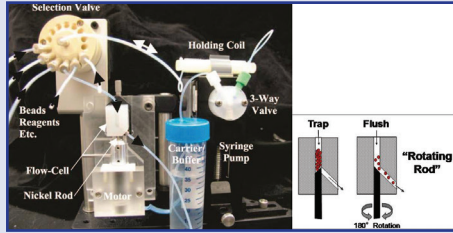


Battelle - Pacific Northwest National Laboratory - Biodetection Enabling Analyte Delivery System (BEADS)



GENERAL DESCRIPTION:

BEADS is a universal fluidics platform that enables automated processing of surface functionalized magnetic and non-magnetic beads. BEADS enables faster more sensitive assays for a wide range of biothreat targets including DNA/ RNA, bacteria, viruses, spores, oocytes, proteins, etc. BEADS enables a high degree of sample purification and concentration and is applicable for a broad range of matrices. BEADS serves as a front-end to a variety of detectors (e.g., PCR, Flow Cytometry, Electrochemical detectors, Fluorescence or Absorbance Detectors, etc.) or can be integrated with robotic systems. BEADS can serve as a sample purification and concentration front-end, or detectors can be integrated within BEADS.



TECHNICAL DESCRIPTION:

The key enabling technology is a bead trap/flow-cell. The flow cell isolates surface functionalized magnetic or non-magnetic beads in a mini-column, which allows sample, reagents, and wash solutions to be passed over the bead column, resulting in significantly improved mass transport and faster, more sensitive assays. The microbeads can be functionalized with a wide range of target analyte capture ligands including oligonucleotides, antibodies and lectins. Semi-selective beads (e.g., silica, hydroxyapatite) can also be used to capture a wide range of pathogens or nucleic acids utilizing electrostatic capture.

CONTACT INFORMATION

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COST

- \$1,000-\$4,000/system
- \$10-\$20/assay

Tier Selection

Final tier assignment is based on overall product score.

- Top Tier
- Second Tier
- Third Tier
- Fourth Tier
- Bottom Tier

RANKINGS

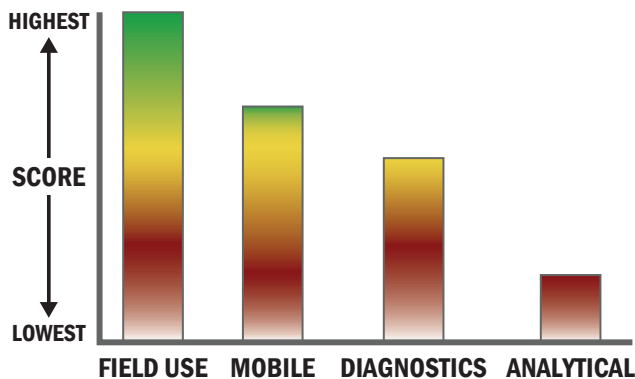
	Biological	Chemical	Radiological
FIELD USE System		N/A	N/A
MOBILE Laboratory		N/A	N/A
DIAGNOSTIC Laboratory		N/A	N/A
ANALYTICAL Laboratory		N/A	N/A

Survey Source

Vendor Supplied Information

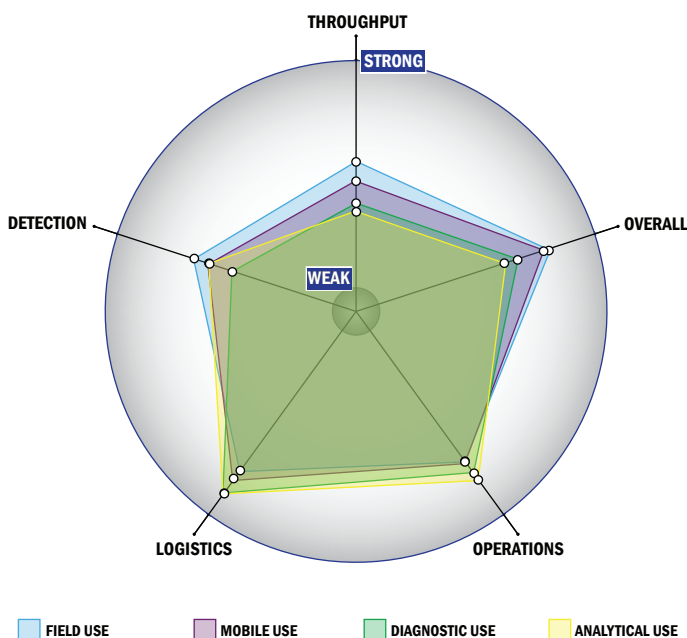
Scoring Analysis

System scores are compared across the four scenarios and ranked from highest to lowest.



Impact Chart

The Impact Chart is a spider graph representing specific categories and designed to give the reader a visual depiction of how a particular system is expected to operate across the four different scenarios. The score for each of the seven categories is presented as the percentage of the total possible score. Higher category scores extend the spokes of a graphic toward the outer edge of the chart. The area graphed for each of the four scenarios relates to how well the system performed in that scenario. Graphics for each of the four scenarios are super-imposed for ease of comparison.



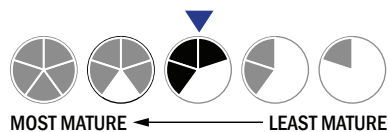
Evaluation Criteria

Throughput:

- Between 2 and 15 minutes for detection
- 1 sample, <10 tests/sample per run
- Less than 32 samples every 2 hours
- The system could be adapted to a fully automated system with some effort
- Device or system is intended for multiple detection assays
- 3 solutions, buffer, eluents, and/or reagents
- 1 component
- Less than 5 minutes is required for set-up
- 1-2 steps are required for detection

Logistics:

- Very brief (minutes-hours) training and minimal technical skills
- Approximately the size of a carry-on luggage suitcase
- Between 5 and 25 kg
- Satellite, wireless and wired connections are available
- System or device has 110V electrical requirement
- 4-8 hours battery life



Operations:

- Can be used from 4 °C to 41 °C
- Components must be stored at 4 °C
- Performance is not influenced by relative humidity
- Between 6 months and 1 year shelf life
- 3-5 years expected life
- Results can be viewed in real-time
- The system or device is currently fully autonomous
- The system software is open and available for modification
- The system hardware is open and available for modification

Detection:

- Possible the system could receive 510K clearance, no current efforts at this time
- Possible the system could receive FDA approval, no current efforts at this time
- Less than 10 µL
- Excellent specificity. System has occasional false alarms under certain conditions (<2%)
- 1-100 colony forming units (CFU) per mL
- 1-100 plaque forming units (PFU) per mL
- Add on capability that is full or semi-automated for spore lysis

