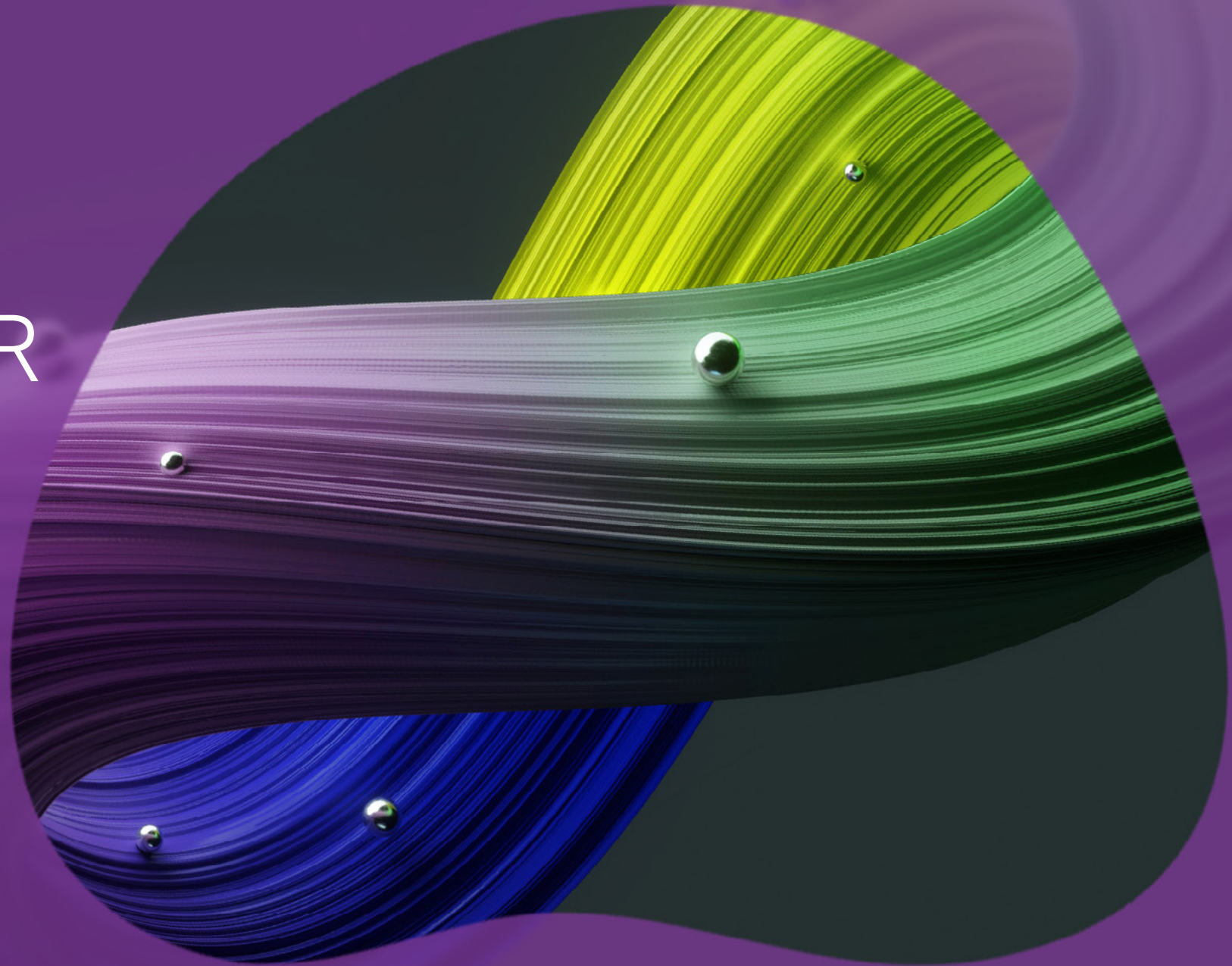


Bring our
strength to your
RNAi and CRISPR
screening.

