

# Biological Intelligence (BIOINT): The Future of Biodetection

## What is BIOINT?

**BIOINT is a vision for a new paradigm in biodetection. Here's what makes it revolutionary:**

- It provides **persistent** environmental surveillance. It's "always on," which means threats can be detected, and responses prepared, before they become deeply consequential.
- Its insights are **pervasive**, offering global coverage, because it involves selecting nodes where biological threats are likely to emerge. Where sample collection isn't possible, the interconnectedness of human-environmental transit systems still allows BIOINT to offer insights, even for regions where we don't have sensors in place.
- It's **threat agnostic**, meaning it's able to identify a wide variety of threats — known or novel, natural or engineered.
- It provides deep **analytical** insights. State-of-the-art, AI-enabled computational tools characterize threats, decide if they're natural or engineered, identify their origins, and model their trajectories under different response scenarios.
- It's **integrated** with other forms of data to create a powerful form of intelligence.
- It takes a **global** approach to elevating local sample collection to networked data aggregation, rather than focusing on any individual country or region.

## Why is BIOINT the future?

- **It's necessary.** Biological threats aren't going away, and current syndromic surveillance approaches are inadequate to provide early warning. BIOINT will empower leaders to make better decisions faster to avoid or minimize biological catastrophes.
- **It's attainable.** Advances in technology mean that BIOINT is finally possible. Governments must embrace this emerging opportunity to protect the world from threats.
- **It's proactive.** BIOINT, which is conducted both during and between crises, can mitigate threats in a way traditional, reactive approaches can't.

## How will BIOINT work?

**Concentric by Ginkgo is leading the charge into a biosecure future. Here's how we get there:**

### 01 Technology

The technology that will enable BIOINT is well underway, from targeted detection of specific pathogens through metagenomic sequencing of environmental samples. Concentric is building towards a transition to a threat-agnostic, metagenomics-first approach, with targeted amplification and enrichment used in follow-up analyses to enhance analytic depth.

### 02 Resources

BIOINT implementation demands substantive investment, to be evaluated against the known and unknown risks to economic stability, public health, and national security. Funding should be driven first by national security agencies. As the bioeconomy develops, it may be additionally funded by demand from the private sector.

### 03 Data Sharing

Timely data exchange, empowered by global data sharing infrastructure that builds on existing global data governance norms, is key to implementing BIOINT. Vigilance around data security and individual privacy is also essential.

### 04 Operationalization

Effective BIOINT requires careful operational design. These operational structures will enable the identification of anomalies within vast troves of data, helping leaders rapidly triage events that are most likely to cause major harm and direct emergency response resources accordingly.