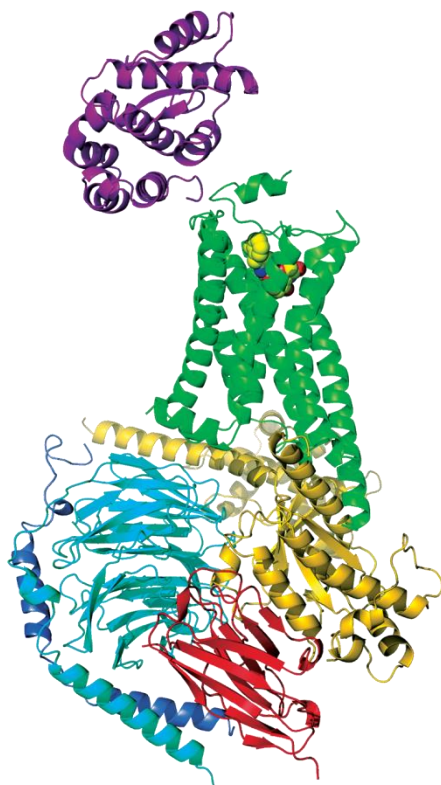


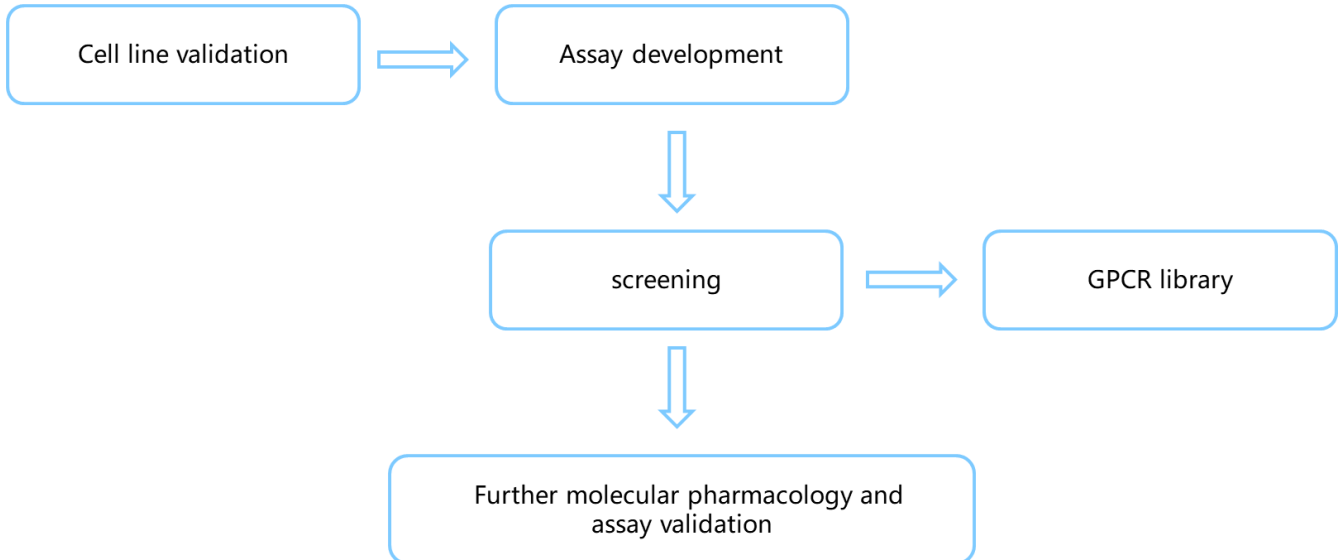


GPCR Target Assays

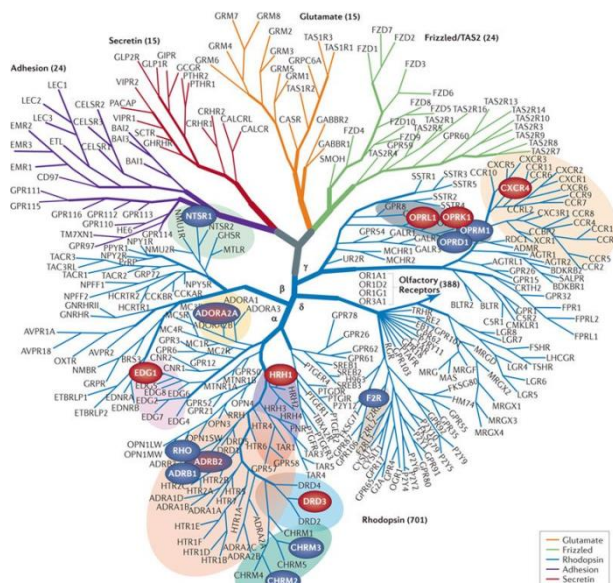


ICE Bioscience INC

Customized GPCR Cell Line Development



- Development of 300+ stable GPCR cell lines in process
- More flexible collaboration choices.
- Fast turnaround, 6-8 weeks for cell line, and 2 weeks for assay validation



Adrenergic Receptor A1A Assay Data Sheet

Receptor	ADRA1A
Gene & Synonyms	ADRA1C; ADRA1L1; ALPHA1AAR
Catalog Ref.	ICE-ADRA1A-HEK
Species/Family	Human / Adrenergic
Accession Number	NM_000680
G coupling	Gq
Method	IP1 Assay
Standard time	2-3 weeks

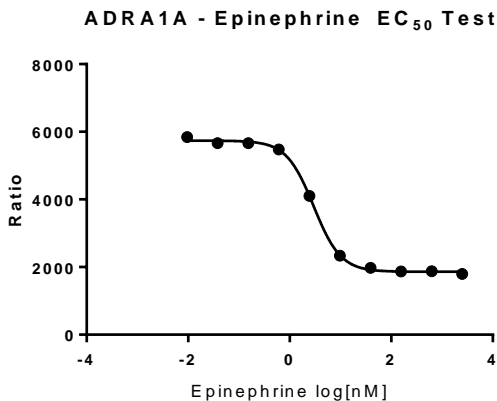


Figure 1. Characterization of agonist in recombinant human ADRA1A receptor IP1 assay systems.

Agonist: Epinephrine
Agonist EC₅₀: 2.96 nM
S/B: 3.25

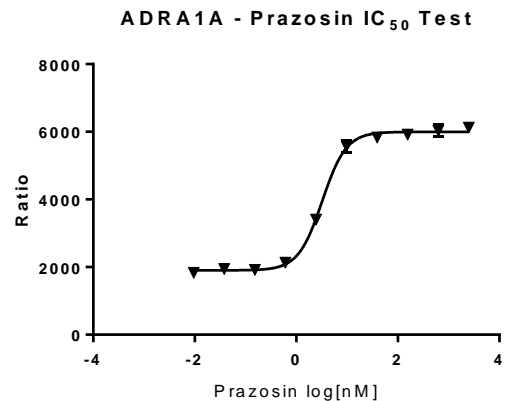


Figure 2. Characterization of antagonist in recombinant human ADRA1A receptor IP1 assay systems.

Antagonist: Prazosin
Antagonist IC₅₀: 3.14 nM
S/B: 2.90

Further validation data available on request.

Adrenergic Receptor A2A Assay Data Sheet

Receptor	ADRA2A
Gene & Synonyms	ADRA2A; ADRA2; ADRAR; ZNF32; ADRA2R; ALPHA2AAR
Catalog Ref.	ICE-ADRA2A-HEK
Species/Family	Human / Adrenergic
Accession Number	NM_000681
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

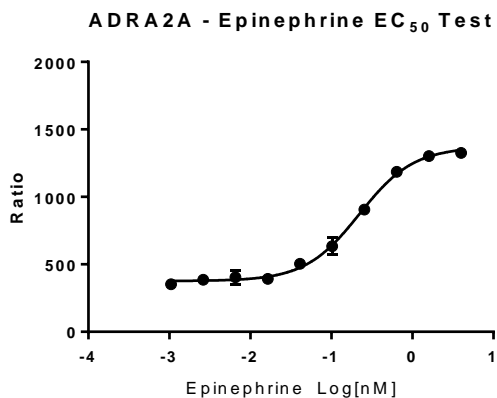


Figure 1. Characterization of agonist in recombinant human ADRA2A receptor cyclase assay systems.

Agonist: Epinephrine
Agonist EC₅₀: 0.22 nM
S/B: 2.69

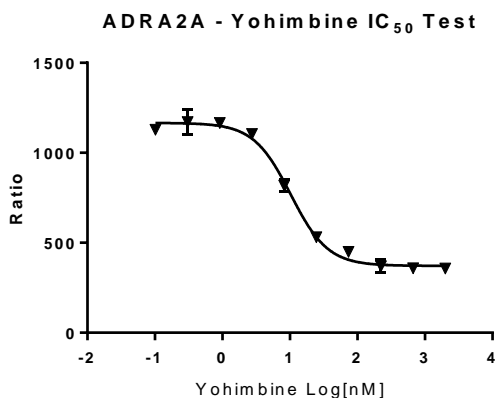


Figure 2. Characterization of antagonist in recombinant human ADRA2A receptor cyclase assay systems.

Antagonist: Yohimbine
Antagonist IC₅₀: 10.26 nM
S/B: 3.59

Further validation data available on request.

Adrenergic Receptor Beta1 Assay Data Sheet

Receptor	β1-adrenoceptor
Gene & Synonyms	ADRB1;RHR; B1AR; ADRB1R; BETA1AR
Catalog Ref.	ICE-ADRB1-CHO
Species/Family	Human /Adrenergic
Accession Number	NM_000684
G coupling	Gs
Method	cAMP Assay
Standard time	2-3 weeks

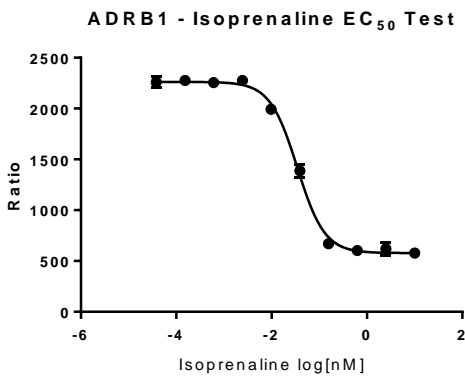


Figure 1. Characterization of agonist in recombinant human ADRB1 receptor cyclase assay systems.

