Omnyra

Initial Problem Statement

Easy access to DNA synthesis and weak buyer checks let bad actors slip through and make dangerous biological agents.

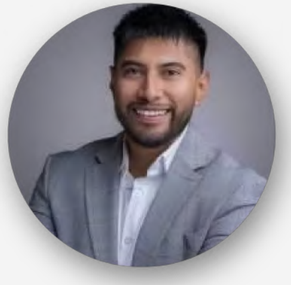
130 Interviews

Final Problem Statement

Existing safeguards miss AI-generated threats and the government lacks visibility into today's bioengineering capabilities.

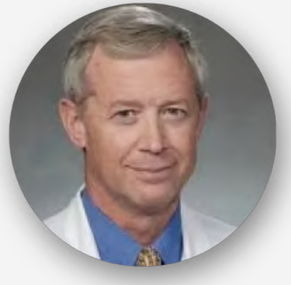
Kari Montoya, FBI
Problem Sponsor

Nelson Layfield, FBI
Government Mentor



Sal Badillo-Rios, DIU
Government Mentor

Laura Clapper, MD
Business Sponsor



Mark Clapper, MD
Business Sponsor

Our Team: A Mix of Computer Science & Biology

Emilin Mathew

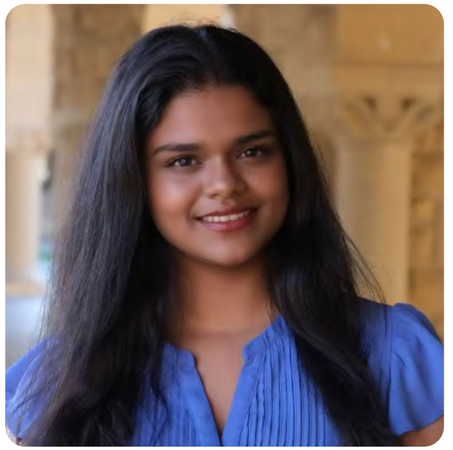
BS in Computer Science & Biology

Taralyn Nguyen

BS in Computer Science & Management

Stefan Thottunkal

MD/MS in Community Health and Prevention Research



Varsha Saravanan

BS & MS in Computer Science

Highs, Lows, and Lightbulbs...

Week 1-2

Initial Discovery

So much to learn, can't wait!

Week 3-4

What's Most Pressing?

But who actually CARES? We're **overwhelmed**

Week 5-6

Map Beneficiaries + Get out of the Building!

The FBI and DNA Synthesis Companies are invested. Let's test our MVPs!

Week 7-8

Design, Iterate and Explore Deployment

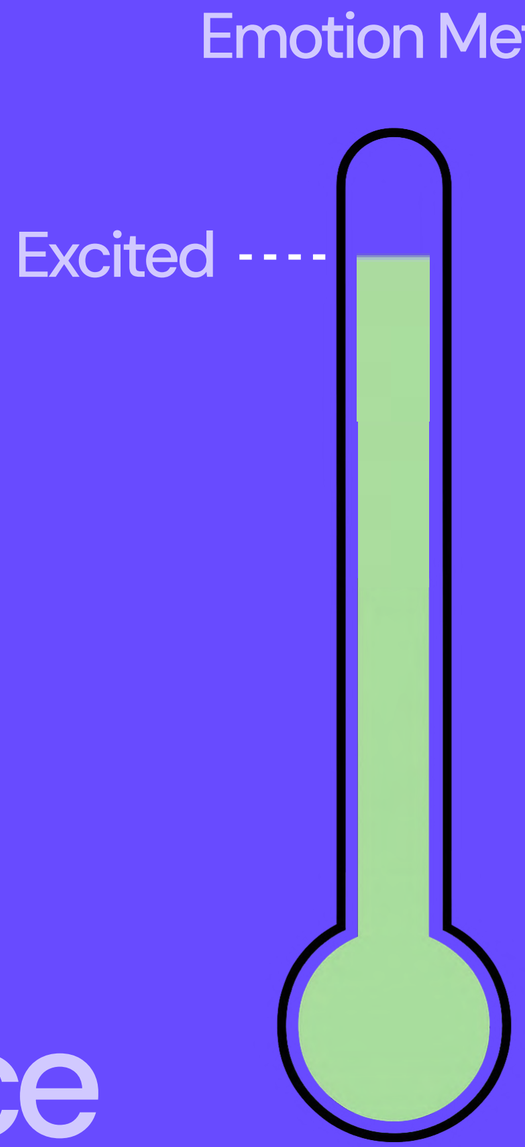
Much feedback to process! Let's continue learning and iterating

Week 9-10

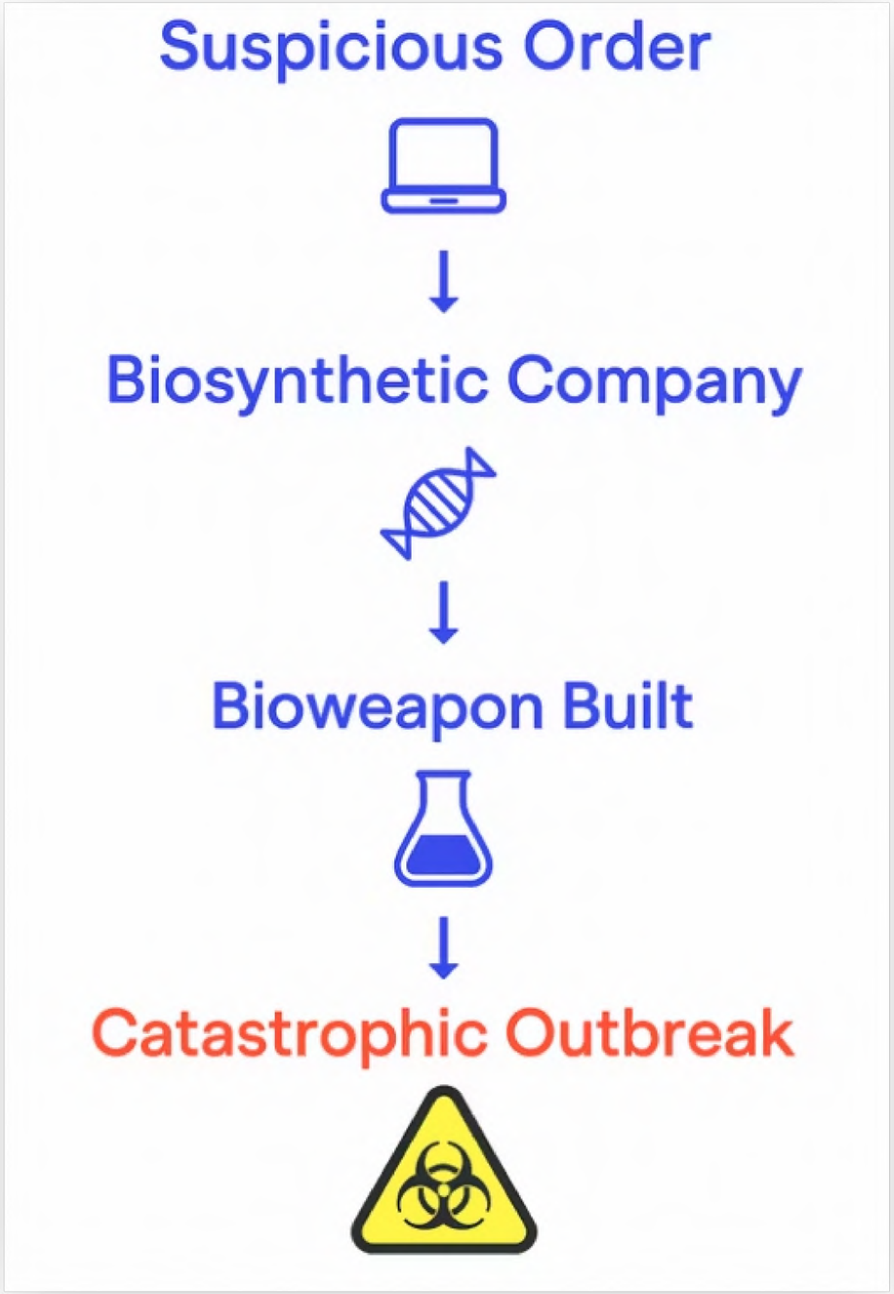
We've connected the dots. Let's dream bigger and continue our journey...

