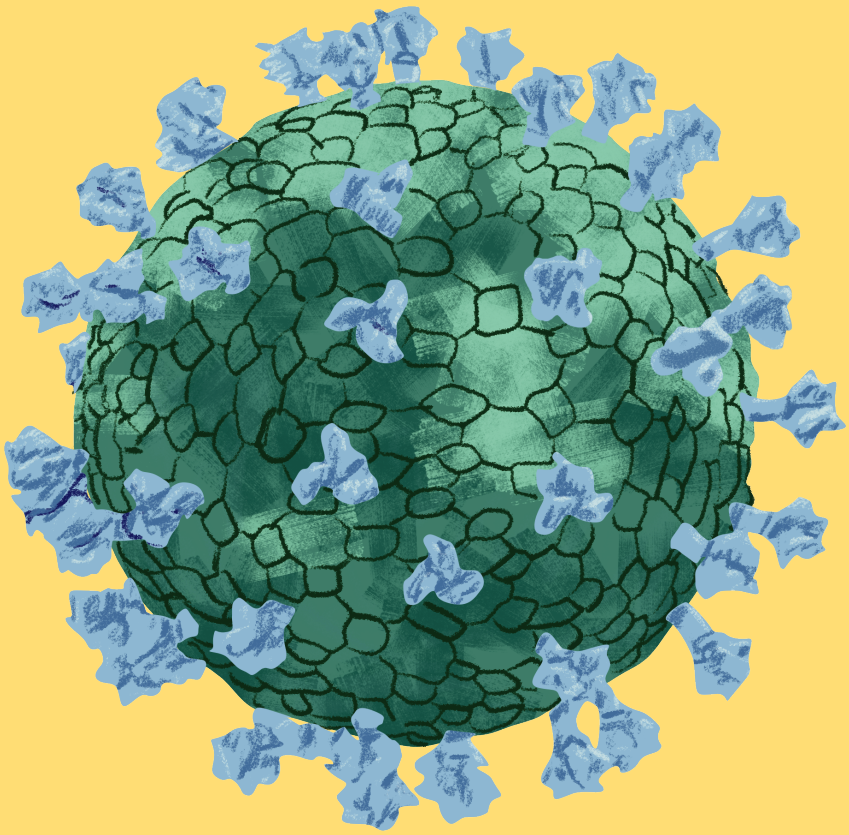
KACTUS

VLP & Nanodisc Displayed Antigens

Multi-pass transmembrane proteins displayed on virus-like particles and nanodiscs



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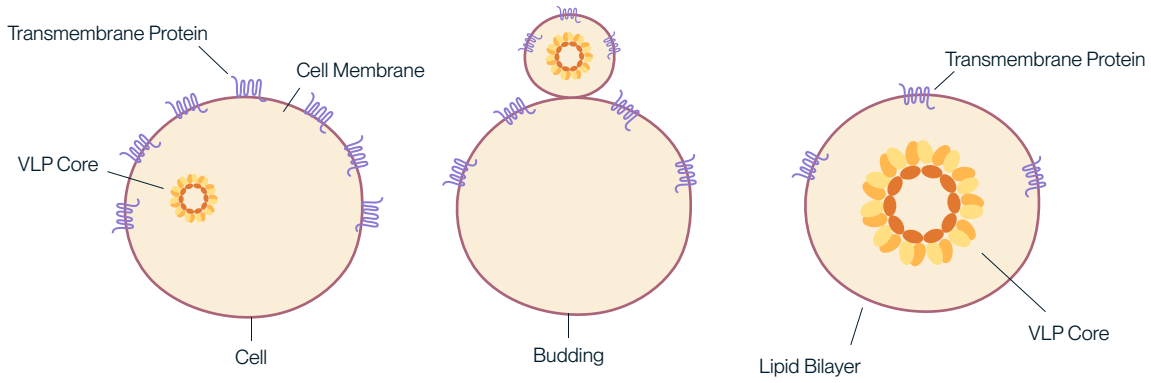
Multipass-Transmembrane Proteins

Multipass transmembrane proteins are a group of proteins with essential roles in physiological process and are also important targets for drug discovery and development. Producing soluble recombinant forms of these proteins, however, has long been a significant challenge, impeding the progress of new drug development. To fulfill this unmet needs, KACTUS has established a robust VLP and Nanodisc technology platform that enables the soluble expression of multipass transmembrane proteins. Our platform technology preserves the native structure and conformation of the proteins while maintaining robust biological activity, supporting academic and industrial drug development against challenging transmembrane proteins.

