



Woodrow Wilson
International
Center
for Scholars

knowledge in the public service



Looking Ahead



March 11, 2010

Edward H. You

Supervisory Special Agent
Countermeasures Unit I
FBI Weapons of Mass
Destruction Directorate



FBI Timeline

Weapons of Mass Destruction Directorate



July 2006

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

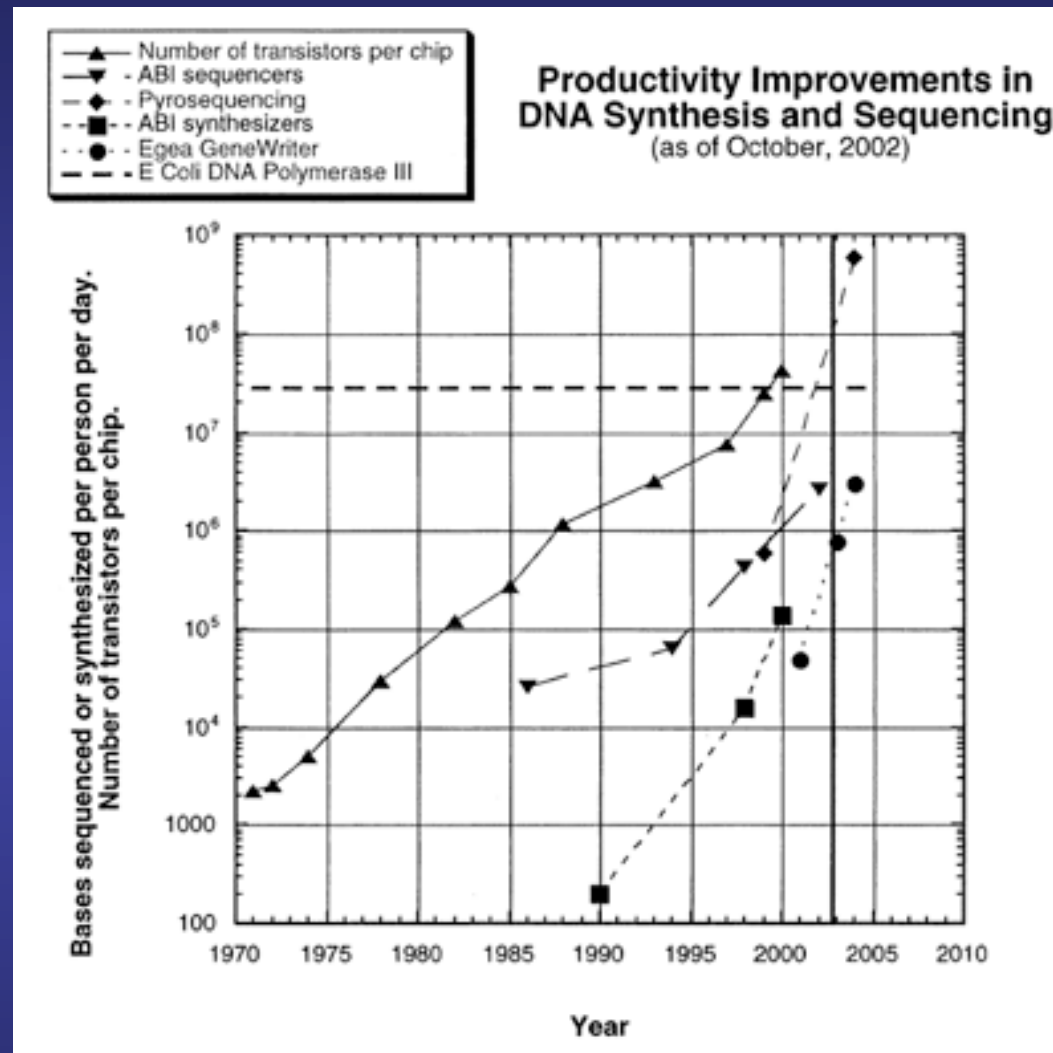


Challenges

