# THE GPCR
## PORTFOLIO THAT LEAVES
# NOTHING OUT

## GPCR
APPLICATION GUIDE

**PerkinElmer**®

*For the Better*

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# BIGGER GPCR SOLUTIONS

**Get more from your research**

With much drug discovery focused on GPCR targets, the need for reliable, proven and versatile assays, reagents and instrumentation to understand these complex signaling mechanisms has never been greater.

The PerkinElmer team understands the significant challenges of identifying biologically and pharmacologically relevant pathways. Scientist to scientist, we have the depth of experience in both cellular and biochemical platforms to support your work every step of the way.

We partner with you to quickly optimize your research, customizing solutions for specific target research.

**From a portfolio that leaves nothing out**

PerkinElmer offers the widest selection of proven GPCR target solutions – beyond the ligand GPCR event to the actual assessment of the cellular-activated signal transduction cascade. Enabling you to identify, validate, screen and profile your leads is our priority.

**Cellular and Biochemical Platforms for GPCR Research**
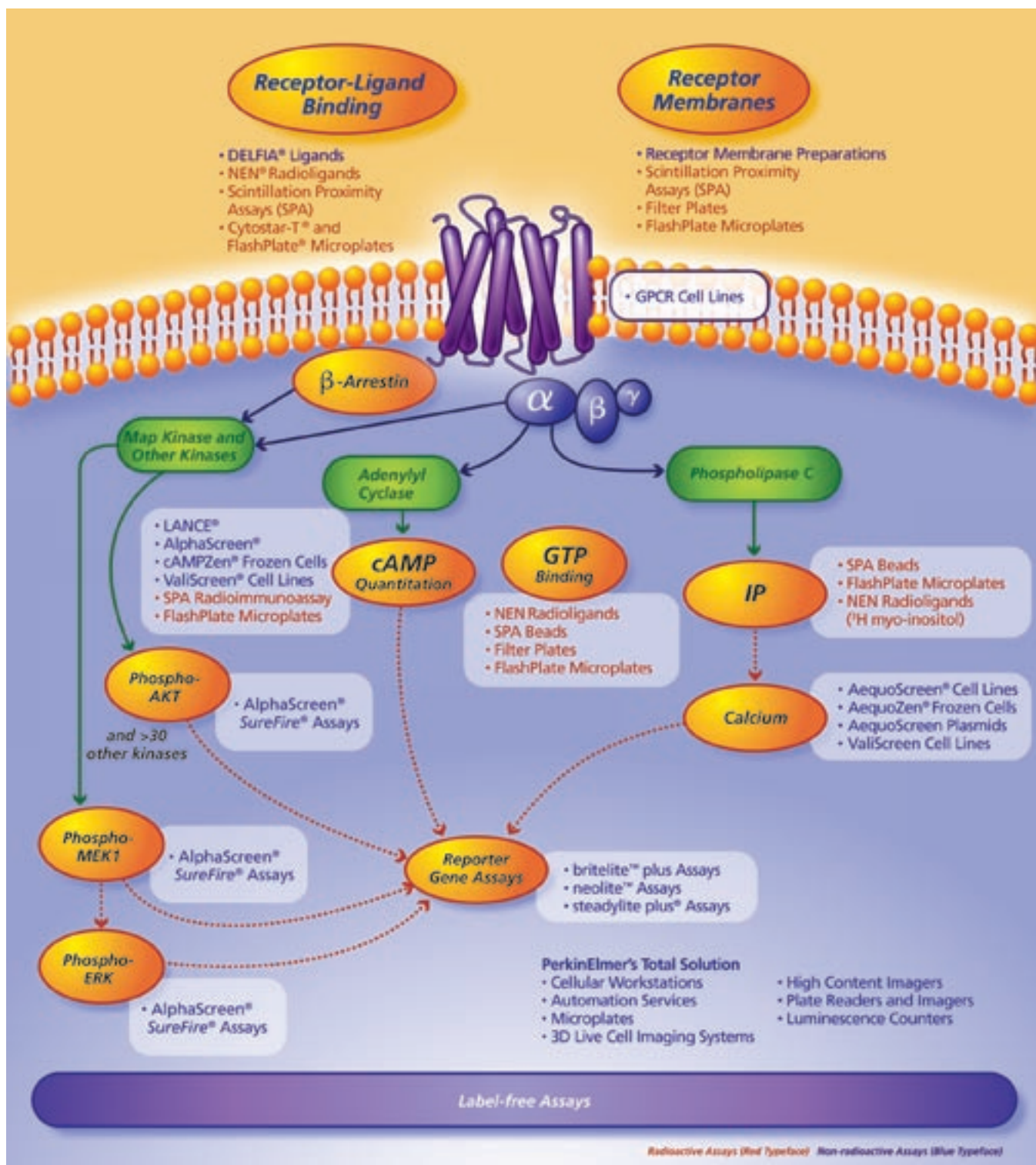
# SELECT YOUR TOTAL GPCR SOLUTION

PerkinElmer is unequaled in providing an integrated solution that accelerates your research and advances drug discovery.

Right from the start, we help you determine the best strategy to identify and monitor:

- Effects of GPCR activation: changes in intracellular calcium, cAMP, phospho-ERK, inositol phosphate
- Reporter gene expression
- Receptor ligand binding
- GTP binding

| Measurement | Intracellular $Ca^{2+}$ | | Inositol Phosphates | Intracellular cAMP | | ERK Phosphorylation |
|---|---|---|---|---|---|---|
| Pathway | Phospholipase C | | Phospholipase C | Adenylyl cyclase (AC) | | MAP kinase |
| Assay Type | Functional | Image-based single-cell readout | Functional | Functional | | Functional |
| G-protein Coupling | Optimal for $G_q$-coupled receptors, as well as for many $G_i$-coupled receptors. Can be used with $G_i$- and $G_s$-coupled receptors in conjunction with promiscuous G protein when needed. | | Optimal for $G_q$-coupled receptors, as well as for many $G_i$-coupled receptors. Can be used with $G_i$- and $G_s$-coupled receptors in conjunction with promiscuous G protein when needed. | $G_i$ (inhibitory), $G_s$ (stimulatory) | | $G_i$, $G_q$, $G_s$ (in some instances) |
| Technologies | Fluorescent dyes (many AequoScreen and ValiScreen cell lines are validated for this assay). Photoproteins for flash luminescence assays: AequoScreen, PhotoScreen®, AequoZen, microplates. | Calcium flux using calcium fluorescent sensors, microplates | $IP_3$ measurements: SPA beads, radiolabeled $IP_3$ precursor, AequoScreen cell lines, AequoZen, microplates | LANCE *Ultra* cAMP, AlphaScreen cAMP, cAMPZen frozen cells and ValiScreen cell lines validated for cAMP measurement, microplates | NEN SPA homogeneous radioimmunoassay, cAMP and adenylyl cyclase FlashPlate, microplates | AlphaScreen® *SureFire®* Phospho-ERK 1/2, AlphaScreen® *SureFire®* Total ERK, microplates |
| Advantages | Highly sensitive automated screening system to detect agonists and antagonists. Real-time kinetic readout. | | Direct IP measurement, useful for confirmation of calcium flux hits using another type of assay | Highly sensitive automated screening system to detect agonists and antagonists. Detects elevations in basal cAMP due to constitutive activity and thus is able to detect inverse agonist activity. Non-radioactive. | Most sensitive ELISA format. Binding signal generation is a direct signal, not indirect like other assays. Less complex and better suited when therapeutic antibodies are developed. | Generic GPCR technology for $G_i$-, $G_q$- and $G_s$-coupled GPCRs. Excellent for receptors optimally coupled to calcium or cAMP pathway. Positive readout for $G_i$. Can be used with endogenously expressed receptors and stem cells. |
| | Luminescence is extremely sensitive and cost-effective, enabling detection of partial agonists as well as allosteric modulators. Fluorescence is widely adopted and can be used when flash luminescence readers are not available. | No artifacts due to varying cell number (transient transfections, pipetting errors). Responders can be distinguished from non-responders, and when using complementary labels, the $Ca^{2+}$ response can be classified according to different cell type. | Allows detection of inverse agonism | | | |
| Reader Requirements | Luminescence or fluorescence reader with injectors | High content screening readers with injectors | Radiometric detector | TR-FRET/Alpha-enabled reader | Radiometric detector | Alpha-enabled reader |
| PerkinElmer Readers | EnVision® Multilabel Plate Reader with Injectors, VICTOR™ *X* Multilabel Plate Reader with Dispenser, MicroBeta²™ LumiJET™ Microplate Counter | Opera™ HCS System with Dispenser, Opera LX HCS System with Dispenser and UV Upgrade | ViewLux™ uHTS Imager, MicroBeta² Scintillation & Luminescence Counter, TopCount® Scintillation & Luminescence Counter, Tri-Carb® Liquid Scintillation Analyzer | ViewLux uHTS Imager, EnVision Multilabel Plate Reader with TRF Laser or Alpha Reader, VICTOR *X4* or *X5* Multilabel Plate Reader, EnSpire™ Multilabel Plate Reader | ViewLux uHTS Imager, MicroBeta² Scintillation & Luminescence Counter, TopCount Scintillation & Luminescence Counter | EnVision Multilabel Plate Reader with Alpha Option, EnSpire Multilabel Plate Reader |
| Page Number | 33, 34, 35 | 37 | 34, 35, 36 | 33, 34 | 34, 35 | 33 |

*Comparison of cAMP Assay Technologies for High Throughput Screening. Patricia Kasila and Harry Harney, PerkinElmer, Inc. Scientific Poster 4083.

Our state-of-the-art solutions portfolio is extensive and includes:

- Scalable cellular imaging, detection instrumentation and liquid handling systems for radiometric, fluorescence, luminescence or photometric detection
- Optimized assay platforms
- Versatile reagents – GPCR cell lines, frozen ready-to-use cells, radioligands, ligands and cloned receptor membranes

Innovation, combined with proven expertise and around-the-clock service, results in best-in-class solutions whatever the need. You can be confident that PerkinElmer specialists will help you find the most effective, and efficient, discovery strategy.

| Reporter Gene Activity NFAT (Ca$^{2+}$ signaling), CRE (cAMP signaling) or Others | GTPγS Binding | GPCR Internalization | | β-arrestin Recruitment | Receptor Ligand Binding | |
|---|---|---|---|---|---|---|
| Phospholipase C/AC/others | G-protein activation | – | | – | – | |
| Functional | Functional | Functional, image-based readout, receptor endocytosis | | Functional, image-based readout, clathrin-coated pit/vesicle formation | Biochemical | |
| Generic | $G_i$ and some $G_s$, $G_q$ | $G_i$, $G_q$, $G_s$, as well as non-G protein-coupled GPCRs | | $G_i$, $G_q$, $G_s$, as well as non-G-protein-coupled GPCRs<br><br>Ideal for orphan GPCRs | Generic | |
| britelite plus, neolite, steadylite plus, nuclear translocation of NFAT using fluorescently labeled antibodies, microplates | SPA WGA-coated beads, NEN radionuclides, membrane preparations, radioligands, microplates | Homemade GFP-tagged receptor, GFP-tagged antibodies, microplates | | Clathrin-coated pit/vesicle formation using GFP-tagged β-arrestin, microplates | NEN radioligands, SPA WGA-coated beads, WGA FlashPlate, membrane preparations, microplates | DELFIA ligands |
| Highly sensitive, cost-effective GPCR screening system | Functional assay for GPCR activation, close to receptor activation | No artifacts due to varying cell number (transient transfections, pipetting errors) | | Highly sensitive follow-up screening system to detect agonists and antagonists. No artifacts due to varying cell number (transient transfections, pipetting errors). | Saturation binding and competitive binding assays possible. Widely used technology for GPCR profiling and screening. | |
| Long stimulation time may reveal interesting pharmacologies | Allows detection of inverse agonism | | | | | |
| Luminescence reader | Radiometric detector | High content screening reader | Radiometric detector | High content screening reader | Radiometric detector | TRF-enabled reader |
| EnVision Multilabel Plate Reader, VICTOR X Multilabel Plate Reader, MicroBeta² Scintillation & Luminescence Counter, ViewLux uHTS Imager, TopCount Scintillation & Luminescence Counter, EnSpire Multilabel Plate Reader, Opera, Opera LX and Operetta® HCS systems | ViewLux uHTS Imager, MicroBeta² Scintillation & Luminescence Counter, TopCount Scintillation & Luminescence Counter, Tri-Carb Liquid Scintillation Analyzer | Opera HCS System, Opera LX HCS, Operetta HCS Reader, UltraVIEW® VoX | TopCount Scintillation & Luminescence Counter, MicroBeta² Scintillation & Luminescence Counter | Opera HCS System, Opera LX HCS, Operetta HCS Reader, UltraVIEW VoX | MicroBeta² Scintillation & Luminescence Counter, TopCount Scintillation & Luminescence Counter, Tri-Carb Liquid Scintillation Analyzer | ViewLux uHTS Imager, EnVision Multilabel Plate Reader with TRF Laser, VICTOR X4 or X5 Multilabel Plate Reader |
| 33, 34, 35, 37 | 34, 35, 36 | 31, 37 | 35 | 31, 37 | 35, 36 | 33, 34 |

# THE LARGEST
## PORTFOLIO OF GPCR
# CELL LINES

**Do you need to decrease your assay development time and increase the quality of your results?**

- >300 stable GPCR cell lines for binding and functional testing
- >130 stable GPCR cell lines for calcium testing
- >150 ready-to-use cAMPZen and AequoZen frozen cells
- All PerkinElmer products are protected against intellectual property (IP) infringement, unlike those of many competitors

PerkinElmer has the largest collection of validated cell lines for GPCR research and offers HTS-friendly cellular testing for agonist and antagonist pharmacology. In addition, the majority of our ValiScreen cell lines have been validated with saturation and competition binding, and approximately 30% of these protocols have been adapted for GTPγS binding.

- Calcium testing using either aequorin, fluorescent dyes or both
- cAMP testing
- GTPγS validation
- IP accumulation assays
- AlphaScreen® *SureFire*® ERK validation
- Label-free validation
- Generation of frozen ready-to-use cells

**Clone selection and validation**

For every PerkinElmer receptor, we offer different stable recombinant clones optimized for specific applications. We have cell lines where clonal selection is carried out with receptor binding. High and low expressors are then tested and selected for optimal binding and functional response according to the receptor-specific transduction pathway. In AequoScreen and PhotoScreen cell lines, clonal selection is carried out with a calcium assay using a luminescent protocol.

Binding conditions are also available for nearly all cell lines. For specific applications on certain receptors, we may select different clones or validate existing clones with alternative protocols. The measure of constitutive activity and its modulation by inverse agonists, for example, often requires high expression levels or adapted protocols.

## Cell line validation

Our validated cell lines typically have saturation and competition binding data, along with functional agonist/antagonist dose response curves using reference ligands.

## Cell line development

A rigorous cell line development process ensures your cell lines are the highest quality possible.

| Literature & FTO Search | cDNA Cloning | Cell Background Selection | Pool | Clones | Stable Clones | Master & Working Stocks | Pharma-cology | HTS Validation |
|---|---|---|---|---|---|---|---|---|
| | 1-2 months | 1 week | 3-6 weeks | 1-2 months | 2 months | 1 month | 1 month | 1 month |

**Frozen** — 6 weeks

**Total: 6-9 months**

**Membranes** — 6 weeks
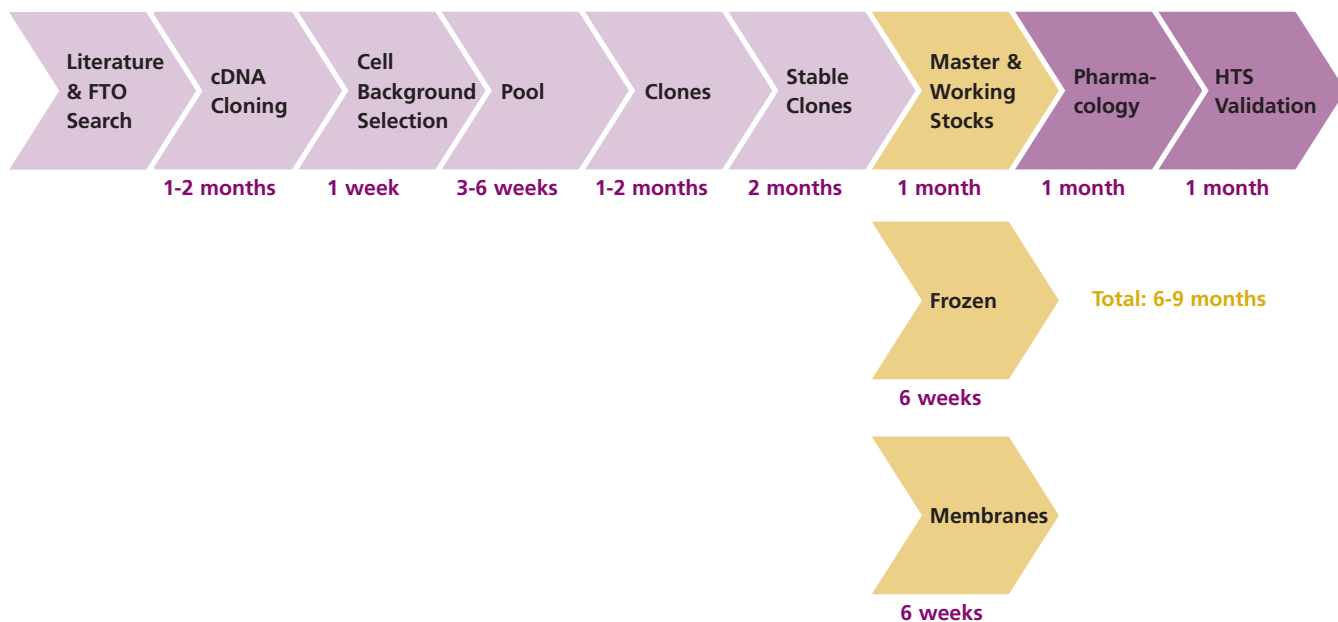
## Radioligand Binding Assay: Adrenergic $\alpha_{2B}$
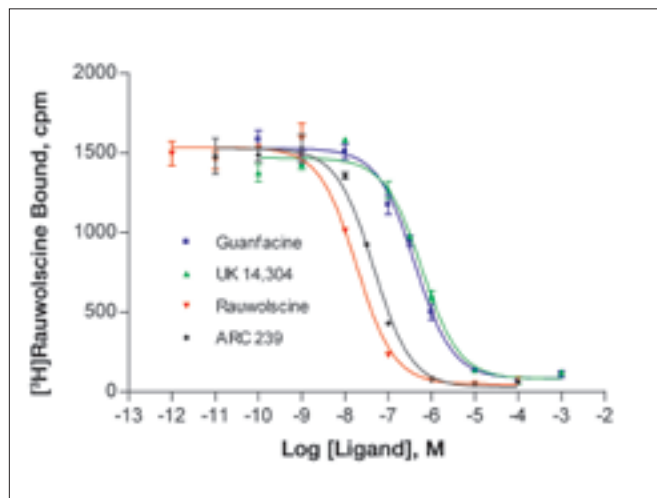


Competition binding experiment: binding of [$^3$H]Rauwolscine to membranes expressing the adrenergic $\alpha_{2B}$ receptor was inhibited by increasing concentrations of reference ligands. The separation of the free and bound radioligand was performed by filtration on 96-well filtration plates. Plate was measured on a TopCount. Assay can also be done in homogeneous format using SPA technology.