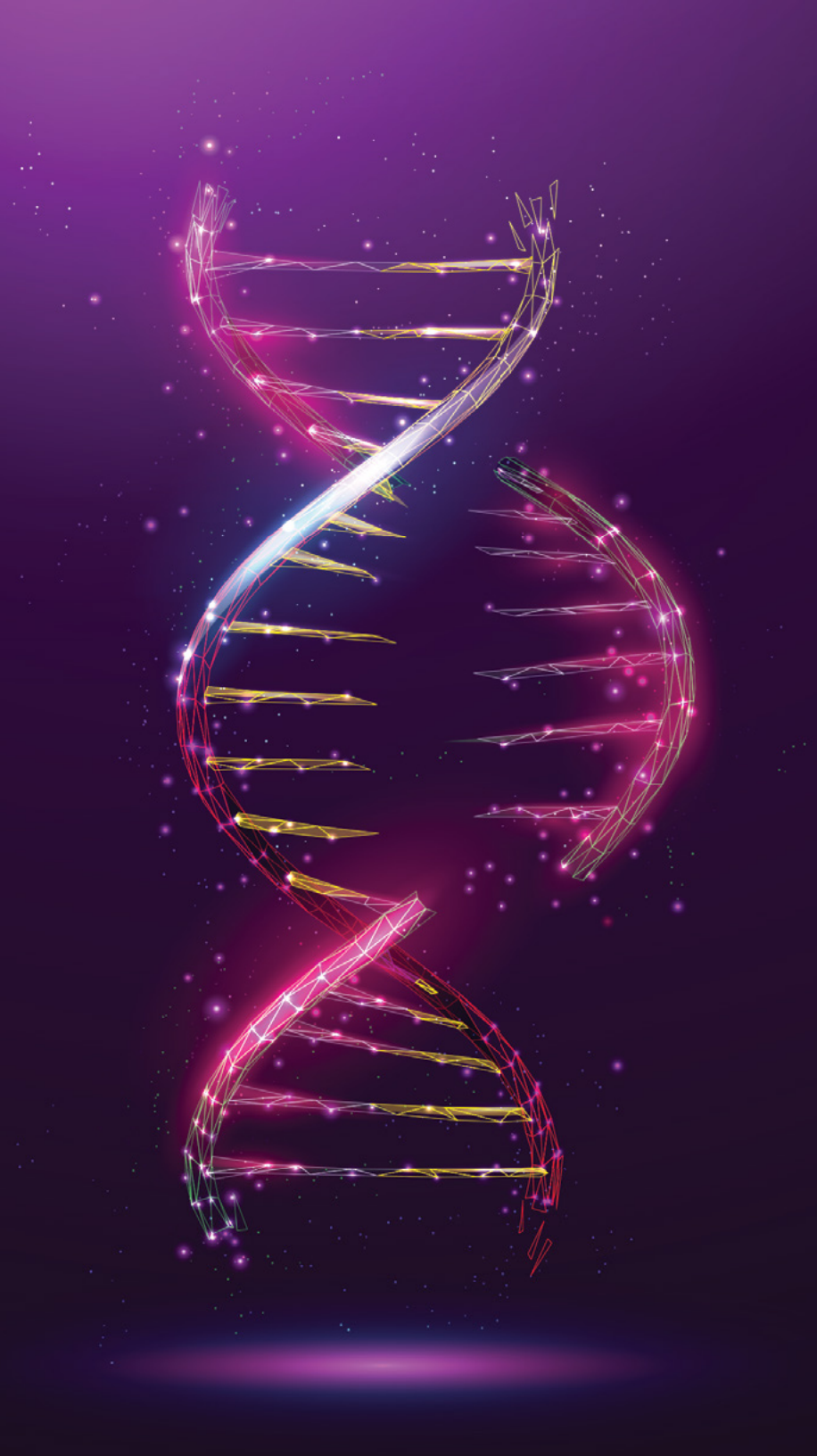
revvity

Functional genomic screening with Dharmacon™ RNAi and CRISPR





- Overview
- Functional genomics
- Introduction
- Pooled and arrayed screening
- Screening libraries
 - RNAi
 - CRISPR K.O.
 - Arrayed overexpression
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RNAi vs. CRISPR: two paths to genomic discovery

Functional genomic screening (FGS) enables you to manipulate the function of thousands of genes in a single experiment. This screening method elucidates genetic pathways, cellular processes, and novel therapeutic targets, so that you can profile existing or potential therapeutics.

