

# **Defense Advanced Research Projects Agency**

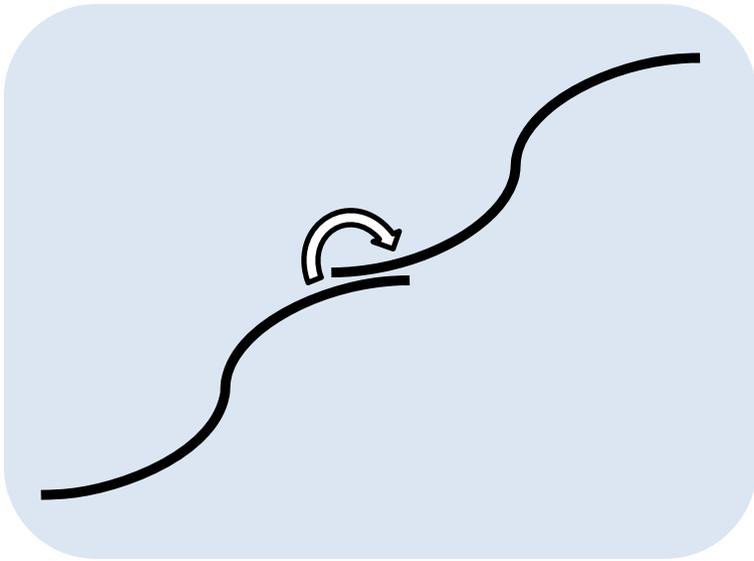
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Breakthrough Technologies for National Security

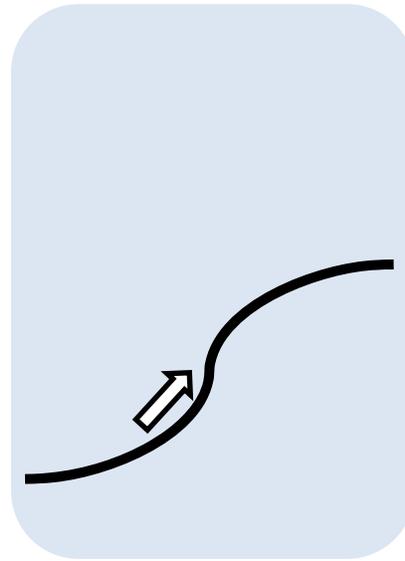
Arati Prabhakar  
Director

November 14, 2014

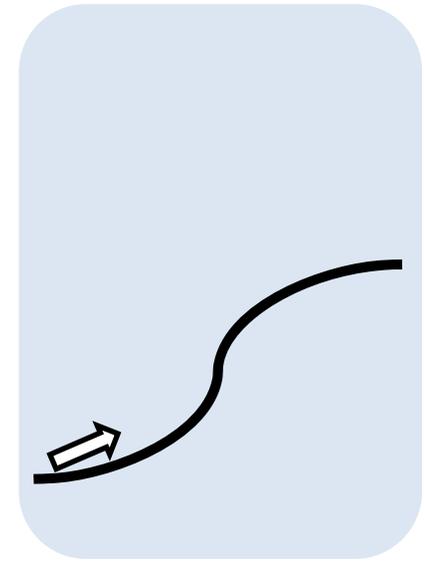




**Complex  
Military Systems**



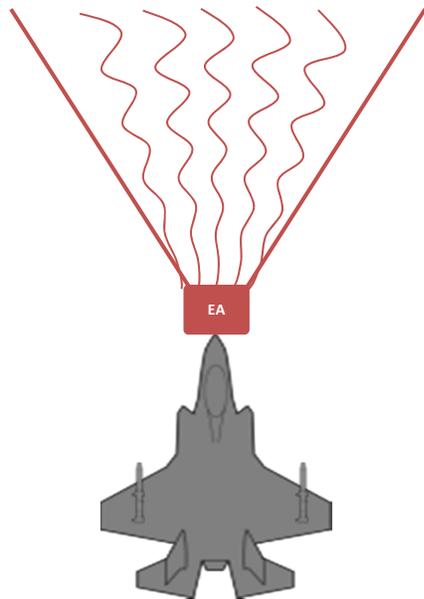
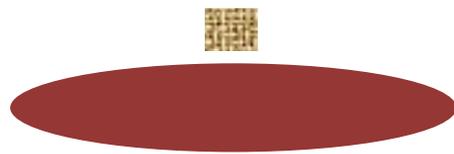
**Information at  
Massive Scale**



