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C1203	HLA–C*12:03	–	3.9%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C1402	HLA–C*14:02	Cw1	2.2%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C1502	HLA–C*15:02	–	3.9%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C1503	HLA–C*15:03	–	0.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C1601	HLA–C*16:01	–	3.4%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C1701	HLA–C*17:01	Cw7	2.3%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
C1801	HLA–C*18:01	Cw6	1%	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
E0103	HLA–E*01:03	–	–	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]
G0101	HLA–G*01:01	–	–	Human	Human	Endogenous	Monomer	4˚C	Research Use Only [RUO]

HLA Class II Basics

Soluble HLA (sHLA) molecules are recombinant and naturally folded glycoproteins. Using proprietary technology, HLA Protein Technologies Inc truncates the two protein subunits just before the trans-membrane and cytoplasmic domain and stabilizes them by inserting a leucine zipper (ZP) that allows easy secretion and purification without associated cell membrane portions.

Structurally, soluble HLA class II proteins are heterodimeric glycoproteins consisting of an alpha chain (comprised of α1, α2 domains), a beta chain (comprised of β1, β2 domains) and an endogenously loaded peptide they present forming a trimeric complex.



Protein Characteristics

HLA Class II genes are highly polymorphic, encoding thousands of different alleles and potentially recombine to create isoform by combination of alpha and beta chains. HLA Protein Technologies Inc offers a broad selection of single-specificity HLA proteins covering not only population frequency but also isoform availability. Like their Class I counterpart, sHLA Class II molecules also lack their transmembrane portions and are readily secreted allowing economic production and purification eliminating detergent cell lysates interferences.

Soluble Class II proteins are well characterized, proven to present native, antigenic epitopes recognized by specific antibodies, demonstrate high stability and integrity of their structures and are most compliable to most application platforms as well as highly adaptable to individual needs.

HLA-DQ

Select from more than 60 HLA-DQ alleles to detect and monitor humoral or cellular antigen-specific immune responses

HLA-DP

Choose from a pool of over 50 HLA-DP alleles to research the variety of heterodimeric isoforms

HLA-DR

Discover a selection of over 40 HLA-DR alleles, the emerging marker for histocompatibility screening

SKU	NAME	SERO-LOGICAL NAME	ALLELE FRE-QUENCY %	HLA SPECIES	HOST CELL LINE SPECIES	PEPTIDE SOURCE	CONFIGU-RATION	STORAGE TEMPERA-TURE	GRADE
DRB10101	HLA–DRB1*01:01	DR1	3.6%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10102	HLA–DRB1*01:02	DR1	2.4%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10103	HLA–DRB1*01:03	DR103	0.6%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10301	HLA–DRB1*03:01	DR17	6.1%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10302	HLA–DRB1*03:02	DR18	1.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10401	HLA–DRB1*04:01	DR4	3.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10402	HLA–DRB1*04:02	DR4	1.8%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10403	HLA–DRB1*04:03	DR4	3.5%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10404	HLA–DRB1*04:04	DR4	2.5%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10405	HLA–DRB1*04:05	DR4	3.4%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10407	HLA–DRB1*04:07	DR4	5.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10411	HLA–DRB1*04:11	DR4	4.1%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10701	HLA–DRB1*07:01	DR7	8.8%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10801	HLA–DRB1*08:01	DR8	1.6%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10804	HLA–DRB1*08:04	DR8	1.3%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10807	HLA–DRB1*08:07	DR8	1.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10901	HLA–DRB1*09:01	DR9	5.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB10902	HLA–DRB1*09:02	DR9	0.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB11001	HLA–DRB1*10:01	DR10	2.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]

SKU	NAME	SERO-LOGICAL NAME	ALLELE FRE-QUENCY %	HLA SPECIES	HOST CELL LINE SPECIES	PEPTIDE SOURCE	CONFIGU-RATION	STORAGE TEMPERA-TURE	GRADE
DRB11101	HLA–DRB1*11:01	DR11	6.1%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB11104	HLA–DRB1*11:04	DR11	4%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB11301	HLA–DRB1*13:01	DR13	4%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB11303	HLA–DRB1*13:03	DR13	1.8%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB11401	HLA–DRB1*14:01	DR14	4.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB11402	HLA–DRB1*14:02	DR14	5.9%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB11454	HLA–DRB1*14:54	DR14	2.5%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB11501	HLA–DRB1*15:01	DR15	7.1%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB11502	HLA–DRB1*15:02	DR15	5.3%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB11503	HLA–DRB1*15:03	DR15	2.6%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB11601	HLA–DRB1*16:01	DR16	2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB11602	HLA–DRB1*16:02	DR16	4.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB30101	HLA–DRB3*01:01	DR52	–	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB30202	HLA–DRB3*02:02	DR52	–	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB30301	HLA–DRB3*03:01	DR52	–	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB40101	HLA–DRB4*01:01	DR53	–	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB40103	HLA–DRB4*01:03	DR53	–	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB50101	HLA–DRB5*01:01	DR51	–	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DRB50102	HLA–DRB5*01:02	DR51	–	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]