VLP-Displayed Multi-Pass Transmembrane Proteins

Virus-like particles (VLPs) are non-infectious nanoscale structures that closely mimic the organization and shape of native viruses but lack viral genetic material. They comprise self-assembled viral structural proteins and are highly immunogenic due to their repetitive, multivalent surface. Therefore, VLPs are now increasingly applied as a powerful display platform for membrane proteins, specifically the multipass transmembrane proteins, empowering the antibody discovery for challenging membrane protein targets.



The mechanism of displaying transmembrane proteins on VLPs.

We have successfully developed a series of full-length, multi-pass transmembrane proteins displayed on VLPs, including Claudin18.2, Claudin 6, GPRC5D, STEAP1, CD20, and more. Our VLP proteins have undergone rigorous biological activity validation, with high sensitivity, specificity, and stability.

VLP | Product Advantages

- Full-length expression
- Boosted Immunogenicity
- Avi-based Biotinylation
- Bioactivity Validation via ELISA, SPR, etc.

VLP | Product Applications

Animal Immunization

Antibody Screening

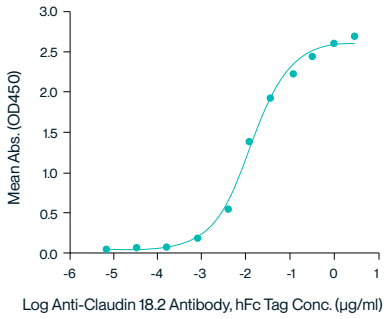
ELISA, SPR Analysis

In vitro PK/PD study

VLP | Product Performance Validation

ELISA | Claudin18.2 VLP

0.5μg Human Claudin 18.2 VLP Per Well

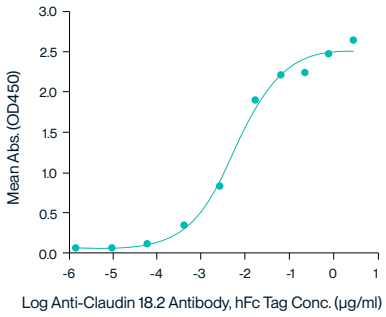


Immobilized Human Claudin 18.2 VLP at 5 μg/ml (100 μl/Well) on the plate. Dose response curve for Anti-Claudin 18.2 Antibody, hFc Tag with the EC50 of 9.8 ng/ml.

Catalog No. *CLD-HM0P37*

ELISA | Biotinylated Claudin18.2 VLP

0.5μg Biotinylated Human Claudin 18.2 VLP Per Well

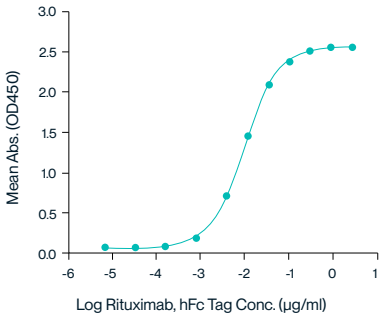


Immobilized Biotinylated Human Claudin18.2 VLP at 5 μg/ml (100 μl/well) on the streptavidin-coated plate (5 μg/ml). Dose response curve for Anti-Claudin18.2 Antibody, hFc Tag with the EC50 of 16.1 ng/ml

Catalog No. *CLD-HE1822B*

ELISA | CD20 VLP

0.5μg Human CD20 VLP Per Well

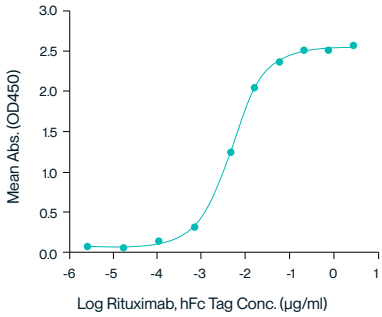


Immobilized Human CD20 VLP at 5 μg/ml (100 μl/Well) on plate on the plate. Dose response curve for Rituximab, hFc Tag with the EC50 of 10.3 ng/ml

