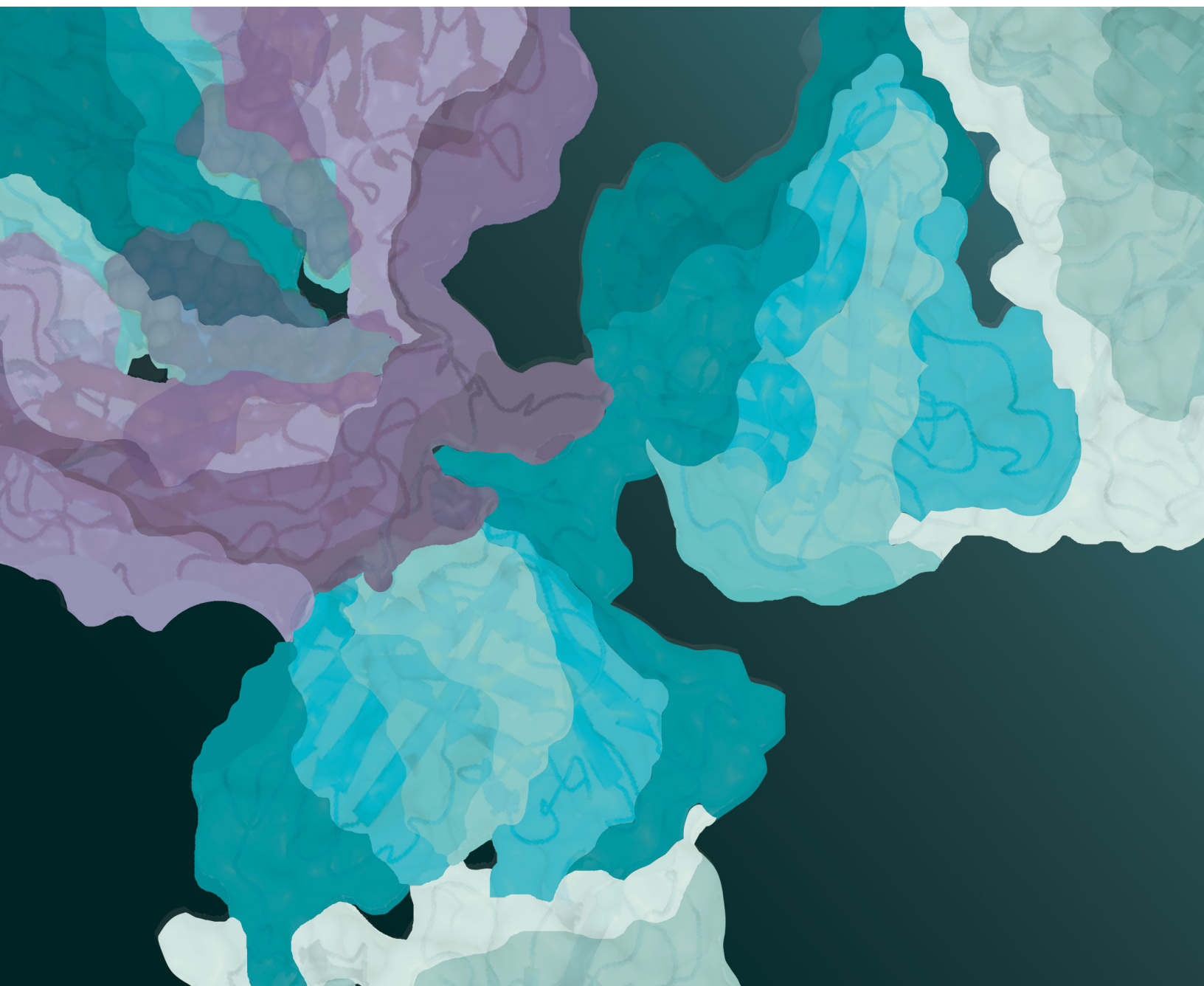




CUSTOM SERVICES

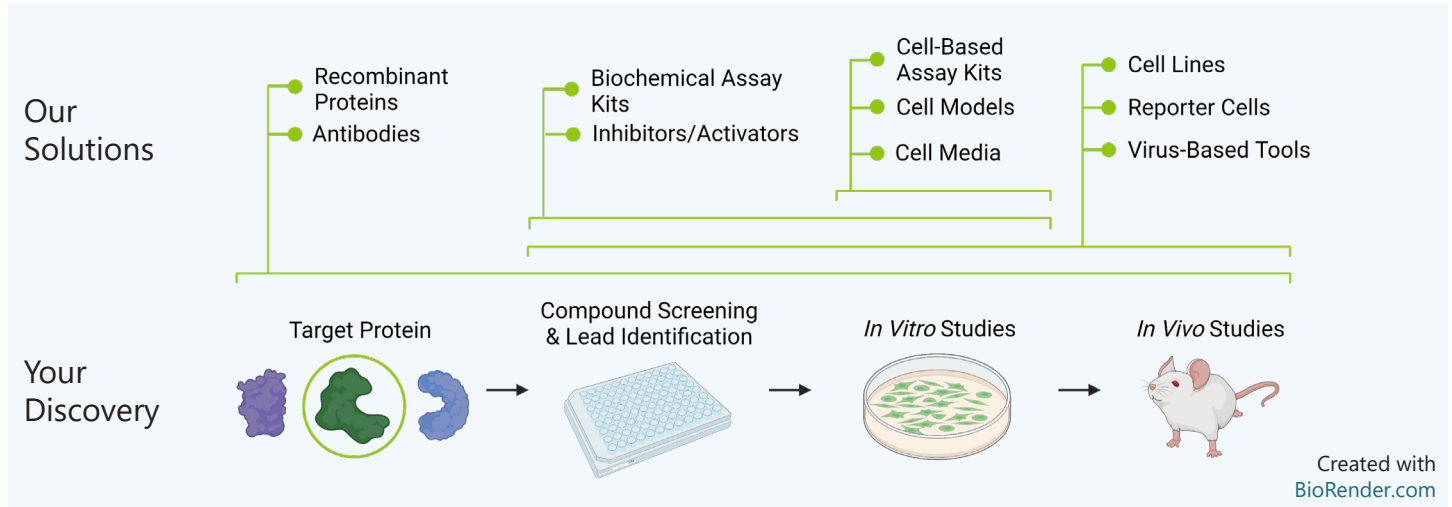
TO ADVANCE DRUG DISCOVERY

Screening & Profiling | Protein Expression | Cell Lines | Virus-Based Tools



Customized Solutions to Advance Your Research

BPS Bioscience offers a wide range of service capabilities for a variety of research applications, focusing on drug discovery. Our expert scientists provide fast, reliable services to clients world-wide, ranging from top pharmaceutical and vaccine companies to startup biotech labs. Our dedication to producing high quality custom products will enable your next discoveries.



Our Advantages



Conducted In-House

- All services are conducted in the USA at our San Diego, CA laboratory
- Experience customized, personal support directly from our scientists



Committed to Excellence

- ISO 9001:2015-certified Quality Management System
- Lot-specific quality control testing



Customized For Your Research Needs

- Protein expression: choice of tags, labeling, expression system, and QC
- Cell line development: choose from >30 cell types and >70 reporter systems



Break the Bottlenecks

- Services aligned with pre-clinical drug development, discovery biology, medicinal chemistry
- Small and large project capabilities
- Process development
- Scale-up and validation
- Enzymatic, structural, stability, and binding studies
- Cellular toxicity measurements
- Data reporting and management

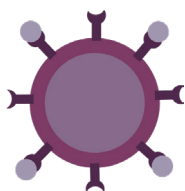
Cell Line Development

Let our experts help you reduce time and complexity with our stable cell-line development services. We custom engineer cell lines for protein production and compound/antibody screening. Our speciality in reporter assays for immune checkpoint pathways provides excellent novel resources for immunotherapy research.

