



Fusion BioLabs DNA Aptamer Development Kit (Capture-SELEX module)

SKU# DAL-02: DNA Aptamer Development Kit (Capture-SELEX module)

Product Overview

Fusion BioLabs offers a validated DNA Aptamer Development Kit (Capture-SELEX module) tailored for independent SELEX projects. This all-inclusive package contains necessary reagents for up to 16 selection rounds on a proprietary Capture-SELEX platform. It streamlines your workflow to yield viable aptamer candidates in just four weeks.

Key Features

- **Streamlined Capture-SELEX Workflow:** Optimized for targets without immobilizing target molecules directly.
- **High-Yield Enzymatic Digestion:** Rapid conversion of PCR products to ssDNA using Lambda Exonuclease with >90% yield.
- **Precise Partitioning Efficiency:** Streptavidin magnetic beads enable high-stringency washing with minimal non-specific background.
- **Dual-Action Purification Columns:** Standardized column-based cleanup removes enzyme, salts, and unused primers rapidly with high recovery rates.
- **Complete Range of Round Requirements:** Includes sufficient reagents for up to 16 iterative selection rounds.

Performance Specifications

- **Throughput Capacity:** $\sim 10^{14}$ - 10^{15} unique ssDNA sequences per kit.
- **Binding Efficiency:** High-affinity capture (>85% recovery rate under standard buffer conditions).
- **Scalability & Compatibility:** Suitable for 1-15 rounds of iterative selection; compatible with downstream NGS sequencing.
- **Target Versatility:** Optimized for small molecules, peptides, proteins, and cell-surface targets.
- **Downstream Compatibility:** High-purity ssDNA output suitable for cloning, NGS sequencing, and binding assays.

Kit Contents

Component	Quantity
Vial 1: ssDNA Library Oligos	20 μ l, 100 μ M
Vial 2: 5'-Biotinylated Capture Oligos	60 μ l, 100 μ M
Vial 3: Forward Primer	20 μ l, 100 μ M

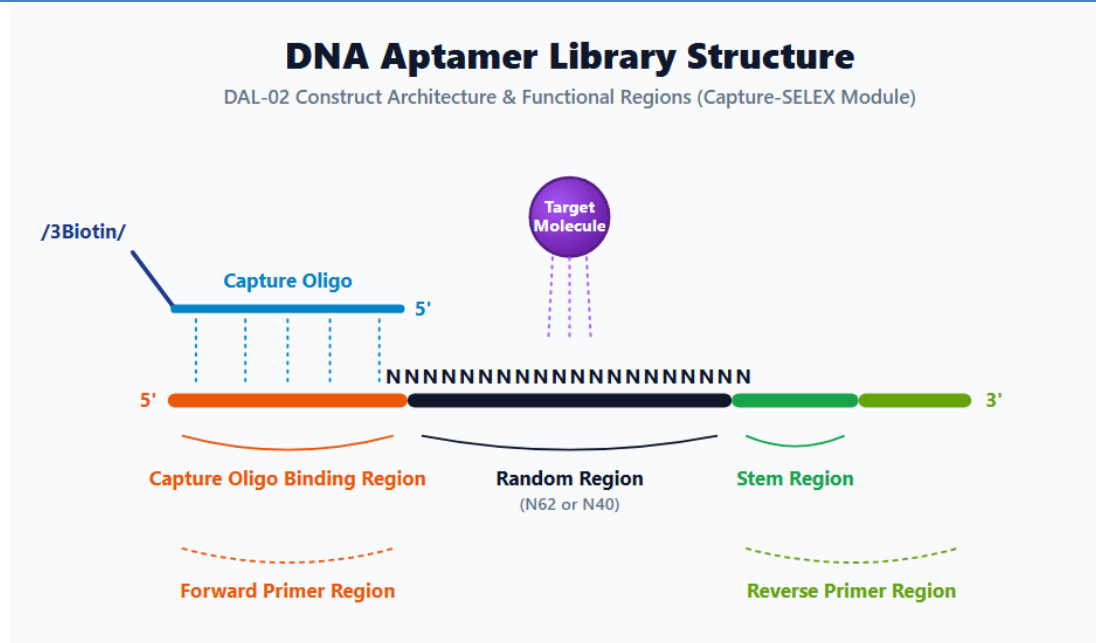


Vial 4: 5'-FAM Labeled Forward Primer	20 µl, 100 µM
Vial 5: Reverse Primer	20 µl, 100 µM
Vial 6: 5'-Phosphorylated Reverse Primer	20 µl, 100 µM
Vial 7: Streptavidin-Coated Magnetic Beads	3.0 ml
Vial 8: Lambda Exonuclease Reaction Buffer (10X)	100 µl
Vial 9: Lambda Exonuclease (5 units/µl)	20 µl
Vial 10: ssDNA Binding Buffer	15 ml
Vial 11: ssDNA Preparation Buffer	15 ml
Vial 12: ssDNA Wash Buffer	9.0 ml
Vial 13: PCR-grade Water	1.5 ml
Vial 14: 2x PCR Master Mix	3.0 ml
ssDNA Cleanup Column I	30 columns
ssDNA Cleanup Column II	30 columns
Collection Tubes	60 tubes
Nuclease-free Tubes	30 tubes

- Kit components must be stored according to individual label specifications: 4 °C, -20 °C, and room temperature (20–25 °C). Reagents are guaranteed stable for 12 months when properly stored.

