Solution phase aptamer selection for challenging small molecule and biological targets

Technology #cu15216

Oligonucleotide-based aptamers can selectively bind with high affinity to target molecules, and systematic evolution of ligands by exponential enrichment (SELEX) can be used to screen for and amplify the desired aptamer. However, some simple target molecules with few functional groups, like glucose and other monosaccharides, glycine, and fatty acids, have proven resistant to aptamer targeting. This technology is a method that utilizes organic reagents to improve the selective binding of DNA aptamers to simple targets. This technology has the potential to enable the use of aptamers to detect and analyze small molecules in situ.

Enhanced aptamer-target binding for detection of challenging analytes in solution

This technology is a method for targeting simple small molecules with aptamers by enhancing aptamer-target binding. To achieve this, an organometallic reagent is used to create enhanced DNA aptamers capable of forming a DNA-metal-target complex with the target small molecule. This technology enables aptamer-mediated solution-phase detection of challenging targets that previously could not be targeted. It could be developed for the detection and analysis of small molecules in solution, or further modified for use in fluorescent detection of analytes or fluorescence microscopy applications.

Using this method, functional aptamer matches for both glucose and amino acid complexes have been identified in solution.

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Applications:

- Development of aptamer-based sensors
- Clinical diagnostic tools
- Food and beverage monitoring
- Allergen detection
Fluorescence microscopy
Basic research tool for organometallic-biomolecule reagent development

**Advantages:**

- Selects functional aptamers for challenging targets
- Identifies high affinity aptamer matches for compounds that have no known matches (e.g. glucose, amino acids, and fatty acids)
- Can be used to detect challenging targets in solution phase
- Generates physiologically relevant synapses between AD neurons.

* Patent Information: *

Patent Pending (WO/2014/144744)

Patent Pending (US 20160076021)

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**Related Publications:**


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