Agonist: Isoprenaline
Agonist EC₅₀: 0.035nM
S/B: 3.98

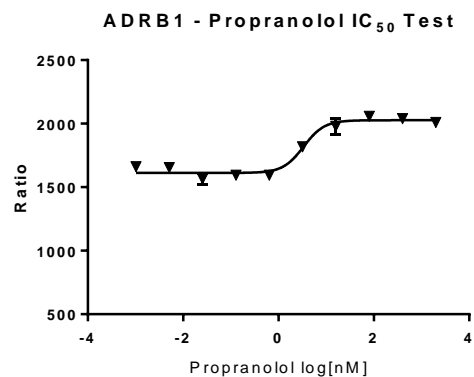


Figure 2. Characterization of antagonist in recombinant human ADRB1 receptor cyclase assay systems.

Antagonist: Propranolol
Antagonist IC₅₀: 3.37 nM
S/B: 1.22

Further validation data available on request.

Adrenergic Receptor Beta2 Assay Data Sheet

Receptor	ADRB2
Gene & Synonyms	ADRB2; BAR; B2AR; ADRBR; ADRB2R; BETA2AR
Catalog Ref.	ICE-ADRB2-CHO
Species/Family	Human /Adrenergic
Accession Number	NM_000024
G coupling	Gs
Method	cAMP Assay
Standard time	2-3 weeks

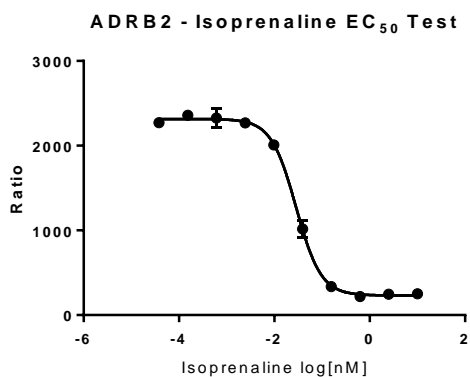


Figure 1. Characterization of agonist in recombinant human ADRB2 receptor cyclase assay systems.

Agonist: Isoprenaline
Agonist EC₅₀: 0.029nM
S/B: 9.27

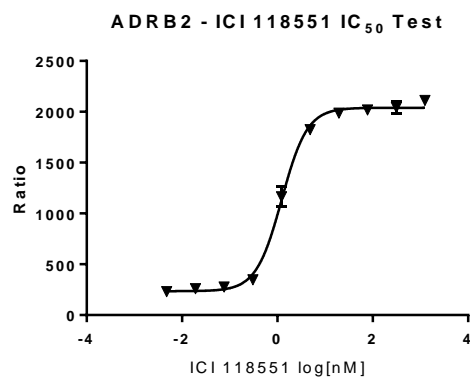


Figure 2. Characterization of antagonist in recombinant human ADRB2 receptor cyclase assay systems.

Antagonist: ICI 118551
Antagonist IC₅₀: 1.23 nM
S/B: 5.54

Further validation data available on request.

Adenosine A2a Receptor Assay Data Sheet

Receptor	ADORA2A
Gene & Synonyms	ADORA2A; A2aR; RDC8; ADORA2
Catalog Ref.	ICE-ADORA2A-HEK
Species/Family	Human / Adenosine
Accession Number	NM_000675
G coupling	Gs & Gq
Method	cAMP Assay
Standard time	2-3 weeks

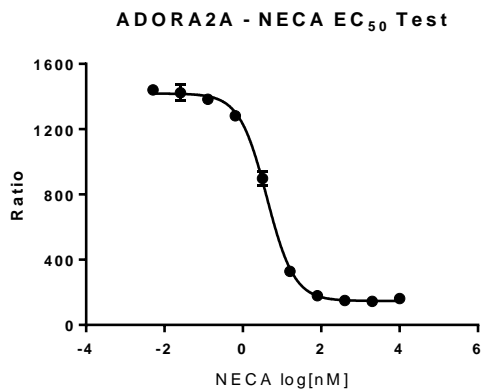


Figure 1. Characterization of agonist in recombinant human ADORA2A receptor cyclase assay systems.

Agonist: NECA
Agonist EC₅₀: 4.00 nM
S/B: 9.09

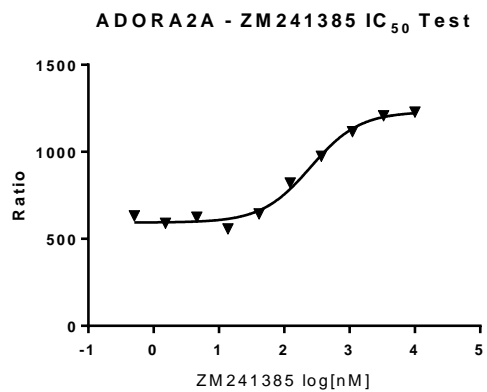


Figure 2. Characterization of antagonist in recombinant human ADORA2A receptor cyclase assay systems.

Antagonist: ZM241385
Antagonist IC₅₀: 253.6 nM
S/B: 1.88

Further validation data available on request.

CB1 Assay Data Sheet

Receptor	CB1
Gene & Synonyms	CNR1; CNR; CB-R; CB1A; CB1R; CANN6; CB1K5
Catalog Ref.	Flp-In-CHO-CB1 Stable Pool
Species/Family	Human / Cannabinoid
Accession Number	NM_016083
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks
Related diseases	pain, feeding disorders, vascular disease, Parkinson's disease, and other central nerve system disorders.

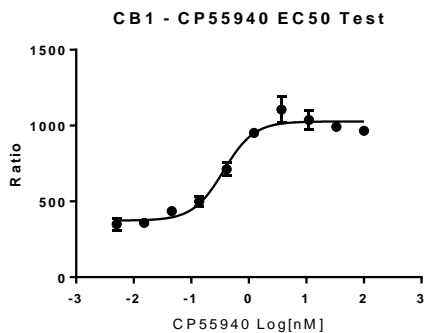


Figure 1. Characterization of agonist in recombinant human CB1 cyclase assay systems.

Agonist: CP55940
Agonist EC50: 0.36nM
S/B: 2.75

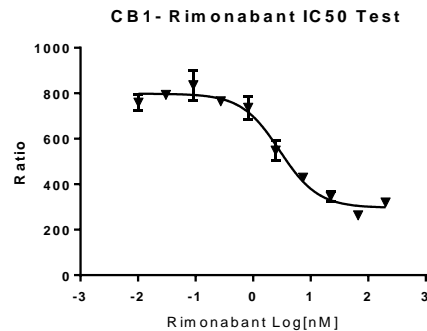


Figure 2. Characterization of antagonist in recombinant human CB1 cyclase assay systems.

Antagonist: Rimonabant
Agonist EC50: 2.90nM
S/B: 2.37

Further validation data available on request.

CB2 Assay Data Sheet

Receptor	CB2
Gene & Synonyms	CB2; CX5; CB-2
Catalog Ref.	Flp-In-CHO-CB2 Stable Cell Line
Species/Family	Human / Cannabinoid
Accession Number	NM_001841
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks
Related diseases	pain, multiple sclerosis, vascular disease, Parkinson's disease, and other central nerve system disorders

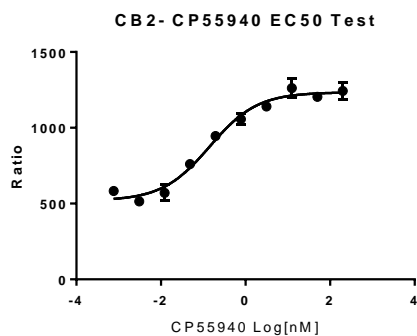


Figure 1. Characterization of agonist in recombinant human CB2 cyclase assay systems.

Agonist: CP55940
Agonist EC50: 0.14nM
S/B: 1.75

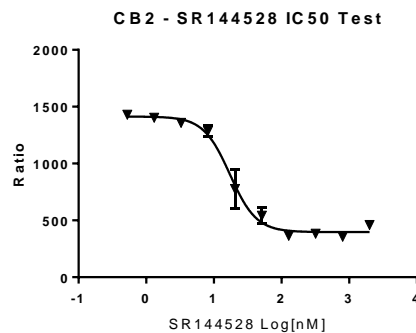


Figure 2. Characterization of antagonist in recombinant human CB2 cyclase assay systems.

Antagonist: SR144528
Agonist EC50: 17.25nM
S/B: 3.21

Further validation data available on request.

CCK1 Assay Data Sheet

Receptor	CCK1
Gene & Synonyms	CCKAR
Catalog Ref.	ICE-CCK1-CHO
Species/Family	Human / Cholecystokinin
Accession Number	NM_000730
G coupling	Gq
Method	IP1 Assay
Standard time	2-3 weeks

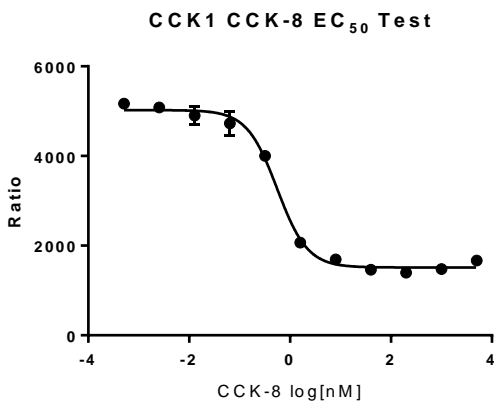


Figure 1. Characterization of agonist in recombinant human CCK1 receptor IP1 assay systems.