Gene expression can be regulated using either RNAi or CRISPR technology. RNAi represses gene expression at the mRNA level (knockdown), while CRISPR works at the DNA level to permanently knockout or transiently modulate genes. You can conduct these screening techniques in either pooled or arrayed formats.

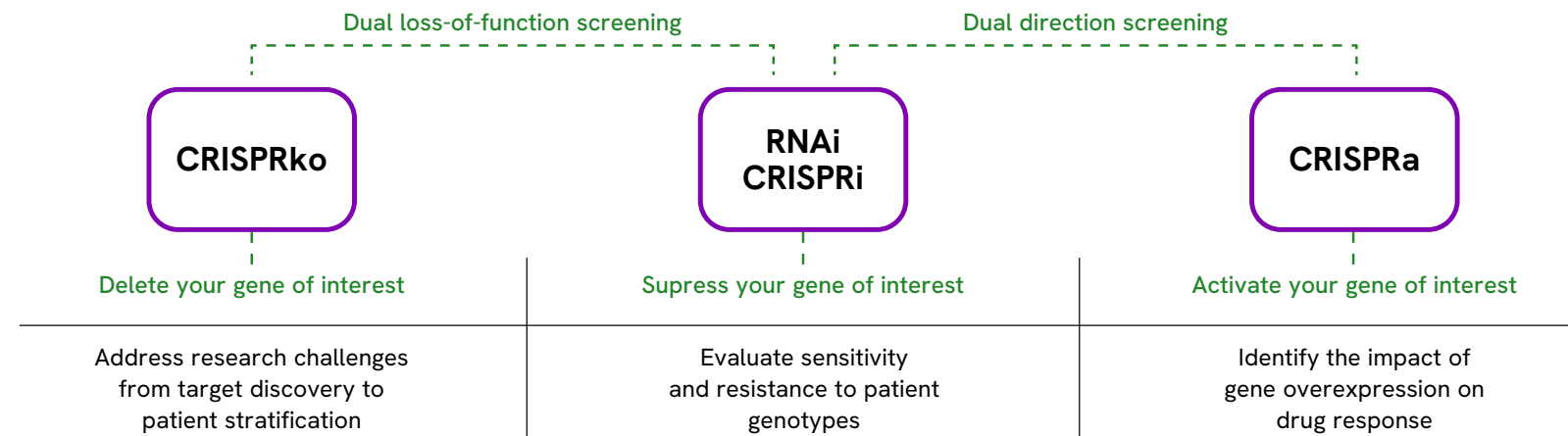
Not sure which format is right for your project? We're here to support you every at step of your workflow with the right tools, advanced technologies, and skilled experts — so you can edit with confidence.



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Level up your discovery research with CRISPRko/a/i screening

Realize the potential of your FGS, redefine your research approach, and rocket toward groundbreaking discoveries.



Pooled screens

- CRISPR ko/i/a
- Single, dual, and combination formats
- Select from pre-evaluated cells or use your model
- Genome-wide, gene family, and custom libraries
- Scalable depth and fold-coverage to meet your needs

Arrayed screens

- CRISPR ko/i/a and RNAi
- Synthesize and screen custom oligos
- Complex assay readouts
- Co-culture screens
- Genome-wide, gene family, and custom libraries
- Efficiency of multiple reagents per gene per well



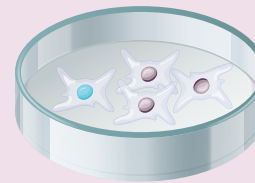
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From pools to plates: choosing the right library screening method

When it comes to choosing the right screening method — pooled or arrayed — the decision is based on your unique project. Let us help guide you to the right technique.