SKU	NAME	SERO-LOGICAL NAME	ALLELE FRE-QUENCY %	HLA SPECIES	HOST CELL LINE SPECIES	PEPTIDE SOURCE	CONFIGU-RATION	STORAGE TEMPERA-TURE	GRADE
DRB50202	HLA–DRB5*02:02	DR51	–	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10501/DQA10101	HLA–DQB1*05:01/DQA1*01:01	DQ5	8.9%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10502/DQA10101	HLA–DQB1*05:02/DQA1*01:01	DQ5	5.3%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10602/DQA10101	HLA–DQB1*06:02/DQA1*01:01	DQ6	7.8%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10604/DQA10101	HLA–DQB1*06:04/DQA1*01:01	DQ6	2.5%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10609/DQA10101	HLA–DQB1*06:09/DQA1*01:01	DQ6	1.5%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10501/DQA10102	HLA–DQB1*05:01/DQA1*01:02	DQ5	8.9%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10502/DQA10102	HLA–DQB1*05:02/DQA1*01:02	DQ5	5.3%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10503/DQA10102	HLA–DQB1*05:03/DQA1*01:02	DQ5	4.1%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10602/DQA10102	HLA–DQB1*06:02/DQA1*01:02	DQ6	7.8%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10603/DQA10102	HLA–DQB1*06:03/DQA1*01:02	DQ6	3.9%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10604/DQA10102	HLA–DQB1*06:04/DQA1*01:02	DQ6	2.5%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10602/DQA10103	HLA–DQB1*06:02/DQA1*01:03	DQ6	7.8%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10603/DQA10103	HLA–DQB1*06:03/DQA1*01:03	DQ6	3.9%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10604/DQA10104	HLA–DQB1*06:04/DQA1*01:04	DQ6	2.5%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10609/DQA10104	HLA–DQB1*06:09/DQA1*01:04	DQ6	1.5%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10201/DQA10201	HLA–DQB1*02:01/DQA1*02:01	DQ2	11.4%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10202/DQA10201	HLA–DQB1*02:02/DQA1*02:01	DQ2	7.5%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10301/DQA10201	HLA–DQB1*03:01/DQA1*02:01	DQ7	22.3%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]

SKU	NAME	SERO-LOGICAL NAME	ALLELE FRE-QUENCY %	HLA SPECIES	HOST CELL LINE SPECIES	PEPTIDE SOURCE	CONFIGU-RATION	STORAGE TEMPERA-TURE	GRADE
DQB10302/ DQA10201	HLA–DQB1*03:02/ DQA1*02:01	DQ8	15.9%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10303/ DQA10201	HLA–DQB1*03:03/ DQA1*02:01	DQ9	5.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10304/ DQA10201	HLA–DQB1*03:04/ DQA1*02:01	DQ7	0.4%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10305/ DQA10201	HLA–DQB1*03:05/ DQA1*02:01	DQ8	0.6%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10401/ DQA10201	HLA–DQB1*04:01/ DQA1*02:01	DQ4	2.6%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10402/ DQA10201	HLA–DQB1*04:02/ DQA1*02:01	DQ4	7.1%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10601/ DQA10201	HLA–DQB1*06:01/ DQA1*02:01	DQ6	5.6%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10201/ DQA10301	HLA–DQB1*02:01/ DQA1*03:01	DQ2	11.4%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10302/ DQA10301	HLA–DQB1*03:02/ DQA1*03:01	DQ8	15.9%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10303/ DQA10301	HLA–DQB1*03:03/ DQA1*03:01	DQ9	5.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10303/ DQA10302	HLA–DQB1*03:03/ DQA1*03:02	DQ9	5.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10303/ DQA10303	HLA–DQB1*03:03/ DQA1*03:03	DQ9	5.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10302/ DQA10401	HLA–DQB1*03:02/ DQA1*04:01	DQ8	15.9%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10402/ DQA10401	HLA–DQB1*04:02/ DQA1*04:01	DQ4	7.1%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10301/ DQA10501	HLA–DQB1*03:01/ DQA1*05:01	DQ7	22.3%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10303/ DQA10501	HLA–DQB1*03:03/ DQA1*05:01	DQ9	5.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10301/ DQA10503	HLA–DQB1*03:01/ DQA1*05:03	DQ7	22.3%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10301/ DQA10505	HLA–DQB1*03:01/ DQA1*05:05	DQ7	22.3%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DQB10301/ DQA10601	HLA–DQB1*03:01/ DQA1*06:01	DQ7	22.3%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]