## GTPγ[$^{35}$S] Binding: Cannabinoid CB$_1$



GTPγ[$^{35}$S] binding assay: membranes expressing the Cannabinoid CB$_1$ receptor were incubated in presence of increasing concentrations of reference ligands and the binding of GTPγ[$^{35}$S] was measured using the SPA technology. Plate was measured on a TopCount.

## LANCE *Ultra* cAMP (G$_i$): Cannabinoid CB$_1$



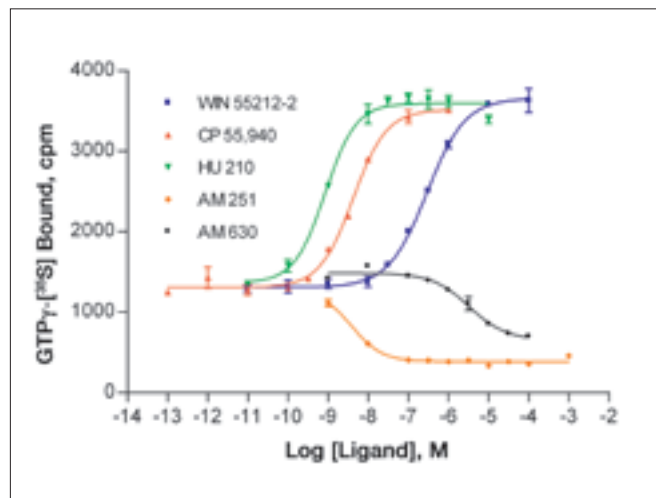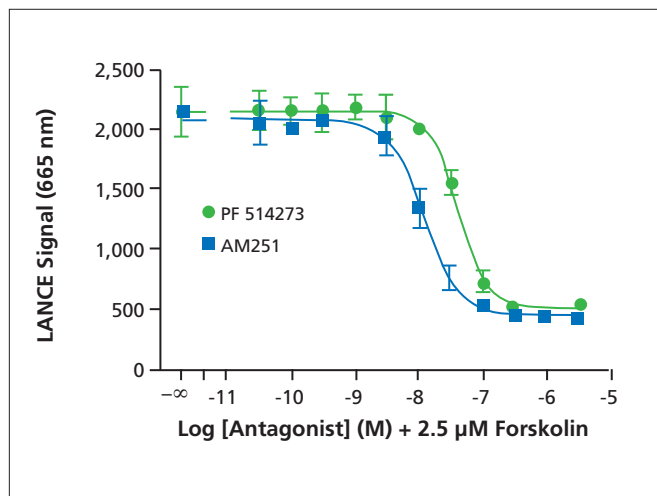LANCE *Ultra* cAMP assay using cAMPZen CHO-CB$_1$ cells: an antagonist dose-response experiment was performed in 384-well format using 2,500 cells/well. Cell stimulation was performed for 30 min at room temperature, and the agonist (WIN 55,212-2), antagonist and 2.5 µM Forskolin were added simultaneously. Plate was read on an EnVision.

## LANCE *Ultra* cAMP (G$_s$): Adrenergic Beta receptor
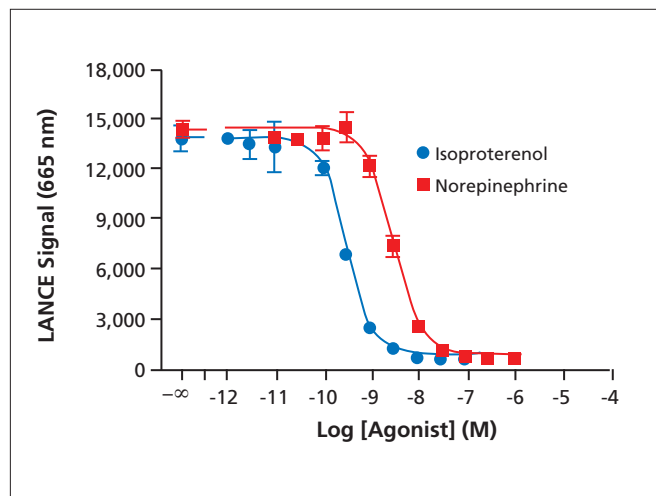


LANCE *Ultra* cAMP assay on endogenous β-adrenergic receptors: an agonist dose-response experiment was performed in 384-well format. SK-N-MC cells were used at 2,000 cells/well. Plate was read on an EnVision.

**Calcium Flux (Fluo-4): Serotonin 5-HT$_{2A}$**
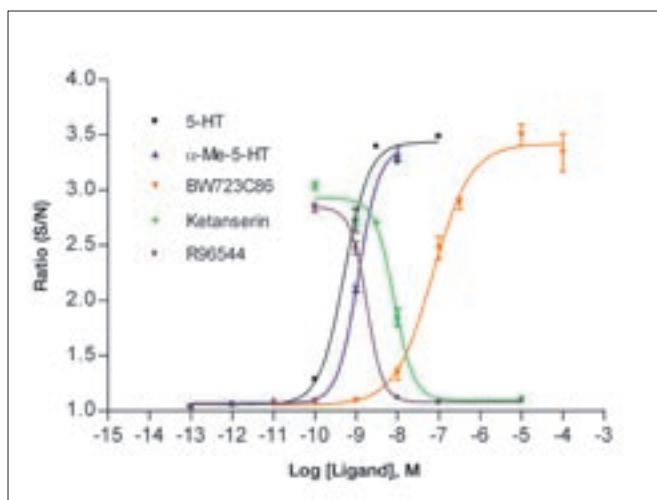


Ca$^{2+}$ flux assay: cells stably expressing the Serotonin 5-HT$_{2A}$ receptor were incubated in presence of increasing amounts of reference ligand and Ca$^{2+}$ flux were followed using Fluo-4 as tracer. Assay was read on an FDSS 6000 (Hamamatsu Photonics).

**Calcium Flux (Aequorin): Muscarinic M$_5$**
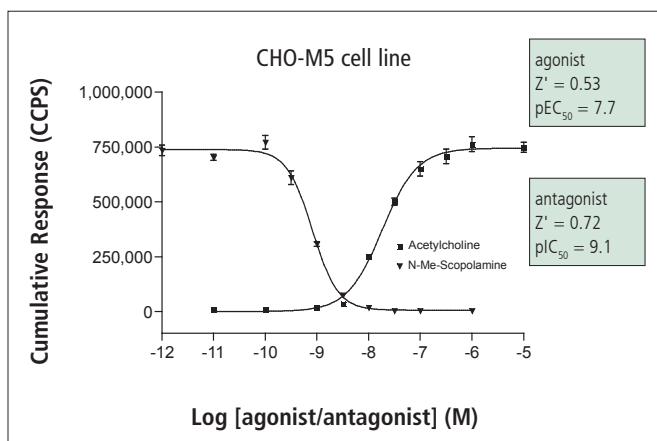


The Muscarinic M$_5$ AequoScreen cell line agonist (Acetylcholine) and antagonist (N-Me-Scopolamine) dose response curves run on a MicroBeta$^2$ LumiJET. 384-well format, 6,000 cells/well.

**A complete offering of cell lines, frozen cells, membrane preparations and complementary ligands.**

Fresh Cell Lines
- ValiScreen GPCR and ion channel cell lines
- AequoScreen aequorin recombinant GPCR cell lines, parental cells and plasmids
- PhotoScreen Photina® cell lines

Ready-to-use frozen cells
- AequoZen aequorin frozen cells
- cAMPZen cAMP frozen cells

Complementary Membranes & Ligands
- NEN radioligands
- PerkinElmer membrane preparations

# INTRACELLULAR CALCIUM DETECTION MADE EASY

## Would easier HTS generic Ca²⁺ measurements make a difference to you?

Measuring intracellular calcium through functional, high throughput screening of cell lines expressing a GPCR has never been easier. PerkinElmer offers the widest selection of luminescence-based platforms for efficient, cost-effective batch screening. Choose from AequoScreen (aequorin) and PhotoScreen (Photina®) cell lines for validated cells.

We bring you the best performing biological coupling by providing the choice of two different photoproteins to measure calcium signaling, resulting in:

- Large signal-to-noise ratio and low background levels
- Short incubation for tested compounds
- Easily followed reaction kinetics
- Stability of signal unaffected by cell growth

## AequoScreen and PhotoScreen Assay Principle
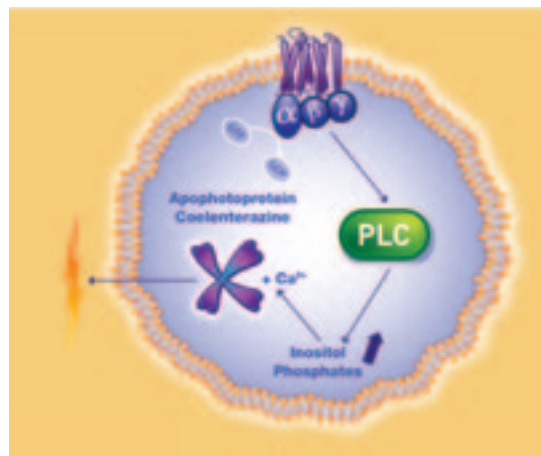


The apophotoprotein requires coelenterazine, to be converted to an active enzyme, aequorin or Photina®, respectively. Upon calcium binding, the photoprotein oxidizes coelenterazine into coelenteramide, producing $CO_2$ and emitting light. The light emission is measured as luminescence.

## CHO Aequorin Vasopressin $V_{1B}$ on FLIPR$^{TETRA}$®
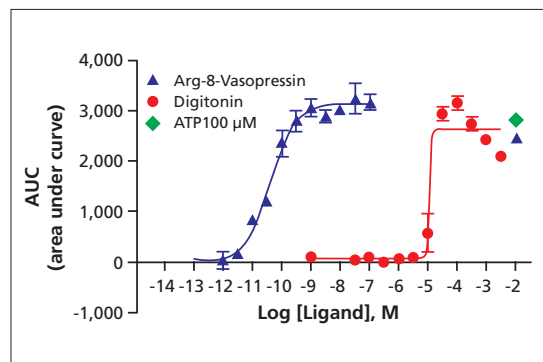


AequoScreen luminescence $Ca^{2+}$ flux assay: cells stably expressing the $Vasopressin_{1B}$ receptor were loaded with coelenterazine h for 4 hours. Ligands were dispensed on cells using the FLIPR$^{TETRA}$ dispensing system and light emission was measured. 384-well adherent assay, 10,000 cells/well, [Arg⁸] Vasopressin $pEC_{50}$ = -10.40.

## Shedding new light on calcium measurement

You can be confident in the highest sensitivity of detection regardless of the physiological coupling of the expressed GPCR.

Optimal localization of a $Ca^{2+}$-activated photoprotein within the mitochondria amplifies the luminescent response triggered by GPCRs coupled to the $G_q$/PLC pathway. AequoScreen and PhotoScreen deliver high signal-to-background ratio, high throughput (over 200,000 data points per day) and a robust assay (high Z', low CV values and solvent resistance). They are suitable for both agonist and antagonist screening.

### The AequoScreen platform includes:

- Parental cell lines
- Double-transfected GPCR aequorin cell lines
- Frozen ready-to-use cells
- Plasmids

### The PhotoScreen platform includes:

- Double-transfected GPCR Photina® cell lines

### CHO Aequorin $H_1$ Agonist Assays



$Z' = 0.70 +/- 0.19$
$pEC_{50} = 7.54 +/- 0.10$
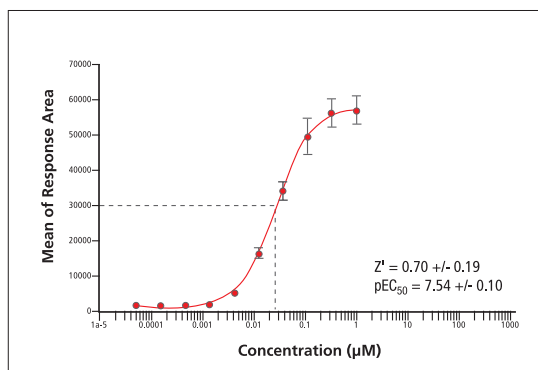
Histamine dose-response curve. 1536-well suspension assay, 1,500 cells/well run on a LumiLux®.

### CHO Aequorin $H_1$ Agonist and Antagonist Assays
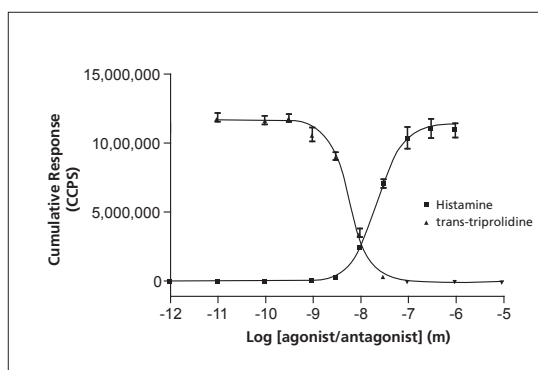


384-well agonist and antagonist suspension assays: 5,000 cells/well run on a MicroBeta[2] LumiJET. The dual dispensing feature of the MicroBeta[2] LumiJET microplate reader allows both agonist and antagonist screening in the same well. $H_1$ AequoScreen cells were dispensed together with either buffer or antagonist (trans-triprolidine, 10 x $pIC_{50}$) into an OptiPlate™-384. The agonist (histamine, 10 x $pEC_{50}$) was dispensed and resulting luminescence was recorded (total volume: 70 µL).

# CONVENIENT READY-TO-USE FROZEN CELLS

**Pay by the assay point**

You need to perform aequorin-based calcium measurement or cAMP measurement, but don't have the time or capability for lengthy cell preparation. Now it's easier than ever to have validated, ready-to-use irradiated cells that you just thaw and use. You simply store your cells in a -80 °C freezer or in liquid nitrogen until you're ready to use them.

PerkinElmer AequoZen and cAMPZen ready-to-use frozen cells offer:

- Reliability – cells are validated for assay protocol performance and shipped worldwide
- Flexibility – perform cellular GPCR tests on multiple receptors at a time for screening, lead optimization and profiling; available in aliquots of 2.5 and 10 million cells per vial
- Convenience – you pay for only the cells you need when you need them

Optimized and standardized culture conditions, even for very sensitive GPCRs, eliminate variability in sensitivity and size of response between different batches of cells. Because cells are pre-validated, you avoid testing expensive and time-consuming failed batches. With PerkinElmer frozen cells, you may never have to postpone a scheduled testing campaign again.
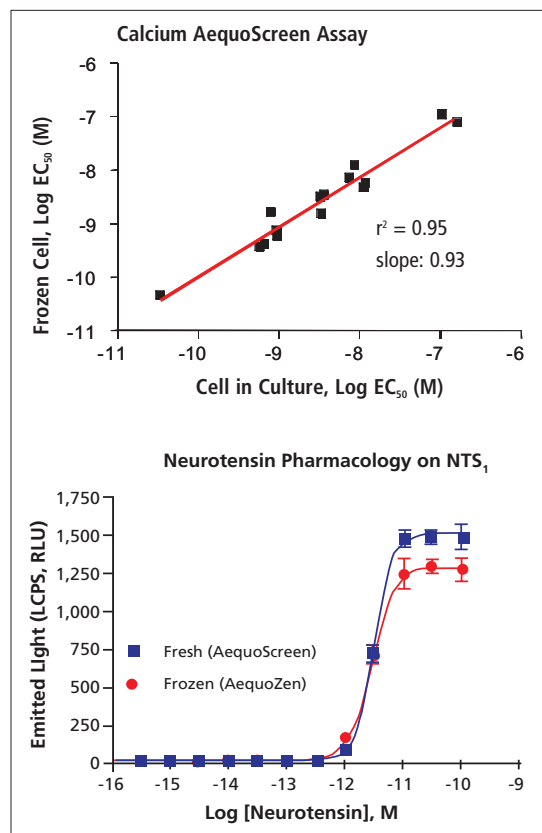


Assay window and consistency of $EC_{50}$ values. The calcium aequorin assay illustrates the correlation between $EC_{50}$ values of the reference agonist obtained on fresh versus frozen cells with an aequorin readout on 15 receptors. Neurotensin shows the pharmacology comparison values between fresh AequoScreen $NTS_1$ and equivalent AequoZen frozen cells. Luminescence was measured with the MicroBeta technology.

## AequoScreen Assay in CHO-secretin AequoZen Cells



| Agonist | $EC_{50}$ (M) |
|---|---|
| Secretin (human) | $3.93 \times 10^{-9}$ |
| VIP | $2.35 \times 10^{-7}$ |
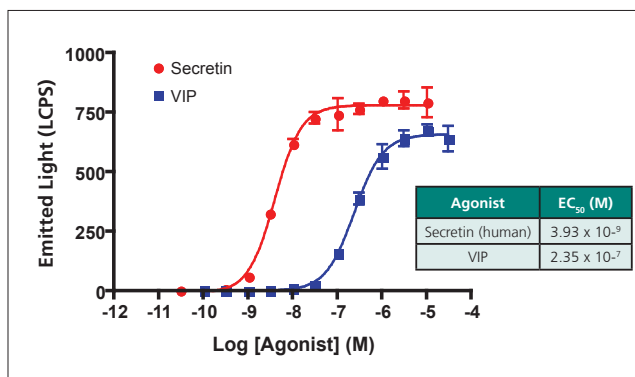
Secretin agonist response in AequoScreen assay. 5,000 cells/well, 384-well format. Luminescence was measured with the MicroBeta technology.

## Stability Testing of Fresh Cells vs. Frozen Cells
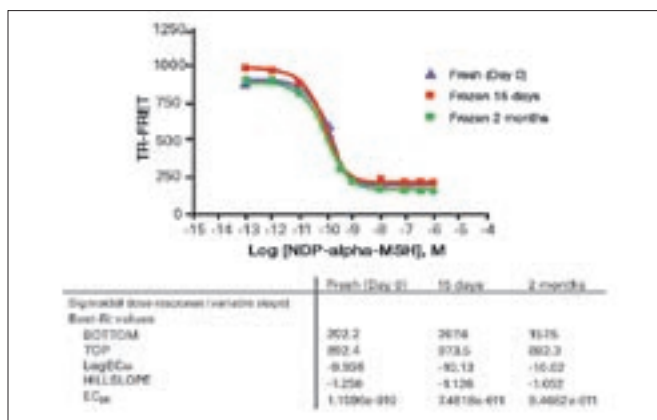


Comparison of freshly cultured cells with frozen cell preparations using a cAMP TR-FRET test on $MC_4$ cells after 15 days and 2 months storage at -80 °C.

The MicroBeta[2] LumiJET with multiple injector assemblies and 12-detector assembly is an ideal platform for studying luminescence calcium flux in assay development, high throughput screening and compound screening using aequorin technology.

# MEASURING cAMP?
# UNMATCHED SENSITIVITY. UNLIMITED POSSIBILITIES.

Choose from several high-performance homogeneous assay technologies to rapidly measure cAMP levels – all designed for optimum detection of $G\alpha_s$- and $G\alpha_{i/o}$- coupled GPCRs.

