

# Dharmacon™ solutions for studying gene function

→ RNAi → Gene Expression → Gene Editing





#### **RNA Interference**

Our RNAi products encompass the most complete portfolio of innovative tools for transient, long-term, inducible and *in vivo* RNAi applications.

#### **Gene Editing**

Interrogate gene function through targeted genome editing using powerful molecular tools to permanently alter endogenous gene expression.

#### **Custom RNA Synthesis**

Design, order, and learn more about custom siRNA, single-stranded RNA, and microRNA products. Use our free, online siRNA design tool or specify your own sequences.

# Why choose Dharmacon?

Since its inception in 1995, Dharmacon's expertise in bioinformatics, RNA biology, and synthetic chemistry enabled us to develop a complete line of products to study gene function. With our RNAi, gene expression and gene editing tools, you can gain a more complete view of what your genes of interest are doing. But, there's more to Dharmacon than industry leading scientific tools; you're also gaining a lab partner; someone who can provide recommendations for experimental design, troubleshoot, and celebrate your successes with you.

→ RNAi      → Gene Expression      → Gene Editing



**RNAi** (RNA Interference)  
A technique for **silencing** gene expression

→ The most complete portfolio of innovative tools for transient, long-term, inducible and *in vivo* RNAi applications!



**cDNA and ORF** (open reading frame) **constructs**  
Molecular tools for **expressing** genes

→ One of the largest clone collections available



**Gene Editing (CRISPR-Cas9)**  
A technique to permanently **knock out** genes

→ Novel CRISPR RNA tools for gene editing without cloning

## Gene Expression (cDNAs and ORFs)

cDNAs and ORFs can be used to overexpress particular genes of interest. Choose from individual clones, lentiviral ORFs, and genome-scale libraries.

## Transfection Reagents

A comprehensive portfolio of competitively priced, proven transfection reagents for a wide range of applications and cell types.

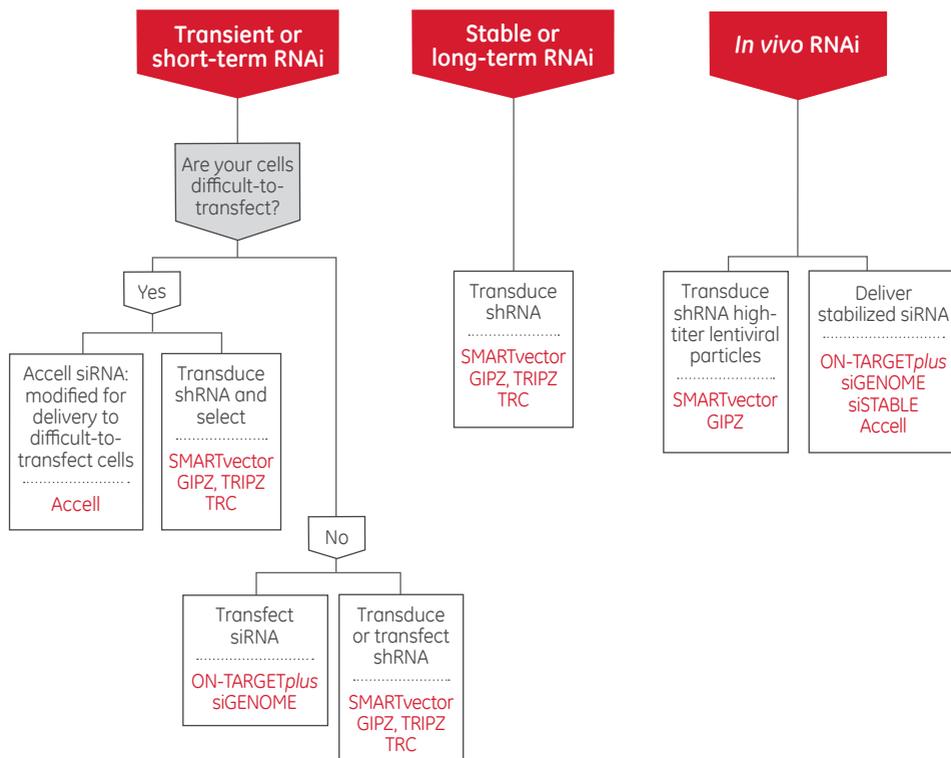
## Lentiviral Packaging

The safest and most effective strategy for packaging lentiviral particles to efficiently deliver your shRNA or gene of interest.