Agonist: CCK-8
Agonist EC₅₀: 0.56 nM
S/B: 3.10

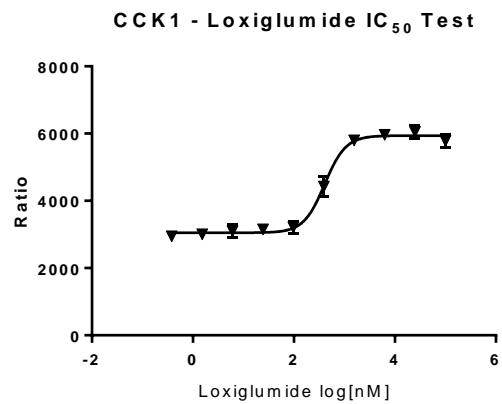


Figure 2. Characterization of antagonist in recombinant human CCK1 receptor IP1 assay systems.

Antagonist: Loxiglumide
Antagonist IC₅₀: 406.9nM
S/B: 2.15

Further validation data available on request.

D1 Assay Data Sheet

Receptor	D1
Gene & Synonyms	DRD1; DADR; DRD1A
Catalog Ref.	Flp-In-CHO-D1 Stable Pool
Species/Family	Human / Dopamine
Accession Number	NM_000794
G coupling	Gs
Method	cAMP Assay
Standard time	2-3 weeks
Related diseases	Parkinson's disease, and other central nerve system disorders

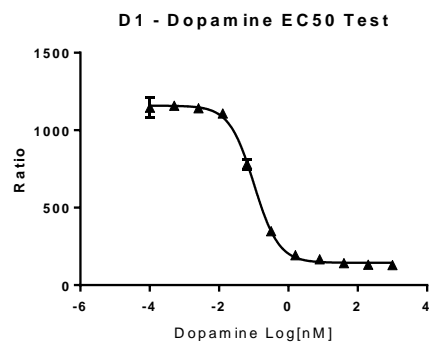


Figure 1. Characterization of agonist in recombinant human D1 cyclase assay systems.

Agonist: Dopamine
Agonist EC50: 0.10nM
S/B: 7.02

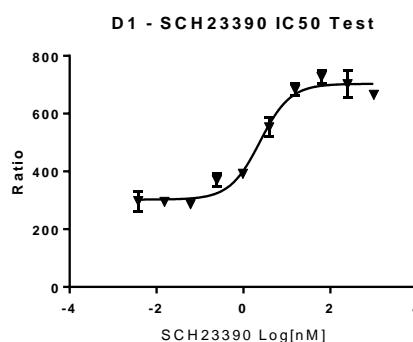


Figure 2. Characterization of antagonist in recombinant human D1 cyclase assay systems.

Antagonist: SCH23390
Agonist EC50: 2.40nM
S/B: 2.26

Further validation data available on request.

D2L Assay Data Sheet

Receptor	D2L
Gene & Synonyms	DRD2; D2R; D2DR
Catalog Ref.	Flp-In-CHO-D2L Stable Pool
Species/Family	Human / Dopamine
Accession Number	NM_000795
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

Pramipexole EC50 Test - cAMP Assay

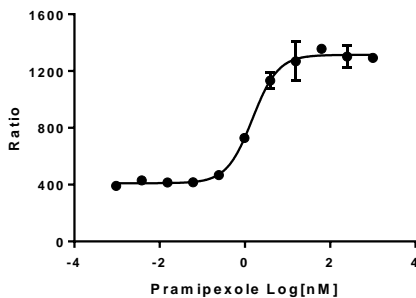


Figure 1. Characterization of agonist in recombinant human D2L cyclase assay systems.

Agonist: Pramipexole
Agonist EC50: 1.50nM
S/B: 3.36

Amisulpride IC50 Test -cAMP Assay

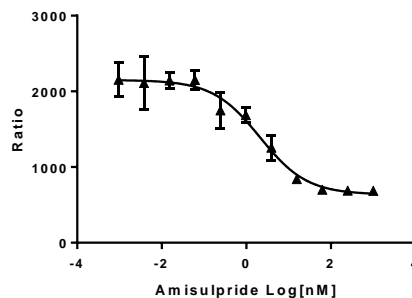


Figure 2. Characterization of antagonist in recombinant human D2L cyclase assay systems.

Antagonist: Amisulpride
Agonist EC50: 2.10nM
S/B: 2.75

Further validation data available on request.

D2S Assay Data Sheet

Receptor	D2S
Gene & Synonyms	DRD2S; D2R; D2DR
Catalog Ref.	ICE-D2S-HEK
Species/Family	Human / Dopamine
Accession Number	NM_016574
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

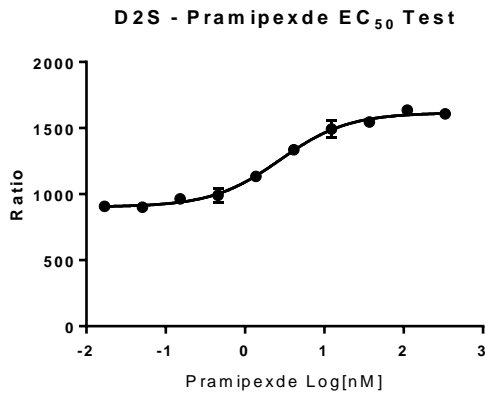


Figure 1. Characterization of agonist in recombinant human D2S cyclase assay systems.

Agonist: Pramipexole
Agonist EC₅₀: 2.77 nM
S/B: 1.76

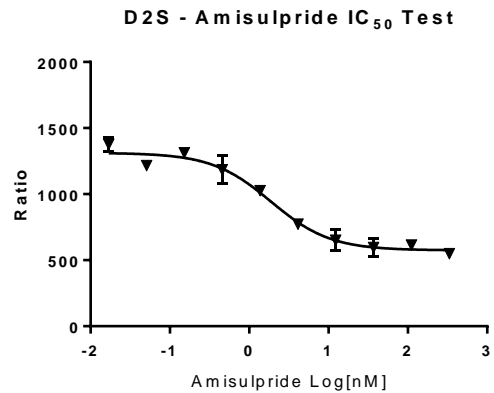


Figure 2. Characterization of antagonist in recombinant human D2S cyclase assay systems.

Antagonist: Amisulpride
Antagonist IC₅₀: 1.89 nM
S/B: 1.77

Further validation data available on request.

D4 Assay Data Sheet

Receptor	D4
Gene & Synonyms	DRD4; D4DR
Catalog Ref.	Flp-In-CHO-D4 Stable Pool
Species/Family	Human / Dopamine
Accession Number	NM_000797
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

Pramipexole EC50 Test - cAMP Assay

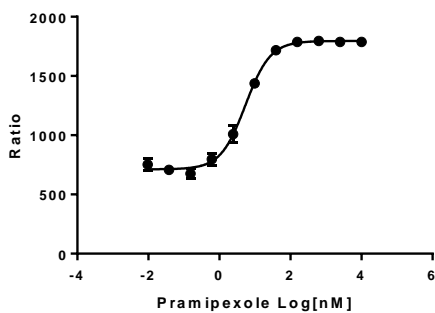


Figure 1. Characterization of agonist in recombinant human D4 cyclase assay systems.

Agonist: Pramipexole
Agonist EC50: 5.40nM
S/B: 2.57

L-745,870 IC50 Test - cAMP Assay

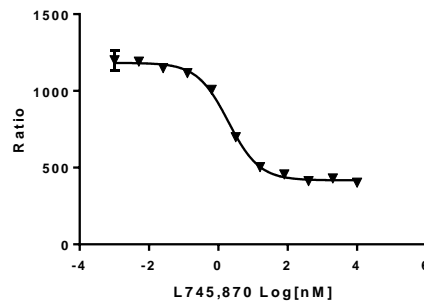


Figure 2. Characterization of antagonist in recombinant human D4 cyclase assay systems.

Antagonist: L-745,870
Agonist EC50: 1.94nM
S/B: 2.98

Further validation data available on request.

D5 Assay Data Sheet

Receptor	D5
Gene & Synonyms	DRD5; DBDR; DRD1B; DRD1L2
Catalog Ref.	Flp-In-CHO-D5 Stable Pool
Species/Family	Human / Dopamine
Accession Number	NM_000798
G coupling	Gs
Method	cAMP Assay
Standard time	2-3 weeks

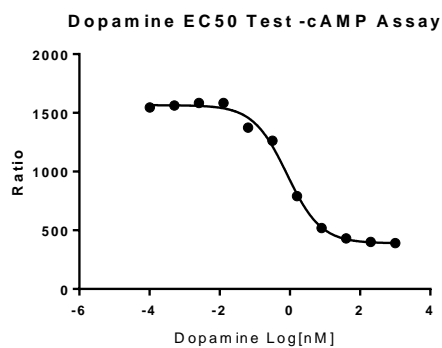


Figure 1. Characterization of agonist in recombinant human D5 cyclase assay systems.

Agonist: Dopamine
Agonist EC50: 0.83nM
S/B: 4.08

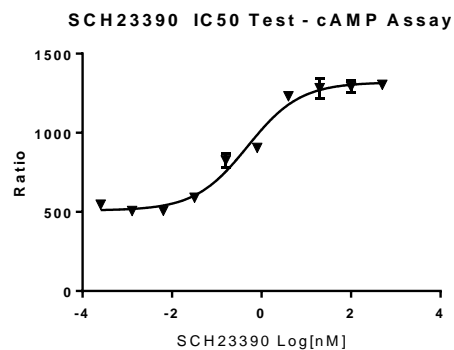


Figure 2. Characterization of antagonist in recombinant human D5 cyclase assay systems.

Antagonist: SCH23390
Agonist EC50: 0.49nM
S/B: 2.49

Further validation data available on request.

ETA Assay Data Sheet

Receptor	ETA
Gene & Synonyms	EDNRA; ETA; ET-A; ETAR; ETRA; MFDA; ETA-R; hET-AR
Catalog Ref.	ICE-ETA-CHO
Species/Family	Human / Endothelin
Accession Number	NM_001957
G coupling	Gq
Method	IP1 Assay
Standard time	2-3 weeks

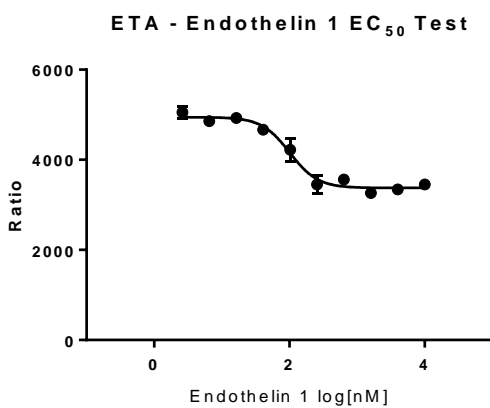


Figure 1. Characterization of agonist in recombinant human ETA receptor IP1 assay systems.