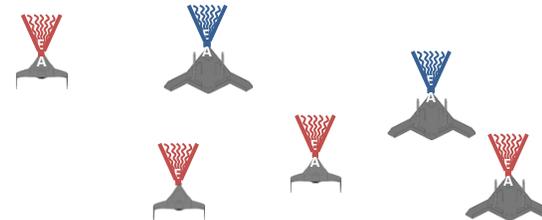
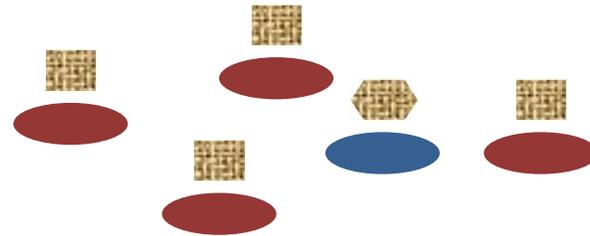
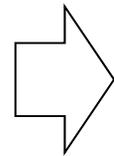
**Biology as  
Technology**



# Rethinking Electronic Warfare



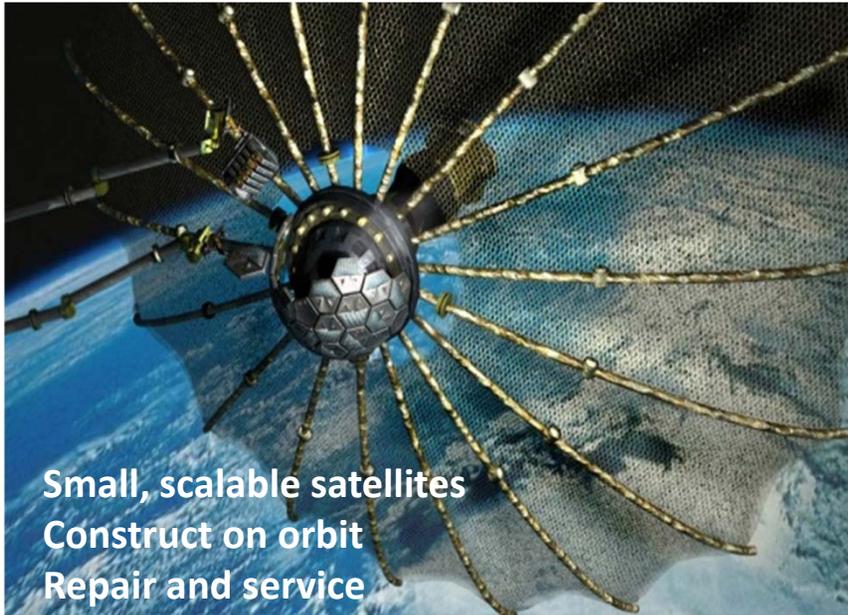
Single large jammer  
Carpet jamming  
One radar type at a time  
Vulnerable monolithic source  
Major upgrade to increase standoff



Multiple coordinated micro jammers  
Precision jamming  
Jam multiple radar types  
Non-attributable sources, graceful degradation  
Increase standoff by adding units



