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SMALL MOLECULE DETECTION ASSAY IN BIOLOGICAL SYSTEMS

DIAGNOSTICS

Nucleic acid aptamer-based platform for the rapid and inexpensive detection of drugs, toxins, or metabolites at low concentrations.

TECHNOLOGY TYPE

Assay Platforms

STAGE OF DEVELOPMENT

Validated detection of cocaine.

IP PROTECTION

U.S. Utility Patents Issued

Small Molecule-Dependent Split Aptamer Ligation
US8735367B2

Aptamer-Based Lateral Flow Assay and Associated Methods
US8945838B2

Continuations Issued in the U.S.

Small Molecule-Dependent Split Aptamer Ligation
US9279805B2
US9599628B2

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Reference Number: U-5091

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TECHNOLOGY SUMMARY

The demand to perform rapid and selective testing for small molecules in biological samples using inexpensive instrumentation is increasing. For example, current drug testing methods rely on antibody-based assays, which can produce false-positive results, requiring additional expensive mass spectrometry-based testing to establish if the illegal substance is present.

A University of Utah inventor developed a novel detection platform based on nucleic acid aptamers capable of selectively detecting small molecules such as drugs, toxins, or metabolites in complex biological systems. The key aspect of the platform is split aptamer ligation technology, which generates an aptamer-based, enzyme-linked detection system that is superior to existing antibody-based assays, as it allows for rapid and inexpensive detection at low concentrations. The new platform has the potential to distinguish between structurally similar analytes such as morphine and codeine. In addition, it will find broad application in the fields of forensics, medical diagnostics, and environmental research.

FEATURES AND BENEFITS

- Nucleic acid aptamers can be chemically synthesized for any molecule/analyte.
- Nucleic acid aptamers can be selective for specific compounds rather than a class of molecules.
- Capable of detecting small molecules in complex biological systems, for example drugs in human blood serum, urine, or saliva.

RECENT PUBLICATIONS

Sharma, A.K. and Heemstra, J.M. (2011). Small-molecule-dependent split aptamer ligation. *J. Am. Chem. Soc. 133*(32), pp. 12426-12429. doi: 10.1021/ja205518e

INVENTOR PROFILE

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