Relevant biosecurity message

Living organisms occurring naturally in the environment

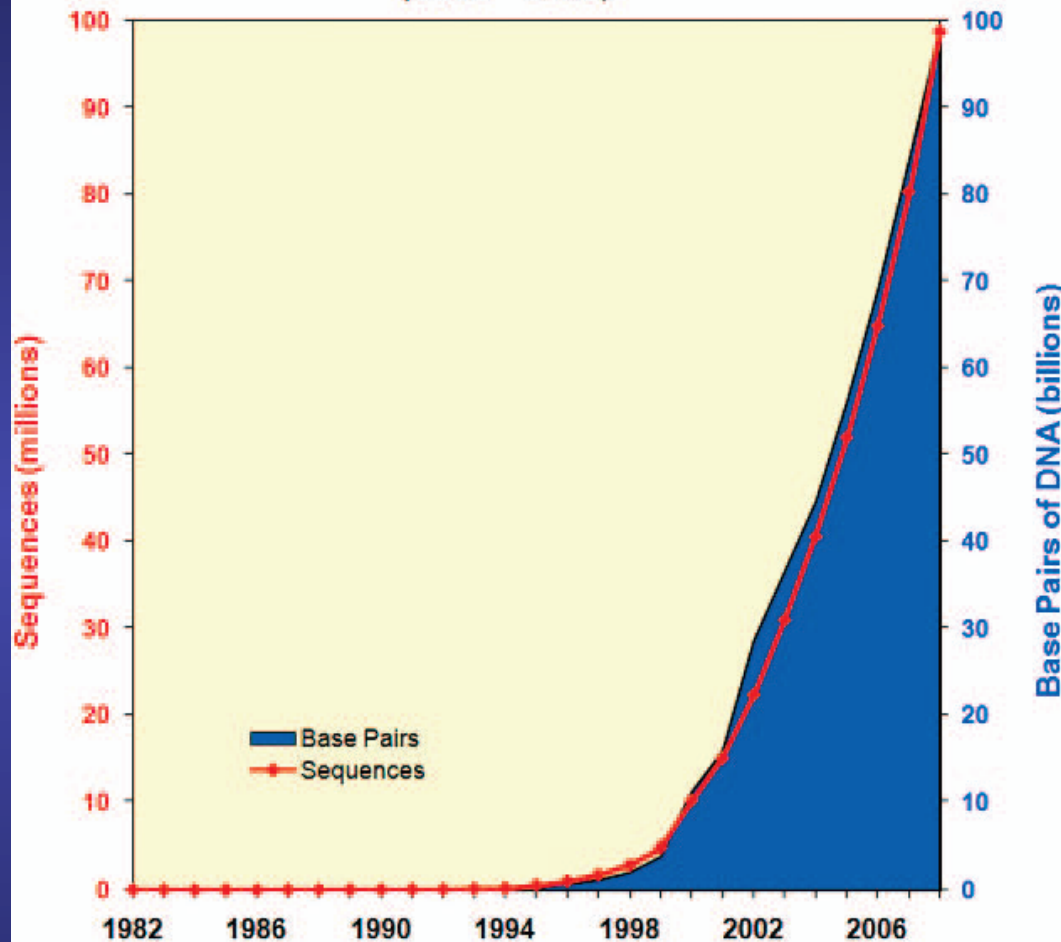
Technological & technical advances



Carlson,
[Biosecurity and Bioterrorism: Biodefense Strategy, Practice, and Science](#)
[Volume 1 Number 3, August 2003](#)



Growth of GenBank (1982 - 2008)



Growth of the publicly available gene-sequence database from its inception through 2008