- Delivery of multiple stable clones for internal validation
- 30+ available cell types and 70+ reporter systems
- Ideal for antibody and compound screening and modeling systems
- Lentivirus generated

Cell Line Formats

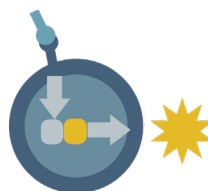
Overexpression



Knockout



Reporter



Co-Stimulatory

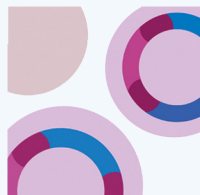


A Milestone-Measured Process Ensures Success



1
Molecular
Biology

Expression vectors will be generated using available image clones, or through the use of synthetic DNA to stably transfect the gene of interest.



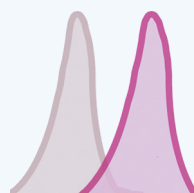
2
Selection and
Pool Generation

Parental cells will be transfected with the expression vector for the desired targets. The cell pool will be selected using antibiotics.



3
Limiting Dilution
and Clonal
Selection

Based on the results of the initial pool testing, the cell pool will be diluted and single cell-derived clones will be selected.



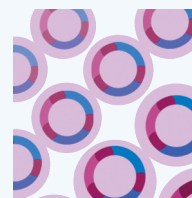
4
Confirmation of
Expression

The expression level of the target protein will be analyzed via Western blot or flow cytometry.



5
Functional
Validation

Cells will be treated with a reference control compound to obtain dose-response titration data.



6
Stability
Testing

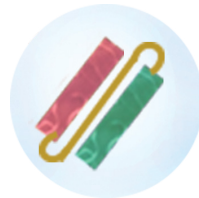
The desired number of clones will be selected for passage stability testing. Mycoplasma testing and cell banking services are also available.

Custom CAR-T Cell Development

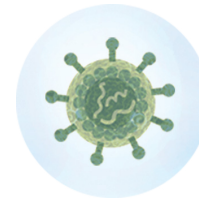
BPS Bioscience provides full service production of CAR-T cells to your desired specifications. With our milestone-measured process, you can monitor your steps to successful custom CAR-T cell generation.



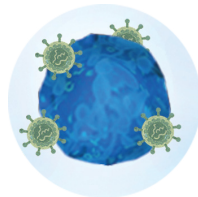
1
Researcher provides Ab sequence against antigen



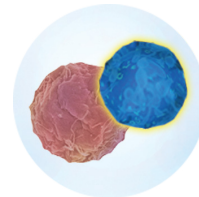
2
Engineering & validation of ScFv for specificity and affinity