# RNA Interference

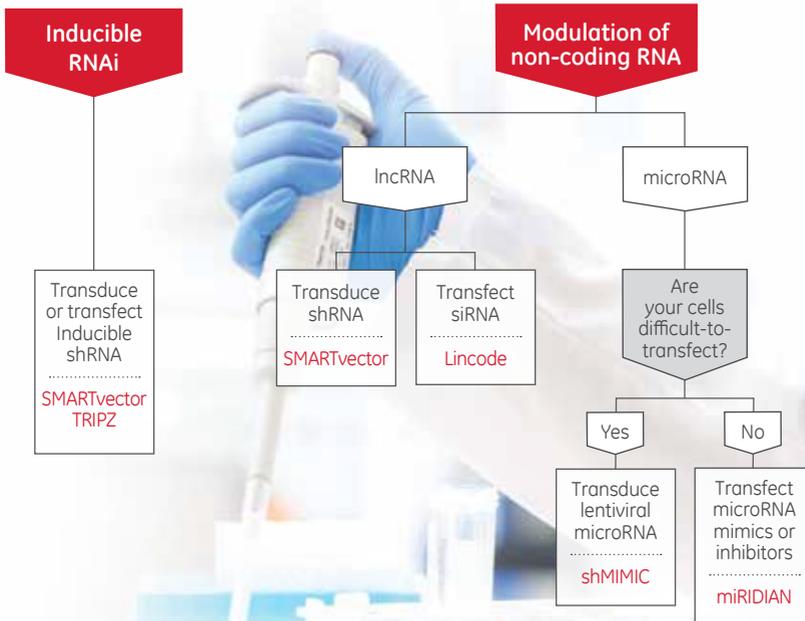
Dharmacon RNAi products encompass the most complete portfolio of innovative tools for transient, long-term, inducible and *in vivo* RNAi applications. Our RNAi reagents are complemented with a complete suite of products for delivery, experimental control and confirmation of results.

Find the right products for common RNAi applications



## RNAi tools

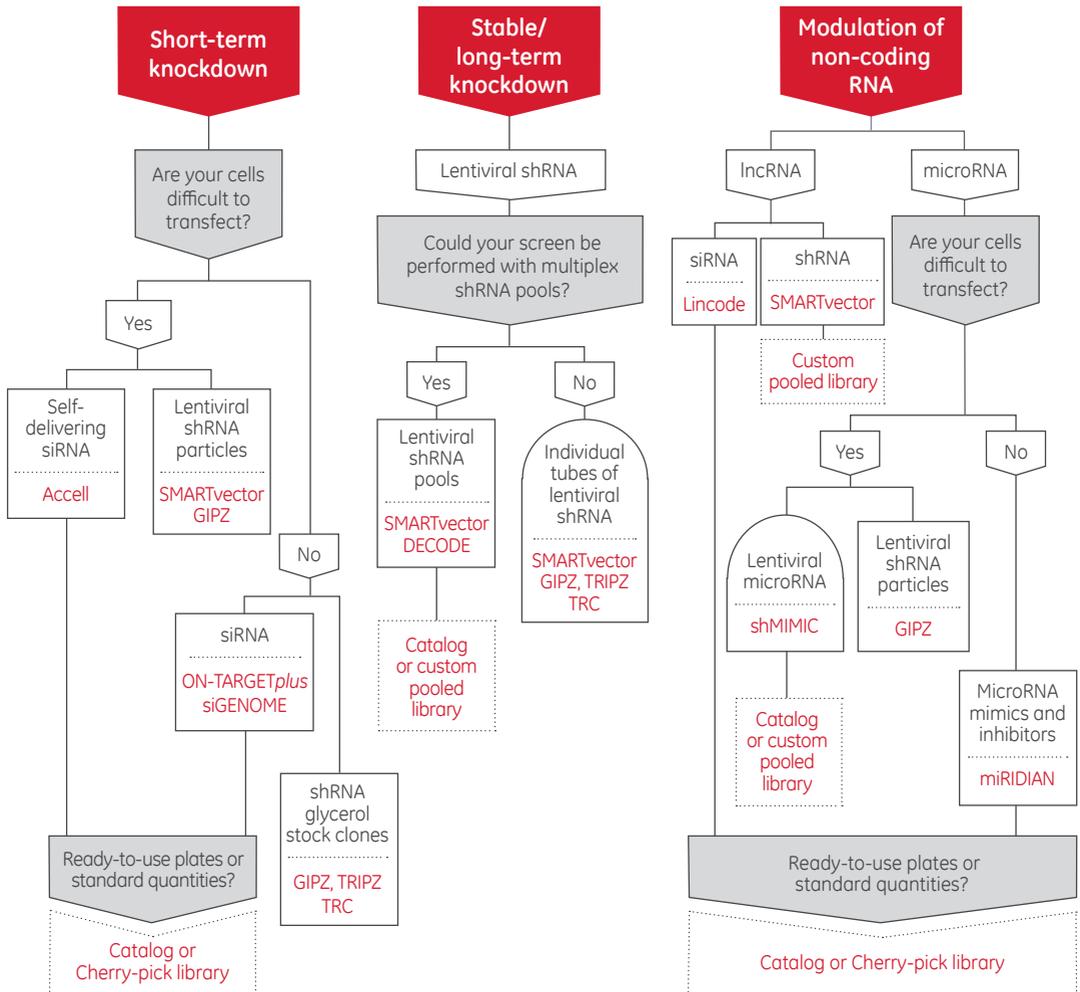
- **siRNA**: short-term silencing, advanced synthetic siRNAs
- **shRNA**: long-term silencing, innovative vector constructs
- **microRNA**: mimics and inhibitors to study endogenous RNAi
- **RNAi screening libraries**: whole genome and gene families
- Products for delivery, experimental controls and confirmation of results