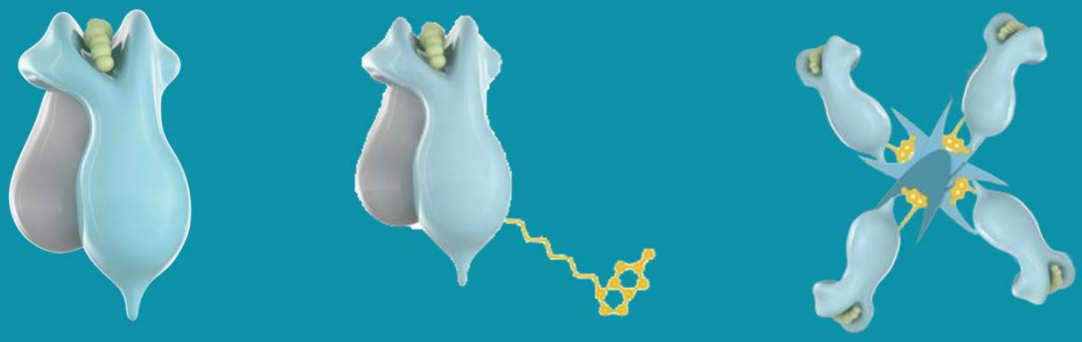
SKU	NAME	SERO-LOGICAL NAME	ALLELE FRE-QUENCY %	HLA SPECIES	HOST CELL LINE SPECIES	PEPTIDE SOURCE	CONFIGU-RATION	STORAGE TEMPERA-TURE	GRADE
DQB10302/ DQA10601	HLA– DQB1*03:02/ DQA1*06:01	DQ8	15.9%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB10401/ DPA10103	HLA– DPB1*04:01/ DPA1*01:03	–	19.1%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB10402/ DPA10103	HLA– DPB1*04:02/ DPA1*01:03	–	21.1%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB11301/ DPA10103	HLA– DPB1*13:01/ DPA1*01:03	–	5.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB11401/ DPA10103	HLA– DPB1*14:01/ DPA1*01:03	–	6.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB12001/ DPA10103	HLA– DPB1*20:01/ DPA1*01:03	–	0.6%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB10301/ DPA10104	HLA– DPB1*03:01/ DPA1*01:04	–	6.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB11801/ DPA10104	HLA– DPB1*18:01/ DPA1*01:04	–	2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB11801/ DPA10105	HLA– DPB1*18:01/ DPA1*01:05	–	2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB10101/ DPA10201	HLA– DPB1*01:01/ DPA1*02:01	–	6%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB10401/ DPA10201	HLA– DPB1*04:01/ DPA1*02:01	–	19.1%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB11301/ DPA10201	HLA– DPB1*13:01/ DPA1*02:01	–	5.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB11801/ DPA10201	HLA– DPB1*18:01/ DPA1*02:01	–	2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB10101/ DPA10202	HLA– DPB1*01:01/ DPA1*02:02	–	6%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB10501/ DPA10202	HLA– DPB1*05:01/ DPA1*02:02	–	21.3%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB10401/ DPA10401	HLA– DPB1*04:01/ DPA1*04:01	–	19.1%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]
DPB11301/ DPA10401	HLA– DPB1*13:01/ DPA1*04:01	–	5.2%	Human	Mouse	Endogenous	Monomer	4˚C	Research Use Only [RUO]

CUSTOM AND COMPLEX ENGINEERING

HLA Peptide Target Reagents to develop T cell epitope-based Immunotherapies.

Using soluble HLA technology, we offer small and large-scale manufacturing of peptide-modified HLA complexes harboring a specific peptide of your choice used as reagents for Immuno-Therapeutic and Diagnostic HLA Receptor Generation and Validation.

Select from three convenient modalities:



HLA peptide Monomers

Soluble HLA peptide monomers are glycoproteins consisting of a heavy chain, a light chain (b2m) and the peptide of interest forming a trimeric complex. These complexes serve as exquisite immunogens for antibody generation.

Biotinylated HLA peptide Monomer

Chemically modified soluble HLA peptide complexes are conjugated with a biotin moiety. These biotinylated sHLA allow for efficient binding to streptavidin allowing their usage in many screening and validation applications.

HLA peptide Tetramer

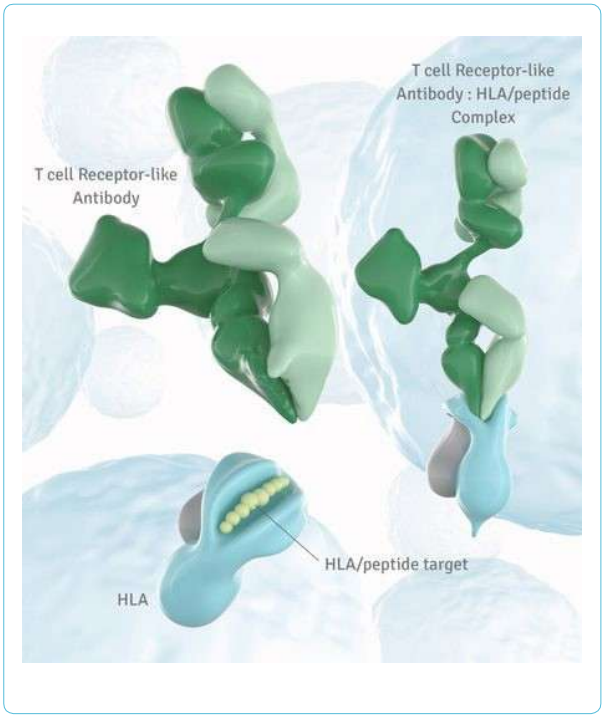
Tetramerized HLA peptide proteins generated by incorporation of biotinylated soluble HLA molecules into streptavidin. Non-labeled HLA tetramers are of high stability and provide increased sensitivity and complexity in immunization protocols.