# Rethinking Space



Small, scalable satellites  
Construct on orbit  
Repair and service



Launch from anywhere on  
24 hour call-up

\$1M for 100 lbs to orbit  
\$5M for 3,000 lbs to orbit

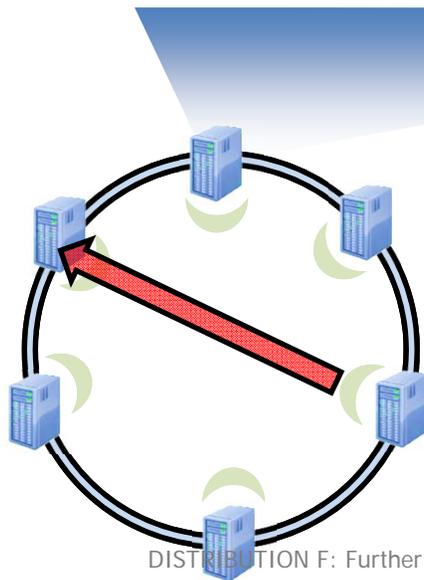


Space Domain Awareness



# Cyber Grand Challenge

*Bring about an automation revolution in computer security*

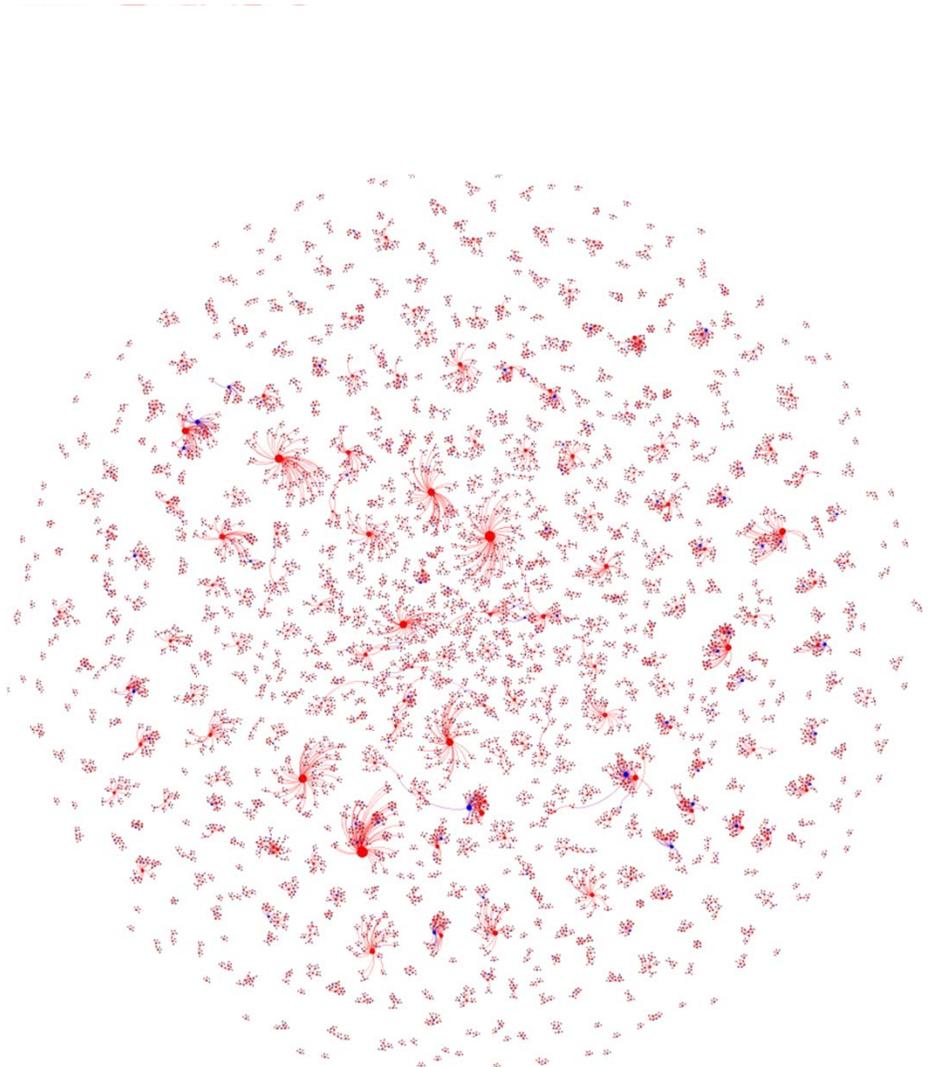
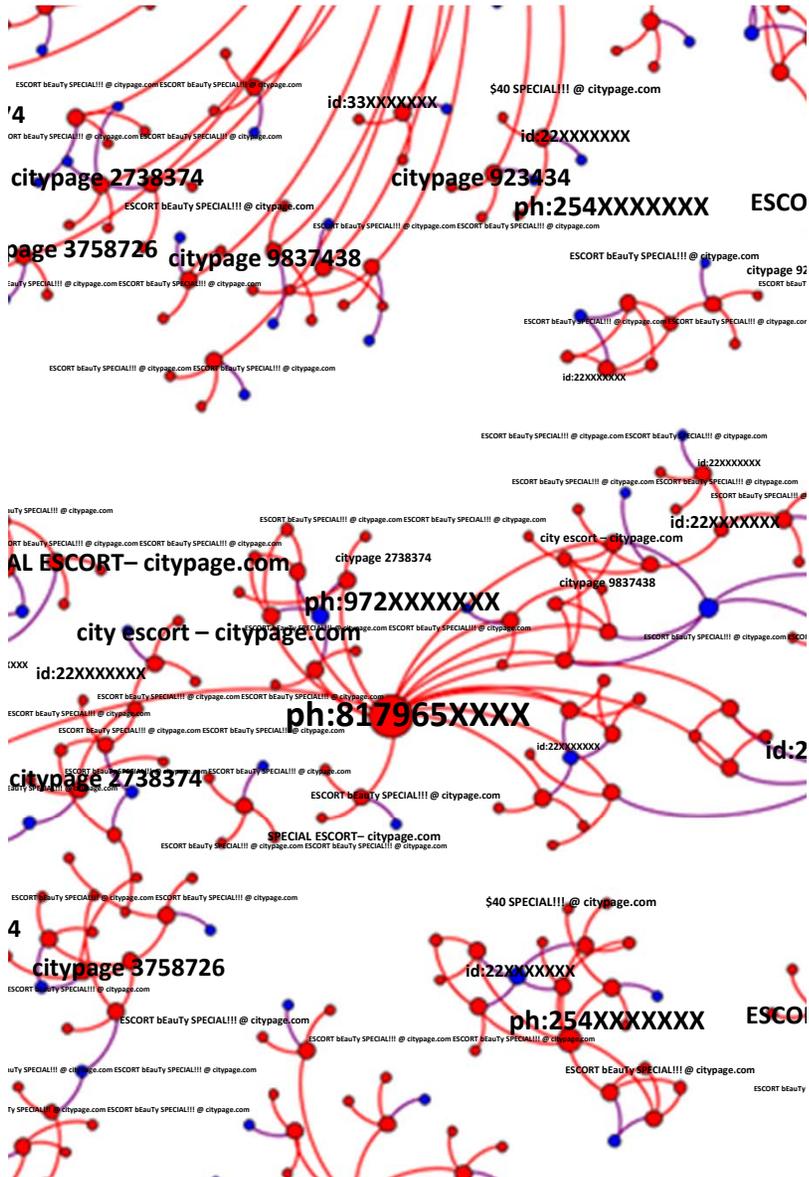


