TIRF Technologies, Inc. - FluoroGazer

GENERAL DESCRIPTION:

FluoroGazer is a multipurpose chem-bio sensor instrument designed for use in analytical laboratory. FluoroGazer uses advanced fluorescence optics, electrochemical system, microfluidics, electronics, software, and nanoengineered bioassays integrated into one bench top instrument. FluoroGazer performs analysis in the format of real-time microarrays that are capable of parallel detecting up to thousands of nucleic acids, proteins, toxins, metabolites, and chemical agents. FluoroGazer detects unlabeled molecular markers using reagentless bioassays based on DNA molecular beacons and aptamer- or antibody-based beacons. The bioassays are equipped with embedded luminescence reporters that change their luminescence upon binding to target molecules. FluoroGazer requires no or minimal sample preparation and is capable of analyzing complex biological fluids. In contrast to traditional microarrays that detect only end-point results, FluoroGazer monitors the entire course of association and dissociation kinetics for each spot of the microarray.

TECHNICAL DESCRIPTION:

FluoroGazer employs synergistic combination of Total Internal Reflection Fluorescence (TIRF) with Electric field Control (TIRF-EC). TIRF-EC sensor chip represents a glass or plastic slide coated with a thin electroconducting transparent layer of indium tin oxide (ITO). TIRF-EC chips are incorporated into cartridges that are available in disposable or reusable formats. TIRF-EC chip carries a microarray of reagentless bioassays printed on the ITO surface. TIRF provides real-time monitoring of the interactions between target molecules and bioassays, while the electric field enables several advantageous functions in TIRF system: accelerated transport of target molecules to their detection sites, discrimination between close homologs of target molecules, and moving fluids in microchannels. TIRF-EC microarray may contain from a few spots of bioassays in a single flow channel to thousands of chem-bio assays in four separate flow channels. FluoroGazer supports fluorescence assays, Electro-Chemi-Luminescence (ECL), other luminescence assays, as well as luminescence assays immobilized in a hydrogel layer printed at the TIRF-EC surface. TIRF-EC microarray is a rapid real-time detection system.

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

Survey Source

Vendor Supplied Information

CONTACT INFORMATION

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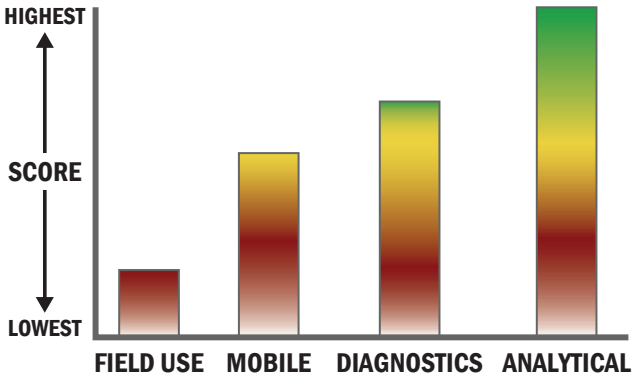
COST

- $95,000/system
- $4.80/analysis

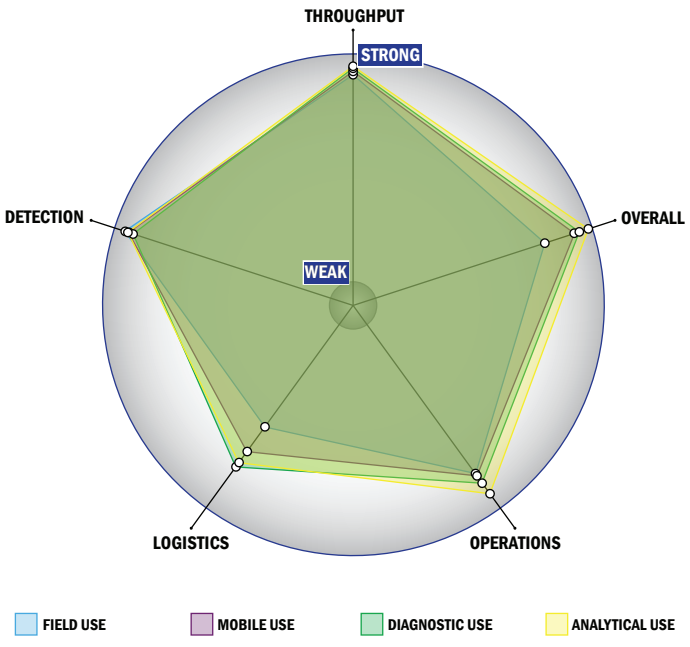
Scoring Analysis

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.



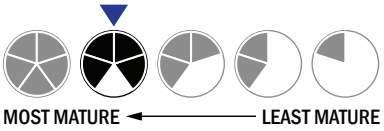
Evaluation Criteria

Throughput:

- Detection is instantaneous
- Continuous operation with no defined runs
- System is continuous and provides real time analysis with no defined tests/samples
- The system or device is currently semi-automated
- 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
- Automatic detection

Logistics:

- An afternoon of training and some technical skills required
- Approximately the size of a carry-on luggage suitcase
- Between 5 and 25 kg
- Wireless and wired connections are available
- System or device has 110V electrical requirement



Operations:

- Can be used from 4 °C to 41 °C
- Components must be stored at room temperature (27 °C)
- Device or system has peak performance at normal relative humidity conditions
- Between 1 to 3 years 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 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
- Superior specificity. System has a false alarm rate approaching zero (~0%)