Agonist: Endothelin 1
Agonist EC₅₀: 100.9 nM
S/B: 1.47

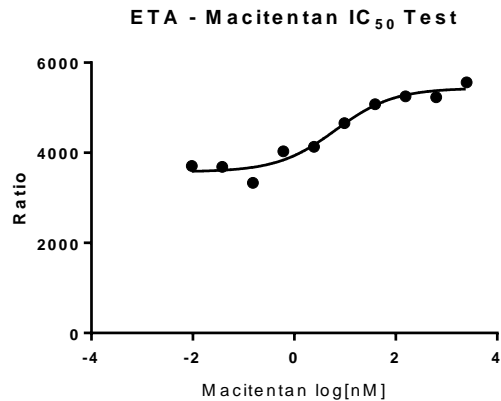


Figure 2. Characterization of antagonist in recombinant human ETA receptor IP1 assay systems.

Antagonist: Macitentan
Antagonist IC₅₀: 6.55 nM
S/B: 1.36

Further validation data available on request.

H1 Assay Data Sheet

Receptor	H1
Gene & Synonyms	HRH1; H1R; H1-R; HH1R; hisH1
Catalog Ref.	ICE-H1-HEK
Species/Family	Human / Histamine
Accession Number	NM_000861
G coupling	Gq
Method	IP1 Assay
Standard time	2-3 weeks

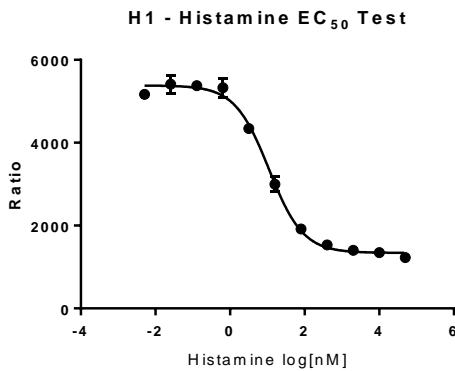


Figure 1. Characterization of agonist in recombinant human H1 receptor IP1 assay systems.

Agonist: Histamine
Agonist EC₅₀: 11.04 nM
S/B: 4.21

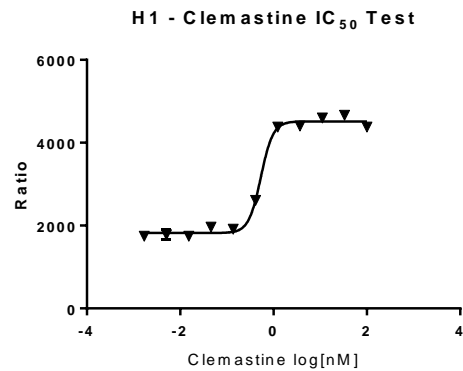


Figure 2. Characterization of antagonist in recombinant human H1 receptor IP1 assay systems.

Antagonist: Clemastine
Antagonist IC₅₀: 0.5348 nM
S/B: 2.51

Further validation data available on request.

H2 Assay Data Sheet

Receptor	H2
Gene & Synonyms	HRH2; H2R; HH2R
Catalog Ref.	ICE-H2-HEK
Species/Family	Human / Histamine
Accession Number	NM_001131055
G coupling	Gs & Gq
Method	IP1 Assay
Standard time	2-3 weeks

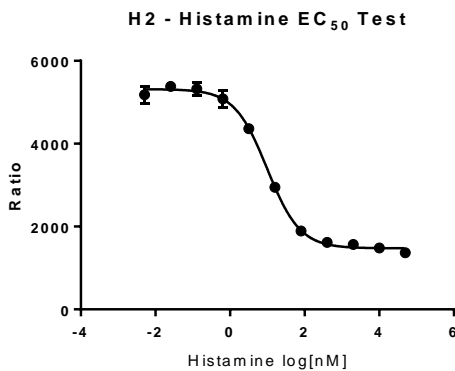


Figure 1. Characterization of agonist in recombinant human H2 receptor IP1 assay systems.

Agonist: Histamine
Agonist EC₅₀: 9.89 nM
S/B: 3.79

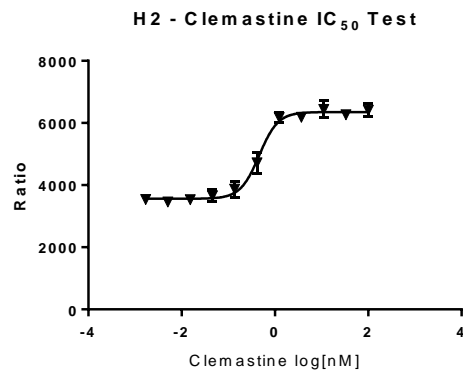


Figure 2. Characterization of antagonist in recombinant human H2 receptor IP1 assay systems.

Antagonist: Clemastine
Antagonist IC₅₀: 0.46 nM
S/B: 1.99

Further validation data available on request.

M1 Assay Data Sheet

Receptor	M1
Gene & Synonyms	CHRM1; M1; HM1; M1R
Catalog Ref.	M1-Gα15 CHO Stable Cell Line
Species/Family	Human / Acetylcholine
Accession Number	NM_000738
G coupling	Gq
Method	IP1 Assay
Standard time	2-3 weeks

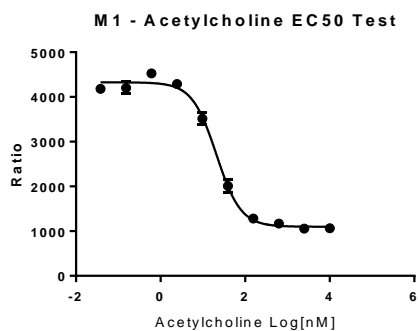


Figure 1. Characterization of agonist in recombinant human M1 IP1 assay systems.

Agonist: Acetylcholine
Agonist EC50: 20.91nM
S/B: 4.18

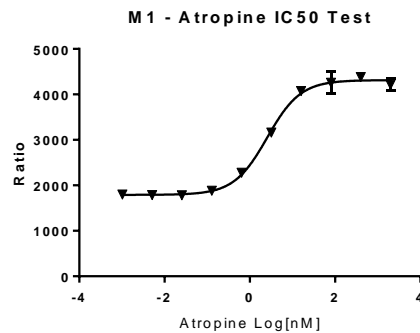


Figure 2. Characterization of antagonist in recombinant human M1 IP1 assay systems.

Antagonist: Atropine
Agonist EC50: 2.57nM
S/B: 2.32

Further validation data available on request.

M2 Assay Data Sheet

Receptor	M2
Gene & Synonyms	CHRM2; HM2
Catalog Ref.	M2-Gα15 CHO Stable Cell Line
Species/Family	Human / Acetylcholine
Accession Number	NM_001006632
G coupling	Gi
Method	IP1 Assay
Standard time	2-3 weeks

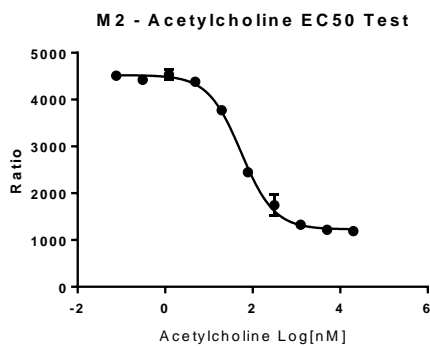


Figure 1. Characterization of agonist in recombinant human M2 receptor IP1 assay systems.

Agonist: Acetylcholine
Agonist EC50: 54.32nM
S/B: 3.70

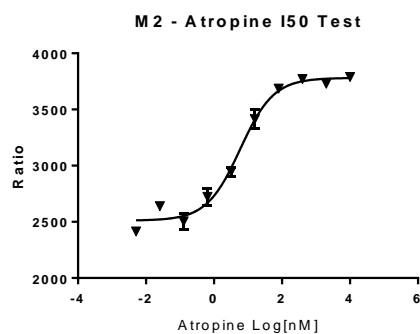


Figure 2. Characterization of antagonist in recombinant human M2 receptor IP1 assay systems.

Antagonist: Atropine
Agonist EC50: 5.88nM
S/B: 1.46

Further validation data available on request.

M3 Assay Data Sheet

Receptor	M3
Gene & Synonyms	CHRM3; HM3; PBS; EGBRS
Catalog Ref.	Flp-In-CHO-M3 Stable Pool
Species/Family	Human / Acetylcholine
Accession Number	NM_000740
G coupling	Gq
Method	IP1 Assay
Standard time	2-3 weeks

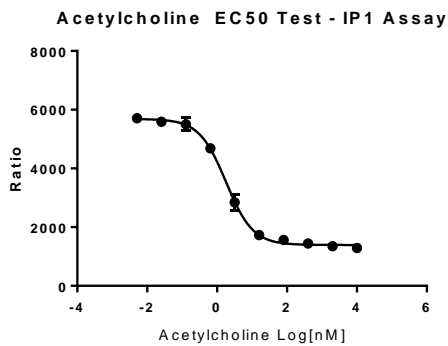


Figure 1. Characterization of agonist in recombinant human M3 receptor IP1 assay systems.

Agonist: Acetylcholine
Agonist EC50: 1.80nM
S/B: 5.76

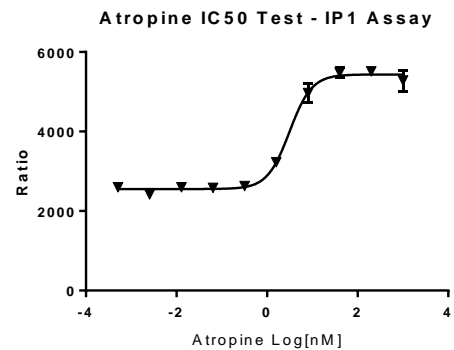


Figure 2. Characterization of antagonist in recombinant human M3 receptor IP1 assay systems.