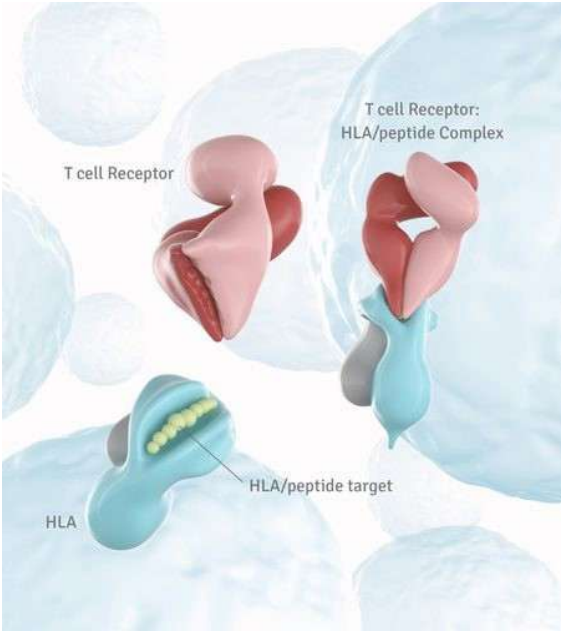
T cell epitope-based Immunotherapies

During the last few years, there have been astonishing advances in the fundamental understanding of disease biology leading to remarkable treatments for once deadly diseases. With the arrival of HLA-based immunotherapies, a thrilling time lies ahead for the development of novel HLA peptide epitope-based diagnostics and therapeutics. With the T cell receptor (TCR) as the guidance system, T cell epitope-based Immunotherapies are considered a groundbreaking and unique new approach to direct cytotoxic T cells to diseased tumor or virus-infected cells and eliminate them.

Our ability to physically modify soluble HLA molecules by exchanging their natural peptide load provides a powerful tool to stimulate, sense and monitor immunological events.

Take advantage of these exquisite natural targeting capabilities and generate your own specific T cell or T cell-like receptors utilizing our specific peptide HLA antigen complexes. Access an unlimited number of both surface and intracellular protein targets overcoming a key limitation of current monoclonal antibody and CAR T cell therapies targeting only cell surface antigens

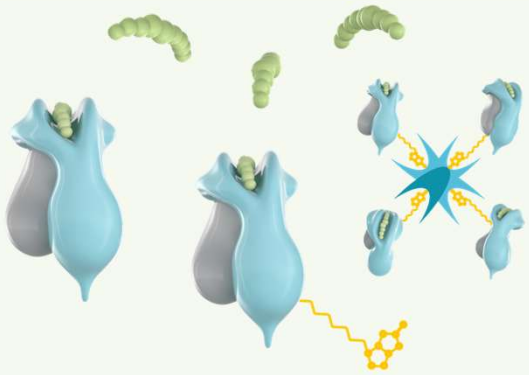




How it Works

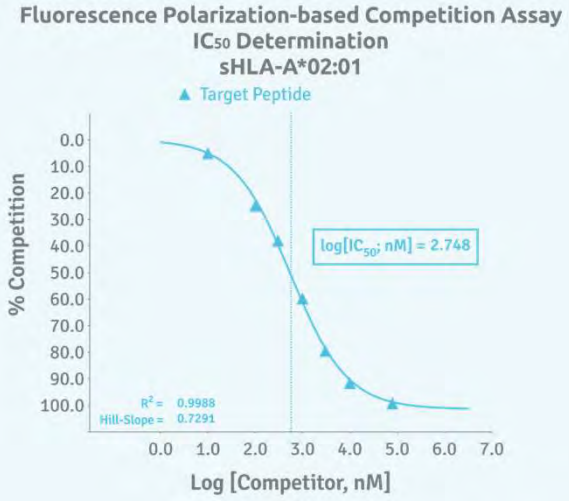
Selection of Peptide, sHLA Molecule and Modality

To start the custom manufacturing of a specific HLA peptide complex, select a target peptide, a sHLA allele and the modality for the assembly. HLA peptide epitopes must be carefully selected. Successful candidates mostly derive from target discovery pipelines showing high promise in being immunologically recognized by T cells in the fight against cancer and infectious diseases. A broad representation of HLA alleles is available to select from at high purity levels to guarantee outstanding performance. Modalities are selected based on the application intended and can be a simple monomer, a biotinylated complex or a tetramer.



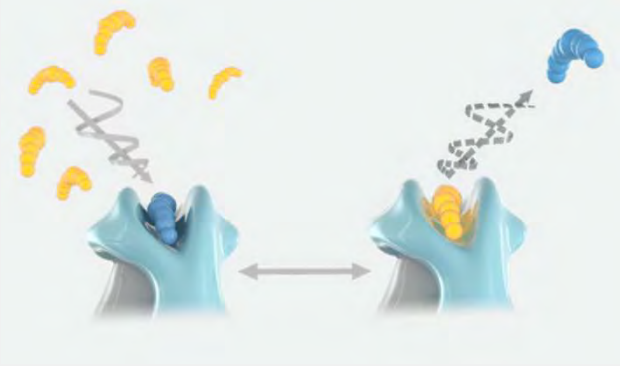
Validation of Target Peptide

Before initiating an exchange process, it is important to validate individual target peptides for HLA binding.
For each project peptide, inhibitory concentrations are determined by plotting the response values as a function of the logarithms of competitor concentrations and applying a nonlinear regression dose response model with variable slope for analysis. The calculated logIC50 value is reported as measure of the effectiveness of the target peptide.