Pooled library screening

This method involves introducing a pool of sgRNA into a population of cells. Enrichment or depletion of certain sgRNAs, following the application of a selection pressure, provides information about the involvement of these genes in a particular phenotype. This method is best for identifying:



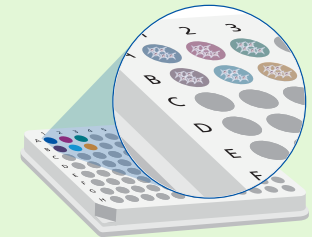
- Genes involved in drug resistance and sensitization
- Novel synthetic lethal interactions with known genetic variations
- Genes involved in biomarker expression (intracellular, cell surface, or secreted)

Read more about the pooled screening process and its challenges, advantages, and disadvantages.

[Read more](#)

Arrayed library screening

This method targets one gene per well across a multiwell-plate format. Using this approach, it's possible to explore phenotypes that develop from many perturbations in parallel. This method is best for identifying:



- Cell behavior such as multiparametric analysis, changes in morphology, and subcellular localization
- Gene function including proliferation, reporter assays, and cell toxicity and apoptosis
- Gene expression upon differentiation, transcriptional response to treatment, and biomarker expression
- Protein expression such as immune cell activation, immune cell protein secretion (cytokines), and cell surface markers

Read more about the arrayed screening process and its challenges, advantages, and disadvantages.

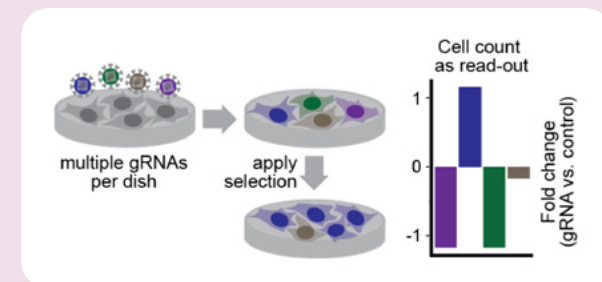
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Pooled library screening

Close window

In a pooled functional genomic screen, a vast number of perturbations are introduced in a single cell population using a lentiviral library resulting in a mixed pool of cells. This enables you to test large numbers of gene-edited cells at once in a high-throughput and cost-efficient manner. This method is typically used for primary whole genome screens.



Pooled screening at a glance

Applications

- Cell viability
 - Cell survival and proliferation
 - Drug treatment
 - Resistance or sensitization
 - Synthetic lethality
- Cell behavior screen
 - Cell migration
 - Cell invasion
- Cell sorting screen
 - GFP or other reporters
 - Specific antibody-detectable marker
- *In vivo* screen
 - Xenograft tumor
 - Mosaic mouse model

Advantages

- Cost effective
- Thousands of genes are integrated at once
- Suitable for longer *in vivo* studies
- No specialized or automated equipment needed

Disadvantages

- Only simple readouts, which include cell death or survival, reporter gene, and sortable biomarkers
- Edited cell type can influence other cells in the mixed population negatively
- Extremely large cell population needed at the start

Readout methods

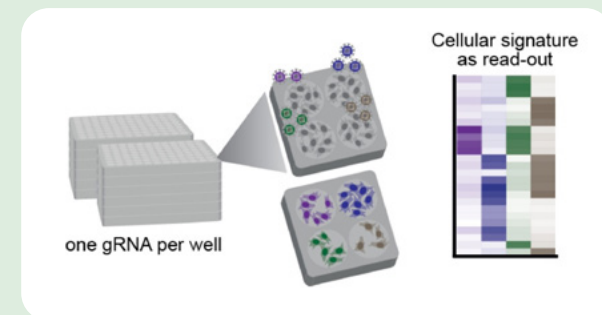
- Next-generation sequencing (NGS) at different time points or after different selective pressures
- NGS combined with certain biological characteristics by FACS sorting using reporter gene or surface biomarker
- scRNA sequencing linking gRNA expression with transcriptomic profile
- In situ sequencing linking gRNA expression with imaging phenotype

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Arrayed library screening

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In this method, each gene perturbation is introduced into a separate well of a multi-well plate, enabling a clear correlation between the observed phenotype and the underlying genotype. Arrayed screening offers a more targeted and detailed analysis of gene function, which is why it's often used for confirmatory or validation screens.