## LANCE *Ultra* cAMP: exceptional sensitivity

With 3x greater sensitivity and the widest assay window available, LANCE *Ultra* cAMP offers unsurpassed detection for even the most challenging targets. LANCE *Ultra* cAMP provides more robust data in a shorter run time using 80% fewer cells.

- Optimizes screening of difficult targets and $G\alpha_i$ antagonists
- Delivers robust sensitivity when miniaturized to 1536-well format for μHTS
- Offers unmatched signal stability – even with overnight incubation
- Uses a simple TR-FRET protocol
- Provides reproducible results with the highest Z' values

LANCE *Ultra* cAMP can be used with PerkinElmer's validated Total GPCR Solution including cAMPZen frozen cell lines.

## LANCE *Ultra* cAMP Assay Principle
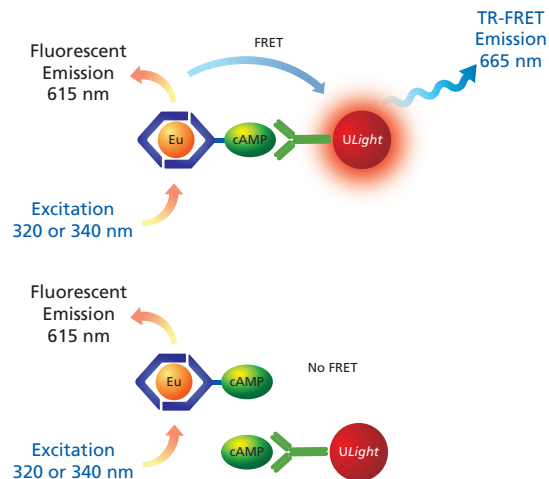


In the absence of free cAMP (top), maximal TR-FRET signal is achieved. Free cAMP produced by stimulated cells competes with the Eu-cAMP tracer for binding to the U*Light*™ monoclonal antibody (bottom), causing a decrease in TR-FRET signal proportional to the concentration of cAMP produced.

## Sensitivity Unaffected After Overnight Incubation
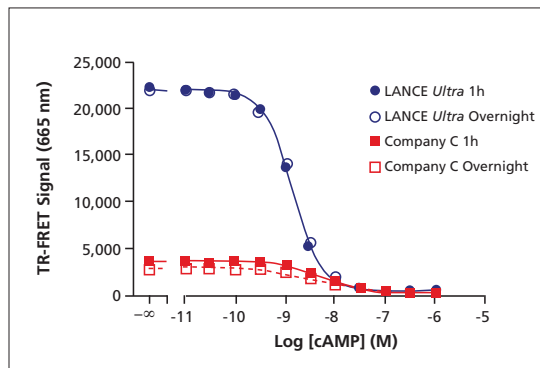


Unlike other cAMP assay options, the LANCE *Ultra* cAMP assay offers both higher sensitivity and a wider assay window that is not affected by overnight incubation.

## Rank Order of Potencies of cAMP Response
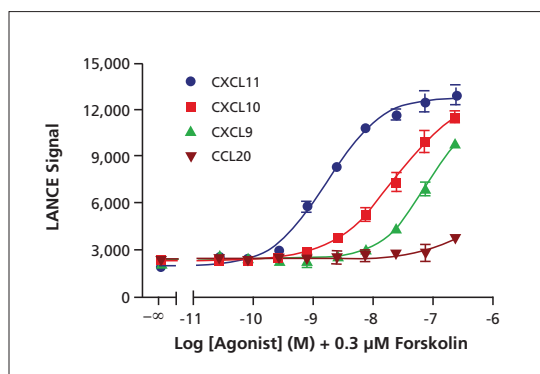


Agonist-induced cAMP response in frozen CHO-CXCR3 cells (2,000 cells/well). The observed rank order of potencies and efficacy is consistent with published data (CXCL11 > CXCL10 > CXCLI9). Assay was read on an EnVision.

### EnVision Multilabel Plate Reader with TRF Laser

The EnVision Multilabel Plate Reader with TRF Laser is ideal for LANCE *Ultra* cAMP assays. This benchtop reader delivers optimized performance for TR-FRET detection and is available with stackers. Optional 20 or 50 microplate magazine stackers make it ideal for use with LANCE *Ultra* cAMP where the same strong TR-FRET signal is observed first plate in to last plate out.

### LANCE TR-FRET cAMP: precision detection

Our first-generation LANCE cAMP kit continues to provide outstanding performance in a three-component assay, combining homogeneous TR-FRET technology for maximum excitation/emission discrimination.

- Offers easy assay development and adaptation to automation
- Provides excellent signal-to-background ratios, Z' values and sample throughput for optimum productivity

### LANCE cAMP Assay Principle
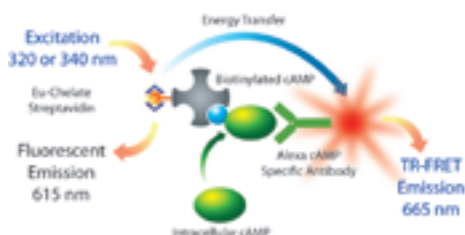


Light pulse at 340 nm excites the Eu-chlelate of the Eu-SA/biotin-cAMP tracer. The energy emitted from the Eu-chelate is transferred to the Alexa Fluor® 647-labeled anti-cAMP antibodies bound to the tracer, generating a TR-FRET signal at 665 nm. Residual energy from the Eu-chelate will produce light at 615 nm. cAMP of a sample competes with the tracer for antibody binding sites and causes signal reduction.

### AlphaScreen cAMP assay kit

Exclusive Amplified Luminescent Proximity Homogeneous Assay (Alpha) technology provides an easy-to-automate screening tool for monitoring modulation of adenylyl cyclase through a wide range of $G\alpha_{i/o}$-coupled and $G\alpha_s$-coupled GPCRs. This system forms the basis for a high throuput, sensitive, functional cAMP assay often yielding very large signal-to-background ratios and high Z' values.

### AlphaScreen cAMP Assay Principle
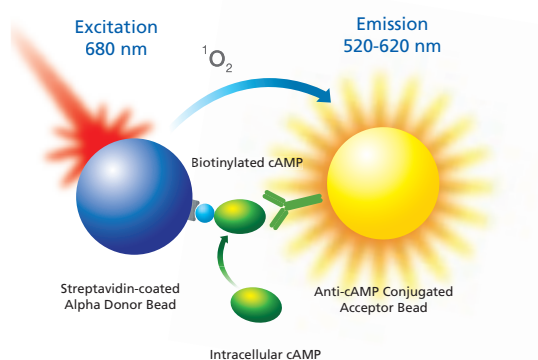


Detection of cAMP is based on the competition between cAMP produced by cells and a biotinylated cAMP probe recognized by streptavidin-coated Alpha Donor beads and anti-cAMP conjugated Acceptor beads. The beads are brought into proximity and a signal is produced.

### Simple to use cAMP, [125I] RIA kit: scintillation proximity assay

The homogeneous cAMP [125I] RIA kit using SPA beads has been developed for the detection and quantitation of cAMP levels in cell lysates using protein A-coated PVT scintillation beads (RPNQ0019) or protein A-coated PS imaging beads (RPNQ0264). The assay is simple to perform, requiring minimal manipulations, and suitable for automated high throughput screening applications. SPA associated with antibody-bound cAMP can be counted in the presence of unbound radiolabeled cAMP without the need for separation. This homogeneous RIA has a working range of 0.2-12.8 pmol cAMP/well (1.32-84.28 ng/mL) with a sensitivity of detection of 0.1 pmol/well (0.65 ng/mL).

### Reliable cAMP, [125I] RIA kit: radioimmunoassay

Our easy-to-use cAMP [125I] RIA kit measures cAMP in plasma, urine, tissue or cell culture samples. The first and second antibodies are supplied pre-reacted, eliminating an assay step. The assay is based upon competitive ligand binding between iodinated cAMP tracer and cAMP contained in the sample. Depending upon the level of sensitivity required, the assay can be run with acetylation (sensitivity 0.025 pmol/mL) or without.

### Rapid FlashPlate [125I] assay systems

**Adenylyl Cyclase Activation**

Solid-phase scintillation proximity FlashPlate microplate technology has long been considered the gold standard for cAMP functional assays in HTS labs. It enables fast and reliable quantification of receptor-mediated adenylyl cyclase activation/inhibition using live cells all in one well. A simple protocol measures a true second messenger response without extraction.

**Acetylation/Non-acetylated Standards and Samples**

Use FlashPlate cAMP assay kits to measure cAMP in biological fluids, including plasma, urine and tissue samples. Choose acetylated samples when the highest sensitivity is desired.

**Functional cAMP Determination**

| | LANCE Ultra | LANCE | AlphaScreen | cAMP [125I] RIA Kit | cAMP [125I] RIA Kit | FlashPlate [125I] |
|---|---|---|---|---|---|---|
| Platform | TR-FRET | TR-FRET | Luminescence | SPA-RIA | Radioimmunoassay | Scintillation |
| Homogeneous | √ | √ | √ | √ | | |
| Non-rad | √ | √ | √ | | | |
| Density Format (well plates) 96, 384, 1536 | √ √ | √ √ | √ √ | √ | n/a | √ |
| Throughput (points/day) | >500,000 | >500,000 | >70,000 | >70,000 | >500 | >20,000 |
| Sample Type Whole Cell | √ | √ | √ | √ | √ | √ |
| Membrane Preparations | √ | √ | √ | √ | √ | √ |
| Tissue | | | √ | √ | √ | √ |
| Plasma | | | √ | √ | √ | √ |
| Urine | | | | | √ | √ |
| Recommended Microplates | OptiPlate CulturPlate™ ProxiPlate™ 1/2 AreaPlate | OptiPlate CulturPlate ProxiPlate 1/2 AreaPlate | OptiPlate CulturPlate ProxiPlate 1/2 AreaPlate AlphaPlate™ | OptiPlate ProxiPlate | | FlashPlate |
| Typical Standard Curve* | $IC_{50}$ = 1.4 nM Z' = 0.80 | $IC_{50}$ = 3 nM Z' = 0.80 | $IC_{50}$ = 6.0 nM Z' = 0.77 | $EC_{50}$ = 3 nM | $IC_{50}$ = 13.9 nM Z' = 0.98 | |
| >24 Hours Signal Stability | √ | √ | √ | √ | √ | √ |

*Comparison of cAMP Assay Technologies for High Throughput Screening. Patricia Kasila and Harry Harney, PerkinElmer, Inc.

# THE EASY SOLUTION
## FOR TOUGH-TO-SCREEN
# TARGETS

### AlphaScreen® *SureFire*® ERK assay

AlphaScreen® *SureFire*® is a unique platform for measuring endogenous levels of phosphorylated ERK which provides a powerful tool to measure many GPCR types. It enables the highly sensitive and precise interrogation of various receptors.

- Excellent secondary GPCR technology for challenging targets
- Applicable to endogenous receptors and primary cells
- Alternative for tough-to-screen targets not optimally coupled through the calcium or cAMP pathway

**ERK-MAP Kinase and AKT Signaling**
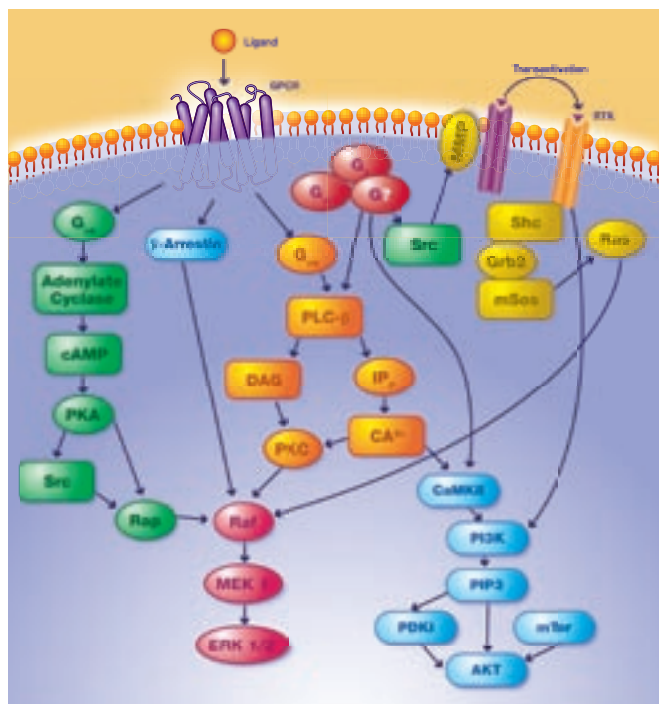


ERK is activated by multiple receptor classes, including $G_q$-, $G_{i/O}$- and some $G_s$-coupled receptors, making it an ideal endpoint measurement for GPCR activation.

## ERK Phosphorylation in CHO-CCR7 cAMPZen Cells



Z' = 0.71
$EC_{50}$ = 5 nM

(ATP control)

RFU vs Log [MIP-3β], (M)
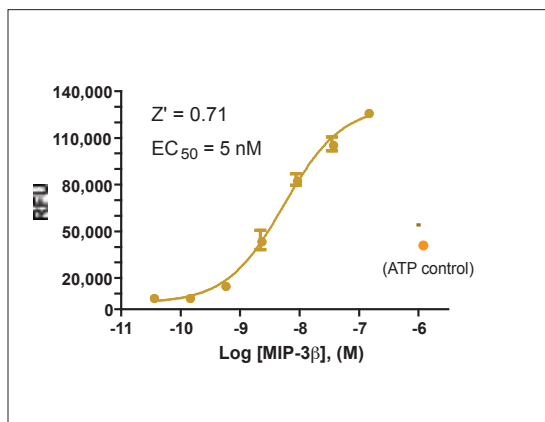
CHO-CCR7 cAMPZen frozen cells were thawed, seeded at 40,000 cells/well and the next day were stimulated with a dose-response of MIP-3β. A single concentration of ATP, acting on an endogenous $P2Y_2$ receptor in CHO cells, was used as a control agonist. The cell lysate was used to assess ERK phosphorylation using the AlphaScreen® SureFire® kit, and measured with the EnVision plate reader.

## ERK Phosphorylation in CHO-Gal$_1$ cAMPZen Cells



Z' = 0.68
$EC_{50}$ = ~1 nM
S/B = 10

(ATP control)

AlphaScreen Signal (counts) vs Log [Galanin], M
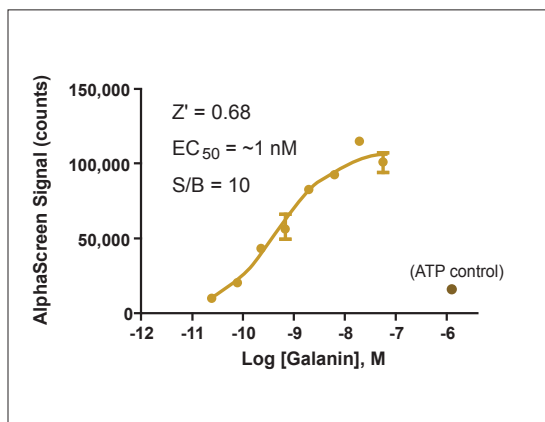
CHO-Gal$_1$ cAMPZen frozen cells were thawed, seeded at 40,000 cells/well and the next day were stimulated with a dose-response of galanin. A single concentration of ATP, acting on an endogenous $P2Y_2$ receptor in CHO cells, was used as a control agonist. The cell lysate was used to assess ERK phosphorylation using the AlphaScreen® SureFire® kit, and measured with the EnVision plate reader.

## AlphaScreen® SureFire® ERK Assay Principle



Excitation 680 nm — $^1O_2$ — Emission 520-620 nm

Streptavidin-coated Alpha Donor Bead | Phospho-substrate | Protein A-conjugated Acceptor Bead
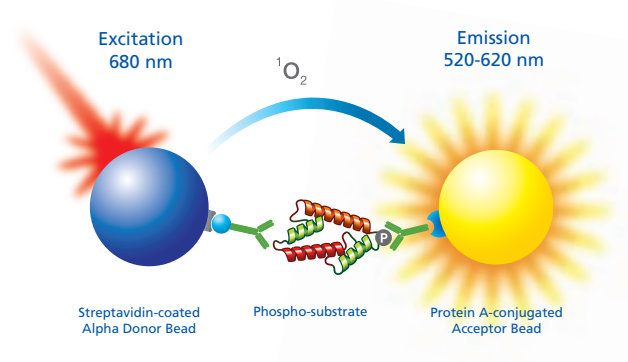
In an AlphaScreen® SureFire® assay, the first antibody is biotinylated and is captured by the streptavidin-coated Alpha Donor bead, which in turn captures the endogenous substrate. The second antibody is captured by the protein A-conjugated Acceptor bead, but only recognizes the phosphorylated form of the substrate of interest. The two beads are only brought into close proximity in the presence of the phosphorylated substrate. This assay setup allows "fishing" of the endogenous substrate in cells, and is extremely sensitive.

## Functional ERK Determination

| Platform | AlphaScreen® SureFire® Luminescence |
|---|---|
| Homogeneous | √ |
| Non-rad | √ |
| Density Format (well plates) 96, 384, 1536 | √ |
| Throughput (points/day) | >70,000 |
| Sample Type | Most cell types including primary cells & tissue samples |
| Recommended Microplates | OptiPlates (white, opaque) AlphaPlate ProxiPlate 1/2 AreaPlate |

# CHOOSE THE RIGHT REPORTER GENE ASSAY FOR YOUR RESEARCH

## "Mix-and-measure" luminescence reporter gene assays: britelite plus, neolite and steadylite plus

Based on the use of firefly luciferase, these assays provide long-lived luminescent signals that allow efficient processing of functional GPCR targets. Choose either britelite plus, neolite or steadylite plus based on sensitivity and half-life requirements. Each offers:

- Excellent Z' values
- No wash platform
- 2-8 °C storage
- DTT-free – eliminates odor and need for hood work

### Strong signaling, remarkably accurate results with britelite plus

With an extremely bright signal and a half-life of 30 minutes, the britelite plus homogeneous ultra-high sensitivity reporter gene assay kit detects and clearly highlights a wide range of luciferase content levels in up to 1536-well formats.

### neolite – strong and stable

Ideal for medium to high throughput applications that require exceptional sensitivity in batch processing, neolite offers a half-life of at least 2.5 hours with a strong signal intensity. neolite delivers superior reproducibility, as it is less sensitive to mixing conditions than typical luminescent detection systems.

### steadylite plus for unequaled signal stability

The steadylite plus system is optimized for use in high-density microplates, reducing the effects of incomplete mixing and capillary action (wicking) often seen in rounded square wells. And the 5-hour half-life will give you the flexibility to run high throughput applications.
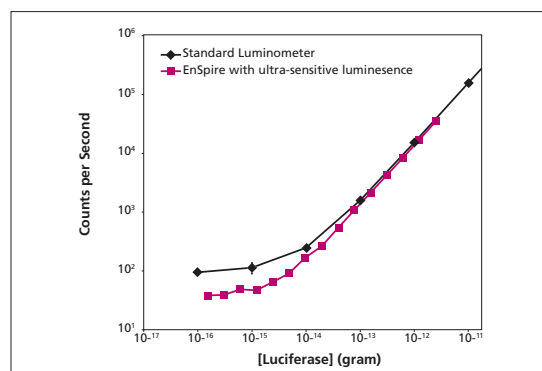


neolite with EnSpire multilabel plate reader with ultra-sensitive luminescence shows superior sensitivity at low levels of luciferase enzyme compared to that of a standard luminometer.