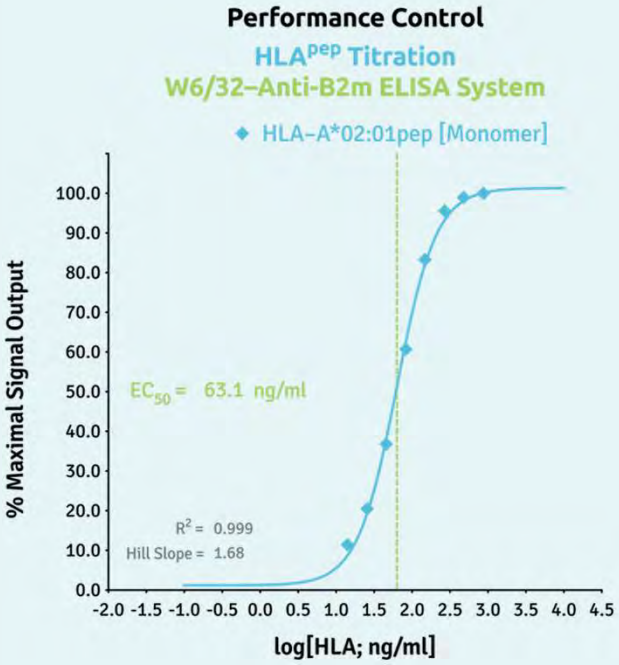
Execution of Peptide Exchange Process

Depending on the product modality, distinct peptide exchange process pipelines have been developed following multi-step protocols that include loading, peptide recovery, purification, enrichment, quantitation, and quality control stages. Each process addresses multiple aspects of increased purity by removing excess assembly components that potentially cause downstream interferences. The assembly is initiated by using a pre-manufactured soluble HLA molecule. All processes deliver stable products in a highly reproducible fashion.



Integrity and Performance Qualification

For validation of peptide exchanged monomers and tetramers, a selective, physiologically relevant assay will be applied to report on the reagent's potency and stability, providing an assessment of the molecule's biological activity. Confirming proper structural configuration is a major part of our quality control validation procedure using best analytical practices. Assays involve the classical W6/32 – Anti-b2m Sandwich ELISA Format and dose-response curve assessments providing proper validation on the function and behavior of HLA molecules where structurally intact HLA proteins are critical.



Choose from a range of HLA Alleles Base Molecules for HLA Peptide Complex Engineering

HLA–A			
A*01:01	A*23:01	A*30:01	A*36:01
A*02:01	A*23:02	A*30:02	A*43:01
A*02:02	A*24:02	A*31:01	A*66:01
A*02:03	A*24:03	A*32:01	A*66:02
A*02:05	A*24:07	A*32:04	A*68:01
A*02:06	A*25:01	A*33:01	A*68:02
A*02:07	A*26:01	A*33:03	A*69:01
A*03:01	A*29:01	A*34:01	A*74:01
A*11:01	A*29:02	A*34:02	A*80:01
A*11:02			

HLA–B						
B*07:02	B*15:02	B*18:01	B*37:01	B*44:02	B*52:01	B*58:01
B*07:03	B*15:03	B*27:01	B*38:01	B*44:03	B*53:01	B*58:02
B*08:01	B*15:08	B*27:02	B*39:01	B*45:01	B*54:01	B*59:01
B*13:01	B*15:10	B*27:03	B*39:05	B*46:01	B*55:01	B*67:01
B*13:02	B*15:11	B*27:05	B*40:01	B*47:01	B*56:01	B*73:01
B*14:01	B*15:12	B*27:08	B*40:02	B*48:01	B*56:02	B*78:01
B*14:02	B*15:13	B*35:01	B*40:06	B*49:01	B*56:04	B*81:01
B*14:05	B*15:16	B*35:05	B*41:01	B*50:01	B*57:01	B*82:01
B*14:06	B*15:18	B*35:08	B*42:01	B*51:01	B*57:02	
B*15:01	B*15:23		B*42:02	B*51:02	B*57:03	

HLA–C			
C*01:02	C*04:01	C*07:01	C*12:02
C*02:02	C*04:03	C*07:02	C*12:03
C*03:02	C*05:01	C*07:04	C*14:02
C*03:03	C*06:02	C*08:01	C*15:02
C*03:04		C*08:02	C*15:03
			C*16:01
			C*17:01
			C*18:01

Peptide Validation and Screening Services

To design improved vaccination and therapeutic targeting strategies, it is critical to identify and validate epitopes that can be recognized and targeted by the immune system to prevent or treat various types of disease conditions.

Overcome the challenge of selecting the “right” targets with a suite of assays aimed at providing critical insight into epitope interactions. Our T-cell peptide epitope discovery and validation services provide solutions and essential information to advance qualified candidates quickly through the development process.