Pooled screening at a glance

Applications

- Cell viability
 - Cell survival/proliferation
 - Drug treatment
 - Resistance or sensitization
 - Synthetic lethality
- Reporter assays
- Enzymatic assays
- High-content morphological assays

Advantages

- Multiparametric read-outs
- Perfect for more complex cell models
- More choices in reagent formats, including nonviral transfection and customization options
- Clear phenotype-to-genotype correlation
- Improved editing efficiency by targeting the same gene with several gRNAs in one well

Disadvantages

- Lab automation equipment needed
- Assays can suffer from transfection or electroporation inefficiencies

Readout methods

- Fluorescence or luminescence detection
- Cell viability and proliferation
- Imaging — cell morphology, biomarker expression, and localization
- Live-cell imaging — differentiation and migration
- Proteomic and metabolomic profiling



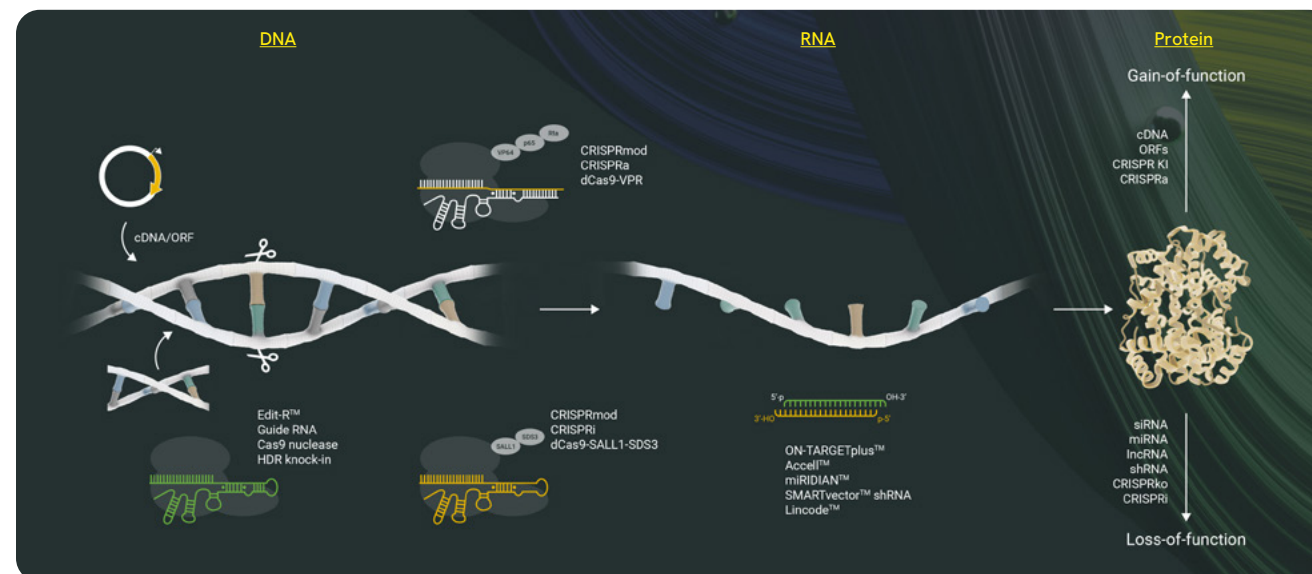
Propel your research forward: functional genomic screening libraries

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Find your target faster through gene family, biological pathway, or whole genome library screens. We offer a wide selection of Dharmacon CRISPR and RNAi libraries for high-throughput functional genomic screening — from whole genome to predefined gene families to custom gene lists.