Week 1-2

21 Interviews in...



Understanding Problem Space



Some companies assume every customer is safe. That assumption could be deadly.

> *"It's not our job to verify customers' orders."*
>
> – U.S. DNA Synthesis Company

We Interviewed Every Major U.S. Competitor in Biosecurity Screening

1 Customer Screening Tool

aclid

5 Sequence Screening Tools

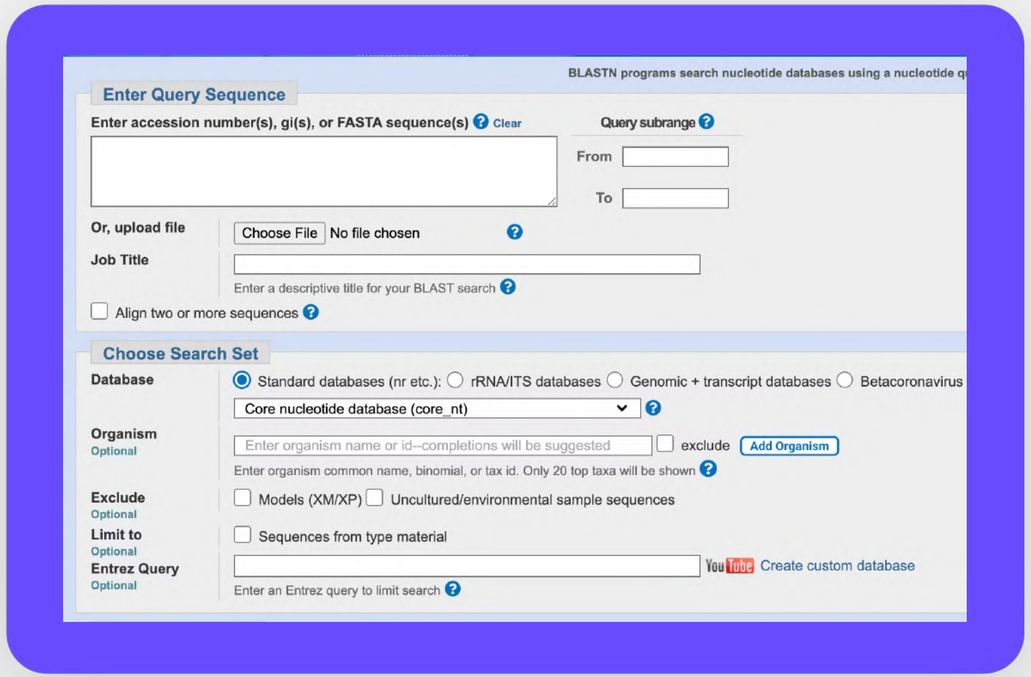
FAST-NA

IBBIS

Protein BLAST
protein ▸ protein

SecureDNA

BATTELLE



We mapped the field. Every tool follows the same outdated playbook.

