Bioforce Nanosciences, Inc. - ViriChip System

GENERAL DESCRIPTION:

The ViriChip System is a technology platform for direct detection and characterization of viral particles rather than nucleic acid or antigens. The affinity substrate used is termed the 'ViriChip'. The ViriChip contains type-specific antibody or ligand domains capable of capturing intact infectious viruses. The integration of AFM with the ViriChip has resulted in the development of an atomic force microscopy–immunoassay (AFMIA). The AFMIA combines two key features: specificity determined by antibody capture, and a label-free AFM readout that offers the additional benefit of providing topographical/morphological information to corroborate affinity-based virus identification. Principal benefits of AFM readout include size of apparatus (hand held) and multiplexing for multiple viruses on single ViriChips. The ViriChip System is versatile being designed for:

- Use in field operations
- Use in laboratory analysis
- Use in remote testing by UAV or other vehicles
- Use in clinical diagnostic laboratories.

TECHNICAL DESCRIPTION:

The ViriChip System consists of a functionalized chip containing 10 micrometer domains of specific capture ligands (antibodies, aptamers, etc.) arrayed in multiplexed format. The specific ligands are qualified to capture intact virus particles, virus-like particles, or sub-virion structures existing on the outer surface of the virus. The chip, assembled into a microfluidics cartridge, receives and analyzes fluids for virus capture. Processing and readout by atomic force microscopy are automated. Analysis software is coordinated with data collection. Data and analysis transmission is designed for existing communication mechanisms. The System will detect and identify biothreat viral agents collected from water, air, foods, surfaces, and body fluids.

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	Second Tier	N/A	N/A
MOBILE Laboratory	Second Tier	N/A	N/A
DIAGNOSTIC Laboratory	Top Tier	N/A	N/A
ANALYTICAL Laboratory	Second Tier	N/A	N/A

CONTACT INFORMATION

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COST

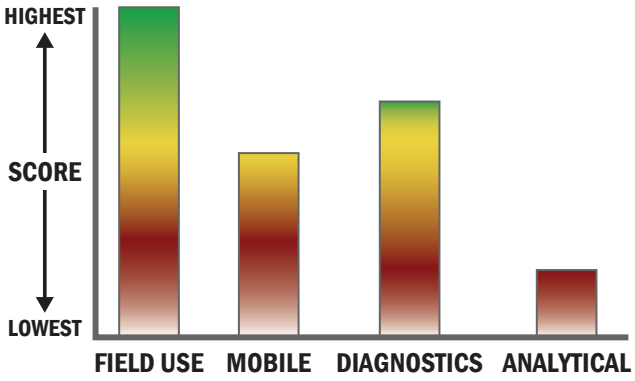
- $35,000-$50,000/system
- <$1/analysis

Survey Source

Vendor Supplied Information

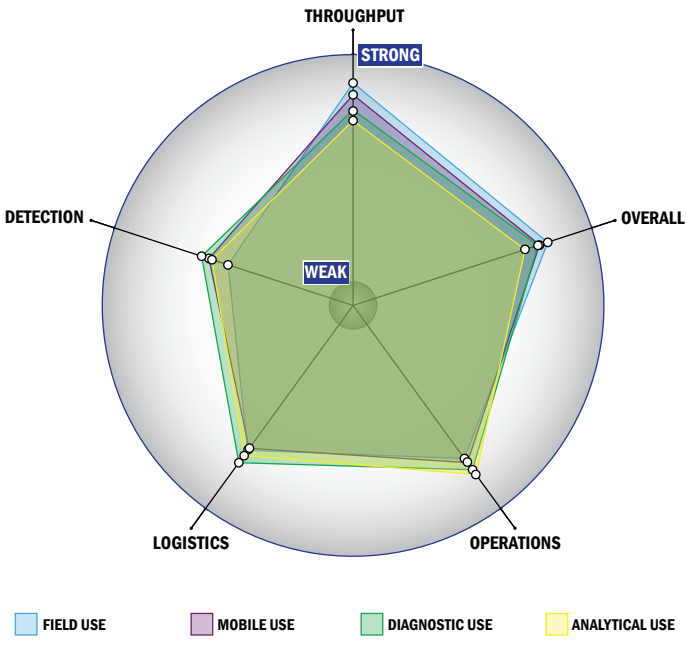
Scoring Analysis

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.



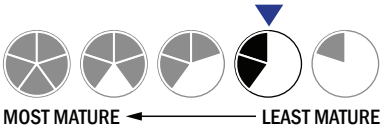
Evaluation Criteria

Throughput:

- Between 15 and 30 minutes for detection
- Multiple samples, multiple tests/sample per run
- Greater than 750 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
- 0-1 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 toaster
- Between 5 and 25 kg
- System or device uses batteries
- 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
- 5-10 years expected life
- Results can be viewed in real-time
- The system could easily be adapted into a fully autonomous system
- The system software is open but modification requires licensing
- The system hardware is open but modification requires licensing

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 PFU per mL