## Choose the Right Detection Reagent Based on Your Application

| | britelite plus | neolite | steadylite plus |
|---|---|---|---|
| Sensitivity | Very High | High | Moderate |
| Half-life (hours) | 0.5 | 2.5 | 5 |
| Phenol Red Sensitivity | Moderate | Moderate | Moderate |
| Plate Format | 96, 384, 1536 | 96, 384, 1536 | 96, 384, 1536 |
| Low Wicking | √ | √ | √ |
| Microplates | OptiPlate, CulturPlate, ProxiPlate | OptiPlate, CulturPlate, ProxiPlate | OptiPlate, CulturPlate, ProxiPlate |
| Applications | • Superior sensitivity<br>• Low transfection efficiency<br>• Stem cell transfection<br>• Rapid read time (continuous processing) | • Low transfection efficiency<br>• Stem cell transfection<br>• Increased assay windows<br>• Extended read times | • Strong steady signal<br>• Long extended read times<br>• High throughput screening |

## Stability Comparison
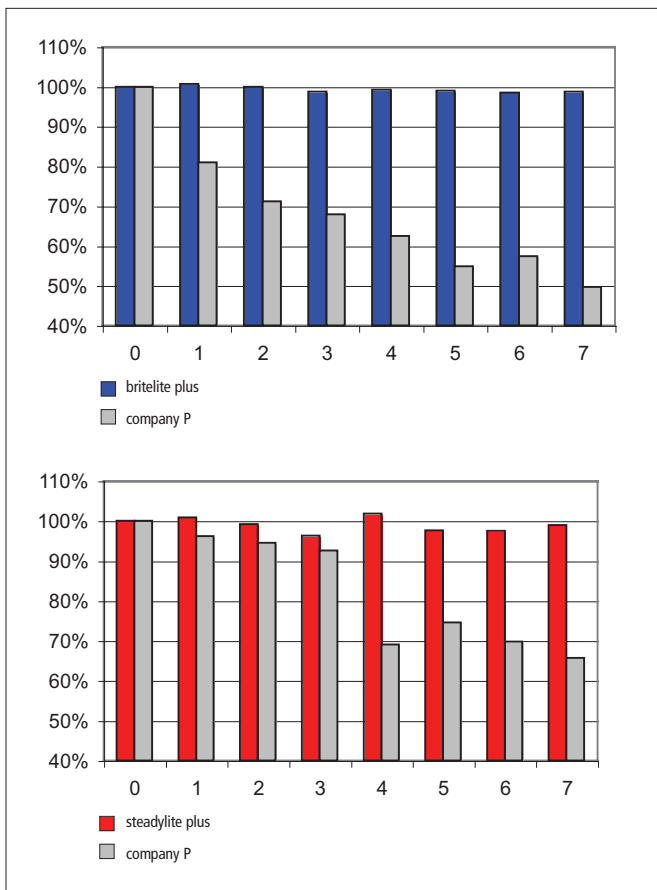


Stability comparison of lyophilized substrates at 22°C for luciferase
detection kits, company P versus britelite plus and steadylite plus,
respectively.

### ViewLux Ultra HTS Microplate Imager



steadylite plus is able to detect lower levels of
luciferase – perfect for more sensitive analyses in 1536-
well plates measured on high throughput imagers
such as our ViewLux uHTS Imager.

# NOW MORE FLEXIBILITY: LABEL-FREE VALIDATION

When you need another option for studying difficult targets or desire more physiologically relevant data, choose from a wide selection of cell lines and frozen cells for label-free technology.

PerkinElmer cell lines and frozen cells offer better flexibility and are fully tested for use with the Corning® Epic® System.

Comparable data can be obtained for both freshly passaged cells and γ-irradiated frozen cells. The pharmacology also compares favorably with labeled technologies.

## Comparison of μ-Opioid Receptor Response Profiles: Fresh vs. Frozen Cells
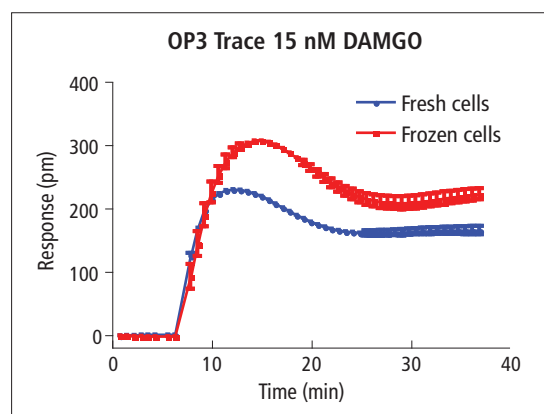


Comparison of response profiles from cells expressing the μ-opioid receptor after stimulation with 15 nM DAMGO (8,000 cells/well, 384-well format; measured on the Epic® reader).

## Label-free Assay Performance: Fresh vs. Frozen Cells
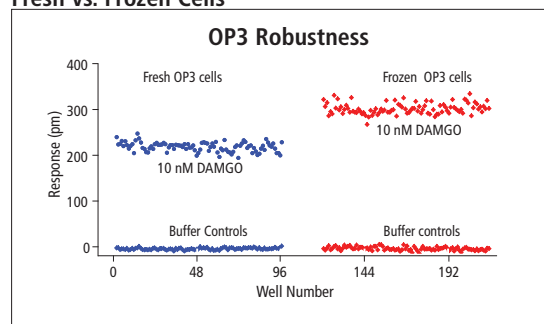


The assay performance between freshly passaged cells ($Z' = 0.81$) and γ-irradiated frozen cells ($Z' = 0.83$) also compares favorably.

## Benefits of label-free technology

- Ability to study multiple GPCR signaling within a single assay
- Complementary pharmacological profiles compared to labeled technologies (calcium flux, cAMP, GTPγS, IP, receptor binding)
- Ability to generate more physiologically relevant data
- Ability to study recombinant and endogenous GPCR targets
- No artifacts from working with labels
- Non-invasive
- Pathway independent

## Comparison of μ-Opioid Receptor Reference Ligand Efficacy and Potency
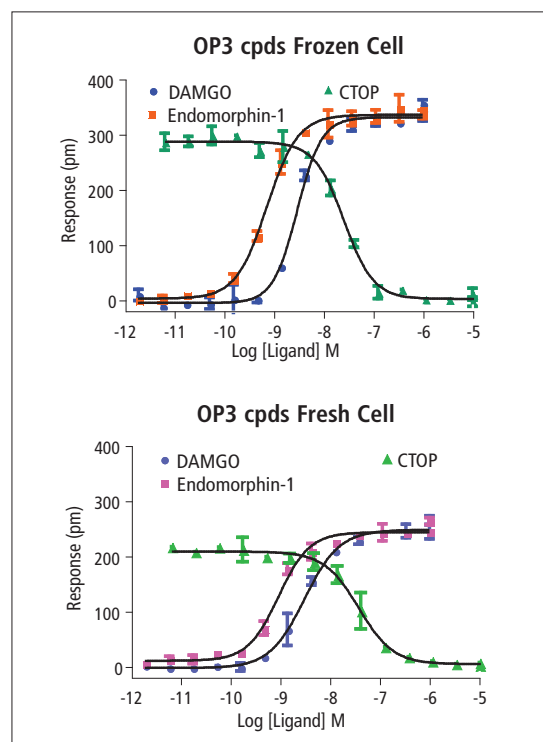


Dose response curves obtained with frozen cells (top) $EC_{50}$ for agonist DAMGO and Endomorphin-1 were 2.9 nM and 0.7 nM, respectively. $IC_{50}$ for the antagonist CTOP was 25 nM. Dose response curves obtained with freshly passaged cells (bottom). $EC_{50}$ for agonist DAMGO and Endomorphin-1 were 2.9 nM and 0.9 nM, respectively. $IC_{50}$ for the antagonist CTOP was 36 nM at $EC_{90}$ concentration of the agonist DAMGO (measured with the Epic® reader).

**EC$_{50}$/IC$_{50}$ Values for the μ-Opioid Receptor are Equivalent for LANCE cAMP and Label-free Technology\***

| Agonist or Antagonist | EC$_{50}$/IC$_{50}$ (nM) Label Free | EC$_{50}$/IC$_{50}$ (nM) cAMP |
|---|---|---|
| DAMGO | 3.2 | 2.0 |
| Endomorphin | 1.0 | 1.6 |
| CTOP | 40.0 | 40.0 |

\*Freshly passaged cells on the Corning® Epic® System; 2,500 cells/well (cAMP) and 8,000 cells/well (label-free).

### Label-free Epic® Assay Principle

The Epic® technology measures the dynamic mass redistribution (DMR) that occurs in response to receptor activation or deactivation. There is an integrated response for every pathway which enables the detection of cellular responses for endogenous as well as over-expressed targets with great sensitivity; the results can be used to complement those obtained using labeled technologies.
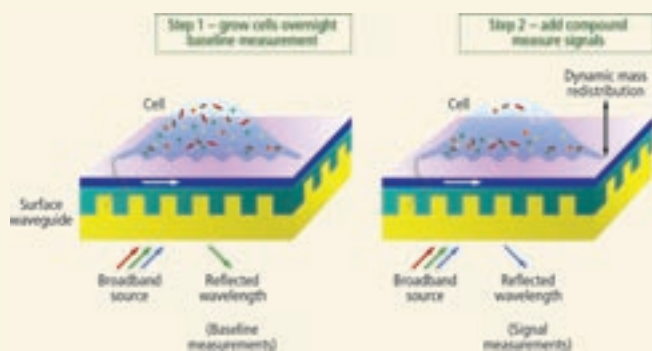


Dynamic mass redistribution within a cell causes index of refraction changes resulting in a resonant wavelength shift; the sensing zone of ~150 nm above the sensor is represented by the wave indicated on the left.

# MORE REAGENTS TO IMPROVE ASSAY PERFORMANCE

**The right mix of GPCR membranes, labeled ligands and consumables to fit every need.**

PerkinElmer offers an unsurpassed selection of reagents including radioactive and non-radioactive options to measure GPCR binding. These options can supplement traditional filtration assays to increase the performance and productivity of your assays.

## GPCR membrane preparations

**Significant Targets: Proven Ligand Receptor Binding**

Now you have instant access to the most extensive portfolio of pharmacologically characterized GPCR membrane preparations. Membrane Target Systems® are quality-assured frozen membranes from cells that express recombinant or endogenous receptors.

We submit every batch of receptor to stringent quality control testing that includes saturation radioligand binding to determine receptor density ($B_{max}$), affinity ($K_d$) and pharmacological analyses (competition curves). At least 30% of our membrane preparations are also tested for GTPγS binding.

## Ligand receptor binding

**DELFIA Europium-labeled Ligands**

The DELFIA ligand family consists of europium (Eu)-labeled peptides and proteins which are ideal for ligand-receptor binding assay. DELFIA ligands can be used in several assay formats, including filtration assays using filter plates, as a solid phase assay using streptavidin-coated microplates and biotinylated-WGA or with adherent cells on a cell culture plate.

DELFIA Eu-labeled ligands are:

- Stable, non-radioactive reagents
- Sensitive – even membranes with low expression levels can be used
- Offered with ready-made protocols for ease of use
- Available for customer labeling

## Fluorescent labeled ligands

Fluorescent labeled ligands (CellAura Technologies Ltd.) can also be used as a novel tool with PerkinElmer's recombinant cell line portfolio enabling the determination of ligand binding characteristics using the Opera High Content Screening platform (page 31). Selective membrane binding of the fluorescent ligand can be displaced using unlabeled competitor compounds in addition to being able to study the binding kinetics.
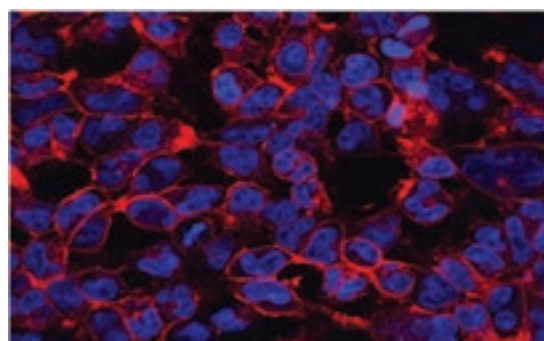


Binding of a fluorescently labeled ligand (β2-633AN) to the β2 adrenergic receptor expressed on HEK293 cells.

## NEN radioligands

A pioneer in the development of essential tools for receptor ligand binding, PerkinElmer now offers over 400 NEN $^3H$ and $^{125}I$ ligands with new products continuously introduced. Each of our ultra-pure radioligands is fully characterized for pharmacological action and validated in receptor binding assay.

If you need further specialization for a specific application, we will work with you, scientist to scientist, to custom-design a radioligand to meet your needs.

## Receptor-ligand binding SPA

The SPA platform technology provides a homogeneous format for studying receptor-ligand binding with either purified receptors or in context, embedded in cellular membranes. SPA beads coated with wheat germ agglutinin (WGA) are used to bind cellular membranes with the appropriate receptor embedded in its normal context or using streptavidin (SA)-coated beads to bind a purified biotinylated receptor. The radiolabeled ligand ($^3H$-, $^{14}C$- or $^{125}I$-) bound to the receptor is detected without the need for separation of unbound ligand in suspension.

- Sensitive even membranes with low expression levels can be used
- Extensive portfolio of radiolabeled ligands with matching receptors embedded in cellular membranes
- Available for customer labeling

## Saturation Binding Experiment
### Scintillation Proximity Assay
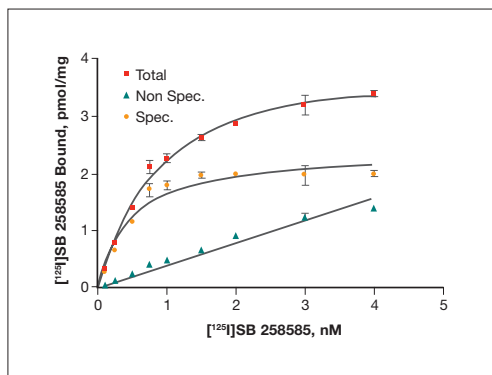


Saturation binding of $[^{125}I]$SB 258585 to membranes from 1321N1 cells stably expressing the serotonin 5-HT$_6$ receptor. Measurement of the bound radioligand was performed with SPA beads.

## Saturation Binding Experiment
### Filtration Method
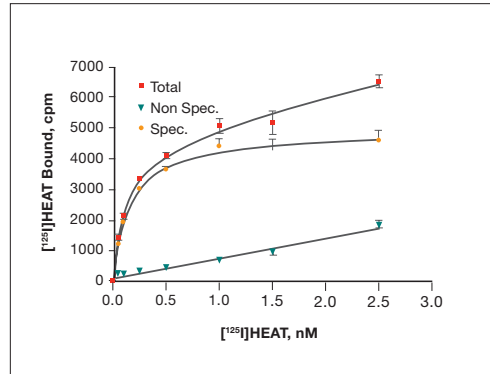


Saturation binding of $[^{125}I]$HEAT to membranes from CHO-K1 cells stably expressing the adrenergic $\alpha_{1A}$ receptor. Separation of the bound from the free radioligand was performed on 96-well filtration plate.

## Competition Binding Experiment
### Scintillation Proximity Assay
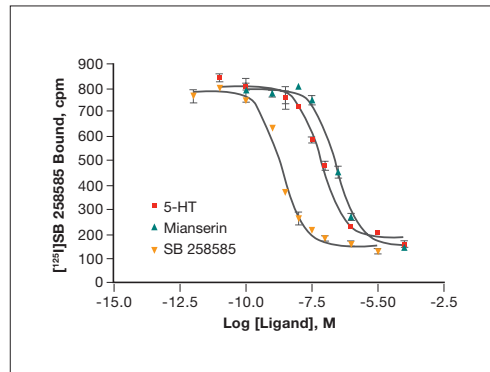


Competition binding of $[^{125}I]$SB 258585 to membranes from 1321N1 cells stably expressing the serotonin 5-HT$_6$ receptor with reference ligands. Measurement of the bound radioligand was performed with SPA beads.

## GTP binding assays

Following GPCR activation, GTP replaces GDP on the alpha subunit of the G protein. This causes the alpha unit to disassociate and interact with effectors. PerkinElmer offers radioactive assays to measure GTP exchange.

## SPA GTP binding kit

Optimize the conditions for screening novel agonists against a GPCR of interest with our SPA [$^{35}$S]-GTPγS binding kit (RPNQ0210). This kit is a homogeneous radiometric detection assay based on GDP-GTP exchange on the G protein alpha subunit following GPCR activation by agonists. With the use of this hydrolysis-resistant nucleotide, [$^{35}$S]-GTPγS, the receptor of interest is kept in an "on" state. Agonist stimulation is measured as an increase in the release of GDP from the G protein and is represented in this assay as an increase in [$^{35}$S]-GTPγS binding and therefore increased signal.

Exclusive to PerkinElmer, SPA has been widely adopted for many HTS applications due to its extremely high sensitivity and wide dynamic range.

**Comparison GTP Binding: SPA vs. Filter Assays**
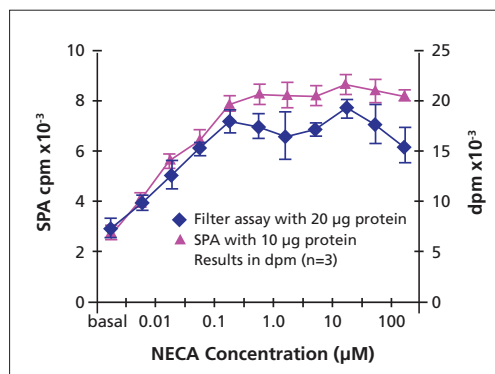


Comparison of A1-agonist stimulated [$^{35}$S]-GTPγS binding detected by SPA and filter assay. Filter assay with 20 μg protein; SPA with 10 μg protein. Results in dpm (n = 3).

## NEN [$^{35}$S]-GTPγS radionuclide filter binding assay

With PerkinElmer's [$^{35}$S]-GTPγS and receptor membranes, successful GTP binding assays can be performed in lower throughput with a high degree of sensitivity. This proven performer is efficient and automatable.

## FlashPlate technology

PerkinElmer WGA-coated FlashPlate microplates are the foundation of homogeneous assay measurement of the binding of GTP to GPCRs. This assay allows quantitative determination of agonist-induced activation of [$^{35}$S]-GTPγS binding to isolated GPCR membrane preparations without the need for filtration and wash steps.