Antagonist: Atropine
Agonist EC50: 3.13nM
S/B: 2.12

Further validation data available on request.

M5 Assay Data Sheet

Receptor	M5
Gene & Synonyms	CHRM5; HM5
Catalog Ref.	Flp-In-CHO-M5 Stable Pool
Species/Family	Human / Acetylcholine
Accession Number	NM_012125
G coupling	Gq
Method	IP1 Assay
Standard time	2-3 weeks

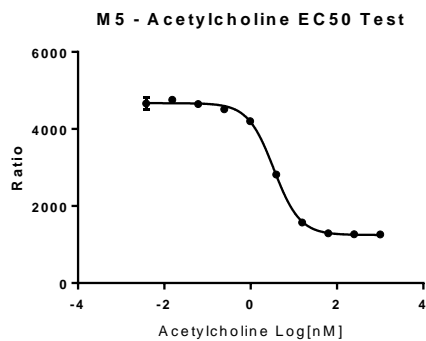


Figure 1. Characterization of agonist in recombinant human M5 receptor IP1 assay systems.

Agonist: Acetylcholine
Agonist EC50: 3.45nM
S/B: 4.37

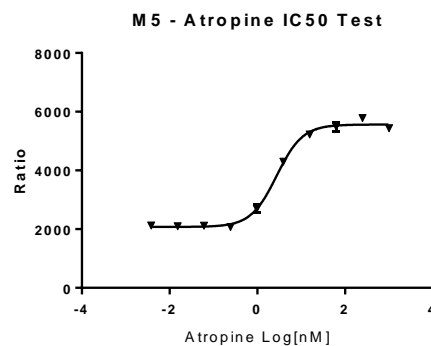


Figure 2. Characterization of antagonist in recombinant human M5 receptor IP1 assay systems.

Antagonist: Atropine
Agonist EC50: 2.76nM
S/B: 2.56

Further validation data available on request.

P2Y12 Assay Data Sheet

Receptor	P2Y12
Gene & Synonyms	P2RY12; HORK3; P2Y12; ADPG-R; BDPLT8; SP1999; P2T(AC); P2Y(AC); P2Y(12)R; P2Y(ADP); P2Y(cyc)
Catalog Ref.	Flp-In-CHO-D4 Stable Pool
Species/Family	Human / P2Y
Accession Number	NM_000797
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

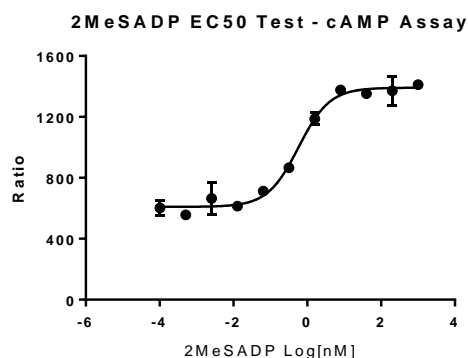


Figure 1. Characterization of agonist in recombinant human P2Y12 cyclase assay systems.

Agonist: 2MeSADP
Agonist EC50: 0.58nM
S/B: 2.54

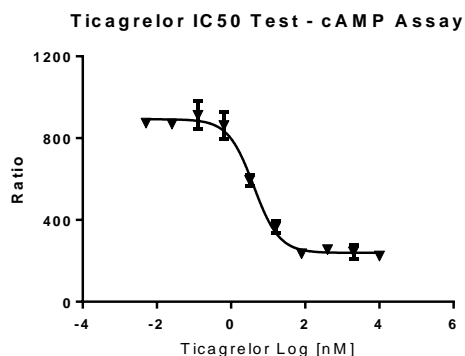


Figure 2. Characterization of antagonist in recombinant human P2Y12 cyclase assay systems.

Antagonist: Ticagrelor
Agonist EC50: 4.08nM
S/B: 1.98

Further validation data available on request.

5HT1A Assay Data Sheet

Receptor	5HT1A
Gene & Synonyms	HTR1A; G-21; 5HT1a; PFMCD; 5-HT1A; 5-HT-1A; ADRBRL1; ADRB2RL1
Catalog Ref.	ICE-5HT1A-CHO
Species/Family	Human / 5-Hydroxytryptamine
Accession Number	NM_000524
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

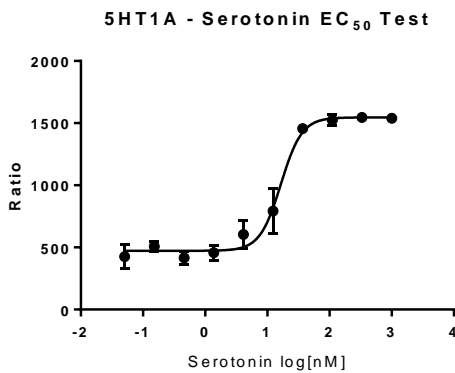


Figure 1. Characterization of agonist in recombinant human 5HT1A cyclase assay systems.

Agonist: Serotonin
Agonist EC₅₀: 16.51 nM
S/B: 3.05

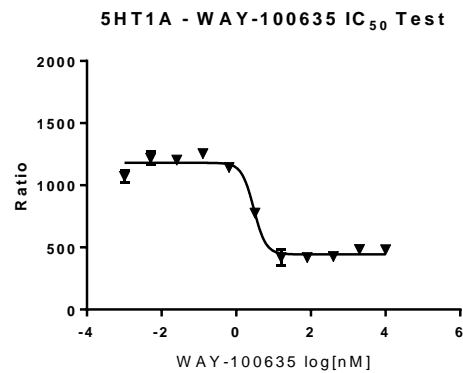


Figure 2. Characterization of antagonist in recombinant human 5HT1A cyclase assay systems.

Antagonist: WAY-100635
Antagonist IC₅₀: 2.95 nM
S/B: 2.57

Further validation data available on request.

5HT1B Assay Data Sheet

Receptor	5HT1B
Gene & Synonyms	HTR1B; S12; 5-HT1B; HTR1D2; HTR1DB; 5-HT-1B; 5-HT1DB; 5-HT-1D-beta
Catalog Ref.	ICE-5HT1B-CHO
Species/Family	Human / 5-Hydroxytryptamine
Accession Number	NM_000863
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

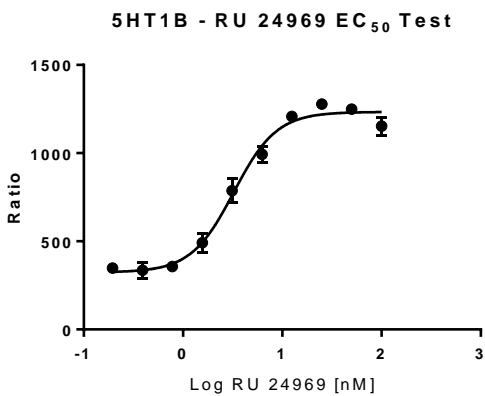


Figure 1. Characterization of agonist in recombinant human 5HT1B cyclase assay systems.

Agonist: RU 24969
Agonist EC₅₀: 3.25 nM
S/B: 2.58

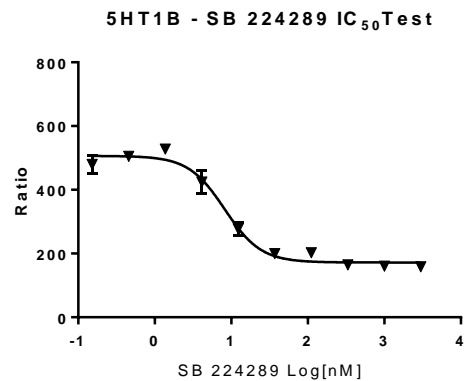


Figure 2. Characterization of antagonist in recombinant human 5HT1B cyclase assay systems.

Antagonist: SB 224289
Antagonist IC₅₀: 8.20 nM
S/B: 2.84

Further validation data available on request.

5HT2A Assay Data Sheet

Receptor	5HT2A
Gene & Synonyms	HTR2A; HTR2; 5-HT2A
Catalog Ref.	ICE-5HT2A-CHO
Species/Family	Human / 5-Hydroxytryptamine
Accession Number	NM_000621
G coupling	Gq
Method	IP1 Assay
Standard time	2-3 weeks

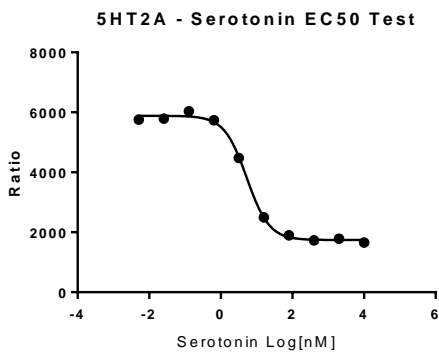


Figure 1. Characterization of agonist in recombinant human 5HT2A receptor IP1 assay systems.

Agonist: Serotonin
Agonist EC₅₀: 5.31 nM
S/B: 3.94

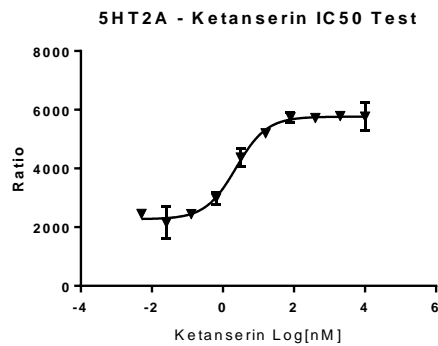


Figure 2. Characterization of antagonist in recombinant human 5HT2A receptor IP1 assay systems.

Antagonist: Ketanserin
Antagonist IC₅₀: 2.34 nM
S/B: 2.41

Further validation data available on request.