Catalog No. *CD2-HM123*

ELISA | Biotinylated C20 VLP

0.5μg Biotinylated Human CD20 VLP Per Well

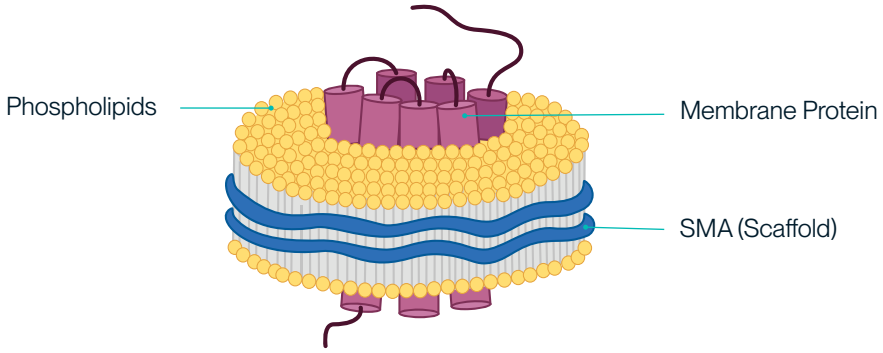


Immobilized Biotinylated Human CD20 VLP at 5 μg/ml (100 μl/well) on the streptavidin-coated plate (5 μg/ml). Dose response curve for Rituximab, hFc Tag with the EC50 of 14.7 ng/ml.

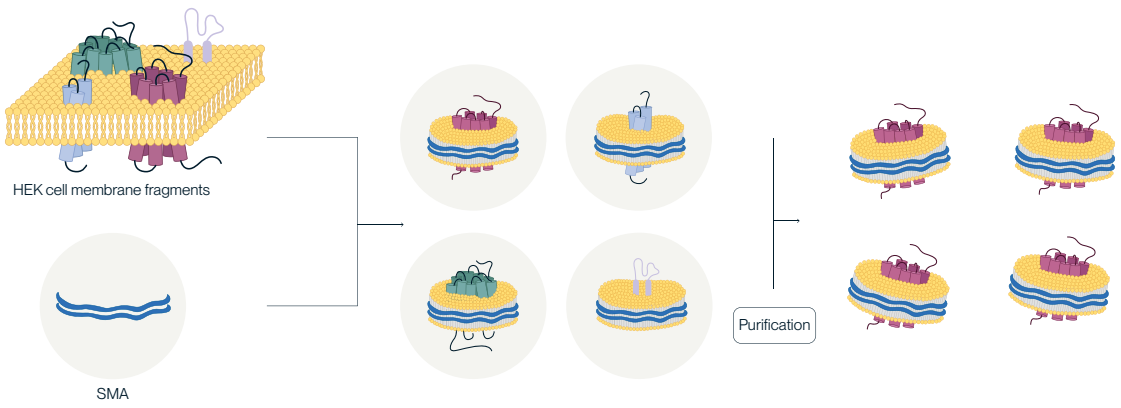
Catalog No. *CD2-HM123B*

Nanodisc-Displayed Multi-Pass Transmembrane Proteins

Nanodiscs are membrane-mimetic structures composed of a phospholipid bilayer and membrane scaffold proteins. They serve as important tools for stably displaying multi-pass transmembrane proteins with native conformation and protein activity. KACTUS leverages a detergent-free production process to produce SMA-based nanodiscs to maximally maintain the native structure and conformation of the full-length, multi-pass transmembrane proteins in soluble format, allowing wide applications in drug screening, analytical assay development and testing.



Structure of the nanodisc displaying multi-pass transmembrane proteins



Process of SMA-based nanodisc production

Nanodisc | Product Advantages

- Full-Length Expression
- Better Purity, More Precise Protein Quantification
- Detergent-Free Process
- Bioactivity Validation via ELISA, SPR, & BLI etc.