**Comparison of WGA FlashPlate PLUS to Filtration in Agonist-induced Binding of GTPγS to Human μ Receptor**
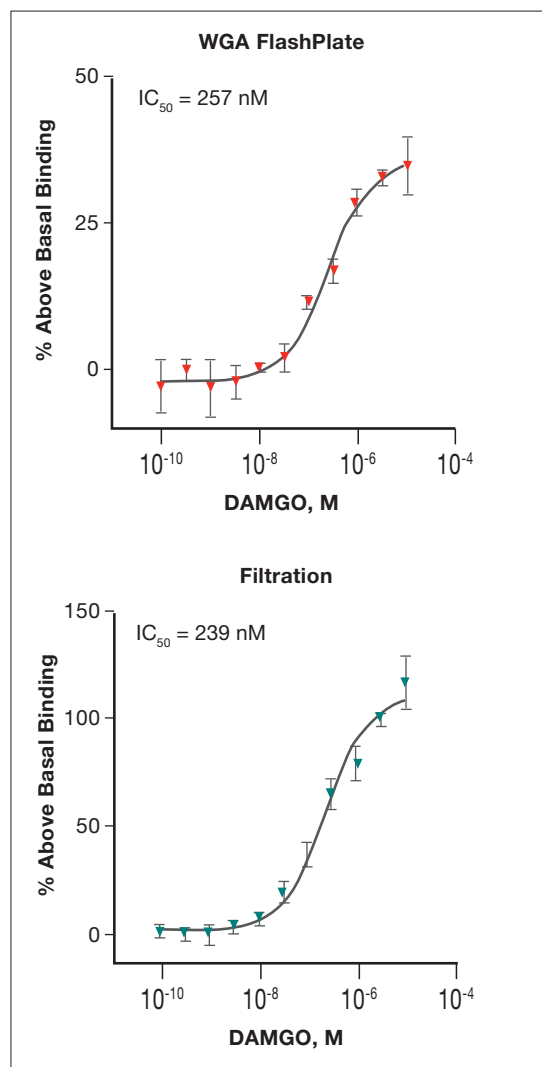


Human MOR membranes were added to either a 96-well WGA FlashPlate PLUS or a low-protein binding assay plate in the presence of GDP, [$^{35}$S]-GTPγS and increasing amounts of the μ-opioid-specific agonist DAMGO, and incubated. Contents of low-protein binding assay plate were filtered and counted on the MicroBeta JET.

**Selection Criteria for GTP Binding Assays**

| | Filter Plates | Scintillation Proximity Assay | FlashPlate Microplates |
|---|---|---|---|
| Homogeneous | | √ | √ |
| Detection Technology | Liquid scintillation | Radiometric scintillation proximity | Radioisotopic scintillation proximity |
| Density Format 96-well 384-well | √ | √ √ | √ √ |
| Throughput (points/day) | >15,000 | >70,000 | >20,000 |
| Complementary Plate Type | 96-well UniFilter® plate | 96-well white OptiPlate 384-well white OptiPlate 96-well ProxiPlate 384-well ProxiPlate | WGA FlashPlate microplate |
| >24 Hours Stability of Signal | √ | √ | √ |



PerkinElmer has the world's largest selection of radiometric detectors. Choose from our MicroBeta² LumiJET (shown) and TopCount plate-based readers, or our Tri-Carb vial-based reader for alpha and beta isotope counting. WIZARD²™ is designed for superior counting performance with all types of samples and for every gamma-counting application.

# PREMIER, POWERFUL HIGH CONTENT SCREENING

**Do you want to identify responders on a new level?**

High content screening (HCS) and analysis is an invaluable resource for secondary screening and follow-up testing:

- To explore mechanisms of action and assess unwanted side effects of a compound early on
- To follow cAMP or calcium-flux-based primary screens and to provide independent readout to those technologies, including receptor internalization/recycling or arrestin recruitment
- To identify partial agonists and antagonists based on their degree of activating or inhibiting receptor activation; atypical ligands can also be distinguished

This approach is particularly appropriate when measuring the association of the activated GPCR with ancillary signaling molecules such as β-arrestin:

- New methods for mechanisms of actions research
- Functional assays for receptor activation, receptor endocytosis, signal molecule recruitment
- Multiplexed assays with multiparameter readout
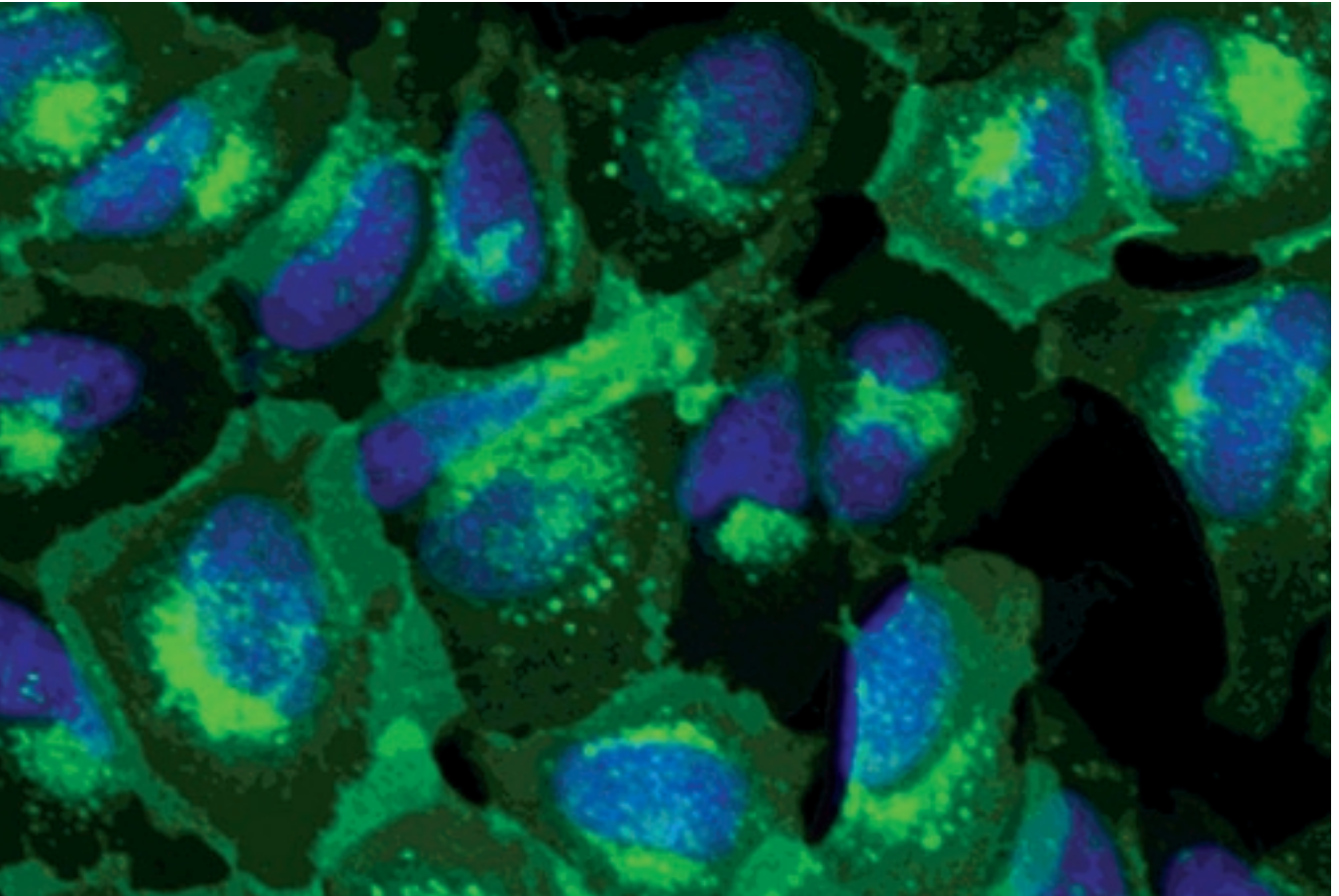
In image-based quantification of Endothelin A Receptor (ETAR) Translocation, images were captured on the Opera using a 20x objective. A false color overlay of nuclear (blue) and ETAR (green) fluorescence is shown. Translocation of ETAR becomes apparent as the concentration of the agonist ET-1 is increased.
Upon binding of ET-1, the receptor is internalized into pericentriolar recycling endosomes.

# UNPARALLELED SCREENING INSIGHT CELL BY CELL

High content analysis can also bring significantly more and different information to calcium-flux-based assays than can whole well readers.

The cell-by-cell-based evaluation provides the opportunity to identify sub-populations such as high and low responders or responders and non-responders, thus eliminating variations due to transient transfectants and revertants in a population.

Population-based statistics provide readout parameters different from intensity only. Additionally, calcium signaling can be combined with other assay parameters in HCS (multiplexing).

## Activation of GPCR calcium release

GPCRs sense molecules outside the cell and activate intracellular signal transduction pathways, which ultimately lead to different cellular responses. Most are linked to calcium signaling. Acapella™ software, which determines sub-populations of cells based on their calcium response, is a particularly useful tool to decrease the number of false positives in drug discovery compared to systems that average the response across the entire population within a well.

CHO-K1 cell lines stably expressing metabotropic glutamate receptors (mGLuRs) under the control of an inducible promoter were used in a cell-based calcium flux assay. The intracellular calcium mobilization due to glutamate-induced GPCR activation was detected using the $Ca^{2+}$ responsive dye, Fluo-4. To study calcium flux kinetics, 25 images were captured within 60 seconds and analyzed with the Acapella Kinetic Intensity Analysis script.



**Mean Signals of All (black), Active (red) and Inactive (blue) Cells**



Percentage of active cells    $EC_{50}$    13 nM
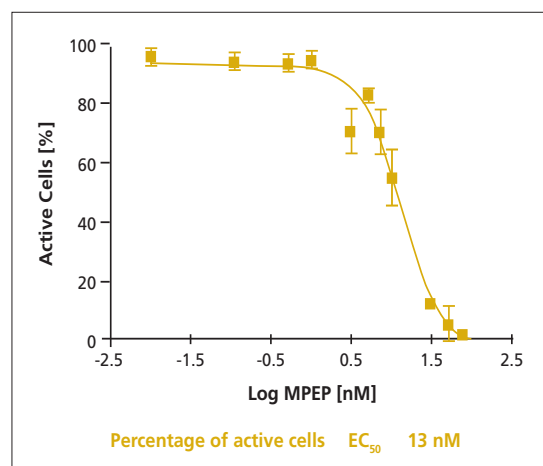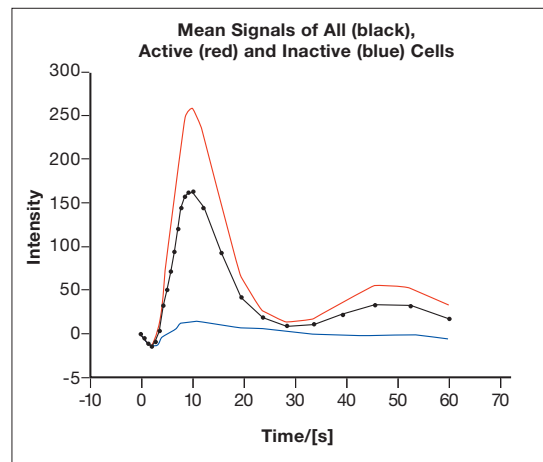
(Top) Time course of Fluo-4 mean fluorescence intensity for the whole population (black) and for the active (red) and inactive (blue) sub-populations incubated without MPEP. The intensity was averaged for each time point, over all the cells in each group (231 cells in total). Classification of cells into the two sub-populations was achieved by introducing a peak intensity threshold at 150. (Bottom) An example dose response curve generated from 3 replicate measurements. A significant decrease in the percentage of active cells is observed with increasing concentrations of MPEP.

## Opera for High Content Screening



The Opera is a confocal imaging high content screening reader with unmatched resolution and speed. This high-performance system is very flexible to run either fixed cell assays – such as receptor internalization – or live cell kinetic assays such as calcium flux, even in primary screening. High-resolution imaging using high-magnification objectives can detect every detail of a cellular process for every cell in a screen and even follow it over time.

## Operetta for High Content Screening



The Operetta is a very easy to use high content screening reader with widefield, brightfield and confocal options. Suited for any size lab, it provides the newcomer to HCS with ready-to-go applications such as receptor internalization/endocytosis, pit and vesicle formation, translocation and many more. Smaller scale screening campaigns can be run with great level of detail in cellular readout.

### Ultra*VIEW* VoX 3D live cell imaging

When a vesicle disappears, where does it go? How does a membrane change across the whole cell? How many bacteria are invading a cell? You face biological mysteries that 2D imaging alone can't unravel. But with the Ultra*VIEW* VoX 3D live cell imaging system, you can find all the answers you're looking for. It's the only 3D spinning disk system that offers acquisition to analysis. Not only will Ultra*VIEW* VoX tell you more about cellular structure and function than other systems, 3D analysis also provides greater context to cellular changes and more accurate results.

The Ultra*VIEW* VoX features leading innovation, such as the advanced Yokogawa® CSU-X1 spinning disk scanner, patented ProSync® technology and award-winning Volocity® software. With this system, you can achieve faster acquisition rates, greater sample protection and higher image data quality than you ever imagined. With the power of 3D live cell imaging, picture all that you can do with your research.

# THE RIGHT INSTRUMENTATION. RIGHT WHERE YOU WANT IT

Versatile, scalable PerkinElmer instrumentation solutions perform consistently and reliably no matter what your platform or volume. From stand-alone instrumentation to fully integrated, automated systems, you can be confident that your GPCR instrument solution has been precisely validated for specific assay technologies. Our application-focused discovery support team means you can be confident our advice will be on target with your needs.

| Assay Platform | ViewLux | EnSpire | EnVision | VICTOR X | MicroBeta[2] | TopCount | Tri-Carb | WIZARD[2] |
|---|---|---|---|---|---|---|---|---|
| Alpha Technology | | √ (w/Alpha option) | √ (w/Alpha option) | | | | | |
| AequoScreen PhotoScreen | | | √ (w/ injectors) | √ (w/ dispenser) | √ (MicroBeta[2] LumiJET) | | | |
| LANCE (TR-FRET) | √ | | √ (enhanced w/TRF LASER) | √ (X4 & X5 models) | | | | |
| DELFIA (TRF) | √ | | √ (enhanced w/TRF LASER) | √ (X4 & X5 models) | | | | |
| Luciferase Assays | √ | √ | √ | √ | √ | √ | | |
| FlashPlate | | | | | √ | √ | | |
| RIA Kits | | | | | √ | √ | | √ |
| Radioligands and Radionuclides | | | | | √ | √ | √ | √ |
| SPA | √ | | | | √ | √ | √ | |

## EnVision Multilabel Plate Reader

Fast, sensitive and versatile benchtop readers that deliver optimized performance for assay development and high throughput screening. A modular design allows label-specific optical screening.

Choose EnVision to complete your total GPCR Solution for all major assay applications.

• Features below-reading, shaking, scanning and kinetics

• Offers temperature control and dispenser options to enable ion channel, calcium flux, dual reporter gene assays and more

• Works with PerkinElmer's AlphaScreen, and TRF (LANCE *Ultra*, DELFIA) for GPCR assays

• Provides scanning and kinetics capabilities and label-specific optical mirror modules and filters to enable GFP assays and dual reporter gene assays using luciferase and beta lactamase

• Performs sensitive kinetic measurements across a wide dynamic range, and high-speed measurements at short-repeat intervals

With easy integration into our automated HCS systems and the ability to accept microplates up to 3456 wells, EnVision's stacker option greatly increases the throughput of kinetic assays: over 100,000 samples per day when 1536-well plates are used.



EnVision Multilabel Plate Reader

## EnSpire Multilabel Plate Reader

EnSpire offers affordable detection across multiple platforms including ultra-sensitive luminescence, Alpha Technology and fluorescence/absorbance using quad-monochromator technology. These detection modes enable the measurement of Alpha cAMP, calcium flux and reporter gene assays. With ultra-sensitive luminescence, you can use fewer precious cells to obtain the same robust signal as standard luminescence. Extra sensitivity compensates for low transfection assays, enhancing assay viability. The stronger signal increases your assay window, so there is no need to redesign assays. All this combined can save up to 75% in reduced transfection reagents and substrates.

EnSpire leverages EnVision's world-class performance technology to deliver flexibility and sensitivity, with easy-to-use software, operational temperature control and bottom-reading capability.



EnSpire Multilabel Plate Reader

**ViewLux Ultra HTS Microplate Imager**

Ultra-high throughput microplate imager for high sensitivity and fast measurement of light from fluorescence polarization (FP), fluorescence intensity, time-resolved fluorescence, luminescence and absorbance assays.

For radiometric detection, the CCD camera in the ViewLux is designed to capture red-shifted light emission from SPA imaging beads in 96-, 384- and 1536-well formats. All HTS screens are rapidly processed with procession in the ViewLux.

Because the instrument reads entire plates in one exposure, throughput is not affected by plate density. Alternate between batch and robot loading according to need – up to 200,000 samples/hr can be read under continuous operation.

**VICTOR *X* Multilabel Plate Reader**

Multilabel, multitask counters for all light-emitting and light-absorbing detection technologies including:

- Fluorescence (top and bottom)
- Luminescence
- UV absorbance
- Time-resolved fluorometry
- Fluorescence polarization

It is ideal for fast multiwavelength assays in a range of microplate applications, including cell-based assays, toxicology screens and more. With over 10 counting modes, multiple options and a range of detection technologies, including luminescence, the VICTOR *X* has the right configuration for your assay needs. It can operate as a stand-alone instrument or integrate into robotic systems.

**VICTOR *X* Light Plate Reader**

Flexible microplate-based benchtop reader offers considerably more sensitivity for luminescence measurement than standard readers using either aequorin or luciferase assays. It is ideal for a variety of applications including cell-based assays, immunoassays, toxicity screens and gene expression. Use it as a convenient stand-alone system or, with optional accessories, integrate it into robotic systems as needed. It is ideal for PerkinElmer's mix-and-measure luminescence assay technologies.

ViewLux Ultra HTS Microplate Imager

## MicroBeta² and TopCount Liquid Scintillation and Luminescence Counters

The MicroBeta² and TopCount are the most popular scintillation and luminescence counters in the world for low and medium throughput applications. They are ideal for flash luminescence applications such as aequorin/Ca²⁺ measurement, dual-label reporter gene assays and traditional GPCR filtration assays or scintillation proximity assays (SPAs).

If your applications require flash luminescence, choose MicroBeta² LumiJET with a choice of single- or dual-channel injectors. Run dual aequorin (agonist and antagonist) screens with no crosstalk between wells for improved data accuracy and assay performance. And with 1-, 2-, 6- or 12-detector configurations, multiple detectors can be used simultaneously to maximize your throughput in formats up to 384-well plates.

All offer linear responses in excess of 20 million CPS and backgrounds below 100 CPS. Temperature control features guarantee the optimum counting conditions for luminescence assays.

## WIZARD² Automatic Gamma Counter

Offering superior counting performance with gamma-emitting samples, the WIZARD² is used for radiometric detection in labs around the world. Featuring Windows® XP software, touch-screen operation, easy networking capability and USB ports for simple data transfer, the WIZARD² Automatic Gamma Counter's user-friendly interface system includes a suite of technology advancements for academic, nuclear medicine and pharmaceutical researchers who conduct radiometric immunoassays (RIAs), chromium release studies and positron emission tomography (PET) research among other gamma radionuclide applications.

TopCount

MicroBeta²

Don't forget, PerkinElmer has cocktails and vials that were designed for our radiometric instruments. To find the best cocktails and vials for your application, visit www.perkinelmer.com/cocktailselector and use our online cocktails and vials selector tool.