Choose from a range of services

At HLA Protein, we offer the following services:

HLA Peptide Complex Engineering

HLA Protein offers chemically modified sHLA proteins that are randomly conjugated with a biotin moiety and loaded with a custom-specific synthetic peptide. These biotinylated sHLA allow for efficient binding to streptavidin without steric hindrance or inactivated antigenic sites fully preserving biological activity. Their high stability and binding capacity allow their usage in many applications involving the streptavidin-biotin system. Streptavidin-based amplification techniques are widely used in flow cytometry, fluorescent imaging, bead-based or microplate-based detection for increased signal output and greater sensitivity

Peptide Epitope Validation:

Validate the binding strength of individual T cell peptide epitope candidates in order to judge their immunogenic potential. Our Peptide Epitope Validation Service (PV) will accurately determine inhibitory concentrations (IC50), representative of the affinity of the HLA ligand to the recognition site by incubating sHLA with a labeled reference peptide in the presence of different concentrations of competitor peptide (i.e. the peptide of interest).

Peptide Epitope Screening:

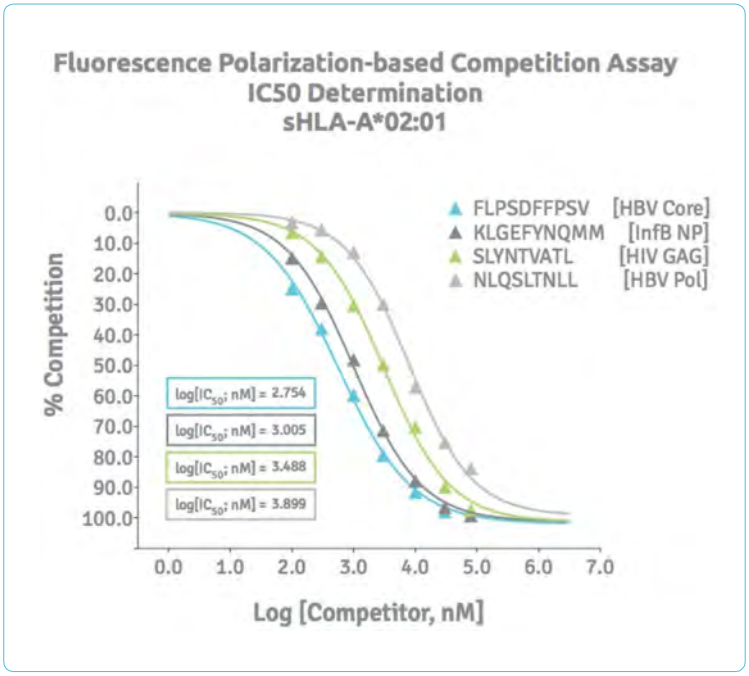
Enhance the value of your target protein and increase efficiency and productivity of your vaccine, therapeutic, or diagnostic developments. Our Peptide Epitope Screening Service (PS) will generate a competition score allowing a simple ranking of all candidates based on their relative affinity.

T Cell Epitope Mapping:

Our most advanced combinatorial peptide library screening approaches for vaccine, therapeutic and diagnostic developments. HLA Protein's T Cell Epitope Mapping service provides a comprehensive and unbiased identification of HLA class I–restricted T cell epitopes using a truncation library–based screening strategy.

Peptide Epitope Validation

Competition based peptide binding assay methodologies have become exceedingly popular for assessing the ability of synthetically defined peptide epitopes to associate with specific HLA complexes. This has been accomplished by determining their half maximal inhibitory concentration (IC50) as a measure of the effectiveness of inhibiting test peptides to judge their immunogenic potential and value in the development of novel immunotherapies.
Advance qualified peptide candidates quickly by validating your screening candidates or predicted epitopes by confirming their affinity and ranking order.