Nanodisc | Product Applications

Antibody Panning

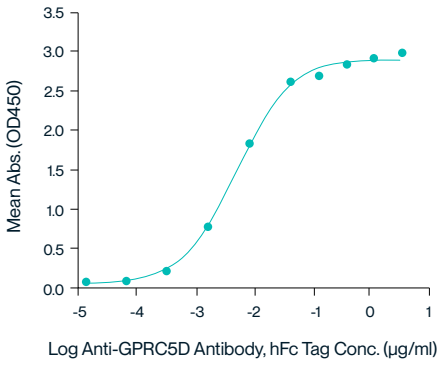
Antibody Screening

ELISA, SPR Analysis

In vitro PK/PD study

Nanodisc | Product Performance Validation

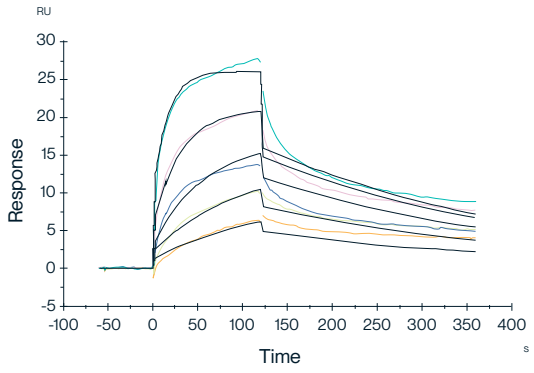
ELISA | GPRC5D Nanodisc



Immobilized Human GPRC5D Nanodisc, His Tag at 2 μg/ml (100μl/well) on the plate. Dose response curve for Anti-GPRC5D Antibody, hFc Tag with the EC50 of 4.9 μg/ml.

Catalog No. *GPR-HM15P*

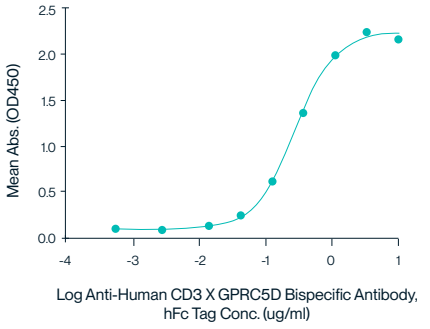
SPR | GPRC5D Nanodisc



Human GPRC5D Nanodisc, His Tag captured on CM5 chip via anti-his antibody, binding to Anti-GPRC5D Antibody with an affinity constant of 1.47 nM.

Catalog No. *GPR-HM15P*

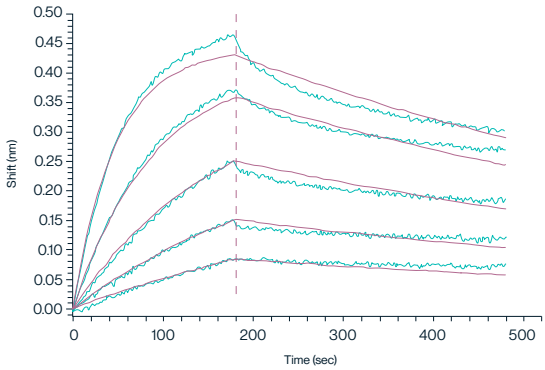
ELISA | Biotinylated GPRC5D Nanodisc



Immobilized Human CD3E&CD3D, His Tag at 2 μg/ml (100 μl/well) on the plate, add serial dilutions of Anti-Human CD3XGPRC5D Bispecific Antibody, hFc Tag and then add Biotinylated Human GPRC5D Nanodisc, His Tag at 5 μg/ml. Detection was performed using HRP-conjugated streptavidin with the EC50 of 0.28 μg/ml.

Catalog No. *GPR-HM45PB*

BLI | Biotinylated GPRC5D Nanodisc



Loaded Biotinylated Human GPRC5D Nanodisc, His Tag on SA-Biosensor, binding to Anti-GPRC5D Antibody with an affinity constant of 1.16 nM.

Catalog No. *GPR-HM45PB*

Custom VLP & Nanodisc Services

KACTUS offers innovative solutions for studying membrane proteins by displaying multipass transmembrane proteins on Virus-Like Particles (VLPs) or SMA-based nanodiscs. Our platforms provide a stable and physiologically relevant environment for membrane proteins. Our membrane protein expression technology provides high-quality proteins for drug discovery, immunization, screening, and analytical assays. On top of our comprehensive catalog of full-length multipass transmembrane proteins, we offer custom transmembrane protein expression on VLPs or nanodiscs.