<http://www.ncbi.nlm.nih.gov/Genbank/genbankstats.htm>



HOME / NEWS / SCIENCE

Accessible science

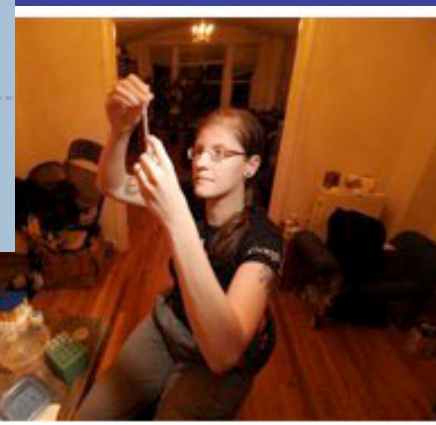
The Boston Globe

Hackers aim to make biology household practice



Mackenzie Cowell (left) and Jason Bobe are trying to create simple, at-home methods for doing sophisticated biology. (Dina Rudnick/Globe Staff)

By Carolyn Y. Johnson





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 ?



Proper Handling of Materials?

Dual Use?



Physical Security?

Exploitation?



Proper Handling of Materials?

Dual Use?

Is what we
doing

for the

Are my
materials

information and
security?



Physical Security?

Exploitation?



Dual Use?

Is what I am
doing safe?

Proper Handling of Materials?

Impact to health or the
environment?



CULTURE OF RESPONSIBILITY

Are my facilities and
materials secure?

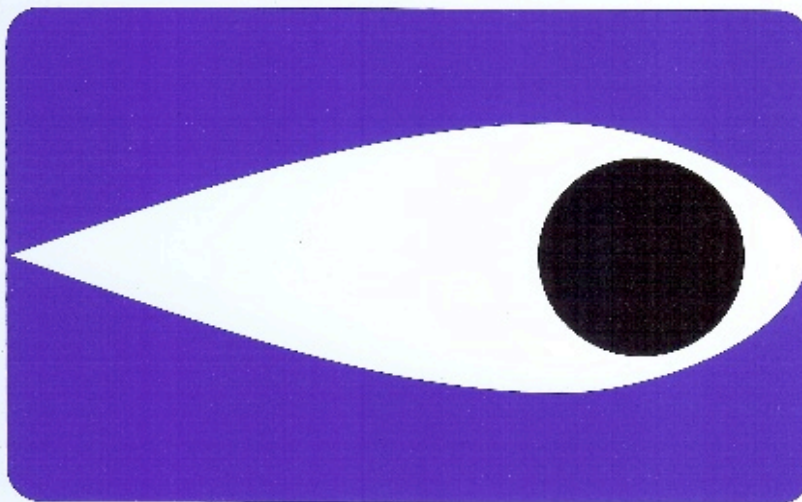
Physical Security?

Are my information and
personnel secure?

Exploitation?



WARNING



**ALL SUSPICIOUS PERSONS AND ACTIVITIES
ARE IMMEDIATELY REPORTED**

NEIGHBORHOOD WATCH
WE LOOK OUT FOR EACH OTHER!



AFP



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.