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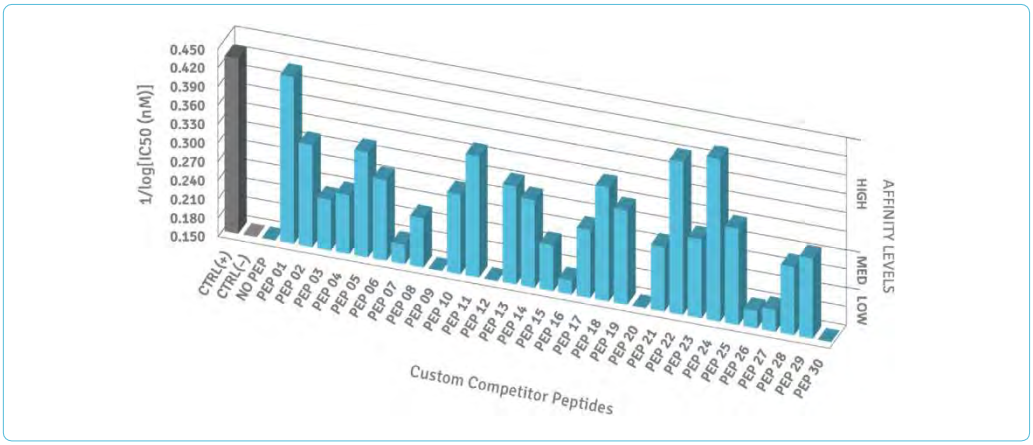
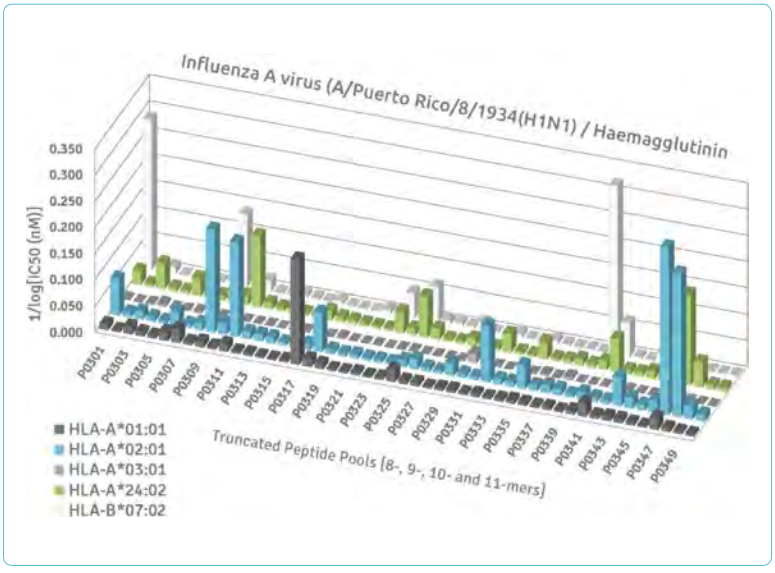


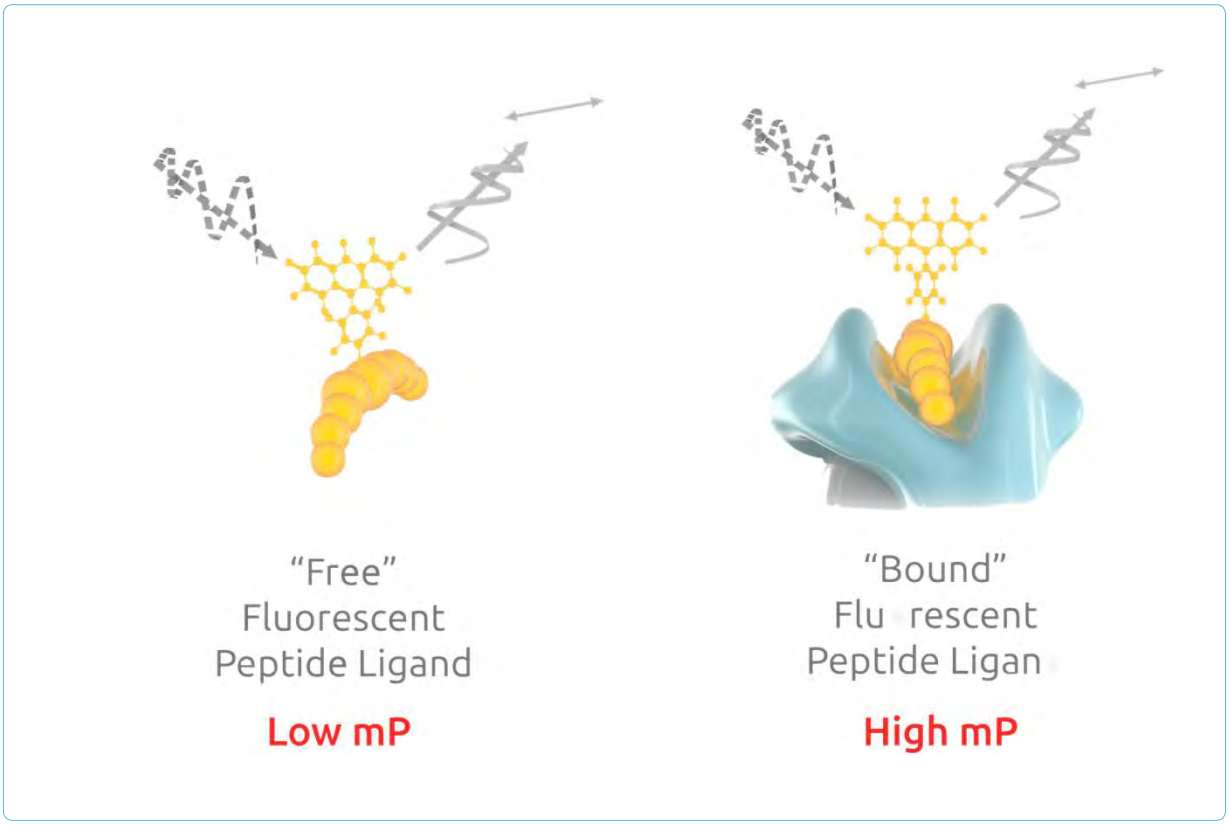
T Cell Epitope Mapping

T cell epitope mapping has emerged as one of the most powerful new drug discovery tools for a range of biomedical applications. Our mapping service is a high-throughput approach, which allows the creation of individual epitope maps for any protein of interest. This application enables the screening of large libraries of overlapping peptides with a broad selection of HLA alleles to identify high affinity binding peptides and the selection of the most potent T cell epitope candidates.