3
CAR Lentivirus production and initial validation



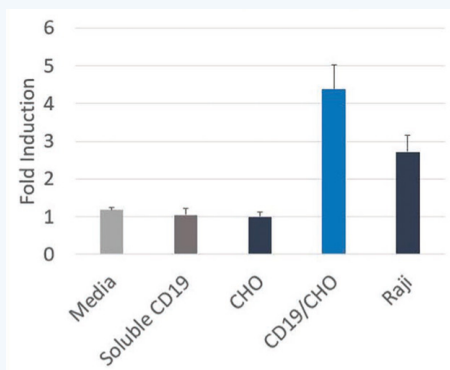
4
T cell preparation & transduction



5
Functional validation of CAR-T cells

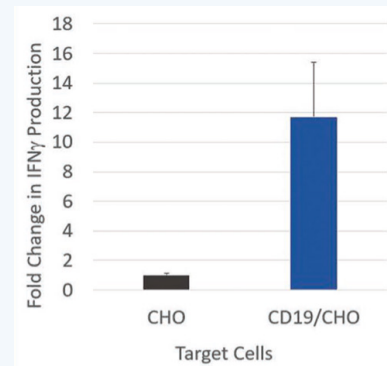
● Functional Validation

Primary Screening & Verification of CAR Activity Using a Reporter Cell Line



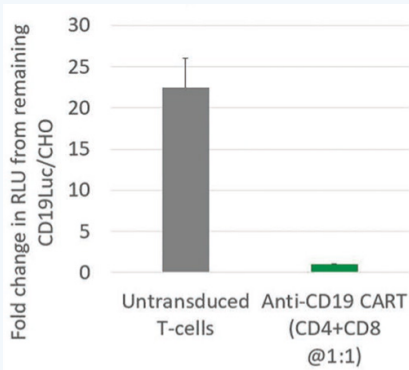
Luciferase activity in a stable cell pool of anti-CD19 CAR-expressing NFAT luciferase Jurkat cells co-cultured with the indicated targets and controls.

IFN γ Cytokine Detection from Activated CAR-T Cells



IFN γ production from Anti-CD19 CAR-T (CD4:CD8, 1:1) cells induced by CD19-expressing CHO cells (effector:target = 10:1), measured by ELISA (#79777).

Target Cell Killing Assays



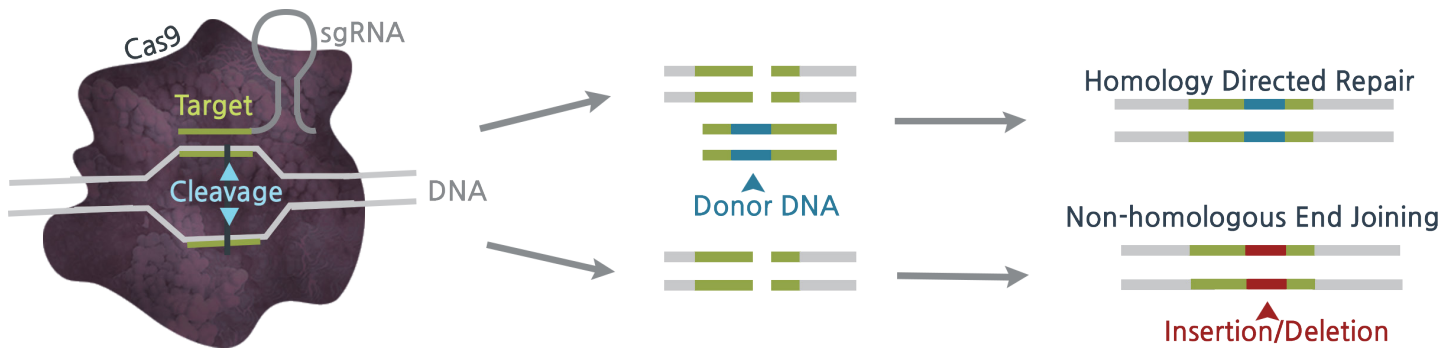
CD19 Luciferase CHO cells (79714) were targeted and killed by anti-CD19 CAR-T cells (effector:target = 10:1).

Additional Assays

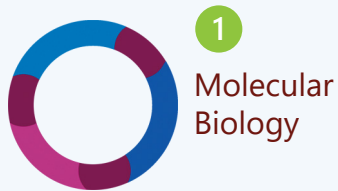
- Flow cytometry to confirm CAR expression
- Mycoplasma testing

CRISPR/Cas9 Knock-out or Knock-in

- Introduce a specific point mutation or add a tag to your endogenous gene of interest
- Knock-out your gene(s) of interest for mechanistic or screening studies
- Customized lentivirus generated cell lines can be used for knock-down/knock-out cell pools



A Milestone-Measured Process Achieves Desired Results



We will synthesize three short guide RNA sequences for knock-out cell lines. We can also design the HDR template for knock-in cell lines.



Depending on the cell type, cells can be transfected via electroporation, liposome-based transfection, or viral infection.