Existing Tools Have Little Defense Against Modern Threats

Direct Match

Detected

Minor Changes

Maybe Detected

Large Rewrite

Not Detected

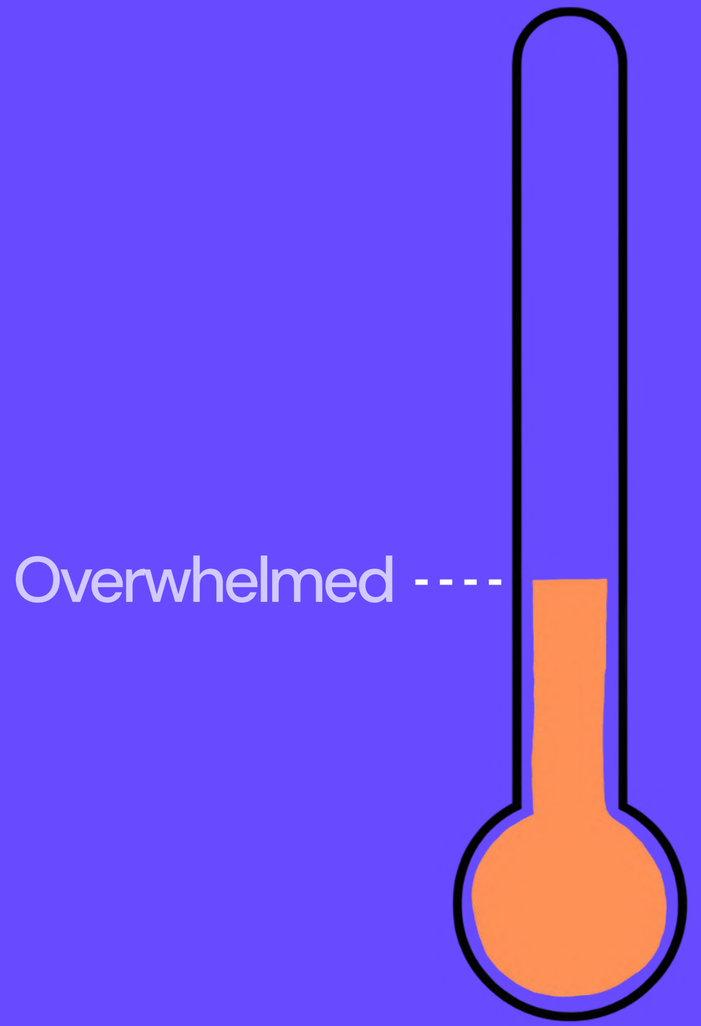
Entirely New Threat

Not Detected

Week 3-4

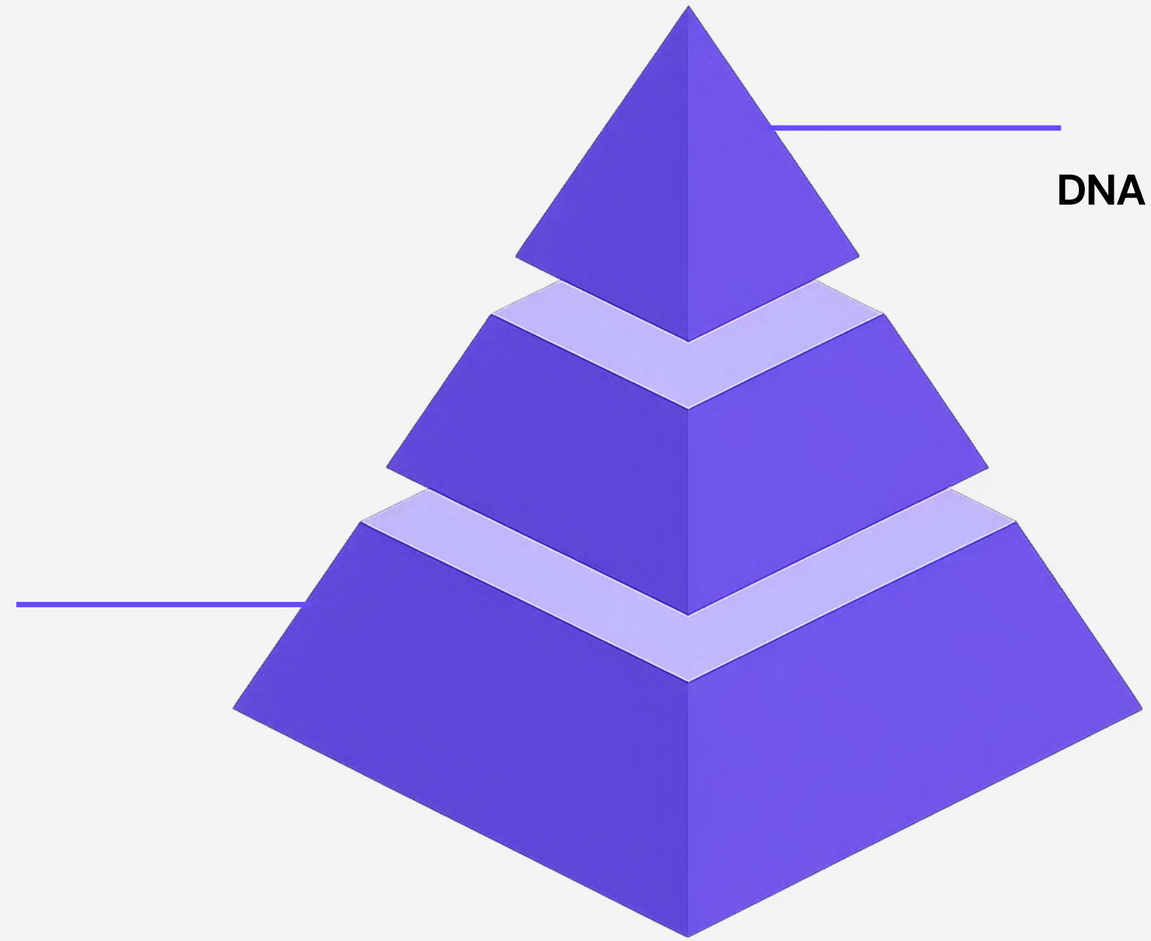
50 Interviews in...

Emotion Meter



What's Most Pressing?

We Started With Active and Strategic Threats



Horizon 1

DNA Synthesis Misuse

Horizon 3

Novel Pathogens

We Noticed Conflicting Perspectives

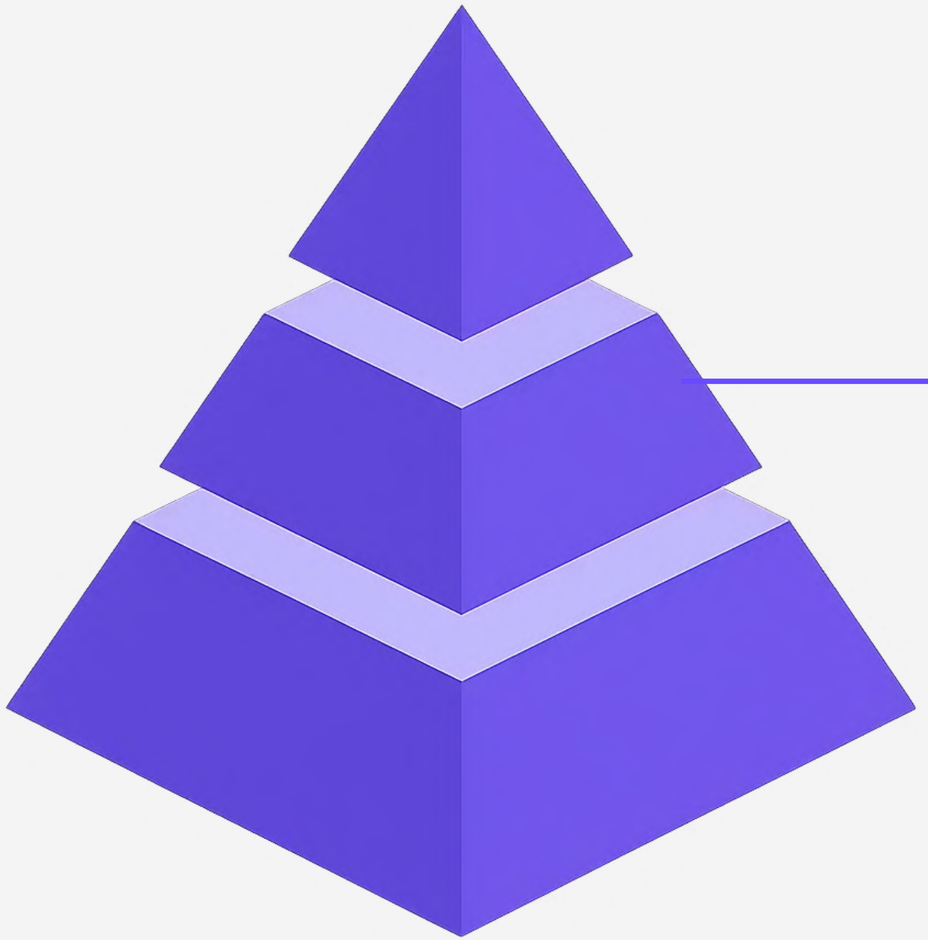
“We do not see novel pathogenic orders often – it is not a pressing threat.”

– Chief Security Officer of U.S. DNA Synthesis Company

“95% of threats the HQ deals with are engineered in some capacity.”

– Intelligence Analyst at FBI Headquarters

But, We Were Still Missing Something Critical



Horizon 2

AI Edited Sequences

AI-Edited Pathogens are more PRESSING than anticipated.

