Looking Ahead

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FBI Weapons of Mass Destruction Directorate

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FBI consolidated all WMD operations into the new WMD Directorate

1. Countermeasures and Preparedness
2. Investigative and Operations
3. Intelligence Analysis
FBI WMD Bioterrorism Prevention Program Objectives

- Build national and international bioterrorism threat detection, identification, and reporting capabilities
- Improve bioterrorism assessment and investigative capabilities
- Enhance bioterrorism scientific, industry, and academic outreach
SYNTHETIC BIOLOGY

BIOSECURITY
Challenges

Relevant biosecurity message
- Living organisms occurring naturally in the environment
- Technological & technical advances
Carlson,  
**Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science**  
Volume 1 Number 3, August 2003
Growth of the publicly available gene-sequence database from its inception through 2008

Challenges

Relevant biosecurity message
Living organisms occurring naturally in the environment
Technological & technical advances

Bridging the gaps and addressing misperceptions and misconceptions between law enforcement and scientific communities
- Distinctly different cultures
- Requires education and awareness training
What is BIOSECURITY?
Dual Use?  Proper Handling of Materials?
Physical Security?  Exploitation?
Dual Use?
Is what I am doing safe for the impact to health or the environment?

Proper Handling of Materials?
Are my facilities and materials secure?

Physical Security?
Are my information and personnel secure?

Exploitation?

Dual Use?  Is what I am doing safe?

Proper Handling of Materials?  Impact to health or the environment?

Are my facilities and materials secure?  Are my information and personnel secure?

Physical Security?  Exploitation?
WARNING

ALL SUSPICIOUS PERSONS AND ACTIVITIES ARE IMMEDIATELY REPORTED

NEIGHBORHOOD WATCH
WE LOOK OUT FOR EACH OTHER!
Al-Qaeda seeks WMD, US unprepared: reports

“Washington no longer has the luxury of a slow learning curve, when we know Al-Qaeda is interested in bioweapons.”

-Former Senator Bob Graham, Chair of the Commission on the Prevention of Weapons of Mass Destruction Proliferation and Terrorism.
U.S. is unprepared for major bioterrorism attack, commission finds

The report, which measured the government's performance in 17 key areas, gave the White House and Congress "F" grades for not building a rapid-response capability for dealing with disease outbreaks from bioterrorism, or providing adequate oversight of security and intelligence agencies.
Legislation & Regulation

- Increased restrictions
- Oversight

- Potentially ill-informed
- Possible negative impact on research activities
SYNTHETIC BIOLOGY

SYNTHETIC GENOMICS
1918 INFLUENZA PANDEMIC

• An estimated one third of the world's population (or ≈500 million persons) were infected and had clinically apparent illnesses

• Total deaths were estimated at ≈50 million internationally
Characterization of the reconstructed 1918 Spanish influenza pandemic virus.

*Science.* 2005 Oct 7;310(5745):77-80


Influenza Branch, Mailstop G-16, Division of Viral and Rickettsial Diseases (DVRD), National Center for Infectious Diseases, Centers for Disease Control and Prevention, 1600 Clifton Road, NE, Atlanta, GA 30333, USA. tft9@cdc.gov

The pandemic influenza virus of 1918-1919 killed an estimated 20 to 50 million people worldwide. With the recent availability of the complete 1918 influenza virus coding sequence, we used reverse genetics to generate an influenza virus bearing all eight gene segments of the pandemic virus to study the properties associated with its extraordinary virulence.
SYNTHETIC BIOLOGY

• Reconstruction of the influenza A (H1N1) orthomyxovirus responsible for the 1918 "Spanish flu" pandemic

• RNA genetic code comprised of approximately 13,500 nucleotides

Mr. Gene - Unbelievable prices in June and July! Starting at $0.39 bp! Simplify your life with gene synthesis! Order your gene online and concentrate on research - not on cloning! Submit your sequence $5265.00
Revealed: the lax laws that could allow assembly of deadly virus DNA

Urgent calls for regulation after Guardian buys part of smallpox genome through mail order

James Randerson, science correspondent

guardian.co.uk

Wednesday 14 June 2006

A phial containing an incomplete sequence of smallpox DNA, obtained by the Guardian over the internet
FBI Synthetic Biology Tripwire Initiative

Initiative goals:

• To prevent the potential unlawful acquisition of dangerous pathogens and/or toxins by providing FBI support through an established reporting mechanism for industry

• Initial contacts with domestic synthetic DNA companies started; Interim Reporting Mechanism created (October 2007 to present)

• Industry very happy that problem of “who to call” was resolved
FBI WMD Coordinators
The Primary Point of Contact

- Contacted by state and local Emergency Responders when confronted by a WMD threat or incident
- Act as a conduit to FBIHQ and the Federal Government for technical information, advice, and assistance
- Emphasis on pre-event planning and prevention
- At least one WMD Coordinator in all of the FBI’s 56 Field Offices
- Liaison with Federal regional counterparts and state, county and local response agencies
FBI WMD Coordinators
The Primary Point of Contact

Synthetic DNA Industry

FBI WMD Coordinators

FBI HQ WMD Directorate

FBI HMRTU
FBI CIRG
FBI HMOU
FBI HMSRU

HHS/CDC
USDA
DOC
FEMA
DOD
EPA
STATE & LOCAL AGENCIES
FBI WMD Coordinators
Case Study

Synthetic DNA Industry

Export Regulations

Foreign Order

FBI WMD Coordinators

FBI HQ WMD Directorate

FBI HMRTU
FBI CIRG
FBI HMOU
FBI HMSRU
FBI CBRNSU
HHS/CDC
USDA
DOC
FEMA
DOD
EPA
STATE & LOCAL AGENCIES
Screening Framework Guidance for Synthetic Double-Stranded DNA Providers

1. Customer Screening Recommendations
2. Sequence Screening Recommendations
3. Government Notification Recommendations

FBI WMD Coordinators
Looking Ahead

FBI Outreach
FBI Synthetic Biology Conference

“Building Bridges Around Building Genomes”

August 4 - 5, 2009        San Francisco, California
iGEM 2009

1,200 Attendees
26 Countries
100 Universities

FBI Biosecurity Workshop
FBI Outreach Booth
Learn about FBI Outreach:
Promoting Responsible Research & Career Opportunities,
Supervisory Special Agent Edward You
The Role of the FBI

Mitigating the Potential Risks:
- Outreach
- Partnership
- Information Sharing
“We’re the FBI,

“We’re with the U.S. Government…

…and we’re here to help.”

“…really”

“And we need YOU!”
THANK YOU

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