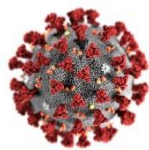


Explore COVID-19 immunity and accelerate vaccine development



Scientists worldwide are working hard to understand the specific immune responses against the coronavirus, SARS-CoV-2, in order to design an efficient vaccine.

The best defense against the virus is to mount an immune response within the patient. An immune response that comprises armies of specific Cytotoxic CD8+ T cells to eliminate virus infected cells, and Helper CD4+ T cells to orchestrate humoral immunity leading to an antibody response against the virus. Cytotoxic and helper T cells are both activated by recognition of virus fragments (peptide-epitopes) displayed by Major Histocompatibility complex (MHC) present on the surface of antigen-presenting cells. Cytotoxic CD8+ T cells recognize virus epitopes presented by MHC I and helper CD4+ T cells epitopes presented by MHC II.

It has been confirmed that T-cell immunity plays an important role in recovery from SARS-CoV infection^{1,2,3}. Therefore, understanding the specific T-cell response to SARS-CoV-2 is important for defining correlates of protective immunity and identifying effective vaccine antigens.

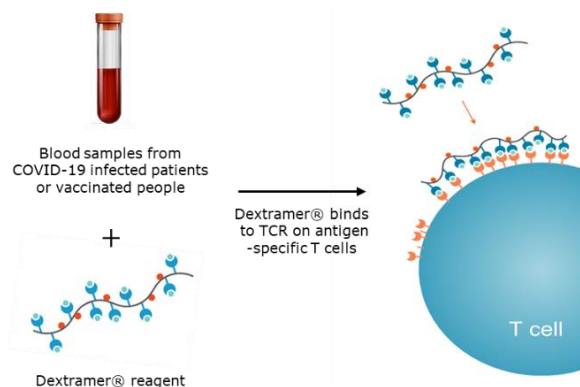
Measure virus-specific immune response

Immudex provides MHC I and II Dextramer[®] reagents able to track COVID-19-specific T cells in blood of patients to evaluate vaccine and disease-induced virus-specific immune responses. The multiple copies of MHC-peptide complexes in the MHC Dextramer[®] reagents ensure strong and specific binding to T-cell receptors on the surface of T cells,

allowing identification of T cells recognizing virus. The MHC Dextramer[®] technology allows researchers to directly evaluate whether the desired effect of their vaccine has been induced by measuring T-cell responses in blood of vaccinated individuals.

MHC Dextramer[®] reagents can

- Monitor T-cell immunity in infected/vaccinated subjects
- Assess vaccine candidates – do they elicit T-cell responses in hosts?
- Facilitate SARS-CoV-2-specific epitope discovery



Immudex is committed to play its part in the fight against the COVID-19 pandemic by helping researchers and vaccine developers around the world to get an increased understanding of immunity to SARS-CoV-2 and speed up vaccine development.

[Contact](#) us today to hear more and set up a meeting for more detailed presentation.

Solutions for COVID-19 specific immune monitoring

Immudex manufactures standard and custom designed MHC Dextramer® and dCODE Dextramer® reagents for measurement of disease-specific T cells in blood samples from patients.

Custom designed reagents are easily made, if we have the requested HLA-allele and if the peptide-epitopes can form stable complexes with the MHC molecule.


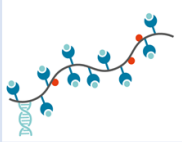
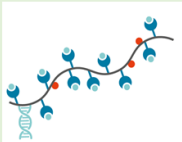
To monitor a virus-specific T-cell response the identity of peptide-epitopes to be bound in the MHC molecules of the Dextramer needs to be known. With SARS-CoV-2 being discovered very recently, immunological information about the virus is limited including which peptide-epitopes from SARS-CoV-2 are the main targets for natural occurring immunity.

Screening for SARS-CoV-2 epitopes that stimulate CD8+ and CD4+ T cells may be needed to design the optimal panel of Dextramer reagents. For that purpose, Immudex provides tools for high throughput screening of large panels of virus-Dextramer reagents comprising candidate epitopes, allowing screening for multiple T-cell specificities at the same time.

Read more about the technologies here:

[Dextramer®](#)
[dCODE Dextramer®, HiT](#)
[dCODE Dextramer®, 10x](#)
 and see [available HLA-alleles](#)

At Immudex we are grateful for the many individual scientists working tirelessly to combat the SARS-CoV-2 virus, and we take pride in playing a small part in the battle. Let us help you find the best solution for your project.

Reagent	Application	Features
 Dextramer®	Flow cytometry	Monitoring disease-specific T cells responses
 dCODE Dextramer®, HiT	Next Generation Sequencing	Monitoring disease-specific T cells responses Screening of TCR specificity
 dCODE Dextramer®, 10x	Next Generation Sequencing and Single cell genomic analysis	Monitoring disease-specific T cells responses TCR recognition TCR clonotype Gene expression

References

- Channappanavar, R., Fett, C., Zhao, J. & Meyerholz, D. K. Virus-Specific Memory CD8 T Cells Provide Substantial Protection from Lethal Severe Acute Respiratory Syndrome Coronavirus Infection. *J. Virol.* **88**, 11034–11044 (2014).
- Liu, W. J. et al. T-cell immunity of SARS-CoV: Implications for vaccine development against MERS-CoV. *Antivir. Res. Elsevier* **137**, 82–92 (2017).
- Chen, H. et al. Response of Memory CD8 + T Cells to Severe Acute Respiratory Syndrome (SARS) Coronavirus in Recovered SARS Patients and Healthy Individuals. *J. Immunol.* **175**, 591–598 (2005).