# RNAi Screening Libraries

Ensure screening success when you choose from our siRNA, shRNA and microRNA libraries. Small gene families to genome-wide collections provide flexible, convenient and high-confidence screening results.

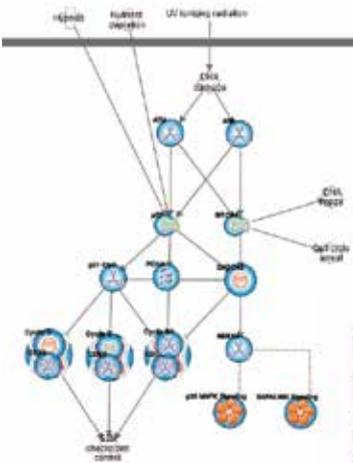
## Screening Selection Guide



# Online creation and ordering of human and mouse synthetic RNA libraries

## → Gene Cart

Build your customized list of genes, interactions and pathways based on annotation powered by Ingenuity™.



## → Cherry-pick RNAi Libraries

Fast and easy online configuration and ordering of plated siRNA & microRNA reagents targeting your genes of interest.



## Cell Analysis & Imaging

Meet your high-content imaging and analysis needs with the IN Cell Analyzer 2200, IN Cell Analyzer 6000 or Cytell™ Cell Imaging System. These cutting-edge quantitative imaging technologies give you incredible depth and breadth of investigation, allowing you to analyze interactions as they happen and gain deeper insights into complex cellular mechanisms. The high-throughput IN Cell Analyzer instrument combined with Dharmacon screening libraries make sure the high quality hits keep coming, while Cytell Cell Imaging System is an affordable and intuitive small scale instrument powerful enough for quick, easy data generation and analysis by anyone in your lab.



# Gene Expression

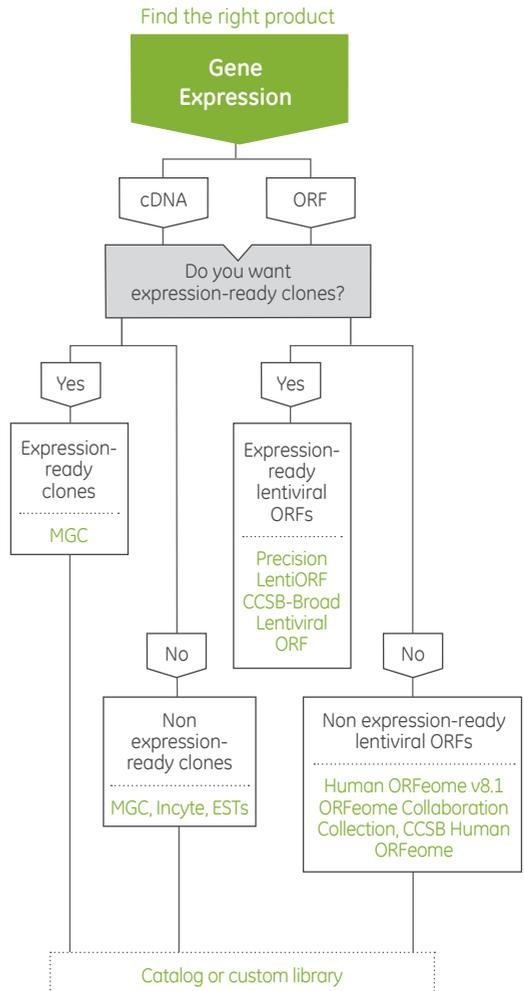
Mammalian cDNA & ORFs  
(open reading frame) enable over-expression of genes of interest

→ **cDNAs:** full length copies of genes with 5' and 3' untranslated regions

→ **ORFs:** ideal for protein expression; expression-ready and Gateway™-adapted

→ **Flexible Formats:** individual clones, pre-defined gene families, genome-scale collections and custom libraries

→ **BLAST Search Tool:** BLAST searches allow investigators to query the Dharmacon clone collection for cDNA and ORF clones containing specific sequences of interest. In order to identify clones that contain a consensus sequence of interest, use the BLAST Search Tool to run your BLAST query of either the nucleotide or peptide database.



