AFA5B-T1

NOVAptamer to Neurofilament Light Chain (NfL)

Target Information

Neurofilament light chain

Neurofilament light chain (NfL) is a protein found in neurons, particularly in their axons, and is part of the neurofilament protein family. NfL helps maintain the structural integrity of neurons. Elevated levels of NfL in blood or cerebrospinal fluid are used as a marker for neurodegenerative diseases and neurological injuries, reflecting neuronal damage and disease progression. For aptamer selection, a recombinant His-tagged protein was used.

NOVAptamer AFA5B-T1

Chemistry: DNA
Size: 36 nt
Molecular weight: 12013.1 g/mol
Molar extinction coefficient: 346400 $Lmol^{-1}cm^{-1}$
Binding buffer: PBS, 3 mM $(CH3COO)_2Mg$, pH 7.4

The full-length version of this aptamer, 80 nt long, is available (see AFA5B).

Folding an aptamer into its tertiary structure is essential for optimal target binding. To achieve this, resuspend the aptamer in assay buffer, heat to 95°C (~2 minutes), then allow to cool to room temperature (~5 minutes) before use.

Affinity Determination

Affinity Determination Method: Surface Plasmon Resonance (SPR)
K_D in the binding buffer: 2.2 nM
Specificity:

- at the measured K_D, no cross-reactivity with Glial Fibrillary Acidic Protein (GFAP) was detected

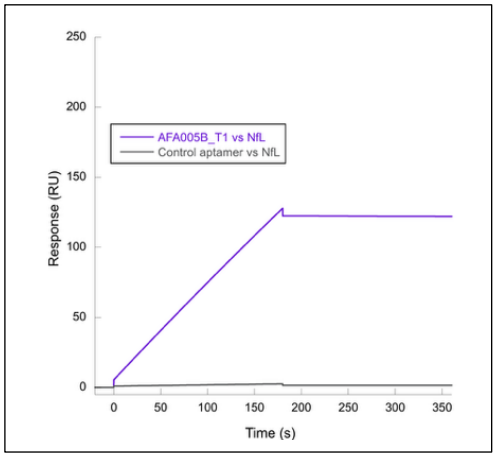

Figure 1. *SPR sensorgram showing the binding of NfL to the immobilized aptamer AFA5B-T1 and the control aptamer in a single-concentration analysis (27 nM). The assay was performed in the binding buffer at 24°C.*

Key advantages offered by aptamers over other affinity reagents, notably antibodies

✓	High affinity and selectivity
✓	Thermostable, long shelf life
✓	Animal- and cell-free discovery
✓	Chemical synthesis
✓	Batch to batch reproducibility

Custom synthesis

- **Available at different scales** – upon request, up to 100 nanomoles
- **Various purification modes** – adapted to specific experimental uses
- **Extensive conjugation options for diverse applications**:
- Grafting: NH_2, SH, biotin, etc.
- Sensing: fluorescent dyes, redox groups
- Cross-linking: other functional groups for click chemistry
- **Molecular beacons** - possible hybridization with a complementary oligonucleotide to form a bimolecular beacon, enabling quantitative detection

Applications (For Research Use Only)

- Biosensing
- Probe for NfL protein – modified with fluorophores, redox groups, and functional groups to enable integration into various assay formats

More information

For more information or inquiries, please contact:

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