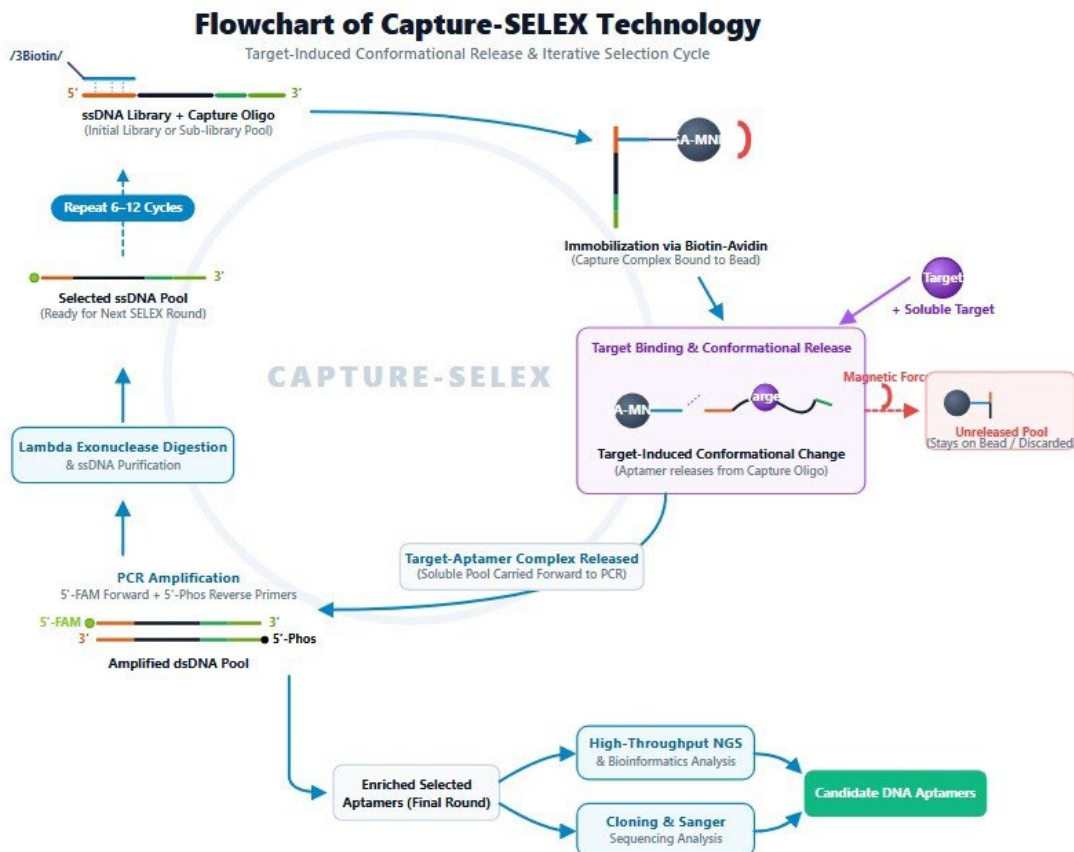
Library Configurations & Specifications

SKU Option	Forward Primer	Random Region	Reverse Primer	Total Length
DAL-02 (N62)	19 bp	N62 (62 nt)	19 bp	100 nt
DAL-02 (N40)	18 bp	N40 (40 nt)	20 bp	78 nt





Selection Workflow



1. **Library Hybridization & Target Immobilization:** The ssDNA library docks onto the biotinylated capture oligos and is captured on streptavidin magnetic beads.
2. **Soluble Target Binding & Target-Induced Release:** Incubation with target molecules triggers conformational changes, releasing target-bound ssDNA into solution away from the bead complex.
3. **Negative/Counter Selection:** Unbound or non-specifically bound sequences are removed using streptavidin magnetic beads to minimize background.
4. **PCR Amplification:** Recovered target-bound ssDNA is amplified using 5'-phosphorylated reverse primers and FAM-labeled forward primers.
5. **Strand Separation via Lambda Exonuclease:** Digest phosphorylated strands to isolate single-stranded DNA pools for subsequent selection rounds.
6. **Iterative Selection & Downstream Analysis:** Perform 8–15 iterative cycles to enrich high-affinity sequences prior to Sanger or NGS sequencing and high-throughput screening.

Applications & Kit Usage

- **Small Molecule Screening:** Ideal for targets that are difficult to immobilize without masking binding sites.
- **Conformational Biomarkers:** Isolates aptamers sensitive to subtle conformational changes.
- **Target-Specific Aptamers:** Generates high-affinity ssDNA aptamers for diagnostics, therapeutics, and biosensors.