Based on the results of the initial pool testing, the cell pool will be diluted and single cell-derived clones will be selected.



The expression level of the target protein will be analyzed via Western blot or flow cytometry.

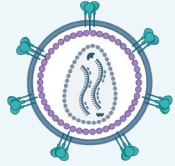


Gene knock-out or knock-in will be analyzed through genomic sequencing. Functional validation is available.

Custom Virus Services

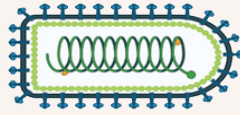
Choose from our three viral product types for your desired viral vector delivery method: lentivirus, vesicular stomatitis virus (VSV), and adeno-associated virus (AAV).

Lentivirus



Ideal for pseudotyping or engineering stable cell lines, lentiviruses deliver relatively large genes that can integrate into the host genome.

VSV



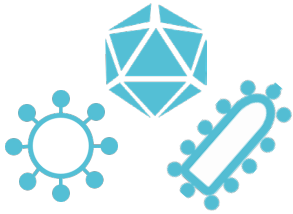
VSV is an excellent tool to model viral infection using pseudotyped viruses that replace the VSV-G protein with a desired viral protein of interest. Some cell infectivity models work best with VSV.

AAV

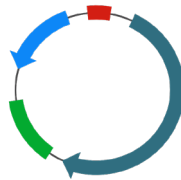


AAV is an ideal viral vector for delivery into primary cells both in vitro and in vivo. Its low immunogenicity and pathogenicity enable safe gene therapy.

Our Capabilities to Meet Your Specifications



We can develop custom viruses for your research needs.



We can engineer your virus and cell lines with reporters, selection markers, variants, and specific mutations.



We can generate custom stable overexpression, knockout, or reporter cell lines using your virus.



Choose integrating or non-integrating lentiviruses for cellular protein knock-out or knock-in.

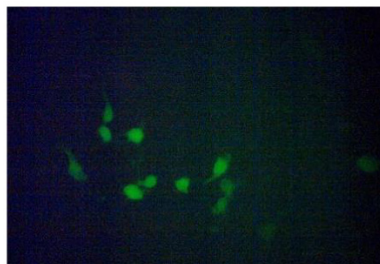
Transduction Validation

We ensure that all our viral products are highly infectious and capable of delivering the desired genes. The Transduction Units (TU) determined by qPCR are provided with each lot of product.

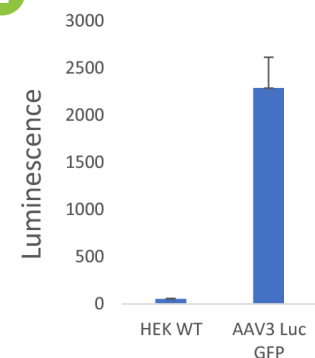
AAV3 Luciferase-eGFP (#78463)

1. Fluorescence microscopy of transduced HEK293 cells.
2. Luciferase activity of transduced HEK293 cells.

1



2



Protein Expression & Purification - High Purity, High Yield

BPS Bioscience has extensive expertise in protein expression, scale-up, purification, and modification. Using our cloning and expression services, constructs can be optimized for high purity and high yield protein expression.

Protein options include:



Our Capabilities

- Expertise in expressing highly active enzymes
- Bulk production
- FPLC methods include: SEC, IEX, HIC
- Glutamine synthetase expression
- Lyophilization option
- Protein immobilization
- Flexible deliverables: supernatants, cell pellets, plasmids

Purification Options

- Multiple rounds of column purification
- Endotoxin testing
- Inclusion body purification
- Biotinylation (Avi-Tag or side chain) and pull-down QC testing
- Protein refolding
- Phosphorylation and dephosphorylation

Customize Your Project Milestones



1
Cloning

BPS Bioscience can supply the clone or synthetic DNA. Mutations will be introduced if needed. Confirmation of successful cloning will be completed through gene sequencing.