# Gene Editing (Edit-R CRISPR-Cas9)

Simplify your gene editing with synthetic RNA

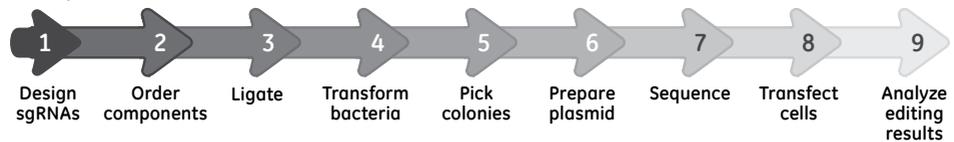
Our innovative approach includes transfection-ready, endotoxin-free DNA and synthetic RNA components which allow you to rapidly target one gene or hundreds and eliminate cloning and sequencing steps.

→ Achieve better Cas9 expression and higher editing efficiency by choosing the most active promoter for your cell type

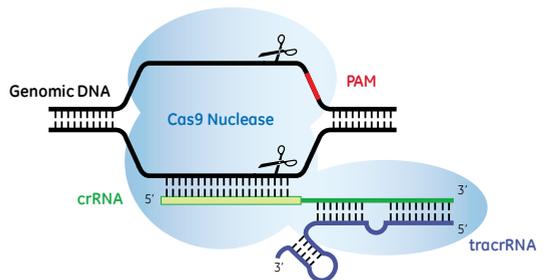
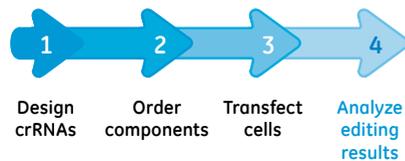
→ Enrich for the edited cell population through antibiotic selection or FACS analysis of fluorescent cells

→ Rapidly target several sites per gene for multiple genes

Do it yourself



Do it with Dharmacon



## Three Component System

**crRNA:** synthetic RNA oligo specifically targets genomic DNA site

**tracrRNA:** synthetic RNA oligo which forms a complex with crRNA

**Cas9 Nuclease:** high expression and editing efficiency from expression vectors with your choice of promoters

# Custom RNA Synthesis

Trust the experts in RNA synthesis chemistry to provide high-quality custom single-stranded RNA, siRNA, and microRNA with an extensive range of modifications, synthesis scales, and purification choices.

## → Custom siRNA Synthesis

siRNA customization has never been easier. Numerous combinations of modifications, sizes, and purification options are available for convenient online ordering.

## → Single-stranded RNA Synthesis

Create and order RNA molecules with a wide variety of chemical modifications or learn about our capabilities for long RNA oligos, dye labeling and custom amidites.

## → siDESIGN Center

Design and order siRNAs targeting genes in non-standard species, particular splice variants, or homologous regions across gene families or species.

## → Custom microRNA

### Modulation Tools

Modify an existing microRNA mimic or inhibitor, target a novel microRNA, or request an Accell microRNA Inhibitor or Stabilized Mimic for special applications.

## Web Tools

We have a number of online tools for checking specificity of CRISPR target sequences, analyzing primers, identifying microRNA seed matches and performing other useful calculations.



Knock down, out or overexpress,  
then detect with the appropriate technology

Dharmacon



**GE High Content Analysis systems (IN Cell, Cytell)**

Dharmacon reagents alter cell phenotypes – High Content readouts common



**Western blotting (AWB, ECL) detect protein expression**

Dharmacon reagents alter cell protein levels – Western blots



**Purification of expressed proteins (AKTA)**

Millions of Dharmacon cDNAs, ORF vectors for protein expression



**Cell Culture (HyClone, PAA)**

Nearly all Dharmacon Reagents used in cultured cells



**Cell Therapy research**

Dharmacon gene editing & vectors  
Potential use for cell therapy research



**Drug Discovery (Biacore, IN Cell)**

Dharmacon libraries used in drug target discovery & HTP screening

# Are you interested in studying gene function?

Explore Dharmacon's solutions for gene silencing, expression and editing.

Visit [gelifesciences.com/dharmacon](http://gelifesciences.com/dharmacon) for more information such as:

- videos
- webinars
- web tools
- RNAi Application guide
- RNAi, Gene Expression & Gene Editing product guide

Contact your local representative:

For more information [gelifesciences.com/dharmacon](http://gelifesciences.com/dharmacon)



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Technical Support: [ts.dharmacon@ge.com](mailto:ts.dharmacon@ge.com) or  
1.800.235.9880; 303.604.9499 if you have any questions.

**Europe:** Customer Support: [cs.dharmacon.eu@ge.com](mailto:cs.dharmacon.eu@ge.com)  
Technical Support: [ts.dharmacon.eu@ge.com](mailto:ts.dharmacon.eu@ge.com)  
0800 515 313 if you have any questions.