### i-Carb Liquid Scintillation Analyzers

The Tri-Carb family of liquid scintillation analyzers (LSA) are benchtop instruments offering the most versatile and sensitive analyzers for detecting small amounts of alpha, beta and gamma radioactivity. Designed for convenient networking, data reduction and data storage, the Tri-Carb family of LSAs offers unmatched flexibility for a variety of applications. A barcode reader option is available for automated sample tracking and the QuantaSmart® instrument and data reduction software includes an enhanced security option for the Tri-Carb 2910TR, 3110TR and 3180TR/SL models.

### JANUS Automated Workstation

From compound management and sample preparation to downstream applications for drug discovery, molecular biology and clinical research, we provide innovative solutions for your automated liquid handling needs. Exceptionally easy to use and flexible to grow with your requirements, the JANUS Automated Workstation is easily integrated with our multilabel detection instruments and diverse portfolio of reagents and kits.

Scale from 96- to 384-well plates to improve your assay throughput and eliminate manual errors. And, with multiple pipetting arms and precision dispensing, you won't compromise your assay sensitivity.

Need a more specialized automation solution? Our Integration Solutions Team stands ready to work with you to develop a custom solution that fits your needs.



JANUS Automated Workstation

### Opera, Opera LX and Operetta: high resolution, high speed, high content screening

The Opera is the premier confocal microplate imaging reader for simultaneous high-speed and high-resolution screening. Point scan spinning-disc confocal imaging and water immersion lenses generate high resolution, while high speed is attained by high-speed autofocusing, simultaneous multicolor image acquisition and multicore parallel data processing. In addition, the Opera is well suited for live cell applications due to very low photo bleaching inherent to the spinning-disc confocal approach. Environmental control and liquid handling can be added.

The Opera LX is an introductory system using the same imaging technology as the Opera. Sequential three-color imaging plus optional non-confocal UV imaging, optional environmental control and liquid handling makes this system almost as flexible and powerful as the full-blown Opera. Both instruments include full Acapella image analysis software including the cellular assay library for online image analysis.

The Operetta is an entry-level instrument ideal as a starter instrument into high content screening. Equipped with a wide variety of fluorescence excitation, emission, brightfield and magnification options, high-speed autofocusing plus a confocal unit for background suppression, it is suited to a broad range of image-based assays for receptor activation and signaling pathways. The included Harmony® image analysis software provides a large number of ready-made applications such as receptor internalization/endocytosis, pit and vesicle formation or translocation.

Opera High Content Screening System

Typical applications are secondary screening and follow-up testing with physiologically relevant readout, phenotypic cell assays and RNAi screening at sub-cellular resolution employing live or fixed cell samples.

### cell::explorer Automated HCS Platform

To complement the speed and high-resolution imaging capabilities of the Opera and Operetta confocal readers, cell::explorer™ is the only high content screening platform dedicated to complete automation. With robotic plate handling capabilities, the cell::explorer provides true walk-away automation of your cellular screening applications such as primary and secondary screening, RNAi and other compound profiling techniques, without compromising your data quality. With a robust and flexible design, cell::explorer easily supports our portfolio of GPCRs and integrates your choice of microplate reader while dramatically reducing well-to-well variances and improving the handling of your live cells. The combination of our proven expertise and ability to integrate additional instruments makes cell::explorer the premier platform for your cellular screening applications.

# BETTER
## MICROPLATES
# BETTER
# RESULTS

**Precision microplates for every need**

Better microplates yield better results. PerkinElmer microplates were designed with both the assay and the instrument in mind for superior screening performance. Miniaturization has never been easier with our patented 1536-well plate. It's the same size as 96- and 384-well plates, so no instrument or software automation adjustments are necessary. Along with a standard footprint, our 1536-well plate meets the most rigorous performance standards so you can screen with confidence.

No matter the type, size, color or detection technology, plate reader or automated workstation, PerkinElmer offers an extensive selection of high-quality, application-focused microplates to meet the most demanding process needs. Special coating, packaging and barcoding services are also available.

PerkinElmer offers a wide selection of microplates for every application (Top: 96-, 384-, 1536-well OptiPlate; Bottom: 384-well ViewPlate®).

## Selection Criteria for Microplates

| Product | Application | Format | Assay Platform | Application |
|---|---|---|---|---|
| OptiPlate | Available in black and white. White polystyrene provides excellent light reflection with highest efficiency and low background for luminescence assays. Black plates can be used with fluorescence detection technologies. | 24-, 96-, 384-, 1536-well | Alpha Technologies (AlphaScreen® SureFire® and cAMP), AequoScreen, LANCE, Lites, SPA | cAMP, calcium flux, reporter gene, phospho-ERK, receptor binding |
| AlphaPlate | Designed specifically for Alpha Technology assays, this light grey plate results in less crosstalk – up to 17 times lower in the 1536-well format | 384- and 1536-well, also shallow 384 | Alpha Technologies | cAMP, phospho-ERK |
| ProxiPlate | Available in black and white. Increased signal with shallow well design. | 96-, 384-well | Alpha Technologies, LANCE, Lites, SPA | cAMP, reporter gene, phospho-ERK, receptor binding |
| 1/2 AreaPlate | Black or white plates are the same size and well depth as conventional plates with 1/2 the area, 180 µL per well maximum volume | 96-well | Alpha Technologies, LANCE | cAMP, phospho-ERK |
| CulturPlate | Available in black and white. Optimal for cell-based applications providing sterile, tissue-culture treated environment. | 24-, 96-, 384-, 1536-well | Alpha Technologies, AequoScreen, LANCE, Lites | cAMP, calcium flux, reporter gene, phospho-ERK |
| DELFIA microplates | Includes clear and yellow plates, which provide low auto-fluorescence | 96-Stripwell™ format and 384-well white | DELFIA | Receptor binding |
| FlashPlate | Scintillating coated microplates in either basic format without coating or plus format with coating (streptavidin, wheat germ agglutinin, and others) | 96- and 384-well; custom options available | Radioligand binding | Receptor binding, GTPγS |
| CytoStar-T | Sterile, tissue culture-treated scintillating microplates that are designed for non-invasive live cell assays. The scintillant is integral to the base plate. | 96- and 384-well; custom coating options available | Live cell-based assays using SPA technology | SPA-based studies for metabolism; radioligand binding; drug uptake and metabolic turnover; signal transduction |
| UniFilter filter plate | Designed for ligand binding assays. UniFilter is supplied with either GF/B or GF/C membrane. | 96-well | Radioligand binding | Receptor binding, GTPγS |
| CellCarrier™ | High-quality black, treated, clear bottomed plates designed specifically for Opera and Operetta HCS systems | 96-, 384- and 1536-well | Imaging | Pathway analysis |
| PDL/collagen-coated CellCarrier plates | Black clear bottomed plates for cell adhesion and growth | 384- and 1536-well | Imaging | Pathway analysis |
| ViewPlate | Black or white clear bottomed plates for HCS, cell imaging applications and bottom reading | 96-, 384- and 1536-well | Imaging, AequoScreen, cell culture | Luminescence/fluorescence calcium flux, imaging, cell culture |
| PDL/collagen-coated ViewPlates | Black clear bottomed plates for cell adhesion and growth | 96-, 384- and 1536-well | Imaging, AequoScreen, cell culture | Luminescence/fluorescence calcium flux, imaging, cell culture |
| SpectraPlate™ | Clear microplates for ELISA and cell culture | 96-, 384-well, 384-shallow and 1536-well | Cell culture | |

Custom coatings and barcoding service available upon request

## Microplate Quick Reference Guide by Detection Method

| Detection Method | Application | Assay Type |
|---|---|---|
| **Luminescence** | Assays | Alpha Technologies (AlphaLISA®, AlphaScreen, AlphaScreen® *SureFire*®) |
| | | britelite plus, neolite, steadylite plus |
| | | AequoZen and AequoScreen (Aequorin), PhotoScreen (Photina®) |
| **Fluorescence** | Assays | LANCE, LANCE *Ultra* |
| | | DELFIA |
| | Confocal Imaging | |
| **Radiometric** | Filtration Assays | Receptor Binding, Cell Harvesting, ³H-Thymidine, DNA Binding/Hybrid |
| | Isotopic Assays | Solid-phase Radiobinding, Scintillation Proximity Assays (SPA) |
| | | Scintillation Proximity Assays (Bead-based SPA) |

**Visit www.perkinelmer.com/microplates to place an order or find catalog numbers.**

| PerkinElmer Instrument | Recommended Microplate | Wells/Plate |
|---|---|---|
| EnVision with Alpha option<br>EnSpire with Alpha option | AlphaPlate<br>CulturPlate<br>OptiPlate<br>ProxiPlate<br>1/2 AreaPlate | 384, 1536<br>24, 96, 384, 1536<br>24, 96, 384, 1536<br>96, 384<br>96 |
| EnVision, EnSpire , VICTOR *X*,<br>ViewLux, TopCount and MicroBeta[2] | CulturPlate<br>OptiPlate<br>ViewPlate | 24, 96, 384, 1536<br>24, 96, 384, 1536<br>96, 384, 1536 |
| EnVision with injectors, EnSpire with<br>injectors, VICTOR *X* with injectors,<br>MicroBeta[2] LumiJET | CulturPlate<br>OptiPlate<br>ViewPlate | 24, 96, 384, 1536<br>24, 96, 384, 1536<br>96, 384, 1536 |
| EnVision, VICTOR *X*, ViewLux | CulturPlate<br>OptiPlate<br>ProxiPlate<br>1/2 AreaPlate | 24, 96, 384, 1536<br>24, 96, 384, 1536<br>96, 384<br>96 |
| EnVision, VICTOR *X*, ViewLux | DELFIA yellow plate<br>DELFIA white plate<br>DELFIA clear plate<br>OptiPlate | 96<br>384<br>8 x 12 strips<br>24, 96, 384, 1536 |
| Opera, Operetta | CellCarrier plate<br>ViewPlate | 96, 384, 1536<br>96, 384, 1536 |
| FilterMate™ Harvester, TopCount, MicroBeta[2] | Harvest plate<br>OmniFilter plate<br>UniFilter plate | 96<br>96<br>24, 96 |
| MicroBeta[2], TopCount | Cytostar-T plate<br>FlashPlate<br>ScintiPlate® | 96, 384<br>96, 384<br>96 |
| MicroBeta[2], TopCount | OptiPlate<br>ProxiPlate | 24, 96, 384<br>96, 384 |
| MicroBeta[2] | IsoPlate<br>VisiPlate™ | 96<br>24 |

| Receptor type | Subtype | Product Type | Host Cell | Binding | GTPγS | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| **GPCRs** | | | | | | | | | | |
| 5-Hydroxytryptamine | 5-HT$_{1A}$ | AequoScreen* | CHO-K1 | X | | | | X | | ES-310-A |
| | | AequoZen✤ | CHO-K1 | | | | | X | | ES-310-AF |
| | | ValiScreen† | CHO-K1 | X | | | | | | MCL-508 |
| | | | | X | X | X | | | | ES-310-C |
| | | cAMPZen▼ | CHO-K1 | | | X | | | | ES-310-CF |
| | | Membrane preparation | CHO-K1 | X | | | | | | 6110501400UA |
| | | | HEK293 EBNA | X | | | | | | RBHS1AM400UA |
| | 5-HT$_{2A}$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-313-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-313-AF |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-313-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-313-M400UA |
| | 5-HT$_{2B}$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-314-A |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-314-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-314-M400UA |
| | 5-HT$_{2C}$ non edited isoform | AequoScreen | CHO-K1 | X | | | | X | X | ES-318-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-318-AF |
| | | ValiScreen | 1321N1 | X | | | X | | | ES-318-C |
| | | Membrane preparation | HEK293 | X | | | | | | 6110548400UA |
| | | | 1321N1 | X | | | | | | ES-318-M400UA |
| | 5-HT$_{2C}$ edited isoform | AequoScreen | CHO-K1 | X | | | | X | X | ES-315-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-315-AF |
| | | ValiScreen | CHO-K1 | X | | | X | | X | ES-315-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-315-M400UA |
| | 5-HT$_{3A}$ (ligand-gated ion channel) see Ion Channels | | | | | | | | | |
| | 5-HT$_{5A}$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-401-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-401-AF |
| | | ValiScreen | HEK293 | X | | | | | | MCL-509 |
| | | | CHO-K1 | X | | | | | | ES-401-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | RBHS5AM400UA |
| | | | | X | | | | | | ES-401-M400UA |
| | 5-HT$_{6}$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-316-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-316-AF |
| | | ValiScreen | CHO-K1/1321N1 | X | | X | | | | ES-316-C |
| | | cAMPZen | 1321N1 | | | X | | | | ES-316-CF |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-316-M400UA |
| | | | HEK293 | X | | | | | | RBHS6M400UA |
| | 5-HT$_{6}$ (Rat) | Membrane preparation | HEK293 | X | | | | | | RBRS6M400UA |
| | 5-HT$_{7}$ | Membrane preparation | CHO-K1 | X | | | | | | 6110512400UA |
| | 5-HT$_{7}$ (Rat) | Membrane preparation | HEK293 | X | | | | | | RBRS7M400UA |
| Acetylcholine (Muscarinic) | M$_1$ | AequoScreen | CHO-K1 | X | | | | X | | ES-210-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-210-AF |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-210-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | RBHM1M400UA |
| | M$_2$ | AequoScreen | CHO-K1 | X | | | | X | | ES-211-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-211-AF |
| | | ValiScreen | CHO-K1 | X | X | | | | | ES-211-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | RBHM2M400UA |

| Receptor type | Subtype | Product Type | Host Cell | Validated for | | | | | | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Binding | GTP$\gamma$S | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | |
| | $M_3$ | AequoScreen | CHO-K1 | X | | | | X | | ES-212-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-212-AF |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-212-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | RBHM3M400UA |
| | $M_4$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-213-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-213-AF |
| | | ValiScreen | CHO-K1 | X | X | | | | | ES-213-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | RBHM4M400UA |
| | $M_5$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-214-A |
| | | AequoZen | CHO-K1 | X | | | | X | | ES-214-AF |
| | | ValiScreen | CHO-K1 | X | | | X | | | ES-214-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | RBHM5M400UA |
| Adenosine | $A_1$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-010-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-010-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-010-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-010-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-010-M400UA |
| | $A_1$ (Rat) | Membrane preparation | CHO-K1 | X | | | | | | 6110511400UA |
| | | | Sf9 | X | | | | | | 6110120400UA |
| | $A_{2A}$ | AequoScreen | HEK293 | X | | | | X | X | ES-011-A |
| | | AequoZen | HEK293 | | | | | X | | ES-011-AF |
| | | ValiScreen | HEK293 | X | | X | | | | ES-011-C |
| | | cAMPZen | HEK293 | | | X | | | | ES-011-CF |
| | | Membrane preparation | HEK293 | X | | | | | | RBHA2AM400UA |
| | $A_{2A}$ (Rat) | ValiScreen | CHO-K1 | X | | | | | | MCL-511 |
| | $A_{2B}$ | AequoScreen | HEK293 | | | | | X | | ES-013-A |
| | | ValiScreen | HEK293 | X | | X | | | | ES-013-C |
| | | | | X | | | | | | RBHA2BC |
| | | cAMPZen | HEK293 | | | X | | | | ES-013-CF |
| | | Membrane preparation | HEK293 | X | | | | | | ES-013-M400UA |
| | $A_3$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-012-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-012-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-012-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-012-CF |
| | | PhotoScreen♦ | CHO-K1 | | | | | X | | AX-001-PCF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-012-M400UA |
| | $A_3$ (Rat) | ValiScreen | CHO-K1 | X | | | | | | MCL-512 |
| | | Membrane preparation | HEK293 EBNA | X | | | | | | RBRA3M400UA |
| Adrenoceptors | $\alpha_{1A}$ | AequoScreen | CHO-K1 | X | | | | X | | ES-036-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-036-AF |
| | | ValiScreen | CHO-K1 | X | | | X | | | ES-036-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-036-M400UA |
| | $\alpha_{1B}$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-037-A |
| | | $\alpha_{1D}$ AequoScreen | CHO-K1 | X | | | | X | | ES-038-A |

* AequoScreen double recombinant photoprotein cell line
❖ AequoZen double recombinant photoprotein frozen cell line
† ValiScreen stable recombinant cell line

▼ cAMPZen stable recombinant frozen cell line
♦ PhotoScreen® double recombinant photoprotein cell line

| Receptor type | Subtype | Product Type | Host Cell | Binding | GTPγS | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | $\alpha_{2A}$ | AequoScreen* | CHO-K1 | X | | | | X | X | ES-030-A |
| | | AequoZen❖ | CHO-K1 | | | | | X | | ES-030-AF |
| | | ValiScreen† | MCHO-K1 | X | X | X | | | | ES-030-C |
| | | cAMPZen▼ | CHO-K1 | | | X | | | | ES-030-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-030-M400UA |
| | | | Sf9 | X | | | | | | 6110113400UA |
| | $\alpha_{2B}$ | AequoScreen | CHO-K1 | X | | | | X | | ES-031-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-031-AF |
| | | ValiScreen | CHO-K1 | X | X | | | | | ES-031-C |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-031-M400UA |
| | $\alpha_{2C}$ | AequoScreen | CHO-K1 | X | | | | X | | ES-032-A |
| | | ValiScreen | CHO-K1 | X | | X | | | | ES-032-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-032-CF |
| | | Membrane preparation | Sf9 | X | | | | | | 6110114400UA |
| | | | CHO-K1 | X | | | | | | ES-032-M400UA |
| | $\beta_1$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-033-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-033-AF |
| | | ValiScreen | CHO-K1 | X | | X | | | | ES-033-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-033-CF |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-033-M400UA |
| | | | Sf9 | X | | | | | | 6110110400UA |
| | $\beta_2$ | ValiScreen | CHO-K1 | X | | X | | | | ES-034-C |
| | | | HEK293 EBNA | X | | | | | | RBHBE2C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-034-CF |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-034-M400UA |
| | | | Sf9 | X | | | | | | 6110106400UA |
| | | Membrane preparation | HEK293 | X | | | | | | RBHBE2M400UA |
| | $\beta_3$ | ValiScreen | CHO-K1 | X | | X | | | | ES-035-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-035-CF |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-035-M400UA |
| | | Non-recombinant, membrane preparation | SK-N-MC | X | | | | | | RBHBE3M400UA |
| Anaphylatoxin | C3a | AequoScreen | CHO-K1 | X | | | | X | | ES-730-A |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-730-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-730-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-730-M400UA |
| | C5a | AequoScreen | CHO-K1 | X | | | | X | | ES-731-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-731-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-731-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-731-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-731-M400UA |
| | | | | X | | | | | | 6110526400UA |
| Angiotensin | $AT_1$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-072-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-072-AF |
| | | ValiScreen | CHO-K1 | X | | | X | | | ES-072-C |
| | | Membrane preparation | Sf9 | X | | | | | | 6110121400UA |
| | | | CHO-K1 | X | | | | | | ES-072-M400UA |
| | $AT_2$ | ValiScreen | CHO-K1 | X | | | | | | ES-070-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-070-M400UA |

| Receptor type | Subtype | Product Type | Host Cell | Binding | GTPγS | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | AT$_2$ (Mouse) | ValiScreen | CHO-K1 | X | | | | | | ES-071-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-071-M400UA |
| Apelin | APJ | AequoScreen | CHO-K1 | | | | | X | | ES-460-A |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-460-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-460-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-460-M400UA |
| Beta Alanine | MRGPRD, TGR7 | AequoScreen | CHO-K1 | | | | | X | X | ES-741-A |
| Bombesin | BB$_1$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-581-A |
| | | Membrane preparation | CHO-K1 | X | | | | | | RBHBS1M400UA |
| | BB$_2$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-582-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-582-AF |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-582-C |
| | | Membrane preparation | HEK293 | X | | | | | | RBHBS2M400UA |
| | | | CHO-K1 | X | | | | | | ES-582-M400UA |
| | BB$_3$ | AequoScreen | CHO-K1 | | | | | X | | ES-580-A |
| | | Membrane preparation | Balb 3T3 | X | | | | | | RBHBS3M400UA |
| Bradykinin | B$_1$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-091-A |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-091-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-091-M400UA |
| | B$_1$ (Rat) | AequoScreen | CHO-K1 | | | | | X | | ES-092-A |
| | B$_2$ | AequoScreen | CHO-K1 | X | | | | X | | ES-090-A |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-090-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-090-M400UA |
| Calcitonin | CGRP$_1$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-420-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-420-AF |
| | | ValiScreen | CHO-K1 | X | | X | | | | ES-420-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-420-CF |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-420-M400UA |
| | | | Sf9 | X | | | | | | 6110135400UA |
| | | Non-recombinant, membrane preparation | SK-N-MC | X | | | | | | RBHGRPM400UA |
| | AM$_1$ | Membrane preparation | Sf9 | X | | | | | | 6110136400UA |
| | AM$_2$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-430-A |
| | | ValiScreen | CHO-K1 | X | | X | | | | ES-430-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-430-CF |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-430-M400UA |
| Cannabinoid | CB$_1$ | AequoScreen | CHO-K1 | | | | | X | X | ES-110-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-110-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-110-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-110-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-110-M400UA |
| | | | Sf9 | X | | | | | | 6110129400UA |
| | | | HEK293 EBNA | X | | | | | | RBHCB1M400UA |