Current Safeguards are likely to FAIL yet very few are talking about it.

We Received Early Support!

National Institute of Health

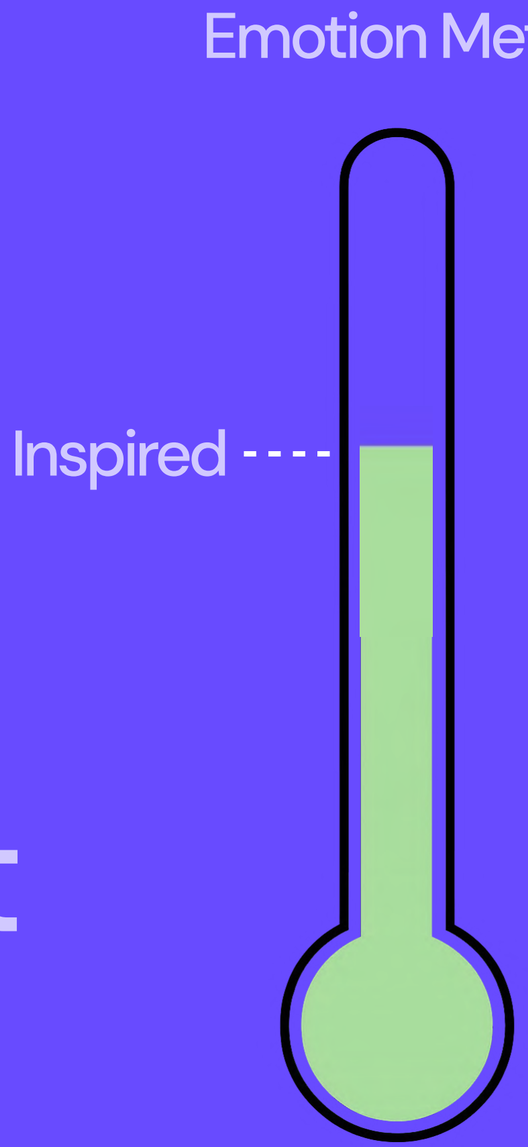
Aclid & SecureDNA

Twist Biosciences

National Security Commission for Emerging Biotechnology

Week 5-6

78 Interviews in...



Does anyone else care? + Get Outside the Building!

