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!

**Gene Expression**
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.
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

**Transient or short-term RNAi**
- Are your cells difficult-to-transfect?
  - Yes
    - Accell siRNA: modified for delivery to difficult-to-transfect cells
    - Accell
  - No
    - Transfect siRNA
      - ON-TARGETplus
      - siGENOME

**Stable or long-term RNAi**
- Transduce shRNA
  - SMARTvector
    - GIPZ, TRIPZ, TRC
  - Transduce shRNA high-titer lentiviral particles
    - SMARTvector
      - GIPZ

**In vivo RNAi**
- Transduce or transfect shRNA
  - SMARTvector
    - GIPZ, TRIPZ, TRC
- Deliver stabilized siRNA
  - ON-TARGETplus
  - siGENOME
  - siSTABLE
  - Accell
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

---

**Inducible RNAi**

<table>
<thead>
<tr>
<th>Transduce or transfect Inducible shRNA</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMARTvector</td>
</tr>
</tbody>
</table>

**Modulation of non-coding RNA**

<table>
<thead>
<tr>
<th>IncRNA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transduce shRNA</td>
</tr>
<tr>
<td>SMARTvector</td>
</tr>
</tbody>
</table>

| microRNA |
| Transfect siRNA |
| Lincode |

**Are your cells difficult-to-transfect?**

- **Yes**
  - Transduce lentiviral microRNA
  - shMIMIC

- **No**
  - Transfect microRNA mimics or inhibitors
  - miRIDIAN
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**

**Short-term knockdown**

- Are your cells difficult to transfect?
  - Yes
    - Self-delivering siRNA
      - Accell
    - Lentiviral shRNA particles
      - SMARTvector GIPZ
  - No
    - siRNA
      - ON-TARGETplus siGENOME
    - shRNA glycerol stock clones
      - GIPZ, TRIPZ TRC

- Ready-to-use plates or standard quantities?
  - Catalog or Cherry-pick library

**Stable/long-term knockdown**

- Could your screen be performed with multiplex shRNA pools?
  - Yes
    - Lentiviral shRNA pools
      - SMARTvector DECODE
  - No
    - Individual tubes of lentiviral shRNA
      - SMARTvector GIPZ, TRIPZ TRC

- Ready-to-use plates or standard quantities?
  - Catalog or custom pooled library

**Modulation of non-coding RNA**

- Are your cells difficult to transfect?
  - Yes
    - IncRNA
      - Lincore
    - shRNA
      - SMARTvector
  - No
    - Custom pooled library

- Ready-to-use plates or standard quantities?
  - Catalog or custom pooled library

- siRNA
  - Lincode
- shRNA particles
  - GIPZ
- Lentiviral microRNA
  - shMIMIC

- MicroRNA mimics and inhibitors
  - miRIDIAN

- Ready-to-use plates or standard quantities?
  - Catalog or Cherry-pick library
Online creation and ordering of human and mouse synthetic RNA libraries

→ **Cherry-pick RNAi Libraries**
Fast and easy online configuration and ordering of plated siRNA & microRNA reagents targeting your genes of interest.

1. **Load Identifiers**
2. **Review Results**
3. **Select Products**
4. **Configure Plates**

---

**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.
Dharmacon

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

**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 (ÄKTA)**
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 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

@DharmaconGE /DharmaconGE

GE, imagination at work and GE monogram are trademarks of General Electric Company. Dharmacon is a trademark of GE Healthcare companies. Ingenuity is property of Qiagen. ©2016 General Electric Company—All rights reserved. First published June 2015. GE Healthcare UK Limited, Amersham Place, Little Chalfont, Buckinghamshire, HP7 9NA, UK

Orders can be placed at: gelifesciences.com/dharmacon

North America: Customer Support: cs.dharmacon@ge.com
Technical Support: 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
Technical Support: ts.dharmacon.eu@ge.com
0800 515 313 if you have any questions.