

Plasmonic Signal Amplification Lateral Flow Sensors

Track Code: 2019-IRUD-68420

Categories:

- Food and Nutrition
- Micro & Nanotechnologies

Keywords:

- Detection
- Food and Nutrition
- Food Safety
- Micro & Nanotechnologies
- Pathogenic bacteria
- Plasmonic Colors
- Plasmonics
- Public Safety

Researchers at Purdue University have developed enhanced lateral flow strips, known as pFLS, by amplifying their plasmonic signals. This technology can be used to detect proteins, whole cells, bacteria, and viruses including E. Coli. The toxin-producing protein E. Coli poses a severe threat to the public as it is commonly found in food items and has shown mortality rates of up to 40%. Current LFS technology such as Enzyme-linked immunosorbent assays (ELISA) often takes hours to get results, is not adapted for practical testing, and requires use of an inconvenient liquid medium for processing. The pLFS device allows for onsite rapid detection, recognizing as low as 100 colony forming units/mL concentration of E. Coli within just 45 minutes — that is 1000 times the sensitivity of traditional LFS and 4 times faster than (ELISA) by comparison. pLFS utilizes a liposome encapsulating reagent to prompt aggregation of gold nanoparticles (GNPs), thereby augmenting colorimetric signals. Researchers have optimized pLFS parameters to ensure reliability and accuracy for food safety.

Advantages:

- Rapid Detection
- Reliable
- Accurate
- High Sensitivity

Potential Applications:

- Food Safety
- Public Health

Publication: Plasmonic enhancement in lateral flow sensors for improved sensing of pathogens.

doi: 10.1016/j.bios.2018.10.066.

People:

- Irudayaraj, Joseph (Project leader)

Intellectual Property:

Application Date: October 15, 2021

Type: CON-Gov. Funding

Country of Filing: United States

Patent Number: (None)

Issue Date: (None)

Application Date: September 9, 2019

Type: Utility Patent

Country of Filing: United States

Patent Number: (None)

Issue Date: (None)

Application Date: October 12, 2018

Type: Provisional-Patent

Country of Filing: United States

Patent Number: (None)

Issue Date: (None)

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