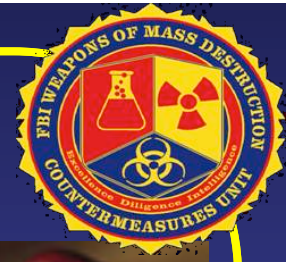
The Washington Post

Wednesday, January 27, 2010

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

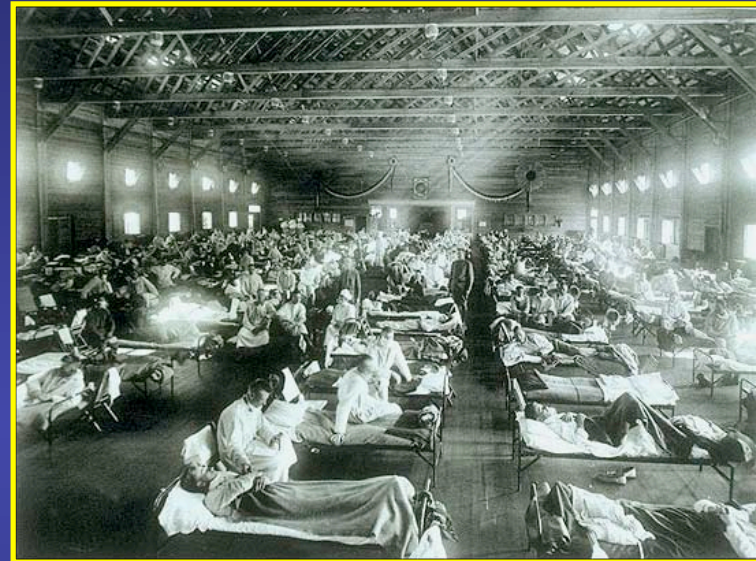
SYNTHETIC GENOMICS



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





SYNTHETIC BIOLOGY

Characterization of the reconstructed 1918 Spanish influenza pandemic virus.

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

[Tumpey TM](#), [Basler CF](#), [Aguilar PV](#), [Zeng H](#), [Solórzano A](#), [Swayne DE](#), [Cox NJ](#), [Katz JM](#), [Taubenberger JK](#), [Palese P](#), [García-Sastre A](#).

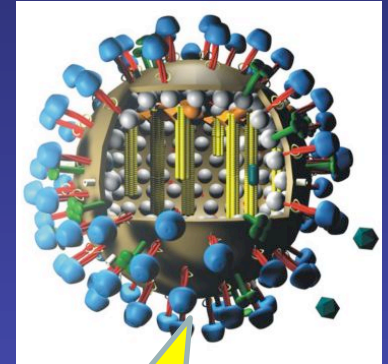
Influenza Branch, Mailstop G-16, Division of Viral and Rickettsial Diseases (DVRD), National Center for Infectious Diseases, Centers for Disease Control and Prevention, 1600 Clifton Road, NE, Atlanta, GA 30333, USA. tft9@cdc.gov

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



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and July! Starting at \$ 0.35
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Order your gene online and come
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