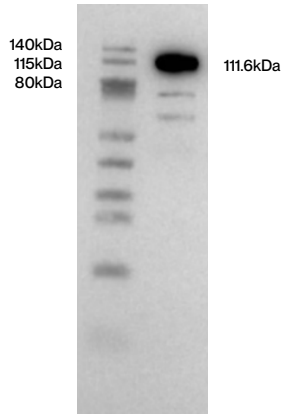
Service Highlights:

- Full-length Expression
- VLP or Nanodisc Display
- Mammalian Cell Expression System
- Biotinylation or Fluorescence
- 8 Week Production
- Bioactivity Analysis

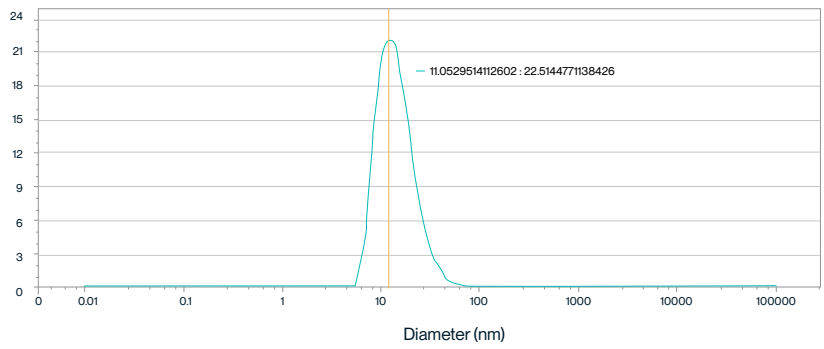
Areas of Expertise

- GPCRs
- Solute Carriers
- Tetraspanins
- Ion Channels

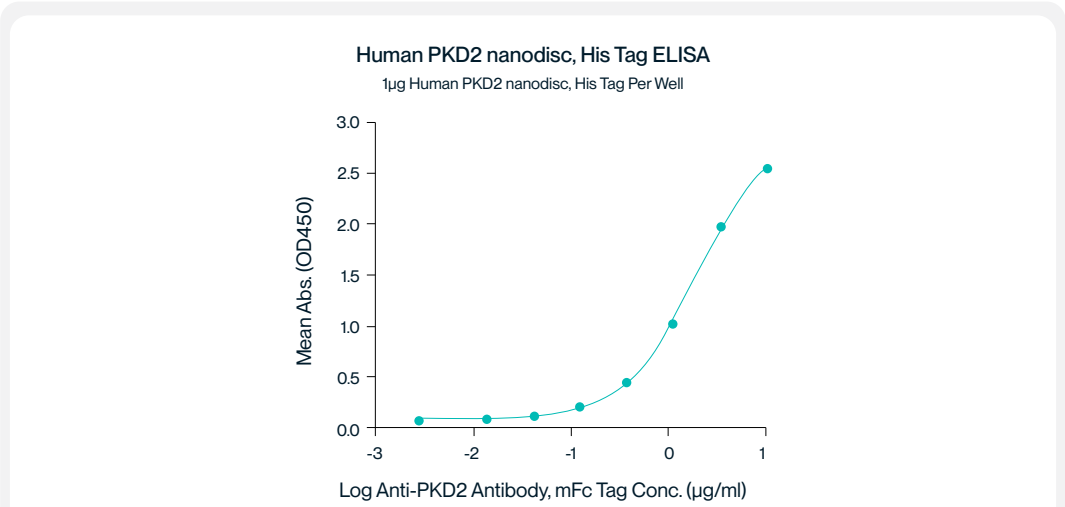
Case Study: Custom Production of Human Polycystin-2 (PKD2) Ion Channel



Western Blot results of Human Polycystin-2 (PKD2), His tag nanodisc, with predicted MW of 111.6kDa



Dynamic Light Scattering (DLS) analysis showcasing the size of the nanodisc.