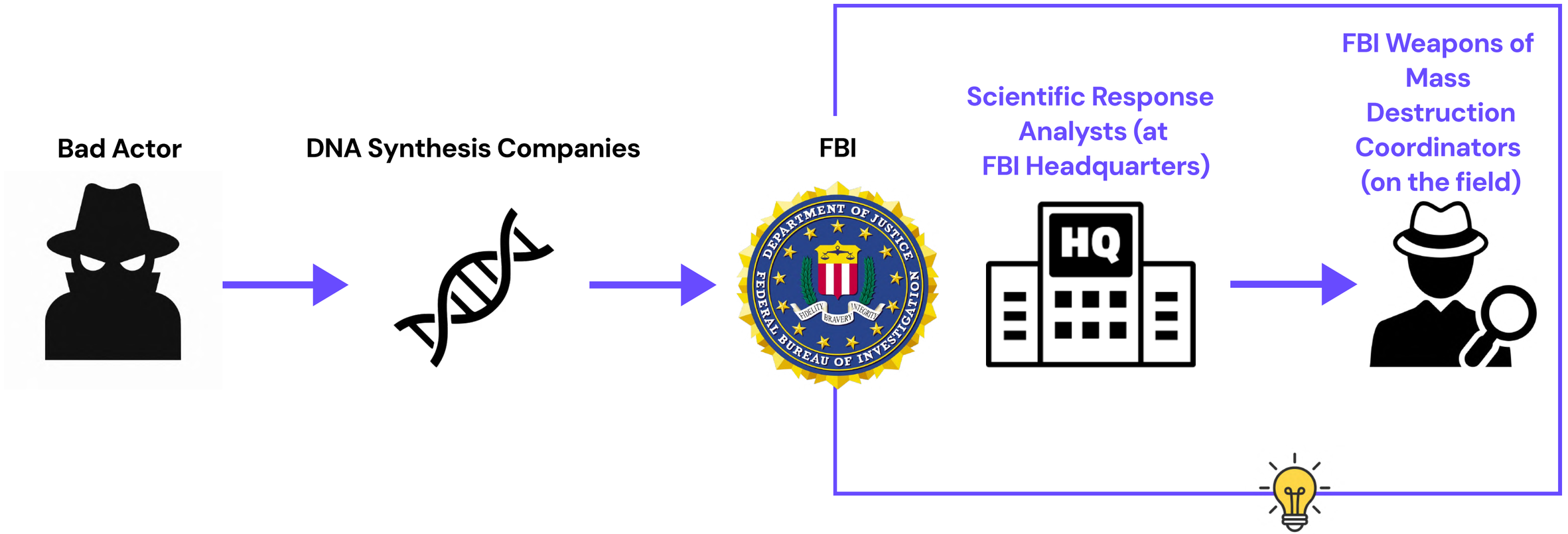
At First, We Missed the Full Picture

Bad Actor

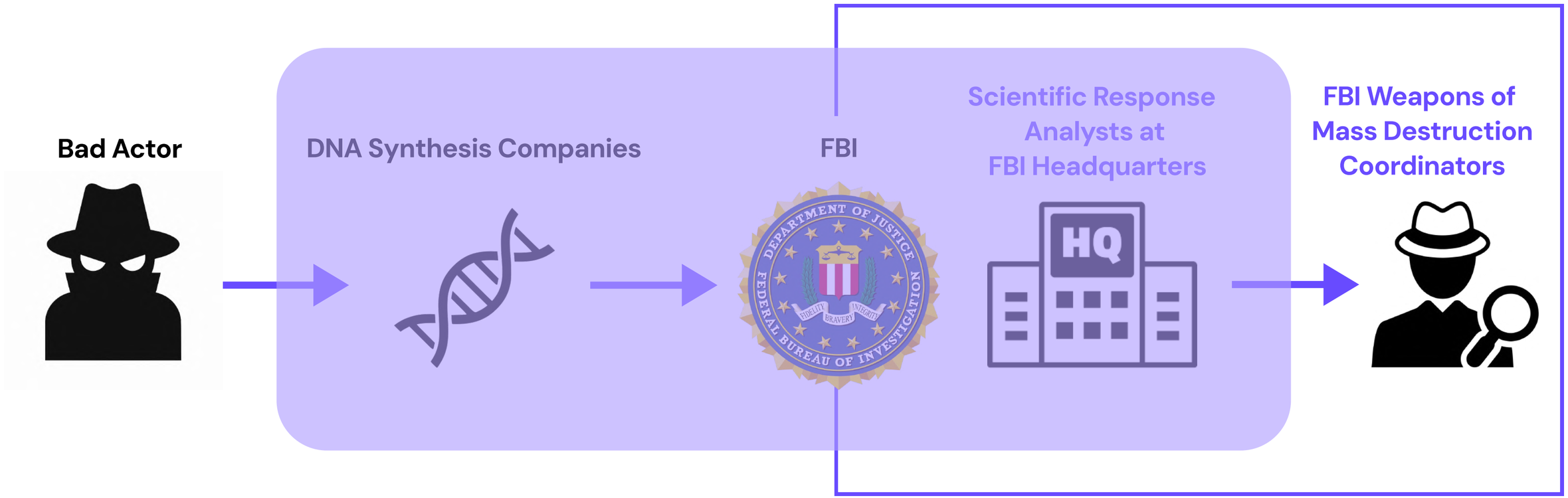
DNA Synthesis Companies

FBI

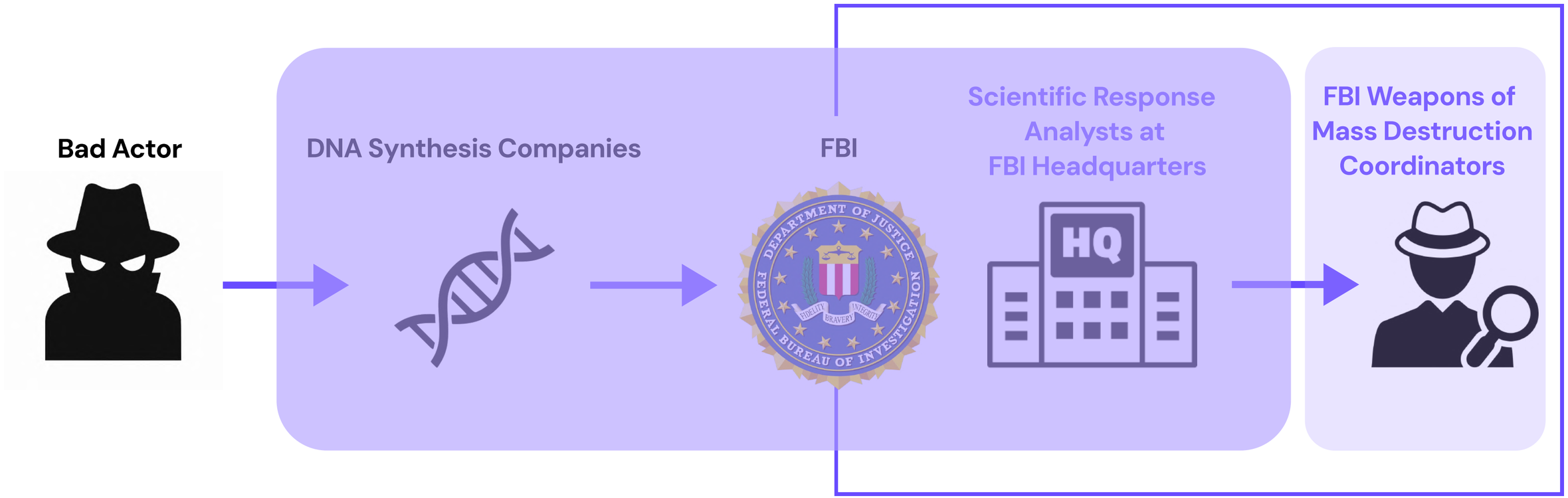
Missing Piece: Clarifying the FBI Workflow