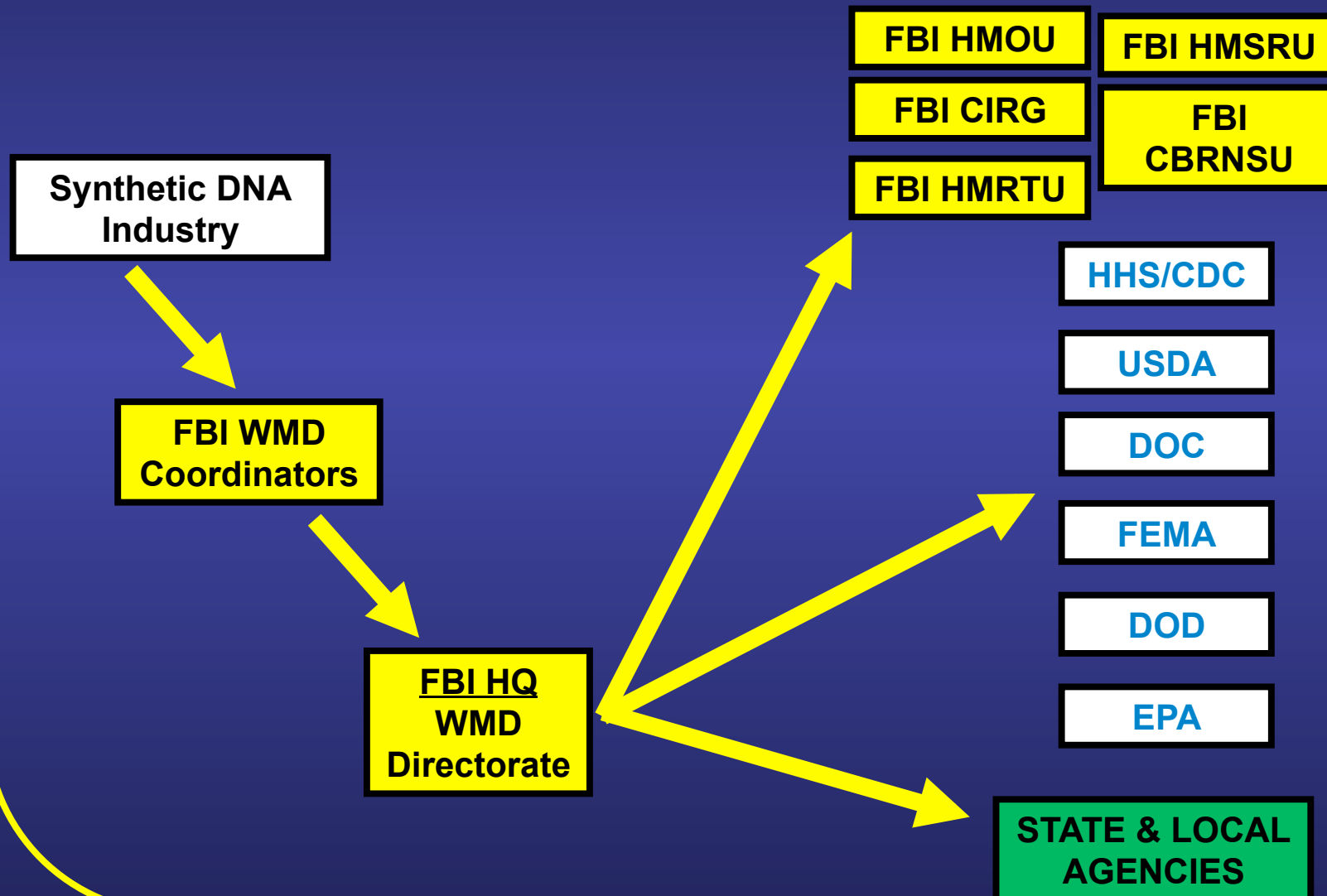
The Primary Point of Contact

- 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

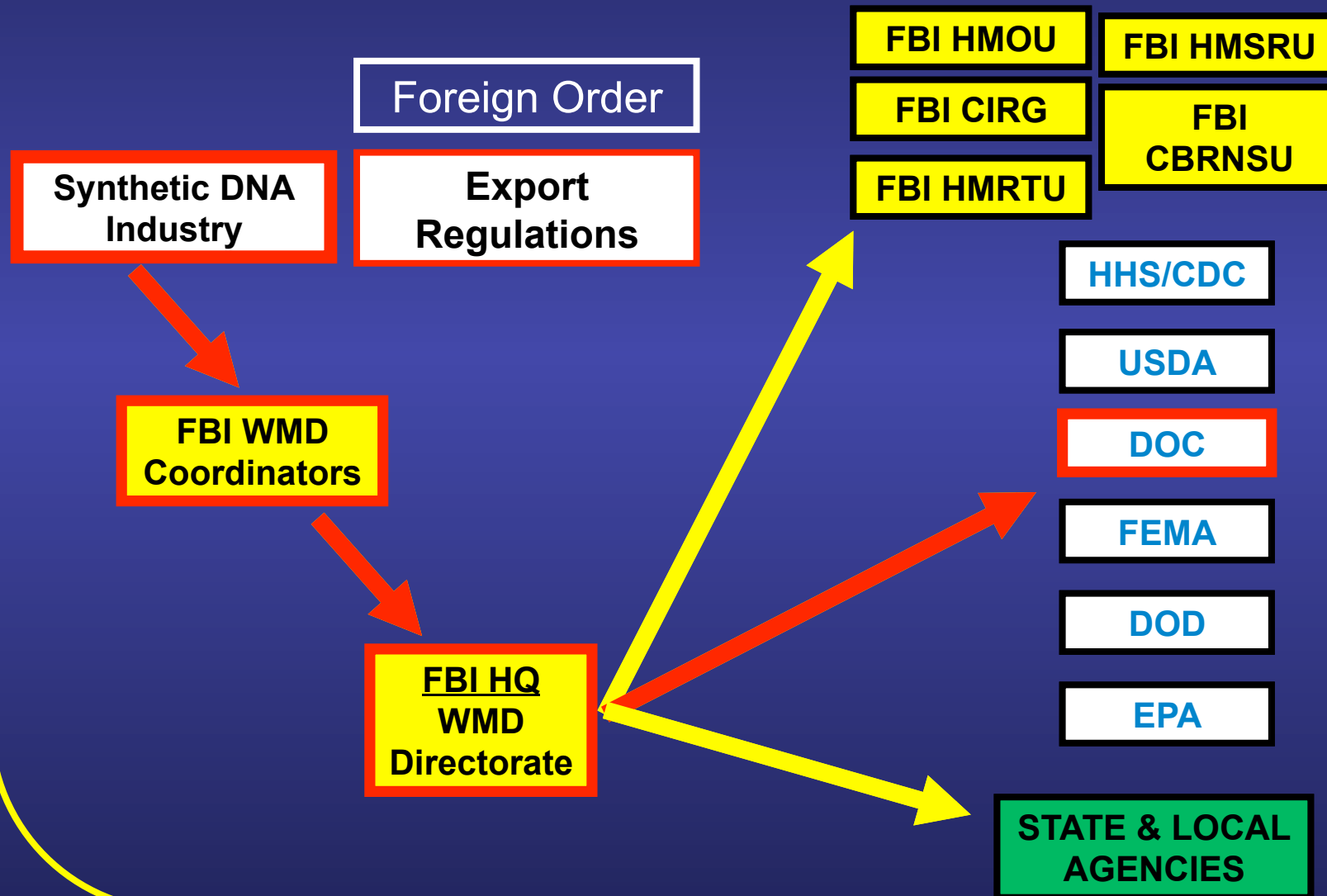
The Primary Point of Contact





FBI WMD Coordinators

Case Study





**Federal Register /Vol. 74, No. 227 /
Friday, November 27, 2009 /Notices**



**DEPARTMENT OF HEALTH AND
HUMAN SERVICES
Office of the Secretary**



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

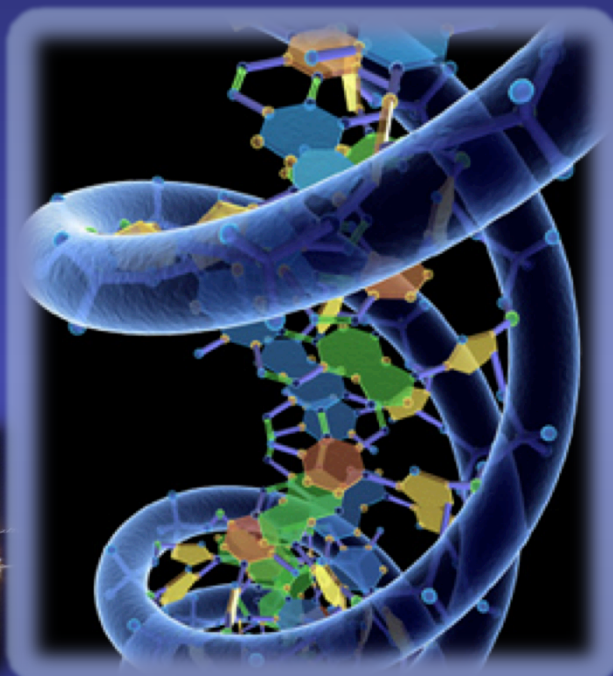


FBI Outreach



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





THE
UCLA
CENTER
FOR
SOCIETY
AND
GENETICS

+ ART | SCI PRESENT



PUBLIC
PARTICIPATION IN
THE AGE
OF BIG BIO

OUTLAW BIOLOGY?

Moderated by **CHRISTOPHER KELTY**
(UCLA Center for Society and Genetics, Los Angeles)

FRIDAY - A SYMPOSIUM exploring
new forms of biological and engineering
research beyond the university and
the corporation.

SATURDAY - AN EXHIBITION +
BIO-FAIRE exploring new forms of
participation, open science and
do-it-yourself biology.

