Gene modulation

Generate precise gene modifications with a catalog of ASOs, miRNA inhibitors, siRNAs, and DsiRNAs

Expert design support

Precision gene regulation

Ship to your lab fast

Integrated DNA Technologies offers a broad and flexible portfolio of tools for gene modulation

Using gene knockdown and silencing tools in your research offers the ability to temporarily and reversibly reduce gene expression, allowing scientists to study gene function without permanently altering the genome. The following tools are especially valuable for functional genomics studies by helping to define the role specific genes play in cellular processes and disease models:

- Antisense oligos (ASOs), DsiRNA, siRNA, and miRNA inhibitors allow you flexibility to tailor tools for your research
- Chemical modifications are available to increase efficiency and stability
- Expert support, easy online ordering, and fast shipping allow you to start your experiments sooner

ASOs with different chemical modifications exhibit different levels of gene inhibition

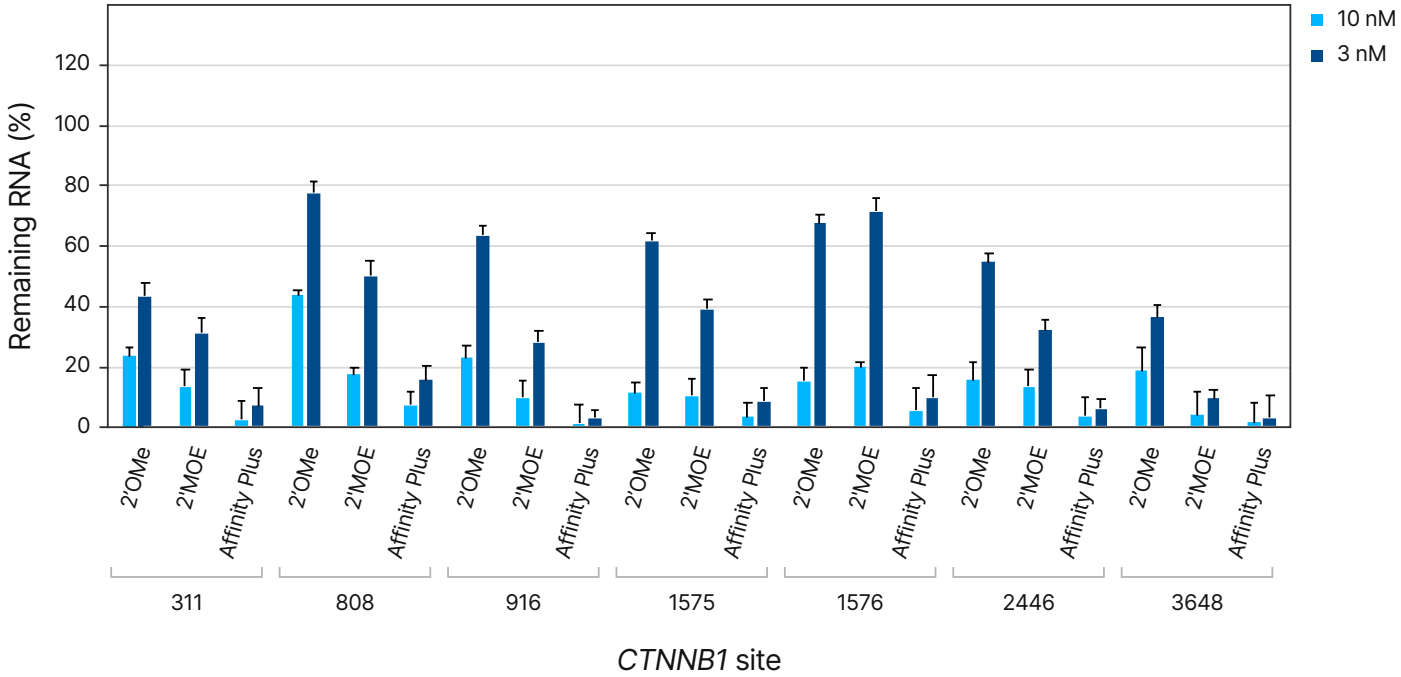

Figure 1. Gene inhibition comparison of 2′OMe, 2′MOE and Affinity Plus gapmer ASOs. Gapmer ASOs were designed to target multiple sites throughout the human *CTNNB1* gene. The 2′OMe and 2′MOE gapmers are 20mer 5-10-5 constructs, while the Affinity Plus gapmers are 16mer 3-10-3 constructs positioned centrally within the 20mer target space (two bases are trimmed off each end of the 20mer site). ASOs were delivered in triplicate into HeLa cells with Lipofectamine™ 2000 (Invitrogen). After 24 hours, RNA levels were measured by RT-qPCR. *CTNNB1* levels were calculated using the internal reference genes *HPRT* and *SFRS9* and compared to negative control sequences with the same chemical modification composition. Error bars represent SEM, *n* = 3.