Pinpointing the Primary Beneficiaries



Reframing WMD Coordinators as Secondary Beneficiaries

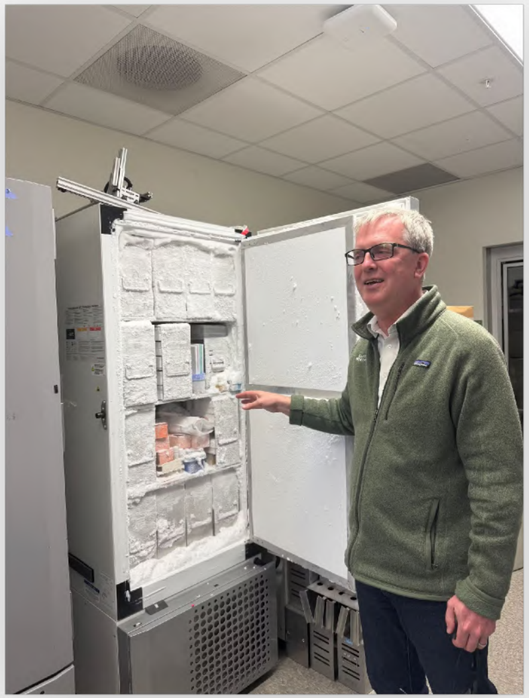


We Got Out of the Building

→ in person connections

→ real world context

→ unexpected opportunitites



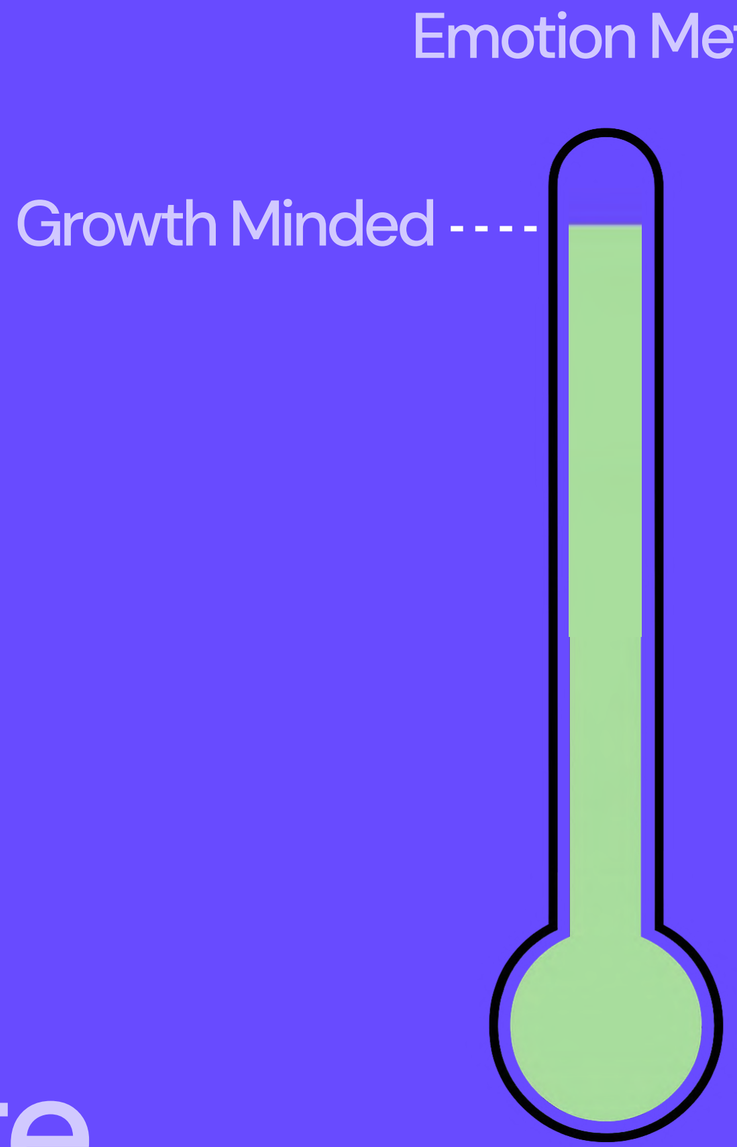
Dr. Drew Endy's Lab

Lawrence Berkeley National Laboratory

SynBioBeta Conference

Week 7-8

108 Interviews in...



Build, Validate, and Iterate

We’re Building a Technical Moat: The First AI-Native Biosecurity Stack

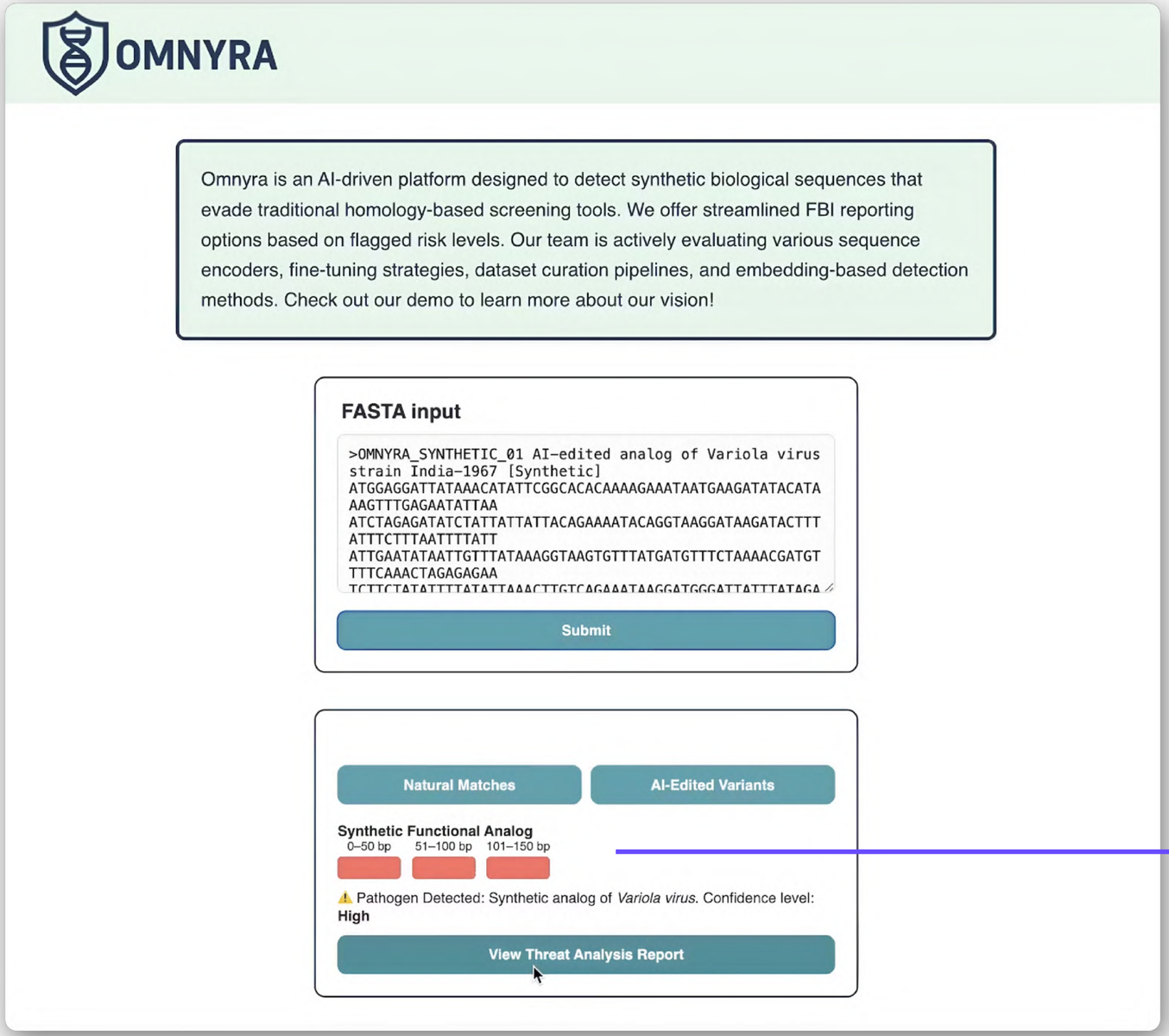
1 – Synthetic Pathogen Database

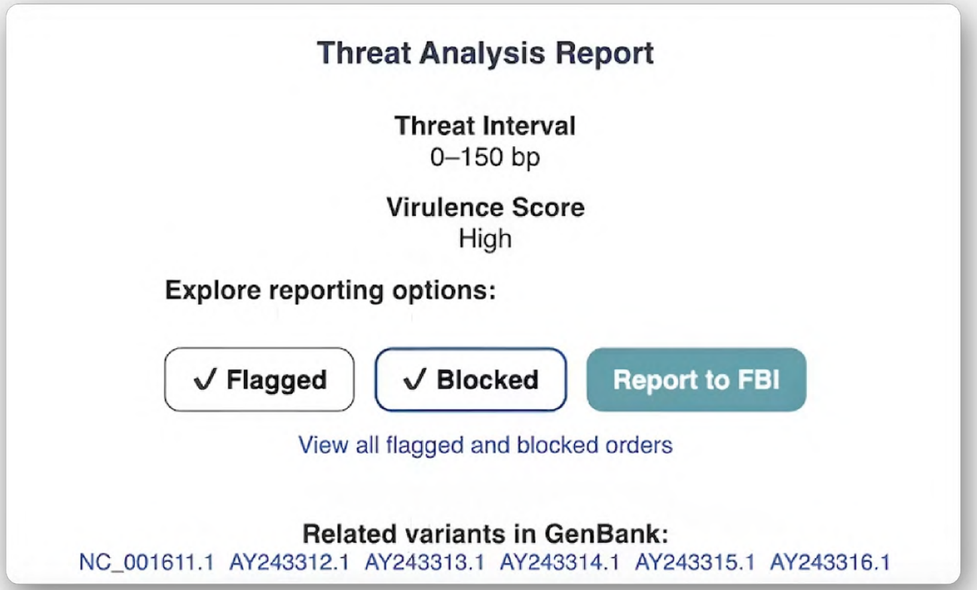
Approach	Value Added
Function Preserving Framework	Simulates real-world evasion tactics to find what legacy tools fail to catch

2 – AI Classifier

Pipeline	Value Added
Analyst Ready Report	• Confidence score • Predicted function or family
Classifier Layer	Predict functional risk (toxin vs non-toxin)
Pretrained Models	Use protein LMs to extract function from sequence.

Testing Interface: AI-Native Pathogen Detection For Industry





We're building something that doesn't currently exist but is needed.