Open to the public
Please RSVP at outlawbiology.net



JAN 29+30 @ C(n)SI

A symposium exploring new forms of public participation in biological research, raising questions and cultivating ideas about how life could and should be studied. Panelists will address issues including do-it-yourself biology, open source science, at-home medical genetics, bio-art, and novel ethical engagements with science at the cutting edge. Event schedule includes: FRIDAY, a panelist discussion with artists, scientists and normal people; SATURDAY, workshops and an open-house exhibition.

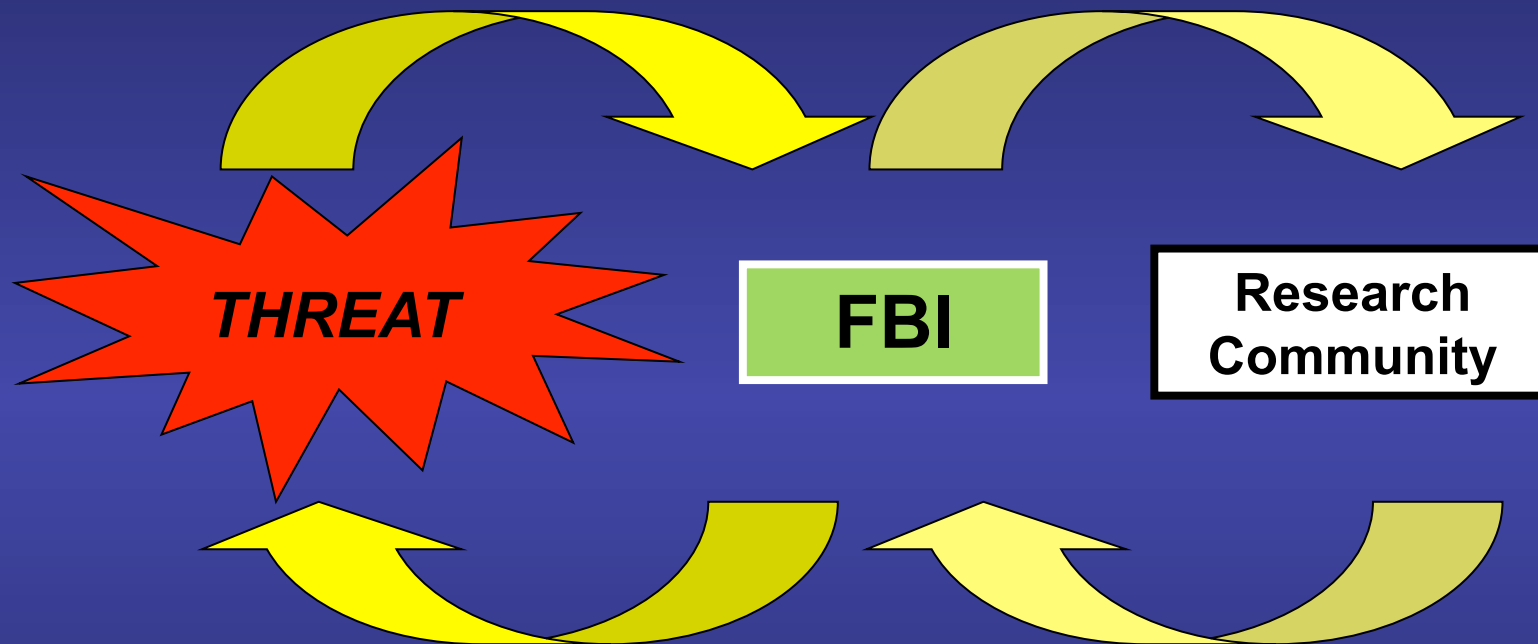
- CITIZEN SCIENCE
- DIY BIOLOGY
- NANO HACKING
- AT-HOME CLINICAL RESEARCH
- RECREATIONAL GENETICS
- SYNTHETIC BIOLOGY
- OPEN SOURCE SCIENCE
- ARS SYNTHETICA
- GENETIC ART

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

Edward H. You

Supervisory Special Agent

Bioterrorism Program

Countermeasures Unit I

FBI Weapons of Mass Destruction Directorate

Edward.You@ic.fbi.gov