- Using the competition format which measures analyst cyber reasoning ability...
- A Grand Challenge for *automated defenders*
- Systems that can detect and repel novel threats from networks



# Memex: Domain-Specific Deep Web Search

## Example: Investigating Human Trafficking Networks

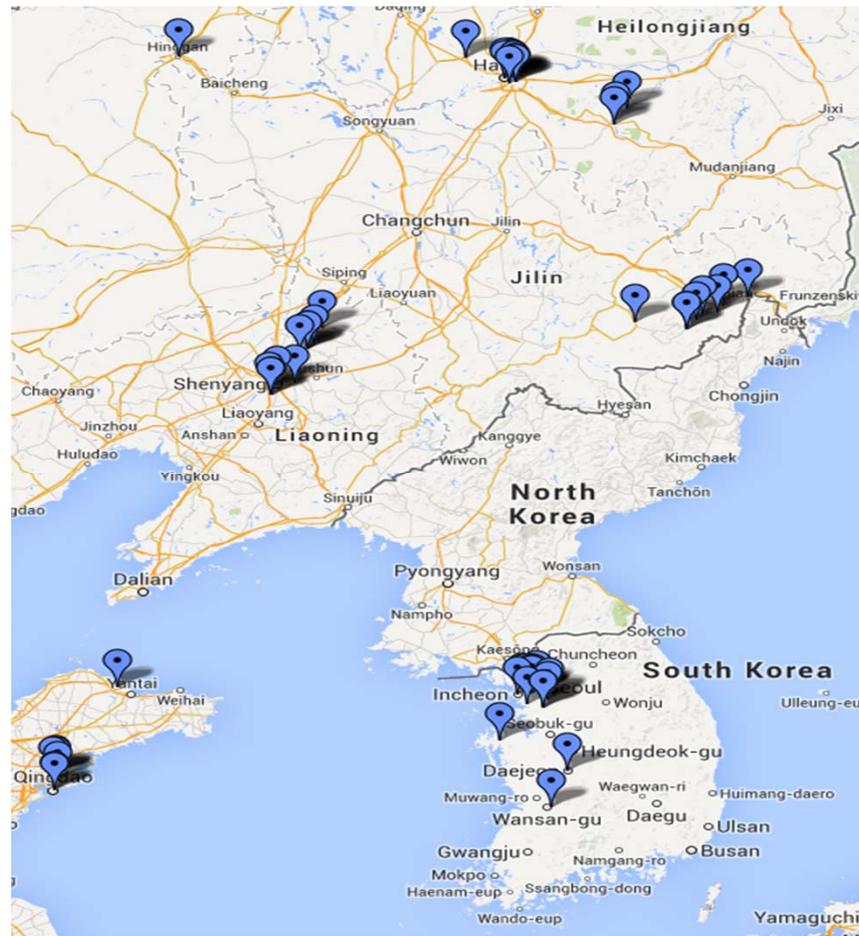




# Memex

## Highly Linked Phone Numbers

Offense	Incidents
Death	2
Drugs	9
Theft	113
Assault	123
Children related	35
Other	184
<b>Total</b>	<b>466</b>