**Validated for**

* AequoScreen double recombinant photoprotein cell line
❖ AequoZen double recombinant photoprotein frozen cell line
† ValiScreen stable recombinant cell line
▼ cAMPZen stable recombinant frozen cell line
◆ PhotoScreen® double recombinant photoprotein cell line

| Receptor type | Subtype | Product Type | Host Cell | Binding | GTPγS | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | CB₂ | ValiScreen† | CHO-K1 | X | X | X | | | | ES-111-C |
| | | | HEK293 | X | | | | | | RBXCB2C |
| | | cAMPZen▼ | CHO-K1 | | | X | | | | ES-111-CF |
| | | Membrane preparation | Sf9 | X | | | | | | 6110130400UA |
| | | | HEK293 EBNA | X | | | | | | RBXCB2M400UA |
| | | | CHO-K1 | X | X | | | | | ES-111-M400UA |
| Chemerin | GPR1 | AequoScreen* | CHO-K1 | | | | | X | | ES-661-A |
| | | AequoZen✤ | CHO-K1 | | | | | X | | ES-661-AF |
| Chemokine | CCR1 | AequoZen | HEK293 | X | | | | | | RBHCC1C |
| | | ValiScreen | CHO-K1 | X | | X | | | | ES-132-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-132-CF |
| | | Membrane preparation | HEK293 | X | | | | | | RBHCC1M400UA |
| | CCR2b | AequoScreen | CHO-K1 | X | | | | X | X | ES-133-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-133-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-133-C |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-133-M400UA |
| | | | HEK293 | X | | | | | | 6110550400UA |
| | CCR3 | AequoScreen | CHO-K1 | | | | | X | | ES-138-A |
| | | AequoZen | CHO-K1 | X | | | | X | | ES-138-AF |
| | | ValiScreen | K562 | X | | X | | | | ES-138-C |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-138-M400UA |
| | CCR6 | AequoScreen | CHO-K1 | X | | | | X | X | ES-139-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-139-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-139-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-139-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-139-M400UA |
| | CCR7 | AequoScreen | CHO-K1 | X | | | | X | X | ES-140-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-140-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-140-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-140-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-140-M400UA |
| | CCR8 | AequoScreen | CHO-K1 | | | | | X | | ES-136-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-136-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-136-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-136-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-136-M400UA |
| | CCR9a | AequoScreen | CHO-K1 | | | | | X | | ES-146-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-146-AF |
| | CCR10 | AequoScreen | CHO-K1 | | | | | X | | ES-143-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-143-AF |
| | CX₃CR1 | AequoScreen | CHO-K1 | X | | | | X | X | ES-137-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-137-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-137-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-137-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-137-M400UA |
| | CXCR2 | AequoScreen | CHO-K1 | X | | | | X | X | ES-145-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-145-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-145-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-145-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-145-M400UA |
| | | | Sf9 | X | | | | | | 6110132400UA |

| Receptor type | Subtype | Product Type | Host Cell | Binding | GTP$\gamma$S | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | **Validated for** | | | | |
| | CXCR3 | AequoScreen | CHO-K1 | X | | | | X | X | ES-142-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-142-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-142-C |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-142-M400UA |
| | CXCR6 | AequoScreen | CHO-K1 | | | | | X | | ES-720-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-720-AF |
| | | ValiScreen | CHO-K1 | | X | X | | | | ES-720-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-720-CF |
| | | Membrane preparation | CHO-K1 | | X | | | | | ES-720-M400UA |
| | | | HEK293 | X | | | | | | RBHCX6M400UA |
| | XCR1 | AequoScreen | CHO-K1 | | | | | X | | ES-148-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-148-AF |
| | | ValiScreen | CHO-K1 | | X | X | | | | ES-148-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-148-CF |
| | | Membrane preparation | CHO-K1 | | X | | | | | ES-148-M400UA |
| Cholecystokinin | CCK$_1$ | AequoScreen | 1321N1 | X | | | | X | X | ES-530-A |
| | | AequoZen | 1321N1 | | | | | X | | ES-530-AF |
| | | ValiScreen | 1321N1 | X | | | X | | | ES-530-C |
| | | Membrane preparation | 1321N1 | X | | | | | | ES-530-M400UA |
| | | | Sf9 | X | | | | | | 6110125400UA |
| | | | NIH-3T3 | X | | | | | | 6110508400UA |
| | CCK$_2$ | AequoScreen | 1321N1 | X | | | | X | X | ES-531-A |
| | | AequoZen | 1321N1 | | | | | X | | ES-531-AF |
| | | ValiScreen | 1321N1 | X | | | | | X | ES-531-C |
| | | Membrane preparation | 1321N1 | X | | | | | | ES-531-M400UA |
| | | | HEK293 | X | | | | | | RBHCKBM400UA |
| Corticotropin-Releasing Factor | CRF$_1$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-152-A |
| | | ValiScreen | CHO-K1 | X | | X | | | | ES-152-C |
| | | Membrane preparation | HEK293 | X | | | | | | RBHCRF1M400UA |
| | | | CHO-K1 | X | | | | | | ES-152-M400UA |
| Dopamine | D$_1$ | ValiScreen | CH4CI | | | | | | | MCL-505 |
| | | | L Cells | | | | | | | MCL-506 |
| | | | CHO-K1 | X | | X | | | | ES-172-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-172-CF |
| | | Membrane preparation | L Cells | X | | | | | | 6110513400UA |
| | | | CHO-K1 | X | | | | | | ES-172-M400UA |
| | D$_{2L}$ | AequoScreen | CHO-K1 | | | | | X | | ES-171-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-171-AF |
| | | Membrane preparation | Sf9 | X | | | | | | 6110137400UA |
| | D$_{2S}$ | Membrane preparation | CHO-K1 | X | | | | | | RBHD2CM400UA |
| | D$_3$ | ValiScreen† | CHO-K1 | X | X | X | | | | ES-173-C |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-173-M400UA |
| | D$_3$ (Rat) | Membrane preparation | Sf9 | X | | | | | | 6110139400UA |
| | D$_4$ (Rat) | ValiScreen | CHO-K1 | X | | X | | | | ES-170-C |

* AequoScreen double recombinant photoprotein cell line   ▾ cAMPZen stable recombinant frozen cell line
❖ AequoZen double recombinant photoprotein frozen cell line   ◆ PhotoScreen® double recombinant photoprotein cell line
† ValiScreen stable recombinant cell line

| Receptor type | Subtype | Product Type | Host Cell | Binding | GTPγS | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | $D_{4.2}$ | Membrane preparation | Sf9 | X | | | | | | 6110112400UA |
| | | | CHO-K1 | X | | | | | | RBHD42M400UA |
| | $D_{4.4}$ | ValiScreen† | CHO-K1 | X | | | | | | MCL-507 |
| | | Membrane preparation | Sf9 | X | | | | | | 6110122400UA |
| | | | CHO-K1 | X | | | | | | RBHD44M400UA |
| | $D_{4.7}$ | Membrane preparation | Sf9 | X | | | | | | 6110123400UA |
| | | | CHO-K1 | X | | | | | | RBHD47M400UA |
| Endothelin | $ET_A$ | AequoScreen* | CHO-K1 | X | | | | X | X | ES-320-A |
| | | AequoZen❖ | CHO-K1 | | | | | X | | ES-320-AF |
| | | ValiScreen | CHO-K1 | | | | | | X | ES-320-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-320-M400UA |
| | $ET_B$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-321-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-321-AF |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-321-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-321-M400UA |
| Formyl Peptide | FPR2 (FPRL1) | AequoScreen | CHO-K1 | X | | | | X | X | ES-610-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-610-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | X | ES-610-C |
| | | cAMPZen▼ | CHO-K1 | | | X | | | | ES-610-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-610-M400UA |
| Free Fatty Acid | FFA1 (GPR40) | AequoScreen | CHO-K1 | | | | | X | | ES-652-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-652-AF |
| | | ValiScreen | 1321N1 | | | | X | | | ES-652-C |
| | FFA (GPR120) | AequoScreen | CHO-K1 | | | | | X | | ES-800-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-800-AF |
| $GABA_B$ | $GABA_{B1a}$ | Membrane preparation | CHO-K1 | X | | | | | | 6110545400UA |
| | | | HEK293 | X | | | | | | 6110560400UA |
| | $GABA_{B1b}$ | Membrane preparation | CHO-K1 | X | | | | | | 6110546400UA |
| | | | CHO-K1 | X | | | | | | 6110557400UA |
| | $GABA_{B1a/B2}$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-500-A |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-500-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-500-CF |
| | | Membrane preparation | HEK293 | X | | | | | | 6110559400UA |
| | | | CHO-K1 | X | X | | | | | ES-500-M400UA |
| Galanin | $GAL_1$ | AequoScreen | CHO-K1 | X | | | | X | | ES-510-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-510-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-510-C |
| | | ValiScreen | HEK293 EBNA | X | | | | | | MCL-513 |
| | | | HEK293 EBNA | X | | | | | | RBXGL1C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-510-CF |
| | | Membrane preparation | HEK293 EBNA | X | | | | | | 6110537400UA |
| | | | CHO-K1 | X | X | | | | | ES-510-M400UA |
| | $GAL_2$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-511-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-511-AF |
| | | ValiScreen | CHO-K1 | X | X | | X | | | ES-511-C |
| | | PhotoScreen◆ Photina double-transfected cell line | CHO-K1 | | | | | X | | AX-008-PCF |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-511-M400UA |

| Receptor type | Subtype | Product Type | Host Cell | Binding | GTPγS | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| Ghrelin | ghrelin | AequoScreen | CHO-K1 | | | | | X | X | ES-410-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-410-AF |
| | | ValiScreen | CHO-K1 | X | | | X | | X | ES-410-C |
| | | Membrane preparation | HEK293 | X | | | | | | RBHGHSM400UA |
| | | | CHO-K1 | X | | | | | | ES-410-M400UA |
| Glucagon | glucagon | ValiScreen | 1321N1 | X | | X | | | | ES-710-C |
| | | Membrane preparation | 1321N1 | X | | | | | | ES-710-M400UA |
| | | AequoScreen | CHO-K1 | | | | | X | | ES-710-A |
| | GIP | Membrane preparation | HEK293 | X | | | | | | RBHGIPM400UA |
| | GLP-2 | ValiScreen | 1321N1 | | | X | | | | ES-711-C |
| | | cAMPZen | 1321N1 | | | X | | | | ES-711-CF |
| | Secretin | AequoScreen | CHO-K1 | | | | | X | | ES-712-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-712-AF |
| Glutamate | mGlu$_{5A}$ | Membrane preparation | CHO-K1 | X | | | | | | ES-555-M400UA |
| | mGlu$_7$ | ValiScreen | CHO-K1 | | | X | | | | ES-553-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-553-CF |
| Glycoprotein Hormone | TSH | AequoScreen | CHO-K1 | | | | | X | | ES-790-A |
| Gonadotropin-releasing Hormone | GnRH | AequoScreen | CHO-K1 | X | | | | X | | ES-600-A |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-600-M400UA |
| GPR | SUCNR1 (Succinate, GPR91) | AequoScreen | CHO-K1 | | | | | X | | ES-744-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-744-AF |
| | GPR120 | AequoScreen | CHO-K1 | | | | | X | | ES-800-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-800-AF |
| | OXGR1 (GPR99, Citric acid cycle) | AequoScreen | CHO-K1 | | | | | X | | ES-743-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-743-AF |
| Histamine | H$_1$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-390-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-390-AF |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-390-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-390-M400UA |
| | H$_2$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-391-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-391-AF |
| | | ValiScreen | CHO-K1 | X | | X | | | | ES-391-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-391-CF |
| | | Membrane preparation | HEK293 | X | | | | | | 6110565400UA |
| | | | CHO-K1 | X | | | | | | ES-391-M400UA |
| | H$_3$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-392-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-392-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-392-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-392-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-392-M400UA |
| | H$_4$ | AequoScreen | CHO-K1 | X | | | | X | | ES-393-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-393-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-393-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-393-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-393-M400UA |

* AequoScreen double recombinant photoprotein cell line
❖ AequoZen double recombinant photoprotein frozen cell line
† ValiScreen stable recombinant cell line
▾ cAMPZen stable recombinant frozen cell line
◆ PhotoScreen® double recombinant photoprotein cell line

| Receptor type | Subtype | Product Type | Host Cell | Binding | GTPγS | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| KiSS1 (Metastin) | KISS1 (GPR54) | AequoScreen* | CHO-K1 | | | | | X | X | ES-630-A |
| | | ValiScreen† | MDA-MB-435S | X | | | | | X | ES-630-C |
| | | Membrane preparation | MDA-MB-435S | X | | | | | | ES-630-M400UA |
| | | | CHO-K1 | X | | | | | | RBHMTSM400UA |
| Leukotriene | BLT$_1$ (LTB4R1) | AequoScreen | CHO-K1 | X | | | | X | X | ES-340-A |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-340-C |
| | | cAMPZen▼ | CHO-K1 | | | X | | | | ES-340-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-340-M400UA |
| | CysLT$_1$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-470-A |
| | | ValiScreen | CHO-K1 | X | | | X | | X | ES-470-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-470-M400UA |
| | OXE (HM74-like) | AequoScreen | CHO-K1 | | | | | X | | ES-640-A |
| Lysophospholipid | S$_1$P$_2$ (EDG5) | AequoScreen | CHO-K1 | | | | | X | | ES-594-A |
| | | AequoZen❖ | CHO-K1 | | | | | X | | ES-594-AF |
| | S$_1$P$_4$ (EDG6) | AequoScreen | CHO-K1 | | | | | X | X | ES-592-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-592-AF |
| | S$_1$P$_5$ (EDG8) | AequoScreen | CHO-K1 | | | | | X | X | ES-593-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-593-AF |
| Mas related | MrgB3 (Rat) | AequoScreen | CHO-K1 | | | | | X | | ES-745-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-745-AF |
| | MrgX1 | AequoScreen | CHO-K1 | | | | | X | X | ES-740-A |
| | MrgX2 | AequoScreen | CHO-K1 | | | | | X | | ES-742-A |
| Melanin-Concentrating Hormone | MCH$_1$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-370-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-370-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-370-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-370-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-370-M400UA |
| | MCH$_2$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-371-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-371-AF |
| | | ValiScreen | 1321N1 | X | | | | | X | ES-372-C |
| | | Membrane preparation | 1321N1 | X | | | | | | ES-372-M400UA |
| Melanocortin | MC$_1$ | ValiScreen | CHO-K1 | X | | X | | | | ES-195-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-195-CF |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-195-M400UA |
| | MC$_3$ | ValiScreen | CHO-K1 | X | | X | | | | ES-193-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-193-CF |
| | | Membrane preparation | HEK293 | X | | | | | | RBXMC3M400UA |
| | | | CHO-K1 | X | | | | | | ES-193-M400UA |
| | MC$_3$ (Mouse) | ValiScreen | CHO-K1 | X | | X | | | | ES-190-C |
| | | cAMPZen▼ | CHO-K1 | | | X | | | | ES-190-CF |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-190-M400UA |
| | MC$_4$ | AequoScreen | CHO-K1 | | | | | X | X | ES-191-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-191-AF |
| | | ValiScreen | CHO-K1 | X | | X | | | | ES-191-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-191-CF |
| | | Membrane preparation | HEK293 | X | | | | | | RBHMC4M400UA |
| | | | CHO-K1 | X | | | | | | ES-191-M400UA |

| Receptor type | Subtype | Product Type | Host Cell | Validated for | | | | | | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Binding | GTPγS | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | |
| | MC$_5$ | ValiScreen | CHO-K1 | X | | X | | | | ES-194-C |
| | | | HEK293 EBNA | X | | | | | | RBXMC5C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-194-CF |
| | | Membrane preparation | HEK293 EBNA | X | | | | | | RBXMC5M400UA |
| | | | CHO-K1 | X | | | | | | ES-194-M400UA |
| | MC$_5$ (Mouse) | ValiScreen | CHO-K1 | X | | X | | | | ES-192-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-192-CF |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-192-M400UA |
| Melatonin | MT$_1$ | AequoScreen | CHO-K1 | X | | | | X | | ES-620-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-620-AF |
| | | ValiScreen | CHO-K1 | X | X | | | | | ES-620-C |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-620-M400UA |
| | MT$_2$ | AequoScreen | CHO-K1 | X | | | | X | | ES-621-A |
| | | AequoZen | CHO-K1 | X | | | | X | | ES-621-AF |
| | | ValiScreen | CHO-K1 | X | X | | | | | ES-621-C |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-621-M400UA |
| Motilin | motilin | AequoScreen | CHO-K1 | X | | | | X | X | ES-380-A |
| | | ValiScreen | HEK293 | X | | | | | | RBHMOTC |
| | | | CHO-K1 | X | | X | | | X | ES-380-C |
| | | Membrane preparation | HEK293 | X | | | | | | RBHMOTM400UA |
| | | | CHO-K1 | X | | | | | | ES-380-M400UA |
| Muscarinic (see Acetylcholine) | | | | | | | | | | |
| Neurokinin (see Tachykinin) | | | | | | | | | | |
| Neuromedin U | NMU1 | AequoScreen | CHO-K1 | X | | | | X | X | ES-450-A |
| | | ValiScreen | CHO-K1 | X | | X | | | X | ES-450-C |
| | | Membrane preparation | HEK293 | X | | | | | | RBHNU1M400UA |
| | | | CHO-K1 | X | | | | | | ES-450-M400UA |
| | NMU2 | AequoScreen | CHO-K1 | X | | | | X | X | ES-451-A |
| | | ValiScreen | CHO-K1 | X | | X | | | X | ES-451-C |
| | | Membrane preparation | HEK293 | X | | | | | | RBHNU2M400UA |
| | | | CHO-K1 | X | | | | | | ES-451-M400UA |
| Neuropeptide S | NPS | AequoScreen | CHO-K1 | X | | | | X | X | ES-770-A |
| | | ValiScreen | CHO-K1 | X | | X | | | X | ES-770-C |
| Neuropeptide FF | NPFF1 | ValiScreen transfected cell line | CHO-K1 | X | | X | | | | ES-491-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-491-CF |
| | | Membrane preparation | CHO-DHRF(-) | X | | | | | | RBHNF1M400UA |
| | | | CHO-K1 | X | | | | | | ES-491-M400UA |
| | NPFF2 | AequoScreen | CHO-K1 | X | | | | X | X | ES-490-A |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-490-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-490-CF |
| | | Membrane preparation | CHO-K1 | X | | | | | | RBHNF2M400UA |
| Neuropeptide W/B | NPBW2 (GPR8) | Membrane preparation | HEK293 | X | | | | | | RBHGP8M400UA |