2
Expression and Purification

The plasmids will be transfected using lipofectamine, electroporation, or lentiviral transduction in the desired expression system.



3
Activity Testing

Choose to test your custom protein using BPS Bioscience's collection of >400 biochemical and cell-based assays, or we can develop a new custom activity assay.



4
Bulk Protein Production

BPS Bioscience has the capabilities to scale up protein production and produce the product in bulk. Our team of scientists will re-express and re-purify the protein.



5
Additional Options

Mutagenesis studies
Protein conjugation with probes and dyes
Protein binding kinetics via BLI

Protein Binding Studies - BLI Services

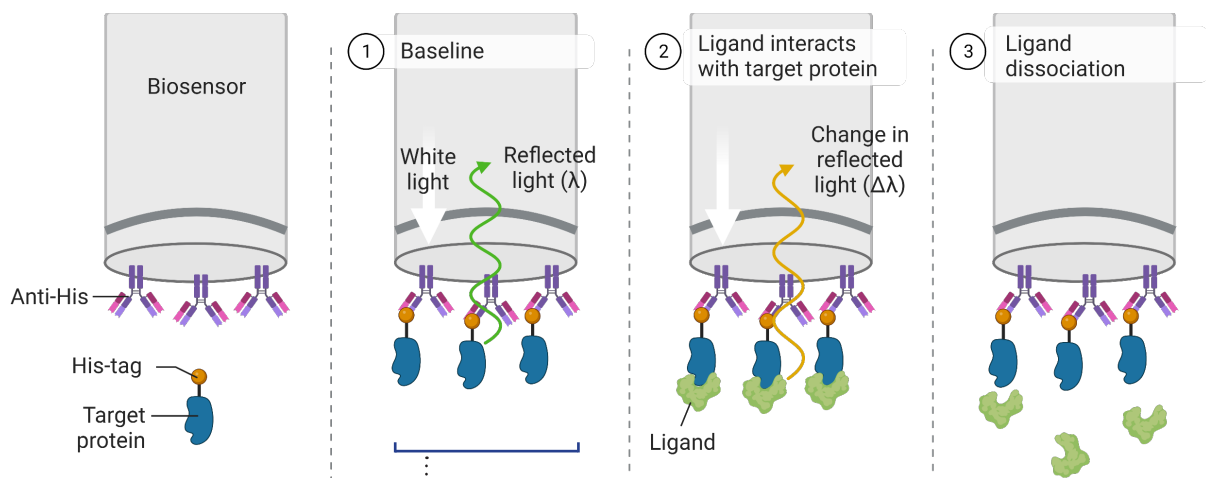
BPS Bioscience offers Bio-Layer Interferometry (BLI) services to evaluate and analyze protein interactions. Label-free analysis is a critical research method to determine the binding kinetic parameters of compounds or other binding partners. These studies are of key importance for pharmaceutical and biotechnological preclinical drug development.

Utilize our BLI services for deeper insight into your protein studies through measuring binding kinetics, steady state affinity, and through target validation. We will provide accurate and sensitive kinetic studies in a timely manner with detailed reports.

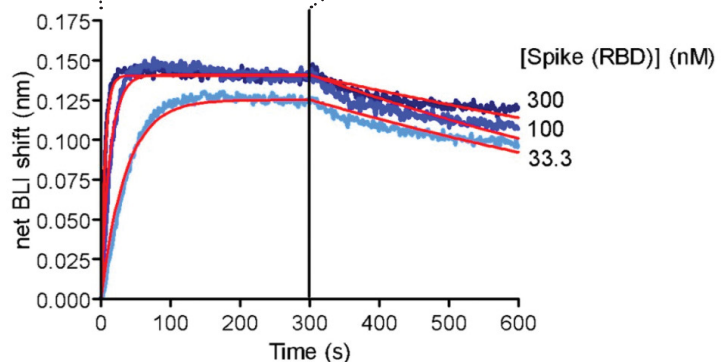
Available Services

- Protein immobilization
- Binding affinity measurements
- Data fitting and reporting
- Access to BPS Bioscience's extensive protein portfolio of target proteins
- Detailed final report includes all data, methods, and results

BLI Illustration Example:



BLI binding analysis of SARS-CoV-2 Spike (RBD) to immobilized ACE2-His (BPS Bioscience #11003) via anti-His antibody. $K_d = 1.2$ nM.