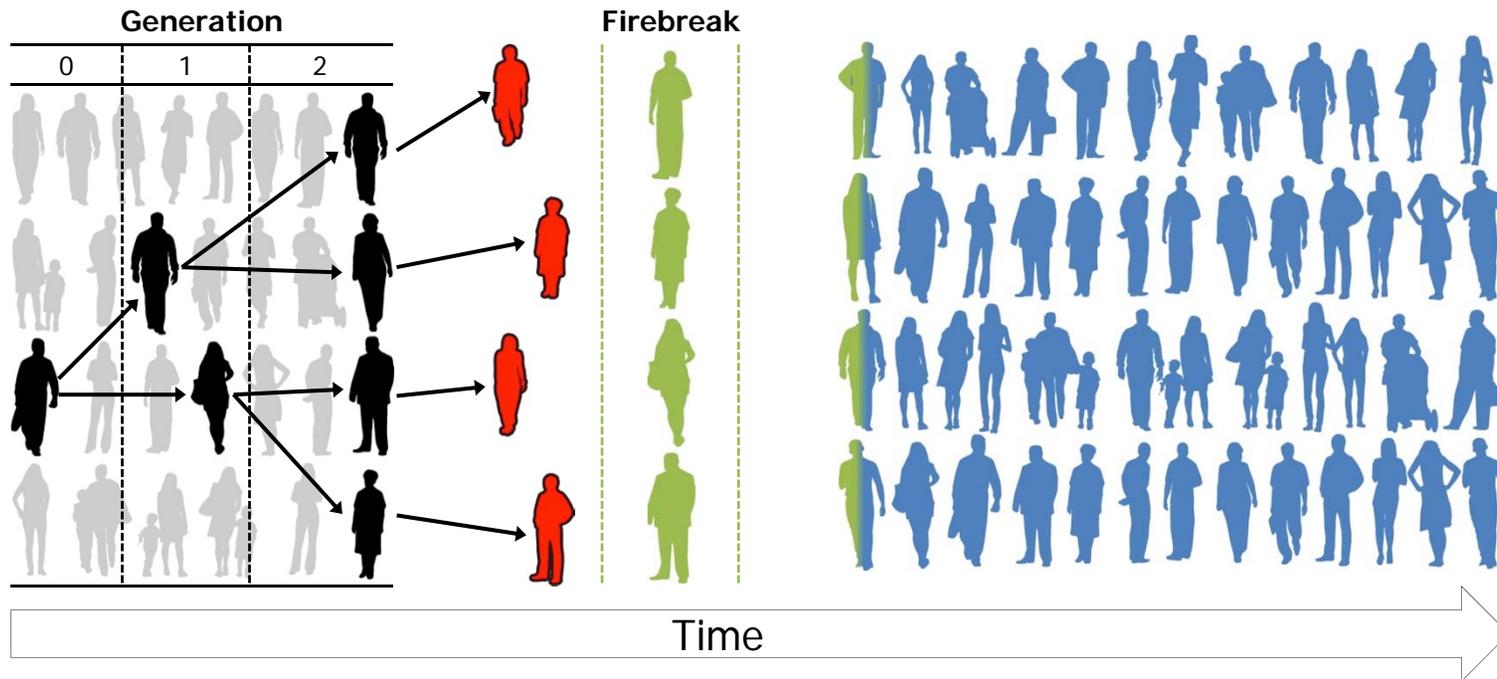


In law enforcement database

Tied to fund transfers



# Outpacing Infectious Disease



## ADEPT Interventions

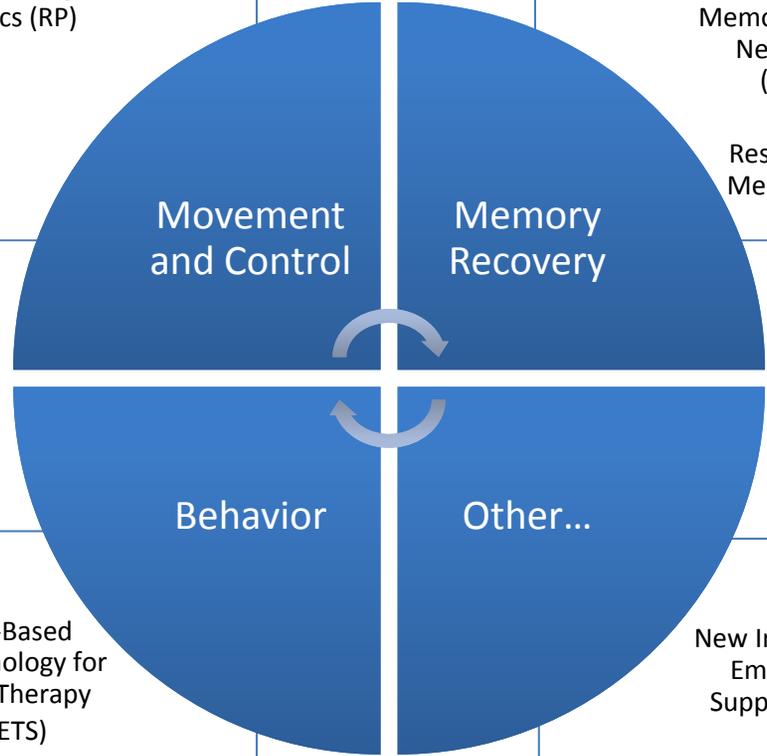
- **Distributed diagnostics:** Molecular and analytical methods suitable for use outside hospital settings
- **Transfer of immune responses:** Nucleic acid constructs and delivery for *in vivo* production of protective antibodies that impart immediate prophylaxis or treatment
- **New vaccine platforms:** RNA-based vaccines with controlled immunogenicity able to be designed and manufactured rapidly



# Neurotechnologies

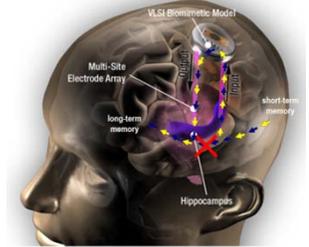


Revolutionizing  
Prosthetics (RP)



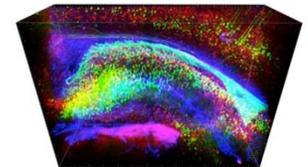
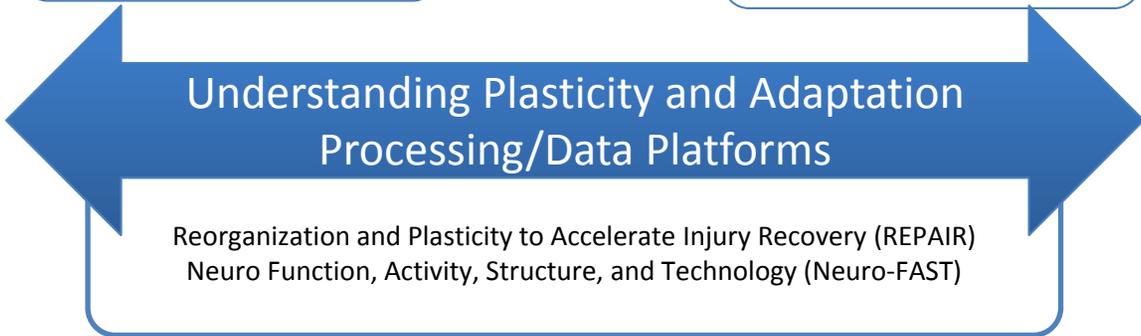
Restorative Encoding  
Memory Integration  
Neural Device  
(REMIND)