With genome-wide collections and gene family libraries, you can:

- Achieve short-term gene knockdown, stable/long term knockdown, and gene knockout
- Modulate noncoding RNA
- Examine pathways or screen a follow-up data set with custom libraries
- Choose from expressing or nonexpressing ready clones



Explore our CRISPR and RNAi libraries

RNAi screening libraries

CRISPRko, CRISPRa, and CRISPRi screening libraries

Arrayed overexpression screening libraries

Design your own custom library

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RNAi screening libraries

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	siRNA	shRNA Glycerol stocks	SMARTvector Lentiviral shRNA	GIPZ pooled Lentiviral shRNA	miRIDIAN mimic and hairpin inhibitors
Species	H/M	H/M	H/M/R	H/M	H/M/R
Arrayed	✓	✓			synthetic
Pooled			✓	✓	shMIMIC
Genome scale	✓	✓	✓	✓	✓
Sub-families	✓	✓	✓	✓	
Custom library	✓	✓	✓	✓	✓
Collections	ON-TARGETplus siGENOME Accell Lincode	SMART SMARTinducible GIPZ TRIPZ TRC	SMART SMARTinducible	GIPZ	miRIDIAN SMART and SMARTinducible shMIMIC
Formats	SMARTpool Set of four	Lentiviral plasmids glycerol stocks	Lentiviral particles	Lentiviral particles	

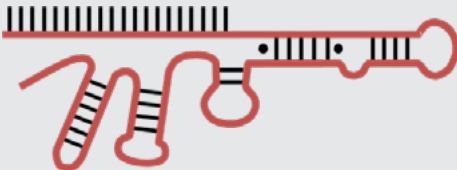
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CRISPR screening libraries

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Technology | CRISPR knockout, CRISPR activation, CRISPR interference, Species and Human/Mouse

	Synthetic sgRNA	Lentiviral sgRNA
Guide reagents for all screening needs		
Species	Human/Mouse	
Library Size	Whole Genome, Pathway Specific and Custom	
QC	OD, MS	NGS, qPCR
Format and Options	▪ Multiple guide designs per gene per well ▪ Single guide design per well ▪ Arrayed in 96-or 384-well plates, Echo-qualified 384-well	▪ 4 - 10 constructs per gene ▪ All-in-one lentiviral vector eliminating need to create a Cas9 cell line ▪ $\geq 5 \times 10^8$ TU/mL lentiviral particles

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Arrayed cDNA and ORF libraries

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	cDNAs	ORFs				
	Mammalian Gene Collection (MGC)	CCBS ORFeome	ORFeome v8.1	OC	CCSB-Broad Lentivirus	Precision LentiORF
Species	H/M/R	H	H	H/M	H	H
Arrayed	✓	✓	✓	✓	✓	✓
Genome scale	✓	✓	✓	✓	✓	✓
Sub-families	✓	✓	✓	✓	✓	✓
Custom library	✓	✓	✓	✓	✓	✓
Fully Sequenced	✓		✓	✓	✓	✓
Expression-ready	Subsets				✓	✓
Ready-to-use					✓	✓
Formats	pDNA glycerol stocks	pDNA glycerol stocks	pDNA glycerol stocks	pDNA glycerol stocks	pDNA glycerol stocks	pDNA glycerol stocks Lentiviral particles

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The power of choice: tailor-made custom libraries

When predefined screening libraries aren't a match for your specialized needs, we work with you and your budget to create a custom library quickly and efficiently.

Some unique features and benefits of building a custom library with Revvity include:

- An online tool that offers the flexibility to configure a library for your unique experimental needs
- A variety of synthetic reagents from our algorithm-optimized predesigned product lines, including siRNA, microRNA, CRISPR sgRNA, and crRNA
- Vector-based reagents and ability to cherry-pick clone libraries
- The option to add standard controls anywhere on the plate
- A 100% customizable plate layout

Try our custom ordering library tool for clones or synthetic reagents

Cherry-pick library tool - synthetic

Cherry-pick library tool - clones

Online ordering made simple

Add targets

Cherry pick product results

View Product Results

Select All	Terms	Gene Symbol	Entrez Gene ID
☐ 1	ABL1	ABL1	25
☐ 2	ABL2	ABL2	27
☐ 3	ALK	ALK	258
☐ 4	AXL	AXL	358
☐ 5	BLK	BLK	840
☐ 6	BMX	BMX	860
☐ 7	BTK	BTK	885
☐ 8	CSF1R	CSF1R	1436