Immobilized Human PC2 nanodisc, His Tag at 10ug/ml (100ul/well) on the plate. Does response curve for Anti-PC2 Antibody, mFc Tag with the EC50 of 3.34 ug/ml determined by ELISA

Ordering Information

Catalog No.	Display Format	Product Name	Sequence	Species	Tag	Expression System
CON-HM0CN	Nanodisc	Nanodisc Control	/	/	C-His	HEK293
A2R-HM1N1	Nanodisc	Human A2AR	Met1-Ser412	Human	C-His	HEK293
CR4-HM1N122	Nanodisc	Human CCR4	Met1-Leu360	Human	C-His	HEK293
CCR-HM107	Nanodisc	Human CCR7	Met1-Pro378	Human	C-His	HEK293
CR8-HM1N29	Nanodisc	Human CCR8	Met1-Leu355	Human	C-His	HEK293
CLD4-HM1N161	Nanodisc	Human Claudin 4	Met1-Val209	Human	C-His	HEK293
CXR5-HM1N72	Nanodisc	Human CXCR5	Met1-Phe372	Human	C-His	HEK293
GLP-HM1N123	Nanodisc	Human GLP-1R	Met1-Ser463	Human	C-His	HEK293
LGR-HM10N	Nanodisc	Human LGR-4	Met1-Asp951	Human	C-His	HEK293
LR5-HM1N157	Nanodisc	Human LGR-5	Met1-Leu907	Human	C-His	HEK293
MR2-HM1N118	Nanodisc	Human MRGPRX2	Met1-Val330	Human	C-His	HEK293
PC2-HM10N	Nanodisc	Human PC2/Polycystin-2	Met1-Val968	Human	C-His	HEK293
TSF-HM00N	Nanodisc	Human TM4SF1	Met1-Cys202	Human	N-His	HEK293
XCT-HM10NB	Nanodisc	Biotinylated Human Cystine/glutamate transporter (SLC7A11)	Met1-Leu501	Human	C-His	HEK293
CLD-HM10NB	Nanodisc	Biotinylated Human Claudin 18.2	Met1-Val261	Human	C-His	HEK293
CCR-HM16NB	Nanodisc	Biotinylated Human CCR6	Met1-Met374	Human	C-His	HEK293
SLC-HM17NB	Nanodisc	Biotinylated Human SLC6A17	Met1-Leu727	Human	C-His	HEK293
CXC-HM1RNB	Nanodisc	Biotinylated Human CXCR5	Met1-Phe372	Human	C-His	HEK293
CLD-HM16NB	Nanodisc	Biotinylated Human Claudin 6	Met1-Val220	Human	C-His	HEK293
CXR-HM1RNB	Nanodisc	Biotinylated Human CXCR4	Met1-Ser352	Human	C-His	HEK293
CCR-HM17NB	Nanodisc	Biotinylated Human CCR7	Met1-Pro378	Human	C-His	HEK293
CXR-HM10NB	Nanodisc	Biotinylated Human CX3CR1	Met1-Leu355	Human	C-His	HEK293
CXC-HM1RNB	Nanodisc	Biotinylated Human CXCR5	Met1-Phe372	Human	C-His	HEK293
CLD-HM16NB	Nanodisc	Biotinylated Human Claudin 6	Met1-Val220	Human	C-His	HEK293
CXR-HM1RNB	Nanodisc	Biotinylated Human CXCR4	Met1-Ser352	Human	C-His	HEK293
GPR-HM15NB	Nanodisc	Biotinylated Human GPRC5D	Met1-Val345	Human	C-His	HEK293
GLP-HM10NB	Nanodisc	Biotinylated Human GLP-1R	Met1-Ser463	Human	C-His	HEK293
CD2-HM12NB	Nanodisc	Biotinylated Human CD20/MS4A1	Met1-Pro297	Human	C-His	HEK293
CLD-HM14NB	Nanodisc	Biotinylated Human Claudin 4	Met1-Val209	Human	C-His	HEK293
GLP-HM4N185BF	Nanodisc	Biotinylated Human GLP-1R	Met1-Ser463	Human	C-His-Avi	HEK293