Restoring Active  
Memory (RAM)



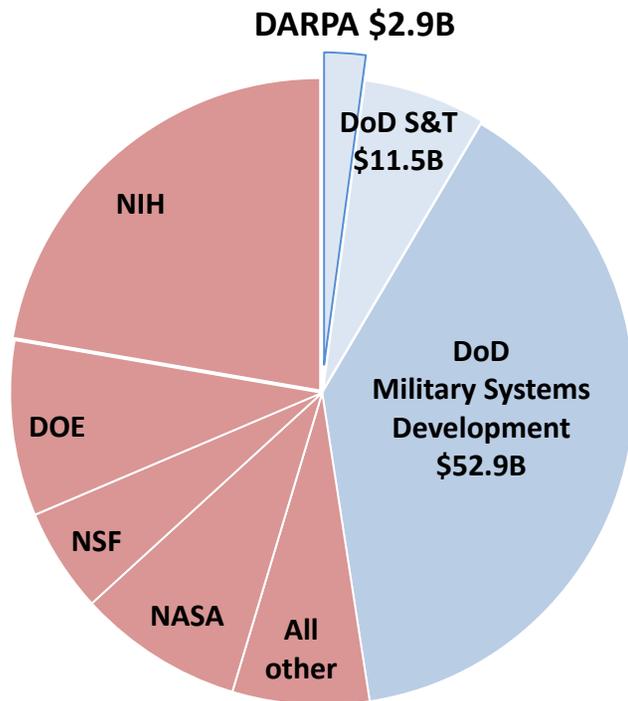
Systems-Based  
Neurotechnology for  
Emerging Therapy  
(SUBNETS)

New Investments in  
Emerging and  
Supporting Areas





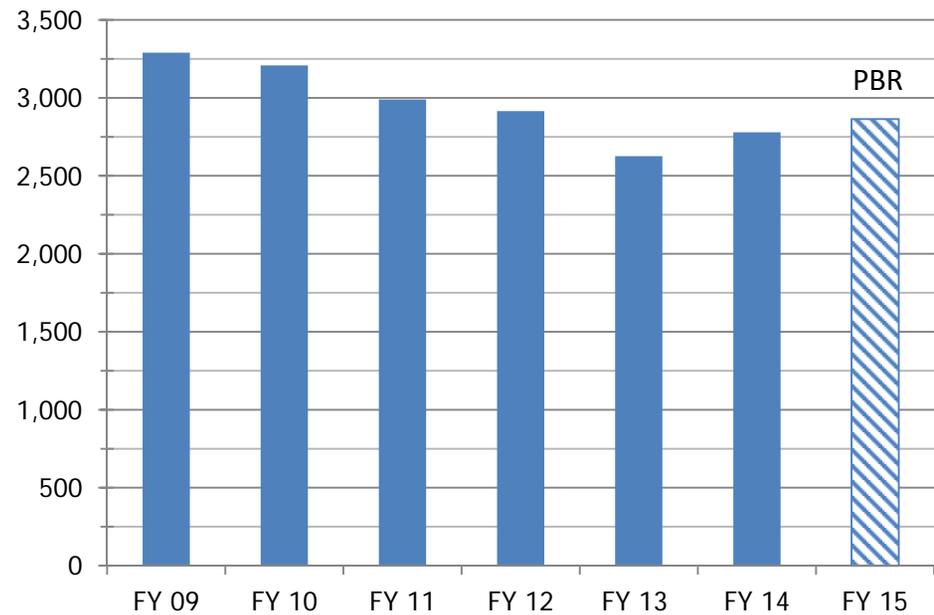
## Federal R&D



**FY15 President's Budget Request**  
**\$135B**

## DARPA Budget

Constant FY14 \$M



	FY 09	FY 10	FY 11	FY 12	FY 13	FY 14	FY 15
Then year \$	\$3014M	\$2985M	\$2835M	\$2814M	\$2580M	\$2779M	\$2915M
Change from FY09		-2%	-9%	-11%	-20%	-16%	-13%



[www.darpa.mil](http://www.darpa.mil)