Created with [BioRender.com](https://www.biorender.com)

Screening & Profiling

Evaluate lead compounds with our biochemical and cell-based screening services. Save time by letting us screen your compounds of interest against our unique assay panels or determine IC_{50} values with our portfolio of >500 assays, so you can focus on advancing your drug discovery program.

Biochemical and Cell-Based Assays

Biochemical assays are designed to examine the function of a protein or protein complex in a controlled in vitro format without influence from impurities or other proteins. On the other hand, cell-based assays are intended to evaluate protein function in the context of the whole cell with existing cellular machinery and other potential factors that may influence protein function.

Biochemical



- Uses purified bioactive protein
- Available in a variety of formats, including no-wash homogenous assays for high throughput screening
- Buffers and substrates are optimized for use in the assay kit

Cell-Based



- Uses intact live cells
- Reporter cells and reporter kits are ideal for high throughput screening
- Effective for validating biochemical assay results

Our Deliverables to You

Detailed Results



Extensive report with raw and analyzed data, graphs, and detailed protocols. Typically includes positive controls for inhibition.

Fast Turnaround



Receive results within weeks after our receipt of your compounds.

Quality & Consistency



Proteins and enzymes synthesized and QC'd in-house to ensure the highest level of inter- and intra-assay consistency.

Extensive Selection



Choose from over 500 in-house developed assays, including many novel assay kits.

Platform Options



Choose the format that works best for your experiment or perform orthogonal testing on multiple platforms to verify your results.

Screening & Profiling - Biochemical Assays

Our expert team of scientists can drive your discovery efforts using our extensive portfolio of over 500 in-house manufactured assay kits, many of which are unique in the marketplace. We can screen your compound libraries for broad hits or generate more detailed IC₅₀ data for a targeted selection.

We Are Uniquely Positioned for Your Discovery

- Extensive immunotherapy panel, including many unique immunotherapy targets
- First commercially available and largest histone demethylase panel
- Over 20 unique histone methyltransferases
- Complete PARP isozyme panel and unique PARP-trapping assays
- Largest phosphodiesterase isozyme panel
- First complete suite of HDAC and SIRT enzymes
- Extensive bromodomain & HSP90 panels

Biochemical Assay Target Categories

Epigenetics

- Acetyltransferase
- Bromodomain
- DNA Methyltransferase
- HDAC/Sirtuin
- Histone Demethylase
- Histone Methyltransferase
- Methyl-lysine Reader