MHC I Dextramer			
MHC allele	Catalog number	Peptide	Origin
A0101	WA5846	LTDEMIAQY	Spike
A0101	WA5847	WTAGAAAYY	Spike
A0201	WB3848	TLACFVLA AV	Membrane Glycoprotein
A0201	WB5751	GMSRIGMEV	Nucleocapsid Phosphoprotein
A0201	WB5762	LLLDRLNQL	Nucleocapsid Phosphoprotein
A0201	WB5848	ILLNKHIDA	Nucleocapsid Phosphoprotein
A0201	WB5750	RLNEVAKNL	Spike
A0201	WB5824	YLQPRTFLL	Spike
A0201	WB5823	VLNDILSRL	Spike
A0201	WB5850	NLNESLIDL	Spike
A0201	WB5825	FIAGLIAIV	Spike
A0301	WC5851	RIAGHHLGR	Membrane Glycoprotein
A0301	WC5853	LLNKHIDAYK	Nucleocapsid Phosphoprotein
A0301	WC5754	KTFPPTEPK	Nucleocapsid Phosphoprotein
A0301	WC5852	KSAAEASKK	Nucleocapsid Phosphoprotein
A0301	WC5854	RLFRKSNLK	Spike
A0301	WC5855	TLKSFTVEK	Spike
A0301	WC5856	QIYKTPPIK	Spike
A0301	WC5857	MTSCCCLK	Spike
A0301	WC5858	VTYVPAQEK	Spike
A1101	WD5859	LSYFIASFR	Membrane Glycoprotein
A1101	WD5754	KTFPPTEPK	Nucleocapsid Phosphoprotein
A1101	WD5852	KSAAEASKK	Nucleocapsid Phosphoprotein
A1101	WD5860	NSASFSTFK	Spike
A1101	WD5857	MTSCCCLK	Spike
A1101	WD5858	VTYVPAQEK	Spike
A1101	WD5853	GVYFASTEK	Spike
A1101	WD5855	TLKSFTVEK	Spike
A1101	WD5861	GVYYHKNNK	Spike
A1101	WD5854	RLFRKSNLK	Spike

Controls			
MHC allele	Catalog number	Peptide	Origin
B0801	NI3233	nonsense	General Negative Control
A0101	WA3579	nonsense	Negative Control
A0201	WB2666	nonsense	Negative Control
A0301	WC3191	nonsense	Negative Control
A0101	WA2131	VTEHDTLLY	Positive Control
A0201	WB2132	NLVPMTATV	Positive Control
A0301	WC2197	KLGGALQAK	Positive Control
A1101	WD4477	ATVQQQNLK	Positive control

MHC II Dextramer

MHC allele	Catalog number	Peptide	Origin
DRB1*0101	FA10170	LLLLDRLNQLESKMS	Nucleocapsid Protein
DRB1*0101	FA10171	LEASFNYLKSPNFSK	Orf1ab
DRB1*0101	FA10172	FYVYSRVKLNLSRV	Envelope Protein
DRB1*0101	FA10173	ESPFVMSAPPAQYE	Orf1ab
DRB1*0101	FA10175	EAFEKMSVLLSVLLS	Orf1ab
DRB1*0101	FA10157	QLIRAAEIRASANLAATK	Spike
DRB1*0101	FA10160	GAALQIPFAMQMAYRF	Spike
DRB1*0101	FA10161	MAYRFNGIGVTQNVLY	Spike
DRB1*0101	FA10162	QALNTLVKQLSSNFGAI	Spike
DRB1*0101	FA10164	SASFSTFKCYGVSPTKL	Spike
DRB1*0101	FA10165	KSFTVEKGIYQTSNFRVQ	Spike
DRB1*0101	FA10167	HWFVTQRNFYEPQII	Spike
DRB1*0101	FA10169	DSLSSTASALGKLQDVV	Spike
DRB1*0401	FB10157	QLIRAAEIRASANLAATK	Spike
DRB1*0401	FB10161	MAYRFNGIGVTQNVLY	Spike
DRB1*0401	FB10162	QALNTLVKQLSSNFGAI	Spike
DRB1*0401	FB10165	KSFTVEKGIYQTSNFRVQ	Spike
DRB1*0401	FB10167	HWFVTQRNFYEPQII	Spike
DRB1*0401	FB10169	DSLSSTASALGKLQDVV	Spike
DRB1*0401	FB10171	LEASFNYLKSPNFSK	Orf1ab
DRB1*0401	FB10172	FYVYSRVKLNLSRV	Envelope Protein
DRB1*0401	FB10173	ESPFVMSAPPAQYE	Orf1ab
DRB1*0401	FB10175	EAFEKMSVLLSVLLS	Orf1ab
DRB1*0701	FE10157	QLIRAAEIRASANLAATK	Spike
DRB1*0701	FE10160	GAALQIPFAMQMAYRF	Spike
DRB1*0701	FE10161	MAYRFNGIGVTQNVLY	Spike
DRB1*0701	FE10164	SASFSTFKCYGVSPTKL	Spike
DRB1*0701	FE10165	KSFTVEKGIYQTSNFRVQ	Spike
DRB1*0701	FE10166	VKQIYKTPPIKDFGGFNF	Spike
DRB1*0701	FE10167	HWFVTQRNFYEPQII	Spike
DRB1*0701	FE10171	LEASFNYLKSPNFSK	Orf1ab
DRB1*0701	FE10172	FYVYSRVKLNLSRV	Envelope Protein
DRB1*0701	FE10175	EAFEKMSVLLSVLLS	Orf1ab