Catalog No.	Display Format	Product Name	Sequence	Species	Expression System
VLP-HM00C	VLP	VLP Control	/	/	HEK293
CON-HM0P34	VLP	FITC-equivalent VLP Control	/	/	HEK293
GPR-HM05CB	VLP	Biotinylated VLP Control	/	/	HEK293
CLD-HM0P9	VLP	FITC-equivalent Human Claudin 18.2	Met1-Val261	Human	HEK293
CLD3-HM0P96	VLP	FITC-equivalent Human Claudin 3	Met1-Val220	Human	HEK293
GPR-HM0P11	VLP	FITC-equivalent Human GPRC5D	Met1-Val345	Human	HEK293
SL7-HM0P29	VLP	FITC-equivalent Human SLC7A1	Met1-Lys629	Human	HEK293
A2R-HM0P108	VLP	Human A2AR	Met1-Ser412	Human	HEK293
APL-HM0P112	VLP	Human APLNR	Met1-Asp380	Human	HEK293
CNR-HM001	VLP	Human Cannabinoid receptor 1	Met1-Leu472	Human	HEK293
CCR-HM02B	VLP	Human CCR2b	Met1-Leu360	Human	HEK293
CD33-HM0P110	VLP	Human CD133	Met1-His865	Human	HEK293
CD2-HM123	VLP	Human CD20/MS4A1	Met1-Pro297	Human	HEK293
CD2-HM124V	VLP	Human CD24	Ser27-Gly59	Human	HEK293
CLD-HM0P37	VLP	Human Claudin 18.2	Met1-Val261	Human	HEK293
CLD-HM104	VLP	Human Claudin 4	Met1-Val209	Human	HEK293
CLD-HM006	VLP	Human Claudin 6	Met1-Val220	Human	HEK293
CLD-HM009	VLP	Human Claudin 9	Met1-Val217	Human	HEK293
CXR-HM00V	VLP	Human CX3CR1	Met1-Leu355	Human	HEK293
CXC-HM1R5	VLP	Human CXCR5	Met1-Phe372	Human	HEK293
EDA-HM0P111	VLP	Human EDNRA	Met1-Asn427	Human	HEK293
GCR-HM00V	VLP	Human GCGR/Glucagon receptor	Met1-Phe477	Human	HEK293
GPC-HM003	VLP	Human GPC3 (438-554)	Arg438-Asn554	Human	HEK293
GPC-HE005	VLP	Human GPC3	Gly510-Asn554	Human	E.coli
GPR-HM05P	VLP	Human GPRC5D	Met1-Val345	Human	HEK293
LPA-HM0P111	VLP	Human LPAR1/LPA receptor 1	Met1-Val364	Human	HEK293
PAR-HM01R	VLP	Human ase-activated receptor 1/PAR-1	Met1-Thr425	Human	HEK293
STR-HM002	VLP	Human SSTR2	Met1-Ile369	Human	HEK293
STP-HM01V	VLP	Human STEAP1	Met1-Leu339	Human	HEK293
TSF-HM002	VLP	Human TM4SF1	Met1-Cys202	Human	HEK293
CLD-HM006B	VLP	Biotinylated Human Claudin 6	Met1-Val220	Human	HEK293
CCR-HM02BB	VLP	Biotinylated Human CCR2b	Met1-Leu360	Human	HEK293
GPR-HM05PB	VLP	Biotinylated Human GPRC5D	Met1-Val345	Human	HEK293
CD2-HM0P10B	VLP	FITC-equivalent Biotinylated Human CD20/MS4A1	Met1-Pro297	Human	HEK293
CLD-HE1822B	VLP	Biotinylated Human Claudin 18.2	Met1-Val261	Human	HEK293
CLD-HM182FB	VLP	FITC-equivalent Biotinylated Human Claudin 18.2	Met1-Val261	Human	HEK293
CD2-HM123B	VLP	Biotinylated Human CD20/MS4A1	Met1-Pro297	Human	HEK293
CD2-CM124V	VLP	Cynomolgus CD24	Ser26-Gly57	Cynomolgus	HEK293
CLD-CM006	VLP	Cynomolgus Claudin 6	Met1-Val220	Cynomolgus	HEK293
GPR-CM05P	VLP	Cynomolgus GPRC5D	Met1-Cys300	Cynomolgus	HEK293
CLD-MM006	VLP	Mouse Claudin 6	Met1-Val219	Mouse	HEK293
GPR-MM05P	VLP	Mouse GPRC5D	Met1-Leu344	Mouse	HEK293

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Contact Information

Contact us at support@kactusbio.us to request more information, speak to a sales representative, request a quote, or with help placing an order.

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