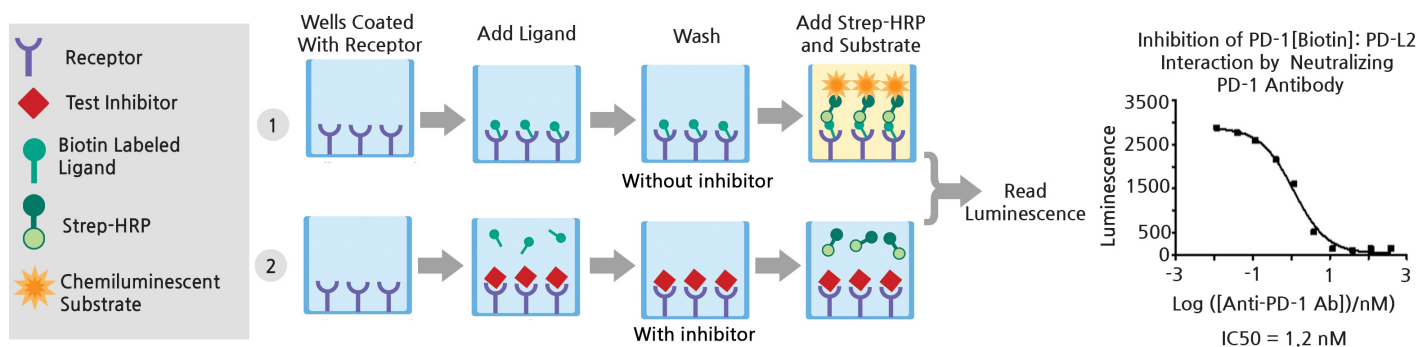
Cell Biology & Signaling

- Apoptosis
- HSP90
- Kinases
- Metabolic Enzymes
- PARP
- PCSK9
- PDE
- Protein Phosphatase
- Protease

Immunology & Infectious Disease

- Cell Surface Receptors
- Coronavirus
- Immune Checkpoints
- Immunotherapy

Biochemical Assay Illustration Example:



Screening & Profiling - Cell-Based Assays

BPS Bioscience has developed a number of recombinant reporter cell lines to screen inhibitors or activators of various cell signaling pathways. If you are developing inhibitors specific to one of our pathway reporters, these cell-based systems offer a more complex and physiologically relevant setting than cell-free systems. This screening service is also a great tool that can be used to tease out the specific pathway that a particular compound is targeting. Screen against our entire portfolio or select a few pathways.

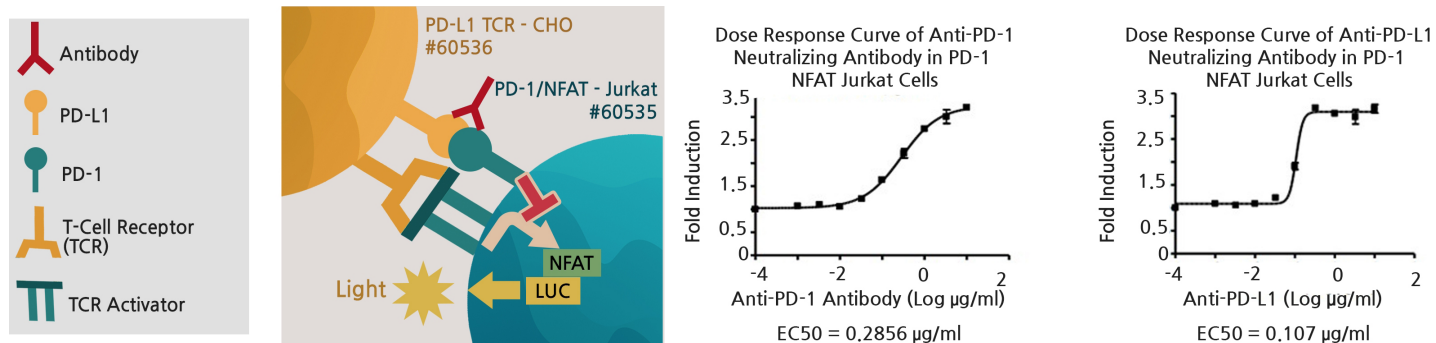
Types of Cell-Based Assays

- CAR-T Cell Screening
- ADCC Assays
- Ion Channel Assays
- Tumor Proliferation Assays
- Reporter Gene Assays

Cell-Based Assay Target Categories

- Cell Signaling Pathways
- Hedgehog Pathway
- Histone Deacetylases
- Immune Checkpoints
- Nrf2 Antioxidant Pathway
- NF- κ B Pathway
- Phosphodiesterases
- T Cell Activation
- Wnt/ β -catenin Pathway

Cell-Based Reporter Assay Illustration Example:





FIND A TRUSTED PARTNER FOR YOUR NEXT PROJECT



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