4basebio

Synthetic DNA platform with unique customisation potential

4basebio's novel synthetic DNA technology addresses the current bottlenecks and limitations of plasmids and other DNA technologies, accelerating the innovation and development of gene therapies and vaccines.

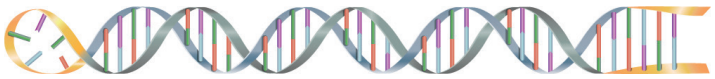
4basebio's DNA construct formats:

hpDNA™, double stranded linear DNA, covalently closed with single strand hairpins at the 5' and 3' ends. This product format is ideally suited for **viral and non-viral vector** applications.

The hairpin design can improve packaging efficiency when producing AAV via triple transfection in producer cell lines, leading to higher Full:Empty ratios and a high quality viral particle. Complex sequences including ITRs are easily produced without risk of deletion or recombination, maintaining sequence integrity. Furthermore, there is no risk of reverse packaging since bacterial sequences are not present in the constructs. The closed ends prevent degradation by exonucleases.

opDNA™ is a partially opened, linear, double stranded DNA product. Each opDNA™ molecule features a hairpin on either the 3' or 5' end, with an opposite open end. The open end of the construct can include an overhang or blunt end. Like hpDNA™, this product is resistant to degradation by exonuclease.

A 3' open end DNA template is ideally suited for in vitro transcription processes for the production of mRNA for use in **vaccines and therapeutics**. Furthermore, a continuous long poly(A)-tail can be coded directly into the DNA template, removing the need for post-transcriptional tailing. opDNA™ generates high quality, homogeneous mRNA products and is suitable for longer, complex sequences such as self-amplifying mRNA constructs.



oeDNA™, or open ended DNA, is a linear, double stranded DNA product where both 3' and 5' ends are open. Constructs can be generated with blunt ends, overhangs or any combination thereof. Like all 4basebio's DNA products, oeDNA™ is resistant to degradation by exonuclease and hence suitable for in vivo applications. This format is ideal for **genome editing** by homology directed repair (HDR).

osDNA™, or open stabilized DNA, is a product incorporating nucleotide modifications within the DNA backbone. This feature not only provides resistance to exonuclease degradation, but enables tuning of the immunostimulatory properties of the construct, making osDNA™ ideally suited for **DNA vaccine applications**.

Benefits of 4basebio's synthetic DNA platform:

- Four construct types available, each with unique, application-specific benefits
- Possibility to incorporate features including barcodes, overhangs, biotin, fluorophores, and other nucleotide modifications
- Sequence independent; no limitation on construct size
- Available in research and GMP compliant grade
- Cost effective with fast turnaround times
- Improved safety profile due to lack of bacterial sequences and antibiotic resistance genes
- Available in microgram to multi-gram-scale

4basebio's further synthetic DNA customisation:

1. Barcodes to support screening of constructs, viral vectors, and/or nanoparticles
2. Nucleotide modifications on 5', 3', and internal positions
3. Inclusion of ligands and dyes such as biotin, fluorescent dyes, or chemical groups
4. Custom 5' or 3' overhangs
5. Customer specific modifications to enable your application

GMP-compliant synthetic DNA manufacturing services

4basebio's unique synthetic DNA templates are available through our manufacturing services. RUO, RUO-HQ and GMP-compliant grades are manufactured in our RUO suites and GMP suites, from microgram scales to multi gram scale, with the capability to produce multiple constructs in parallel. Thanks to our synthetic process, your timeline from receipt of sequence to first GMP-compliant, multi gram batch can be achieved within 3 months.

Onboarding process & timeline to GMP-compliant batch:

	Time per step	Cumulative time
Sequence compatibility review	1 week	1 week
De novo synthesis	4-6 weeks	5-7 weeks
Template generation and validation	1 week	6-8 weeks
Pilot batch production (RUO)	1 week	7-9 weeks
QC and report	1 week	8-10 weeks
Commercial batch production (RUO-HQ or GMP-compliant)	1 week	9-11 weeks
QC and release	2 weeks	11-13 weeks

Other services:

4basebio also offers mRNA manufacturing services, AAV early-stage production, and targeted non-viral nanoparticle development and production with our Hermes™ delivery platform.

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