Review results

Cherry pick library family results

Product availability for your selected genes

Accell siRNA Reagents - Human (85 Results)

ON-TARGETplus siRNA Reagents - Human (85 Results)

siGENOME siRNA Reagents - Human (85 Results)

View Product Results

Select products

Plate 1 of 2

1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10
1	2	3	4	5	6	7	8	9	10

Configure plate

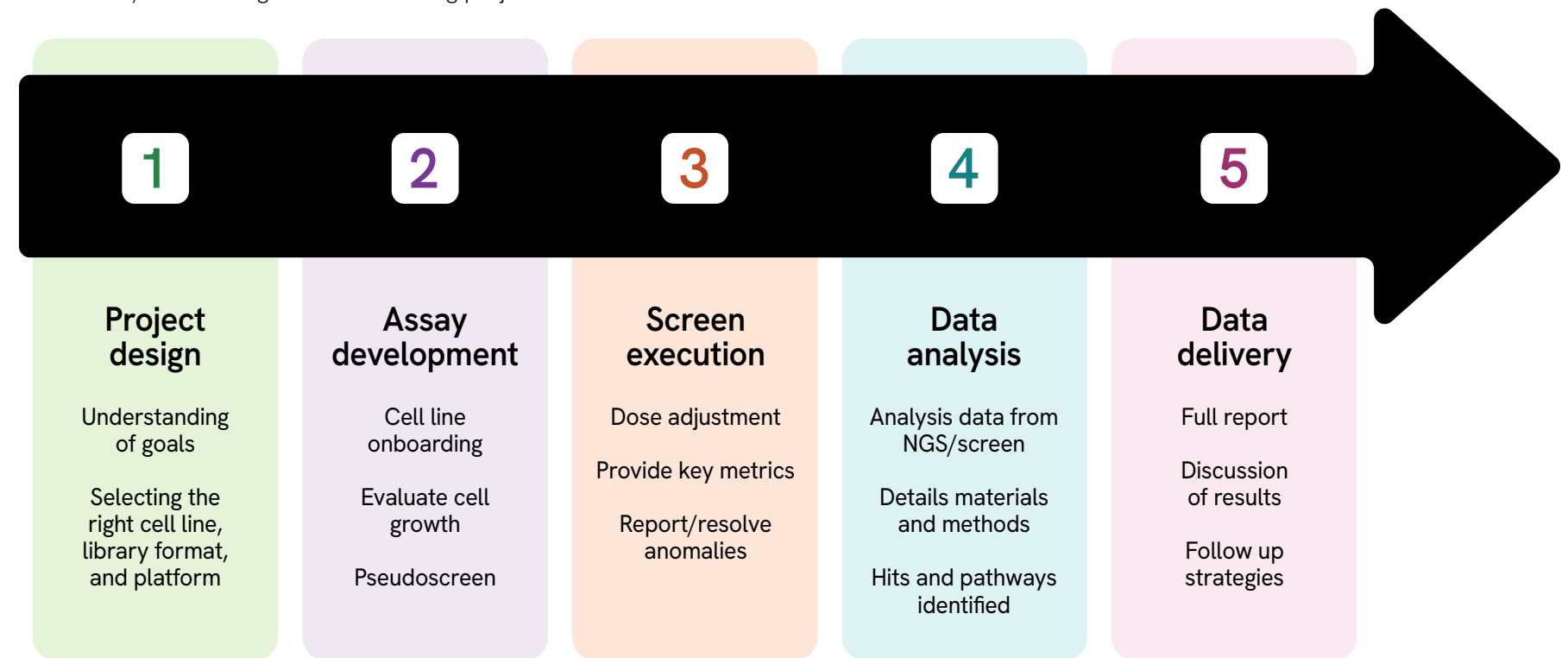


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Our commitment to being a trusted partner