5HT2B Assay Data Sheet

Receptor	5HT2B
Gene & Synonyms	HTR2B; 5-HT2B; 5-HT-2B; 5-HT(2B)
Catalog Ref.	ICE-5HT2B-CHO
Species/Family	Human / 5-Hydroxytryptamine
Accession Number	NM_000867
G coupling	Gq
Method	IP1 Assay
Standard time	2-3 weeks

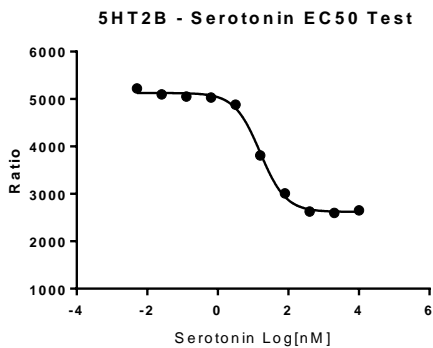


Figure 1. Characterization of agonist in recombinant human 5HT2B receptor IP1 assay systems.

Agonist: Serotonin
Agonist EC₅₀: 15.87 nM
S/B: 2.04

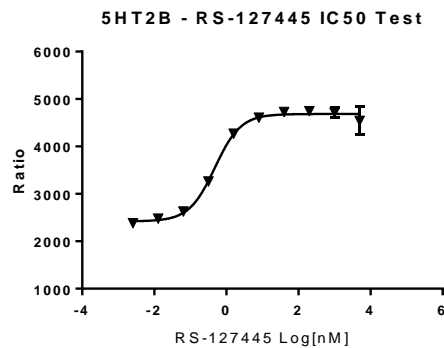


Figure 2. Characterization of antagonist in recombinant human 5HT2B receptor IP1 assay systems.

Antagonist: RS-127445
Antagonist IC₅₀: 0.48 nM
S/B: 1.94

Further validation data available on request.

AVPR1A Assay Data Sheet

Receptor	AVPR1A
Gene & Synonyms	AVPR1A; V1aR; AVPR1; AVPR V1a
Catalog Ref.	ICE-AVPR1A-CHO
Species/Family	Human / Vasopressin and Oxytocin
Accession Number	NM_000706
G coupling	Gq
Method	IP1 Assay
Standard time	2-3 weeks

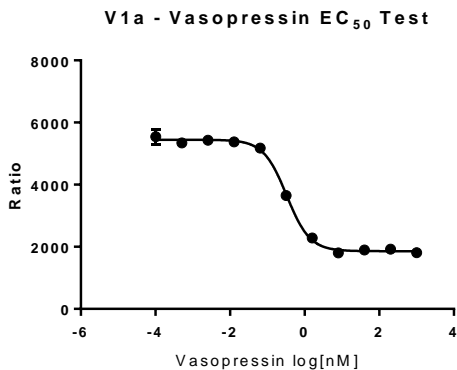


Figure 1. Characterization of agonist in recombinant human AVPR1A receptor IP1 assay systems.

Agonist: Vasopressin
Agonist EC₅₀: 0.33 nM
S/B: 2.84

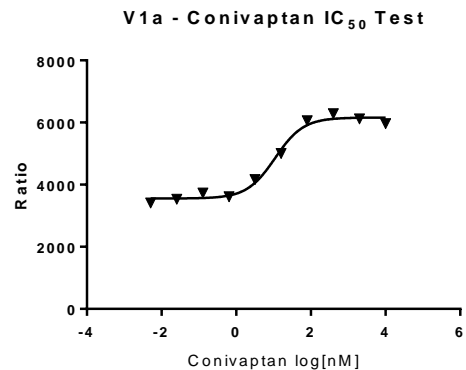


Figure 2. Characterization of antagonist in recombinant human AVPR1A receptor IP1 assay systems.

Antagonist: Conivaptan
Antagonist IC₅₀: 11.03 nM
S/B: 1.73

Further validation data available on request.

δ receptor Assay Data Sheet

Receptor	DOR
Gene & Synonyms	DOR; DOP; DOR; DOR1; OPRD
Catalog Ref.	Flp-In-CHO-hDOR Stable cell line
Species/Family	Human / Opioid
Accession Number	NM_000911
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

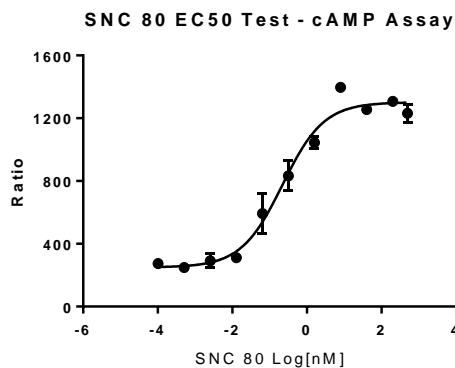


Figure 1. Characterization of agonist in recombinant human DOR receptor cyclase assay systems.

Agonist: SNC 80
Agonist EC50: 1.6nM
S/B: 4.8

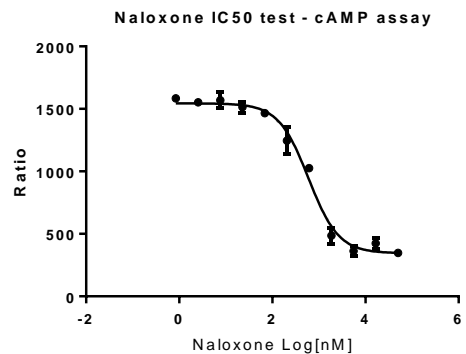


Figure 2. Characterization of antagonist in recombinant human DOR receptor cyclase assay systems.

Antagonist: Naloxone
Agonist EC50: 598nM
S/B: 4.5

Further validation data available on request.

κ receptor Assay Data Sheet

Receptor	KOR
Gene & Synonyms	OPRK1; KOR; OPRK; KOR-1; K-OR-1
Catalog Ref.	κ receptor-HEK Stable Cell Line
Species/Family	Human / Opioid
Accession Number	NM_000912
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

op-kappa Dynorphin A (1-10) EC50 Test

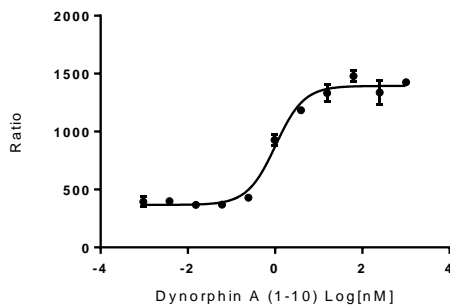


Figure 1. Characterization of agonist in recombinant human KOR receptor cyclase assay systems.

Agonist: Dynorphin A (1-10)
Agonist EC50: 1.03nM
S/B: 3.63

op-kappa LY2795050 IC50 Test

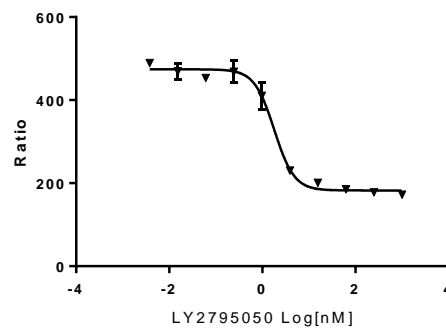


Figure 2. Characterization of antagonist in recombinant human KOR receptor cyclase assay systems.

Antagonist: LY2795050
Agonist EC50: 1.81nM
S/B: 2.62

Further validation data available on request.

μ receptor Assay Data Sheet

Receptor	MOR
Gene & Synonyms	MOP; MOR; LMOR; MOR1; OPRM; M-OR-1
Catalog Ref.	Flp-In-CHO-hMOR Stable cell line
Species/Family	Human / Opioid
Accession Number	NM_000914
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

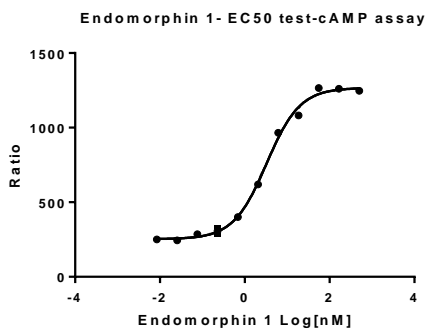


Figure 1. Characterization of agonist in recombinant human MOR receptor cyclase assay systems.

Agonist: Endomorphin 1
Agonist EC50: 3.2nM
S/B: 5.0

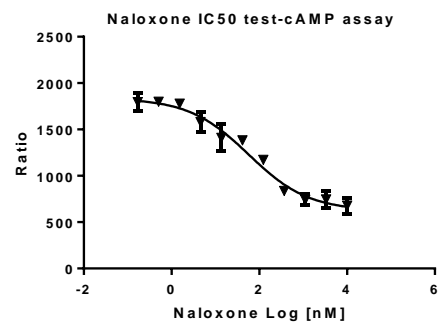


Figure 2. Characterization of antagonist in recombinant human MOR receptor cyclase assay systems.

Antagonist: Naloxone
Agonist EC50: 57.04nM
S/B: 3.1

Further validation data available on request.

Mouse μ receptor Assay Data Sheet

Receptor	mMOR
Gene & Synonyms	mMOR; mor; Oprm; muOR; MOP-R; MOR-1; M-OR-1; MOR-1O
Catalog Ref.	Flp-In-CHO-hMOR Stable cell line
Species/Family	Mouse / Opioid
Accession Number	NM_001039652
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

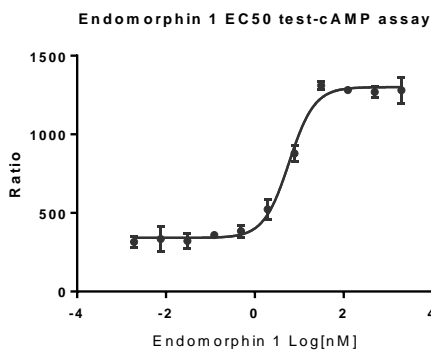


Figure 1. Characterization of agonist in recombinant mouse MOR receptor cyclase assay systems.