Our Screening Tool Received Positive Feedback And Interest

Open to collaborating if Omnyra excel in speed, accuracy, and/or cost.

– Two Major Screening Tools in Market

... Companies will appreciate the inbuilt ability to report to FBI when threats emerge.

– Postdoc at Engineering Biology Research Consortium

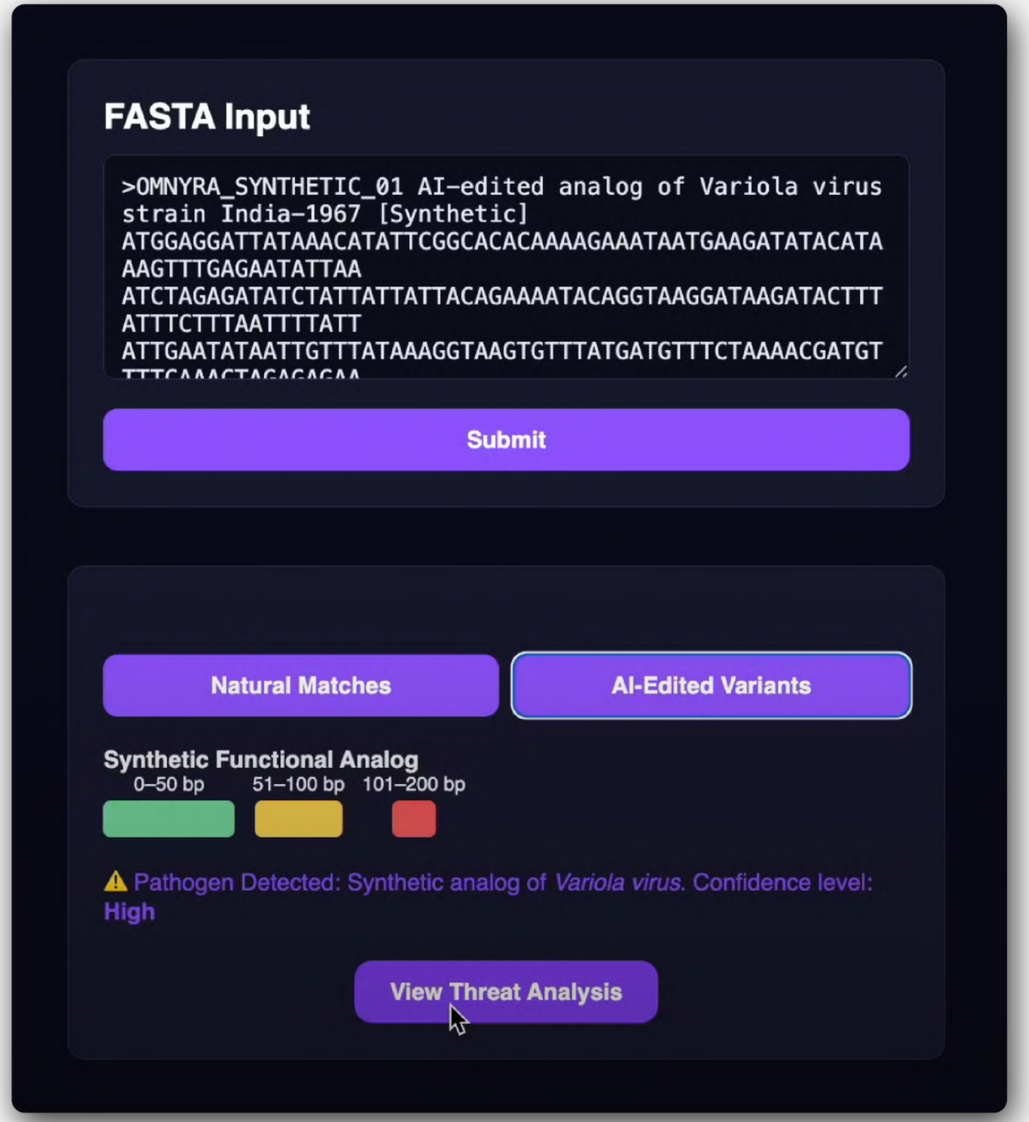
How Do These Insights Inform a FBI-Facing Tool

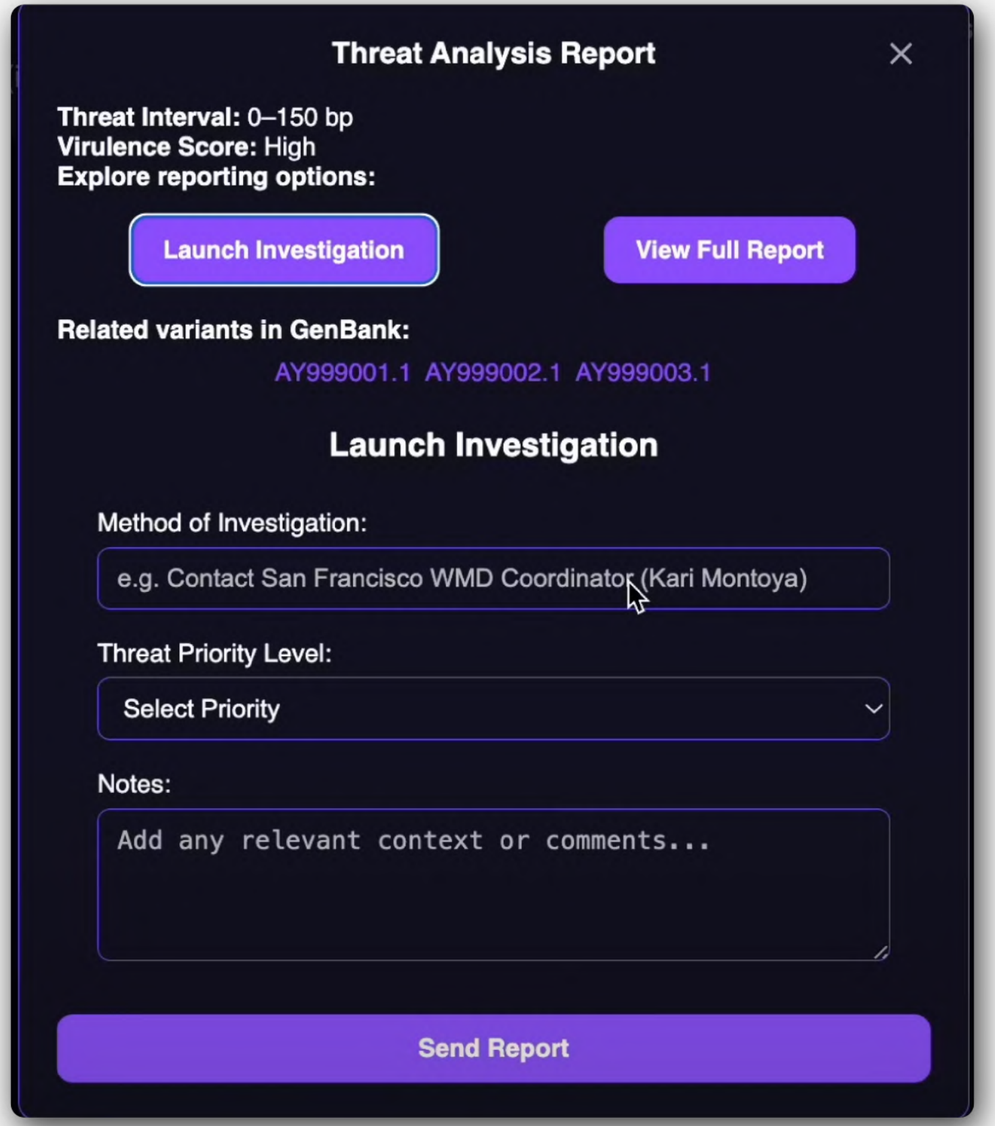
Solve Bottleneck in Threat Reporting at FBI Headquarters