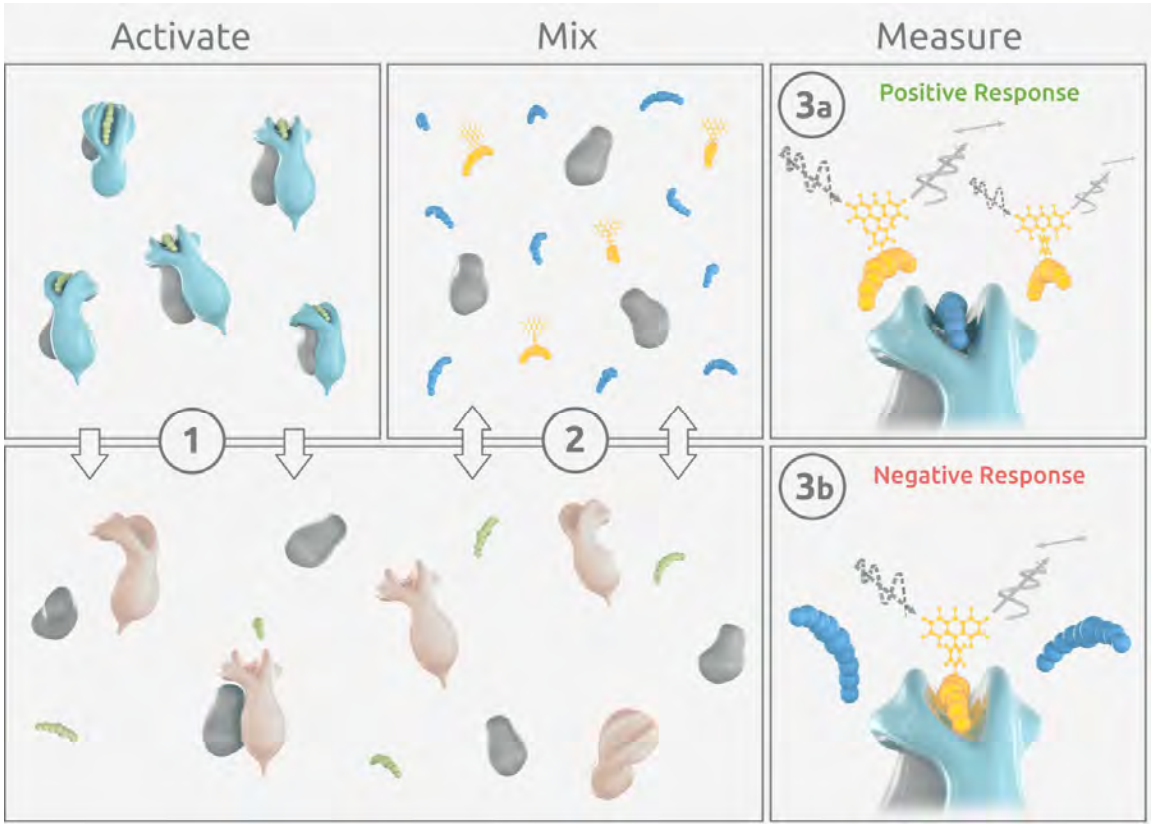
Fluorescence Polarization Technology

Fluorescence polarization (FP) is unique among methods used to analyze molecular binding events because it allows the instantaneous measurement of the ratio between free and bound labeled ligand in solution without any separation steps. The technology is based on the principle that if a fluorescent-labeled peptide binds to a sHLA molecule of higher molecular weight, polarization values will increase due to the slower molecular rotation of the bound probe.



Competitive Assay Technology

To elaborate the fast and precise molecular binding of a peptide to an HLA molecule, a reference fluorescent-labeled peptide is incubated with activated sHLA in the presence of a peptide competitor and peptide/HLA interaction is monitored over time. Only a simple three step process is required to perform the assay. The activation step (1) is forcing the folded structure into a temporary state of instability, making it amenable for the competitor peptide to be inserted into the groove. The mixing step (2) is providing a fluorescent-labeled tracer peptide (yellow) and test peptide (blue) for competition. And lastly, the measuring step (3) where data is collected, and a positive response will occur when the peptide of interest outcompetes the labeled peptide tracer. A negative response will take place when the peptide of interest has no binding characteristics and only the tracer is assembling with the sHLA.



Advantages

Customized Selection

Choose from a wide range of major HLA alleles stably expressed in mammalian cell lines and available in large quantities

State of the Art Detection System

All assays are based on Fluorescence Polarization, allowing direct measurement of the ratio between bound and free in real-time

Speed

Profit from short turnaround times with results available in as little as 3 days upon receipt of the peptides

Highly Accurate

Fluorescence polarization-based assays have high accuracy and reproducibility with data outputs easy to interpret

No Radioisotopes

Our peptide binding assays do not use radioisotopes and are suitable for high-throughput applications

Homogeneous Assays

HLA peptide binding assays are homogeneous in nature with no antibody involvement, cumbersome ligand/complex separation or washing steps

hla protein Technologies Inc

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