Agonist: Endomorphin 1
Agonist EC50: 5.90nM
S/B: 4.5

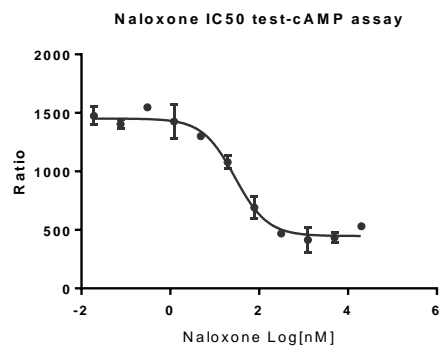


Figure 2. Characterization of antagonist in recombinant mouse MOR receptor cyclase assay systems.

Antagonist: Naloxone
Agonist EC50: 28.53nM
S/B: 3.1

Further validation data available on request.

Rat μ receptor Assay Data Sheet

Receptor	rMOR
Gene & Synonyms	rMOR; MORA; Oprm; Oprm1
Catalog Ref.	Flp-In-CHO-hMOR Stable cell line
Species/Family	Rat / Opioid
Accession Number	NM_013071
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

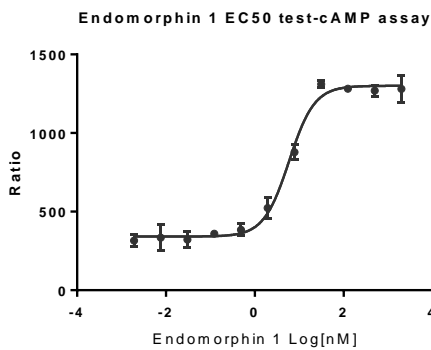


Figure 1. Characterization of agonist in recombinant rat MOR receptor cyclase assay systems.

Agonist: Endomorphin 1
Agonist EC50: 5.90nM
S/B: 4.5

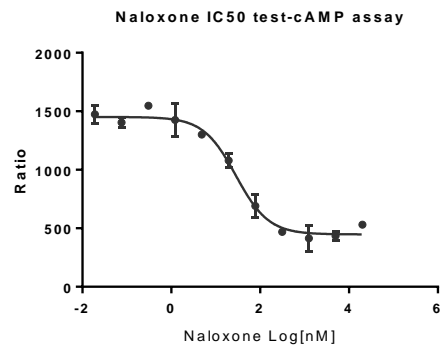


Figure 2. Characterization of antagonist in recombinant rat MOR receptor cyclase assay systems.

Antagonist: Naloxone
Agonist EC50: 28.53nM
S/B: 3.1

Further validation data available on request.

NOP receptor Assay Data Sheet

Receptor	NOP
Gene & Synonyms	NOP; OOR; NOPr; ORL1; KOR-3; NOCIR
Catalog Ref.	Flp-In-CHO-hNOP Stable cell line
Species/Family	Human / Opioid
Accession Number	NM_000913
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

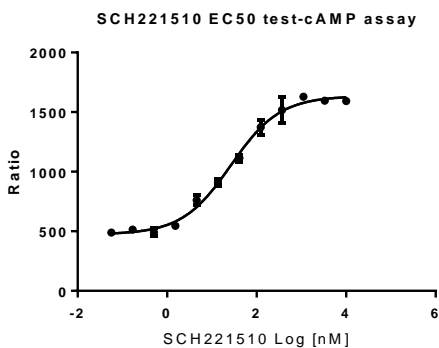


Figure 1. Characterization of agonist in recombinant human NOR receptor cyclase assay systems.

Agonist: SCH221510
Agonist EC50: 26.6nM
S/B: 3.5

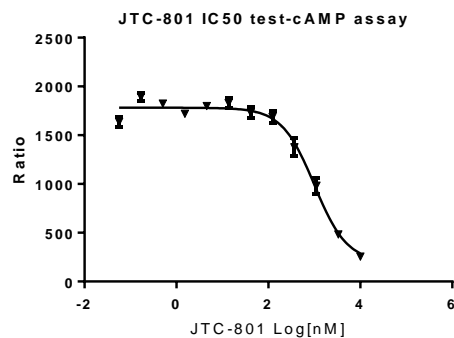


Figure 2. Characterization of antagonist in recombinant human NOR receptor cyclase assay systems.

Antagonist: JTC-801
Agonist EC50: 1001nM
S/B: 6

Further validation data available on request.

Mouse NOP receptor Assay Data Sheet

Receptor	mNOP
Gene & Synonyms	NOP; KOR3; ORGC; ORL1; Oprl; XOR1; morc; KOR-3; LC132; MOR-C
Catalog Ref.	Flp-In-CHO-mNOP Stable cell line
Species/Family	Mouse / Opioid
Accession Number	NM_011012
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

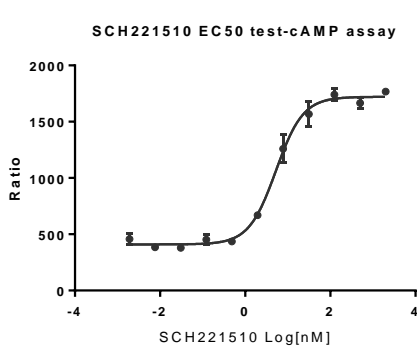


Figure 1. Characterization of agonist in recombinant mouse NOR receptor cyclase assay systems.

Agonist: SCH221510
Agonist EC50: 5.3nM
S/B: 4.2

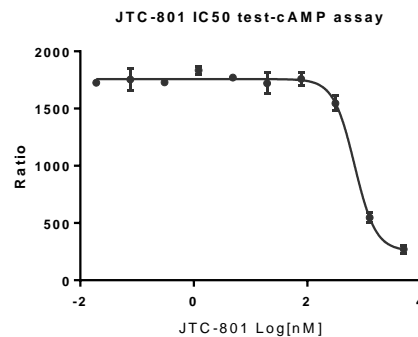


Figure 2. Characterization of antagonist in recombinant mouse NOR receptor cyclase assay systems.

Antagonist: JTC-801
Agonist EC50: 679nM
S/B: 5.7

Further validation data available on request.

Rat NOP receptor Assay Data Sheet

Receptor	rNOP
Gene & Synonyms	KOR3; OFQR; ORL1; Oprl; XOR1; KOR-3; LC132; MOR-C
Catalog Ref.	Flp-In-CHO-rNOP Stable cell line
Species/Family	Rat / Opioid
Accession Number	NM_031569
G coupling	Gi
Method	cAMP Assay
Standard time	2-3 weeks

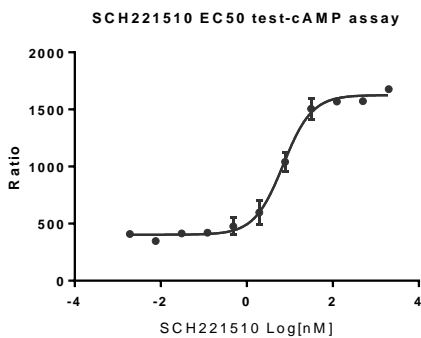


Figure 1. Characterization of agonist in recombinant rat NOR receptor cyclase assay systems.

Agonist: SCH221510
Agonist EC50: 7.02nM
S/B: 4.0

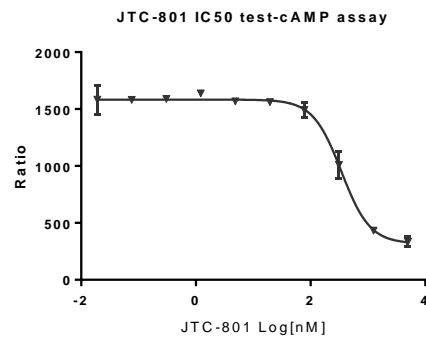


Figure 2. Characterization of antagonist in recombinant rat NOR receptor cyclase assay systems.

Antagonist: JTC-801
Agonist EC50: 345.3nM
S/B: 5.0

Further validation data available on request.

DP1 Assay Data Sheet

Receptor	DP1
Gene & Synonyms	DP; AS1; DP1; ASRT1; PTGDR1
Catalog Ref.	DP1-HEK Stable Cell Line
Species/Family	Human / Prostanoid
Accession Number	NM_000953
G coupling	Gs
Method	cAMP Assay
Standard time	2-3 weeks

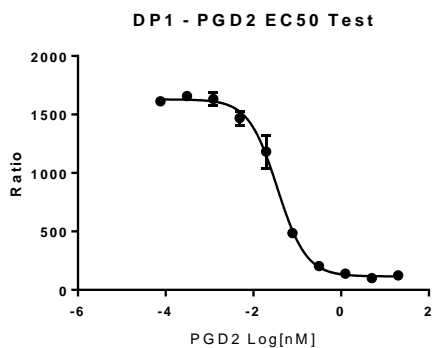


Figure 1. Characterization of agonist in recombinant human DP1 receptor cyclase assay systems.

Agonist: Prostaglandin D2
Agonist EC50: 0.035nM
S/B: 13.64

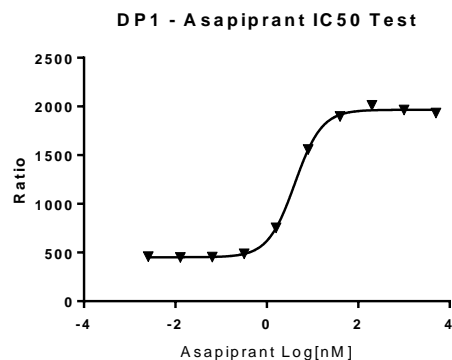


Figure 2. Characterization of antagonist in recombinant human DP1 receptor cyclase assay systems.

Antagonist: Asapiprant
Agonist EC50: 4.10nM
S/B: 4.97

Further validation data available on request.