+

Seamlessly Integrate with Existing Pipeline

We Designed The First SynBio Threat Triage Tool For The FBI





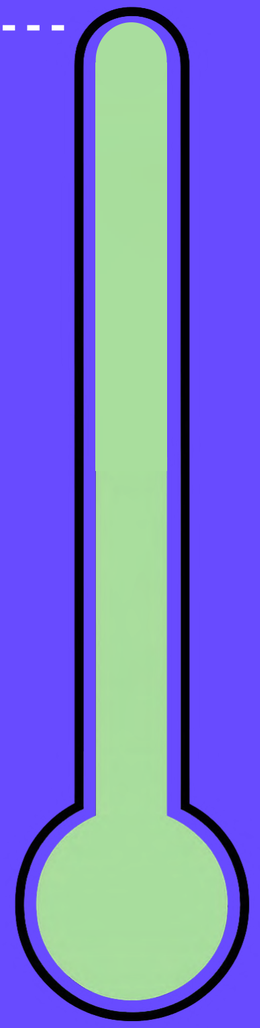
They Just Dropped The Mandate.
We Already Built The Tool.

Week 9-10

130 Interviews in total

Emotion Meter

Fired Up ----



Deployment + Post Class Journey...

Positioning to Define the Dual-Use Future

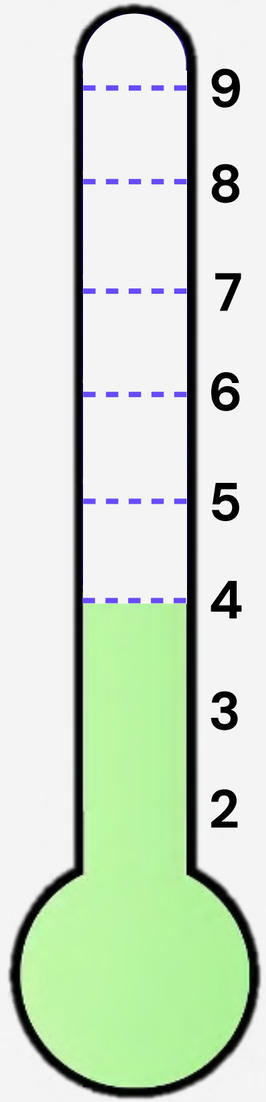
Where Our Existing Tech Goes Next
DIU Commercialization Summer Fellowship
FBI Pilot
Inform EO policy via OSTP conversations with our domain insights
Collaborate with screening providers

Strategic Extensions
Gene function annotation
Deployable battlefield biosensors
Generative protein design platforms
Predictive drug discovery framework

Our Technology and Investability Readiness Levels = 4

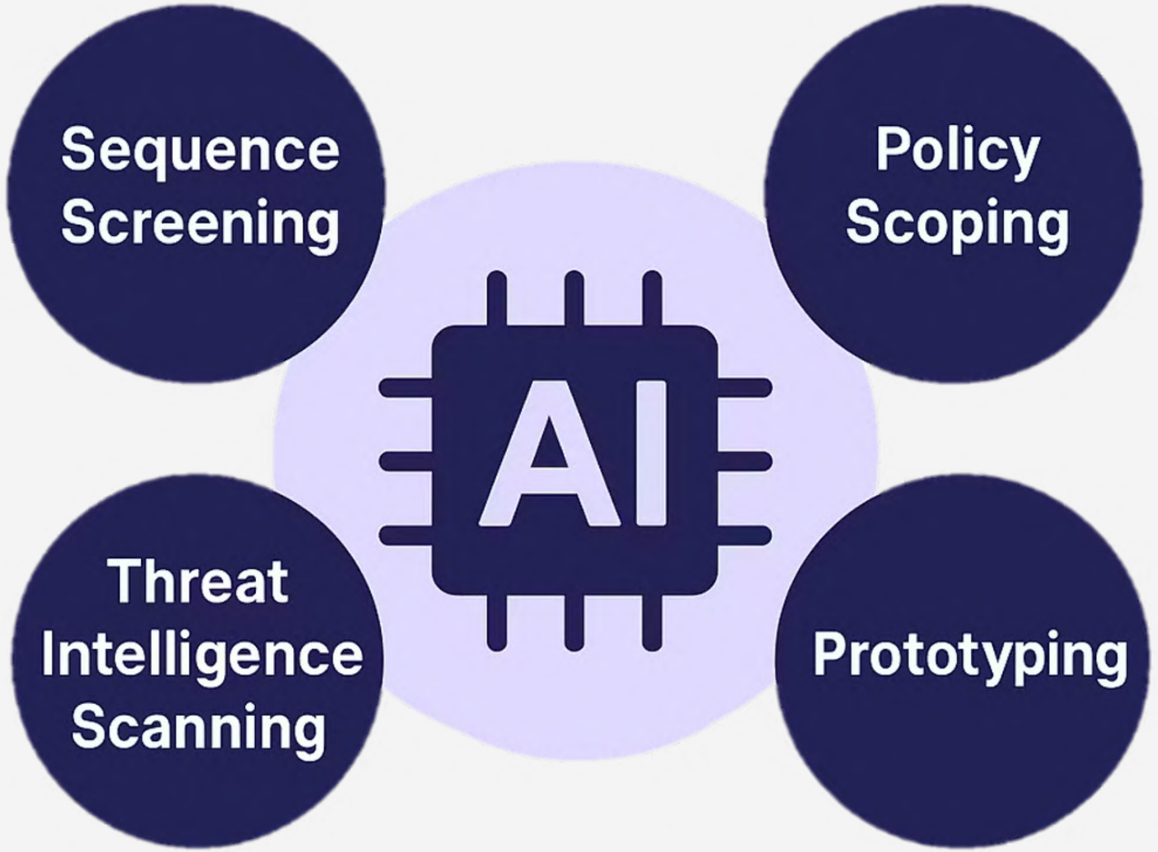
✓ Completed scoping research to prove feasibility

✓ Prototyped minimum fidelity MVP – proving it can detect sequences with high AI edits



AI Usage

We used AI to augment our work, to consult and assist - not replace



Claude OpenAI