\* AequoScreen double recombinant photoprotein cell line    ▼ cAMPZen stable recombinant frozen cell line
❖ AequoZen double recombinant photoprotein frozen cell line    ◆ PhotoScreen® double recombinant photoprotein cell line
† ValiScreen stable recombinant cell line

| Receptor type | Subtype | Product Type | Host Cell | Validated for | | | | | | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Binding | GTPγS | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | |
| Neuropeptide Y | Y₁ | AequoScreen* | CHO-K1 | X | | | | X | | ES-351-A |
| | | ValiScreen† | CHO-K1 | X | | X | | | | ES-351-C |
| | | cAMPZen▼ | CHO-K1 | | | X | | | | ES-351-CF |
| | | Membrane preparation | Sf9 | X | | | | | | 6110133400UA |
| | | Non-recombinant, membrane preparation | SK-N-MC | X | | | | | | RBHNP1M400UA |
| | Y₂ | AequoScreen | CHO-K1 | X | | | | X | | ES-352-A |
| | | AequoZen✤ | CHO-K1 | | | | | X | | ES-352-AF |
| | | ValiScreen | CHO-K1 | X | | X | | | | ES-352-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-352-CF |
| | | Non-recombinant, membrane preparation | KAN-TS | X | | | | | | RBHNP2M400UA |
| Neurotensin | NTS₁ | AequoScreen | CHO-K1 | X | | | | X | X | ES-690-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-690-AF |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-690-C |
| | | | HEK293 | X | | | | | | RBXNT1C |
| | | Membrane preparation | CHO-K1 | X | | | | | | 6110518400UA |
| | | | HEK293 | X | | | | | | RBXNT1M400UA |
| | | | CHO-K1 | X | | | | | | ES-690-M400UA |
| | NTS₂ | ValiScreen | 1321N1 | X | | | | | | ES-691-C |
| | | Membrane preparation | HEK293 | X | | | | | | 6110566400UA |
| | | | 1321N1 | X | | | | | | ES-691-M400UA |
| Nicotinic | GPR109A (HM74A) | AequoScreen | CHO-K1 | X | | | | X | X | ES-760-A |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-760-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-760-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-760-M400UA |
| Opioid | delta | Membrane preparation | CHO-K1 | X | | | | | | RBHODM400UA |
| | | | HEK293 | X | | | | | | 6110549400UA |
| | delta (Mouse) | Membrane preparation | Sf9 | X | | | | | | 6110115400UA |
| | kappa | AequoScreen | CHO-K1 | X | | | | X | X | ES-541-A |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-541-C |
| | | Membrane preparation | HEK293 | X | | | | | | 6110558400UA |
| | | | CHO-K1 | X | X | | | | | ES-541-M400UA |
| | mu | AequoScreen | CHO-K1 | X | | | | X | X | ES-542-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-542-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-542-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-542-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-542-M400UA |
| | NOP (ORL1) | AequoScreen | CHO-K1 | X | | | | X | X | ES-230-A |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-230-C |
| | | | HEK293 | X | | | | | | RBHORLC |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-230-CF |
| | | Membrane preparation | CHO-K1 | X | | | | | | 6110540400UA |
| | | | HEK293 | X | | | | | | RBHORLM400UA |
| Orexin | OX₁ | AequoScreen | CHO-K1 | X | | | | X | X | ES-330-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-330-AF |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-330-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-330-M400UA |

| Receptor type | Subtype | Product Type | Host Cell | Binding | GTPγS | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | OX$_2$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-331-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-331-AF |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-331-C |
| Peptide P518 | QRFP (OX$_2$-like, GPR103) | AequoScreen | CHO-K1 | X | | | | X | X | ES-670-A |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-670-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-670-M400UA |
| | | | HEK293 | X | | | | | | RBH103M400UA |
| Prokineticin | PKR$_1$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-750-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-750-AF |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-750-M400UA |
| | PKR$_2$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-751-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-751-AF |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-751-M400UA |
| | | | HEK293 | X | | | | | | RBHPK2M400UA |
| | | ValiScreen | CHO-K1 | | | X | | | | ES-751-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-751-CF |
| Prolactin Releasing Peptide | PRRP | AequoScreen | CHO-K1 | X | | | | X | X | ES-480-A |
| | | ValiScreen | CHO-K1 | X | | | X | | | ES-480-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-480-M400UA |
| Prostanoid | DP$_1$ | AequoScreen | 1321N1 | X | | | | X | X | ES-560-A |
| | | ValiScreen | 1321N1 | X | | X | | | | ES-560-C |
| | DP$_2$ (CRTH2) | AequoScreen | CHO-K1 | X | | | | X | X | ES-561-A |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-561-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-561-CF |
| | | Membrane preparation | HEK293 | X | | | | | | RBHTH2M400UA |
| | | | CHO-K1 | X | X | | | | | ES-561-M400UA |
| | EP$_2$ | ValiScreen | HEK293 | X | | X | | | | ES-562-C |
| | | cAMPZen | HEK293 | | | X | | | | ES-562-CF |
| | | Membrane preparation | HEK293 | X | | | | | | ES-562-M400UA |
| | EP$_4$ | AequoScreen | HEK293 | X | | | | X | X | ES-563-A |
| | | ValiScreen | HEK293 | X | | X | | | | ES-563-C |
| | FP | ValiScreen | 1321N1 | X | | | | | X | ES-564-C |
| | TP | ValiScreen | HEK293 EBNA | X | | | | | | RBHTPC |
| | | Membrane preparation | HEK293 EBNA | X | | | | | | RBHTPM400UA |
| Protease-activated | PAR2 | AequoScreen | CHO-K1 | | | | | X | X | ES-780-A |
| | PAR4 | AequoScreen | CHO-K1 | | | | | X | | ES-782-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-782-AF |
| Purinergic P2Y | P2Y$_1$ | ValiScreen | 1321N1 | X | | | | | | RBHP1C |
| | P2Y$_2$ | ValiScreen | 1321N1 | | | | X | | | ES-290-C |
| | P2Y$_4$ | ValiScreen | 1321N1 | X | | | | | | RBHP4C |
| | P2Y$_6$ | ValiScreen | 1321N1 | | | | X | | | ES-292-C |
| | P2Y$_{11}$ | AequoScreen | 1321N1 | | | | | X | | ES-293-A |
| | | AequoZen | 1321N1 | | | | | X | | ES-293-AF |
| | | ValiScreen | 1321N1 | X | | | | | | RBHP11C |
| | P2Y$_{12}$ | ValiScreen | CHO-K1 | X | | X | | | | RBHP12C |

\* AequoScreen double recombinant photoprotein cell line　　▾ cAMPZen stable recombinant frozen cell line
❖ AequoZen double recombinant photoprotein frozen cell line　　◆ PhotoScreen® double recombinant photoprotein cell line
† ValiScreen stable recombinant cell line

| Receptor type | Subtype | Product Type | Host Cell | Validated for | | | | | | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Binding | GTPγS | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | |
| Relaxin | RXFP3 | AequoScreen* | CHO-K1 | | | | | X | | ES-656-A |
| | | ValiScreen† | CHO-K1 | | X | X | | | | ES-656-C |
| | | cAMPZen▼ | CHO-K1 | | | X | | | | ES-656-CF |
| | | Membrane preparation | CHO-K1 | | X | | | | | ES-656-M400UA |
| | RXFP4 | ValiScreen | CHO-K1 | | X | X | | | | ES-659-C |
| | | Membrane preparation | CHO-K1 | | X | | | | | ES-659-M400UA |
| | | AequoScreen | CHO-K1 | | | | | X | | ES-659-A |
| Serotonin (see 5-hydroxytryptamine) | | | | | | | | | | |
| Somatostatin | sst$_1$ | ValiScreen | CHO-K1 | X | X | | | | | ES-520-C |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-520-M400UA |
| | sst$_{2a}$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-521-A |
| | | AequoZen❖ | CHO-K1 | | | | | X | | ES-521-AF |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-521-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-521-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-521-M400UA |
| | sst$_3$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-523-A |
| | | ValiScreen | CHO-K1 | X | X | X | | | | ES-523-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-523-CF |
| | | Membrane preparation | CHO-K1 | X | X | | | | | ES-523-M400UA |
| | sst$_4$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-524-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-524-AF |
| | | ValiScreen | HEK293 EBNA | X | | | | | | RBHST4C |
| | | | CHO-K1 | X | X | X | | | | ES-524-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-524-CF |
| | | Membrane preparation | HEK293 EBNA | X | | | | | | RBHST4M400UA |
| | | | CHO-K1 | X | X | | | | | ES-524-M400UA |
| | sst$_5$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-522-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-522-AF |
| | | ValiScreen | HEK293 EBNA | X | | | | | | RBHST5C |
| | | | CHO-K1 | X | X | X | | | | ES-522-C |
| | | cAMPZen | CHO-K1 | | | X | | | | ES-522-CF |
| | | Membrane preparation | HEK293 EBNA | X | | | | | | RBHST5M400UA |
| | | | CHO-K1 | X | X | | | | | ES-522-M400UA |
| Succinate (see GPR91) | | | | | | | | | | |
| Tachykinin | NK$_1$ | Non-recombinant, membrane preparation | UC11 | X | | | | | | 6110551400UA |
| | NK$_2$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-251-A |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-251-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-251-M400UA |
| | NK$_3$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-252-A |
| | | ValiScreen | CHO-K1 | X | | | X | | | ES-252-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-252-M400UA |
| Thyrotropin Releasing Hormone | TRH$_1$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-700-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-700-AF |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-700-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-700-M400UA |
| Urotensin | UT (Uro II, GPR14) | AequoScreen | CHO-K1 | X | | | | X | X | ES-440-A |
| | | ValiScreen | CHO-K1 | X | | | | | X | ES-440-C |
| | | PhotoScreen◆ Photina double-transfected cell line | CHO-K1 | | | | | X | | AX-007-PCF |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-440-M400UA |

| Receptor type | Subtype | Product Type | Host Cell | Binding | GTPγS | cAMP | Inositol Phosphate | Calcium Luminescence | Calcium Fluorescence | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|
| | UT (Uro II, GPR14) (Rat) | AequoScreen | CHO-K1 | X | | | | X | | ES-441-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-441-AF |
| | UT (Uro II, GPR14) (Mouse) | Membrane preparation | CHO-K1 | X | | | | | | RBMUR2M400UA |
| Vasoactive Intestinal Peptide | PAC$_1$ (PACAP) | AequoScreen | CHO-K1 | X | | | | X | X | ES-272-A |
| | VPAC$_1$ (VIP) | AequoScreen | CHO-K1 | X | | | | X | X | ES-273-A |
| | | Non-recombinant, membrane preparation | HT29 | X | | | | | | RBHVIPM400UA |
| | VPAC$_2$ | AequoScreen | CHO-K1 | | | | | X | X | ES-274-A |
| Vasopressin | V$_{1A}$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-361-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-361-AF |
| | | ValiScreen | 131N1 | X | | | | | X | ES-361-C |
| | | Membrane preparation | HEK293 | X | | | | | | RBHV1AM400UA |
| | | | 131N1 | X | | | | | | ES-361-M400UA |
| | V$_{1B}$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-362-A |
| | | AequoZen | CHO-K1 | | | | | X | | ES-362-AF |
| | | ValiScreen | 131N1 | X | | | | | X | ES-362-C |
| | | | HEK293 | X | | | | | | RBHV1BC |
| | | Membrane preparation | CHO-K1 | X | | | | | | 6110543400UA |
| | | | HEK293 | X | | | | | | RBHV1BM400UA |
| | | | 131N1 | X | | | | | | ES-362-M400UA |
| | V$_{1B}$ (Rat) | ValiScreen | CHO-K1 | X | | | | | X | ES-360-C |
| | | Membrane preparation | CHO-K1 | X | | | | | | ES-360-M400UA |
| | V$_2$ | AequoScreen | CHO-K1 | X | | | | X | X | ES-363-A |
| | | ValiScreen | 131N1 | X | | X | | | | ES-363-C |
| | | cAMPZen | 131N1 | | | X | | | | ES-363-CF |
| | | Membrane preparation | MDA-MB-435 | X | | | | | | 6110541400UA |
| | | | 131N1 | X | | | | | | ES-363-M400UA |
| **Tyrosine Kinase Receptors** | | | | | | | | | | |
| Epidermal Growth Factor | EGF | Non-recombinant, membrane preparation | A431 | X | | | | | | RBHEGFM400UA |
| **Transporters** | | | | | | | | | | |
| Dopamine | n.a. | Membrane preparation | CHO-K1 | X | | | | | | RBHDATM400UA |
| Norepinephrine | n.a. | Membrane preparation | MDCK | X | | | | | | RBHNETM400UA |
| Serotonin | n.a. | Membrane preparation | HEK293 | X | | | | | | RBHSTM400UA |
| **Ion Channels** | | | | | | | | | | |
| 5-Hydroxytryptamine | 5-HT$_{3A}$ | AequoScreen | HEK293 | | | | | X | | ES-402-A |
| | | AequoZen | HEK293 | | | | | X | | ES-402-AF |
| | 5-HT$_3$ | Membrane preparation | HEK293 | X | | | | | | RBHS3M400UA |
| Calcium Release Activated | CRAC (Stim1 + Orai1) | PhotoScreen validated in e-phys | HEK293 | | | | | X | | AX-013-PCL |
| hERG | K+ channel | Membrane preparation | HEK293 | X | | | | | | RBHERGM400UA |
| Nicotinic | n.a. | Non-recombinant, membrane preparation | IRM32 | X | | | | | | RBHNICM400UA |
| Purinergic | P2RX$_2$/ P2RX$_3$ (Human/Rat) | PhotoScreen validated in e-phys | CHO-K1 | | | | | X | | AX-014-PCL |
| | P2RX$_1$ | PhotoScreen validated in e-phys | CHO-K1 | | | | | X | | AX-009-PCF |
| | P2RX$_4$ | PhotoScreen validated in e-phys | HEK293 | | | | | X | | AX-015-PCF |

\* AequoScreen double recombinant photoprotein cell line  
❖ AequoZen double recombinant photoprotein frozen cell line  
† ValiScreen stable recombinant cell line  

▼ cAMPZen stable recombinant frozen cell line  
◆ PhotoScreen® double recombinant photoprotein cell line

| | | | | | Binding | GTPgS | cAMP | Inositol Phosphate | Validated for Calcium Luminescence | Calcium Fluorescence | Cat. No. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Receptor type | Subtype | Product Type | | | | | | | | | |
| Transient receptor potential | TRPA1 | PhotoScreen◆ validated in e-phys | HEK293 | | | | | | X | | AX-004-PCL |
| | TRPC3 | ValiScreen† validated in e-phys and membrane potential assay | HEK293 | | | | | | | | AX-011-C |
| | TRPC6 | ValiScreen validated in e-phys and membrane potential assay | HEK293 | | | | | | | | AX-012-C |
| Voltage gated potassium channel | Kv1.3 (KCNA3) | ValiScreen validated in e-phys and membrane potential assay | CHO-DUKX | | | | | | | | AX-010-C |
| **Wild-type membranes** | | | | | | | | | | | |
| 1321N1 cells | | Membrane preparation | 1321N1 | | | | | | | | RBH1321M010MG |
| A9 cells | Mouse | Membrane preparation | A9 | | | | | | | | RBMA9M010MG |
| CHO-K1 cells | Hamster | Membrane preparation | CHO-K1 | | | | | | | | RBCCHOM010MG |
| HEK293 cells | | Membrane preparation | HEK293 | | | | | | | | RBHHEKM010MG |
| K562 cells | | Membrane preparation | K562 | | | | | | | | RBHK56M010MG |
| THP-1 cells | | Membrane preparation | THP-1 | | | | | | | | RBHTHPM010MG |
| U373 cells | | Membrane preparation | U373 | | | | | | | | RBHU37M010MG |
| **Parental cell lines** | | | | | | | | | | | |
| | | AequoScreen* | 1321N1 | | | | | | X | | ES-000-A27 |
| | | AequoZen❖ | 1321N1 | | | | | | X | | ES-000-A27F |
| | | AequoScreen | 1321N1 | | | | | | X | | ES-000-A28 |
| | | AequoZen | 1321N1 | | | | | | X | | ES-000-A28F |
| | | AequoScreen (+Gα₁₆,medium level) | CHO-K1 | | | | | | X | | ES-000-A2 |
| | Hamster | AequoZen s (+Gα₁₆,medium level) | CHO-K1 | | | | | | X | | ES-000-A2F |
| | Hamster | AequoScreen | CHO-K1 | | | | | | | X | ES-000-A12 |
| | Hamster | AequoZen | CHO-K1 | | | | | | X | | ES-000-A12F |
| | Hamster | AequoScreen | CHO-K1 | | | | | | X | | ES-000-A21 |
| | Hamster | AequoZen | CHO-K1 | | | | | | X | | ES-000-A21F |
| | Hamster | AequoScreen | CHO-K1 | | | | | | X | | ES-000-A24 |
| | Hamster | AequoZen | CHO-K1 | | | | | | X | | ES-000-A24F |
| | | AequoScreen | HEK293 | | | | | | X | | ES-000-A30 |
| | | AequoZen | HEK293 | | | | | | X | | ES-000-A30F |
| | | AequoScreen | HEK293 | | | | | | X | | ES-000-A26 |
| | | AequoZen | HEK293 | | | | | | X | | ES-000-A26F |
| **Aequorin Plasmids** | | | | | | | | | | | |
| | | AequoScreen | | | | | | | X | | ES-002-AC |
| | | AequoScreen | | | | | | | X | | ES-003-AC |
| **Starter Kits** | | | | | | | | | | | |
| Muscarinic and Histamine | M₅ and H₁ | AequoZen Starter Kit | CHO-K1 | | | | | | X | | ES-001-AF |
| Muscarinic and Histamine | M₅ and H₁ | AequoScreen Starter Kit | CHO-K1 | | | | | | X | | ES-001-A |

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❖ AequoZen double recombinant photoprotein frozen cell line  ◆ PhotoScreen® double recombinant photoprotein cell line
† ValiScreen stable recombinant cell line

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