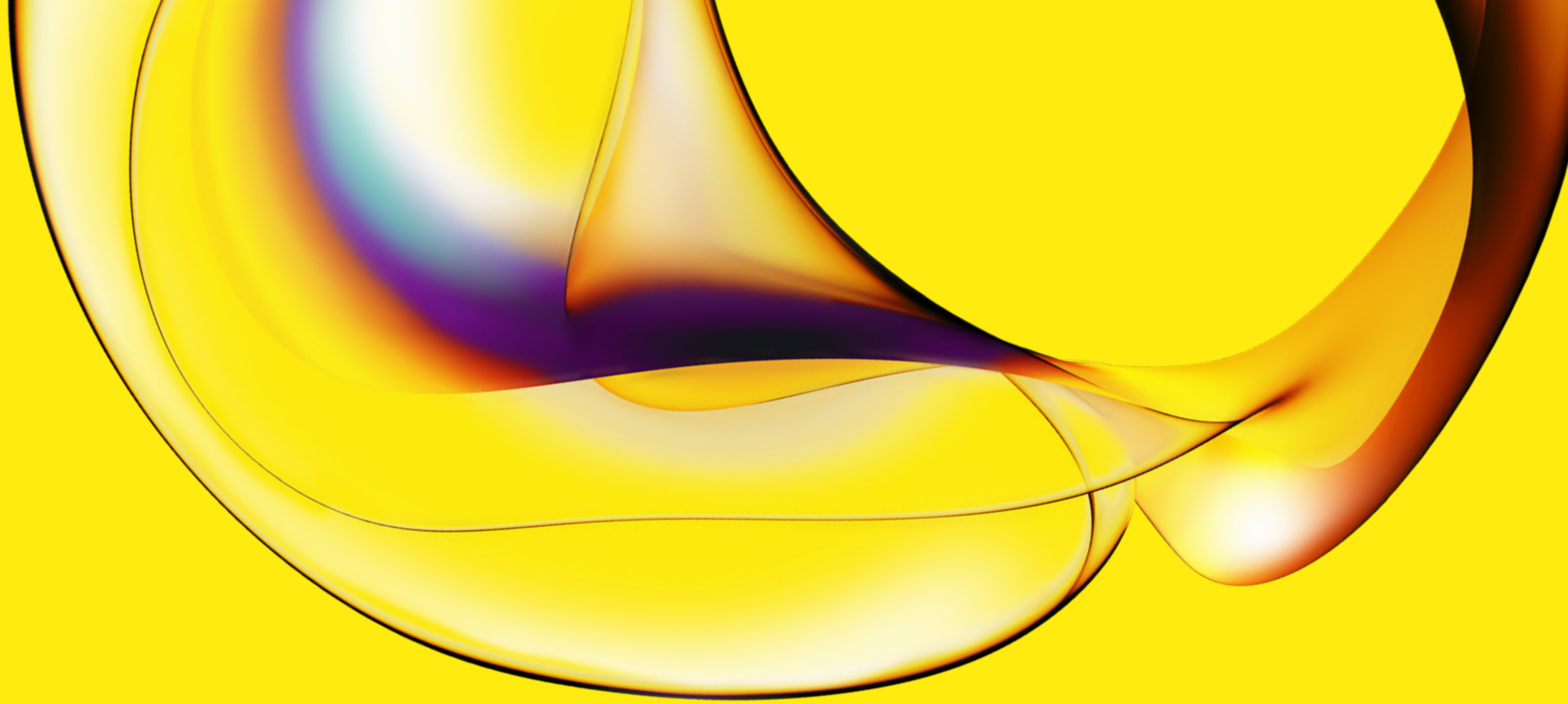
Revvity's dedicated preclinical services team works with you to advance your therapeutic research program. We're committed to providing you with data that you can trust to help you make decisions and move your therapeutic development project forward.

If capacity is a problem or you want to work with experts, get in touch to explore working with our team for your next gene modulation/ functional genomics screening project.



Contact our services team





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