Gene regulation product details:

Below you can compare various product mechanisms of action, design options, formats, and scale to determine which are best for your experiments. If you're not sure what's right for you **our experts are happy to help**.

	Antisense oligonucleotides (ASOs)			RNAi		MicroRNA inhibitors
	2′MOE	Affinity Plus™	Custom	DsiRNAs	siRNA	miRNA inhibitor
Description	Chemically modified DNA oligos that modulate gene expression through the RNase H pathway, steric blocking, or splicing modulation.			Silences gene expression by degrading mRNA via the RISC pathway. RNA duplexes optimized for knockdown of cytoplasmic RNA.		Steric blocking oligos to inhibit miRNA function.
Size (nt)	14–24	14–24	12–36	27 24–30 allowed	18–23	16–26
Design support	Custom ASO design services via Application Support team			Predesigned, custom design, custom entry	Design guidance/ support available	Sequence configurator
Chemical modifications*	DNA, PS, 2′MOE	DNA, PS, Affinity Plus	DNA, PS, 2′MOE, Affinity Plus, 2′OMe, 5′Methyl dC, 2′F	DNA bases at 3′ end of sense strand to prevent sense-strand loading. (DsiRNA only) RNA, 2′F, 2′OMe, DNA, and PS linkage modifications available		2′OMe, ZEN
Format	Tubes, plates			Tubes, plates		Tubes
Scale*	5, 10, 50, 200 nmol (with optional HPLC purification)			2, 10 nmol		5, 20, 250 nmol
Common applications	RNase H1-mediated gene knockdown targeting cellular RNAs, splice modulation, blocking translation and blocking RBP binding, HT screening			Gene silencing, HT screening		miRNA functional studies, HT screening

* Not seeing what you need? Many other modifications and quantities are available upon custom request, simply **contact us** or email **FunctionalGenomics@idtdna.com**.

IDT miRNA inhibitors

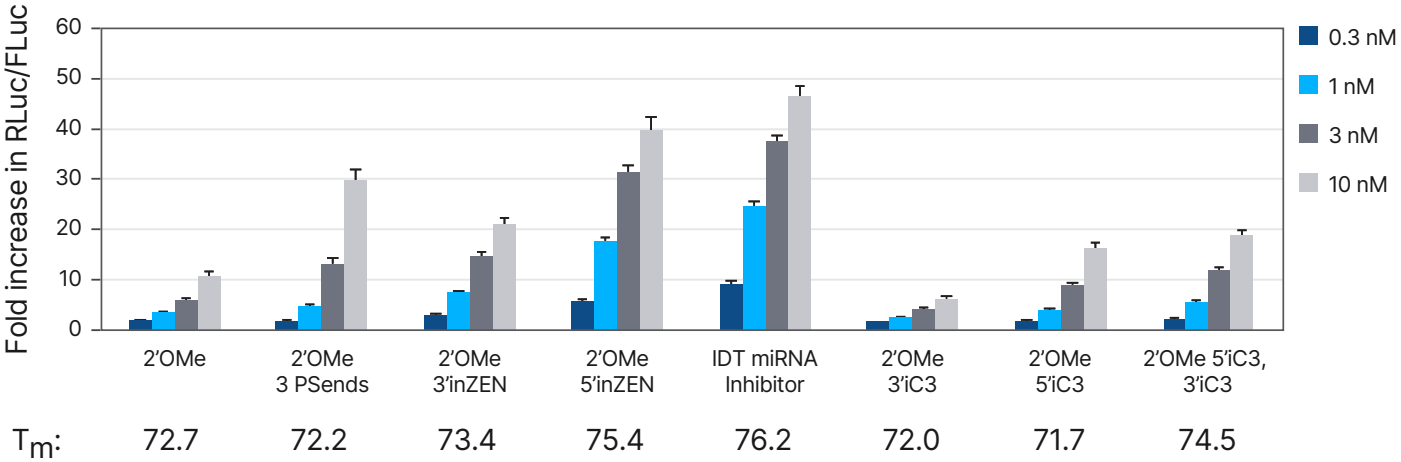

Figure 2. IDT miRNA Inhibitors. Oligonucleotides designed to target miR-21 were transfected at 0.3–30 nM in HeLa cells expressing the psiCHECK-miR-21 plasmid using Lipofectamine® RNAiMAX transfection reagent (Thermo Fisher Scientific). The cells were lysed after 24 hours and analyzed for luciferase activity. Results were normalized with the internal firefly luciferase (FLuc) control and are shown as fold change in Renilla luciferase (RLuc) compared with the lipid reagent control, which was set at 1. Below their respective profiles, T_m values for the various oligos are shown. Error bars represent the standard error of the mean (SEM), n = 3

For more information, visit **idtdna.com/FunctionalGenomics**