In situ derivatization of challenging targets enables solution phase aptamer selection

Aptamers are oligonucleotide sequences that bind with high affinity to specific target molecules. They are utilized widely in basic and clinical research to probe molecular entities. However, it is not yet possible to identify aptamers for some target ligands, such as glucose, glycine, and fatty acids, that have relatively few chemical functional groups. This technology is a method in which the target ligand is first modified by in situ derivatization with a known organic compound. Subsequently, a high-affinity aptamer is selected that binds with the complexed ligand. Using this method, functional aptamer matches for both glucose and amino acid complexes have been identified in solution phase. It is envisioned that this technique could be used to select functional aptamers for a vast array of challenging targets in clinical chemistry.

In situ derivatization enables detection of challenging analytes in solution

Analytes that lack chemical functional groups can be complexed with an organic compound to improve aptamer matching. Aptamers that bind the ligand derivative complex enable detection of the given analyte in solution. This process enables aptamer-mediated detection of challenging targets that previously had no known aptamer matches.

This method has been demonstrated by identifying functional aptamers for both glucose and amino acid complexes.

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Applications:

- Development of aptamer-based sensors
- Clinical diagnostic tools
- Food and beverage monitoring
• Allergen detection
• Fluorescence microscopy

**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

**Patent information:**


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**Related Publications:**


**Inventors**

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