EP1 Assay Data Sheet

Receptor	EP1
Gene & Synonyms	PTGER1; EP1
Catalog Ref.	EP1-HEK Stable Cell Line
Species/Family	Human / Prostanoid
Accession Number	NM_000953
G coupling	Gq
Method	IP1 Assay
Standard time	2-3 weeks

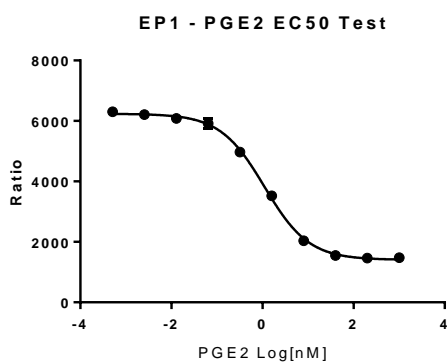


Figure 1. Characterization of agonist in recombinant human EP1 receptor IP1 assay systems.

Agonist: Prostaglandin E2
Agonist EC50: 1.11nM
S/B: 4.26

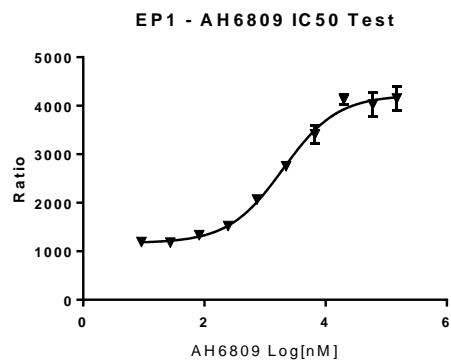


Figure 2. Characterization of antagonist in recombinant human EP1 receptor IP1 assay systems.

Antagonist: AH6809
Agonist EC50: 1.98nM
S/B: 3.47

Further validation data available on request.

EP2 Assay Data Sheet

Receptor	EP2
Gene & Synonyms	PTGER2; EP2
Catalog Ref.	EP2-HEK Stable Cell Line
Species/Family	Human / Prostanoid
Accession Number	NM_000956
G coupling	Gs
Method	cAMP Assay
Standard time	2-3 weeks

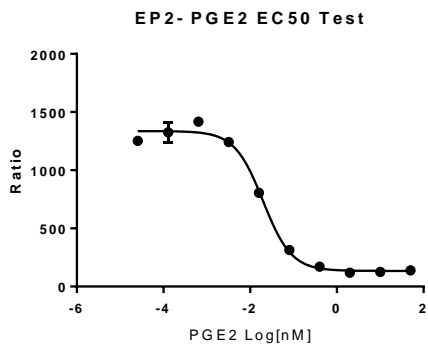


Figure 1. Characterization of agonist in recombinant human EP2 receptor cyclase assay systems.

Agonist: Prostaglandin E2
Agonist EC50: 0.020nM
S/B: 9.61

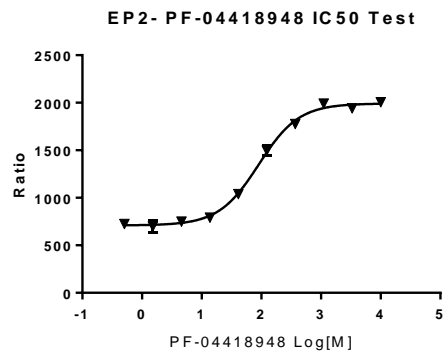


Figure 2. Characterization of antagonist in recombinant human EP2 receptor cyclase assay systems.

Antagonist: PF-04418948
Agonist EC50: 90.61nM
S/B: 2.75

Further validation data available on request.

EP4 Assay Data Sheet

Receptor	EP4
Gene & Synonyms	EP4, EP4R
Catalog Ref.	EP4-HEK Stable Cell Line
Species/Family	Human / Prostanoid
Accession Number	NM_000958
G coupling	Gs
Method	cAMP Assay
Standard time	2-3 weeks

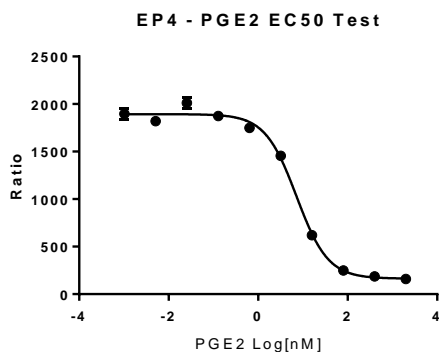


Figure 1. Characterization of agonist in recombinant human EP4 receptor cyclase assay systems.

Agonist: Prostaglandin E2
Agonist EC50: 7.20nM
S/B: 12.13

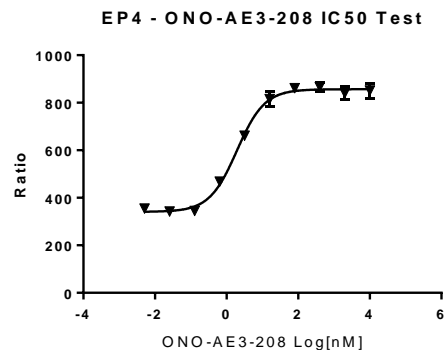


Figure 2. Characterization of antagonist in recombinant human EP4 receptor cyclase assay systems.

Antagonist: ONO-AE3-208
Agonist EC50: 1.95nM
S/B: 2.23

Further validation data available on request.

FP Assay Data Sheet

Receptor	FP
Gene & Synonyms	FP
Catalog Ref.	FP-HEK Stable Cell Line
Species/Family	Human / Prostanoid
Accession Number	NM_000959
G coupling	Gq
Method	IP1 Assay
Standard time	2-3 weeks

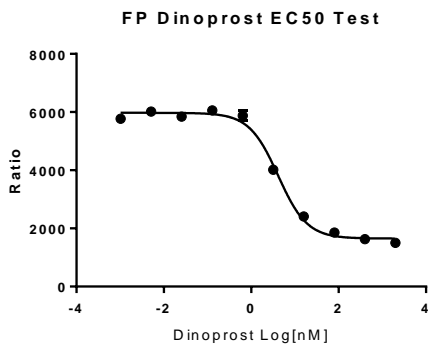


Figure 1. Characterization of agonist in recombinant human FP receptor IP1 assay systems.

Agonist: Dinoprost
Agonist EC50: 4.14nM
S/B: 4.00

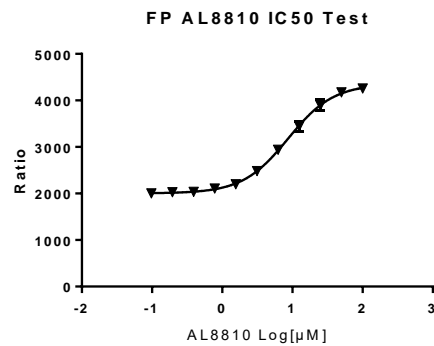


Figure 2. Characterization of antagonist in recombinant human FP receptor IP1 assay systems.

Antagonist: AL8810
Agonist EC50: 8.67nM
S/B: 2.34

Further validation data available on request.

TP Assay Data Sheet

Receptor	TP
Gene & Synonyms	TXA2-R; BDPLT13
Catalog Ref.	FP-HEK Stable Cell Line
Species/Family	Human / Prostanoid
Accession Number	NM_001060
G coupling	Gq
Method	IP1 Assay
Standard time	2-3 weeks

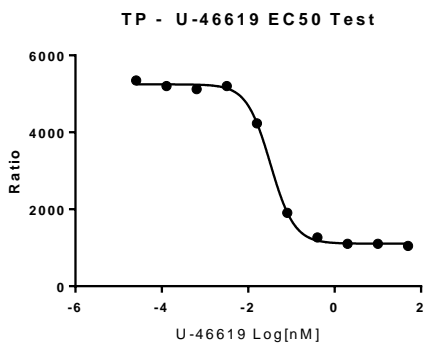


Figure 1. Characterization of agonist in recombinant human TP receptor IP1 assay systems.

Agonist: U-46619
Agonist EC50: 0.056nM
S/B: 5.32

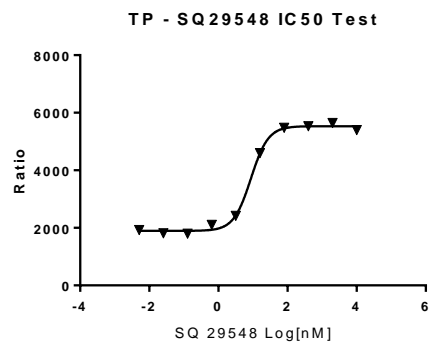


Figure 2. Characterization of antagonist in recombinant human TP receptor IP1 assay systems.

Antagonist: SQ 29548
Agonist EC50: 8.72nM
S/B: 2.96

Further validation data available on request.

IP Assay Data Sheet

Receptor	IP
Gene & Synonyms	PTGIR; IP; PRIPR
Catalog Ref.	IP-HEK Stable Cell Line
Species/Family	Human / Prostanoid
Accession Number	NM_000960
G coupling	Gs
Method	cAMP Assay
Standard time	2-3 weeks

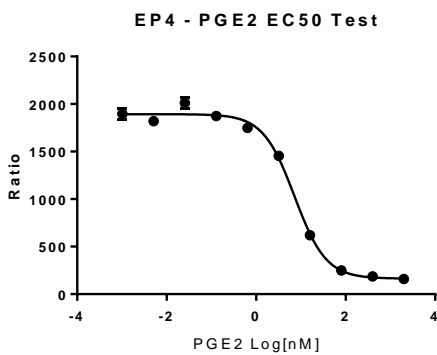


Figure 1. Characterization of agonist in recombinant human EP4 receptor cyclase assay systems.

Agonist: Prostaglandin E2
Agonist EC50: 7.20nM
S/B: 12.13

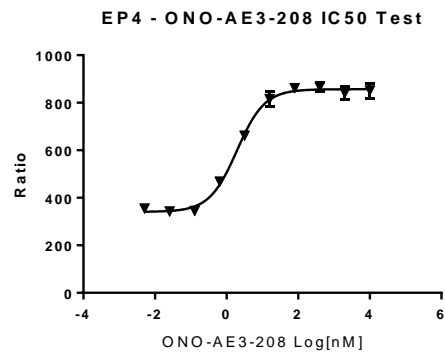


Figure 2. Characterization of antagonist in recombinant human EP4 receptor cyclase assay systems.

Antagonist: ONO-AE3-208
Agonist EC50: 1.95nM
S/B: 2.23

Further validation data available on request.