Department of Defense "101"

Lewis-Burke Associates, LLC May 23, 2017 Dr. Reed Skaggs

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Today's talk

- Overview of the Department of Defense S&T organization
- Navigating the Landscape –What messages best resonate –How does working with DOD, NIH, and NSF differ from each other
- Questions



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DOD Overview

• FY 2017 budget: RDTE: \$72.3 billion; S&T Total: \$14.01 billion (increased 3.6 %/ 5.6 %)

- Political leaders starting to get appointed/confirmed
- Leadership at Air Force Office of Scientific Research (AFOSR), Office of Naval Research (ONR), and Army Research Office (ARO) will remain in place
- New funding opportunities continue to roll out
- Presidents' FY 2018 budget would:

– Provide an additional \$52 billion for DOD in FY 2018 to address <u>readiness</u> and <u>force structure</u> -Increases to Research, Development Testing & Evaluation (RDT&E)





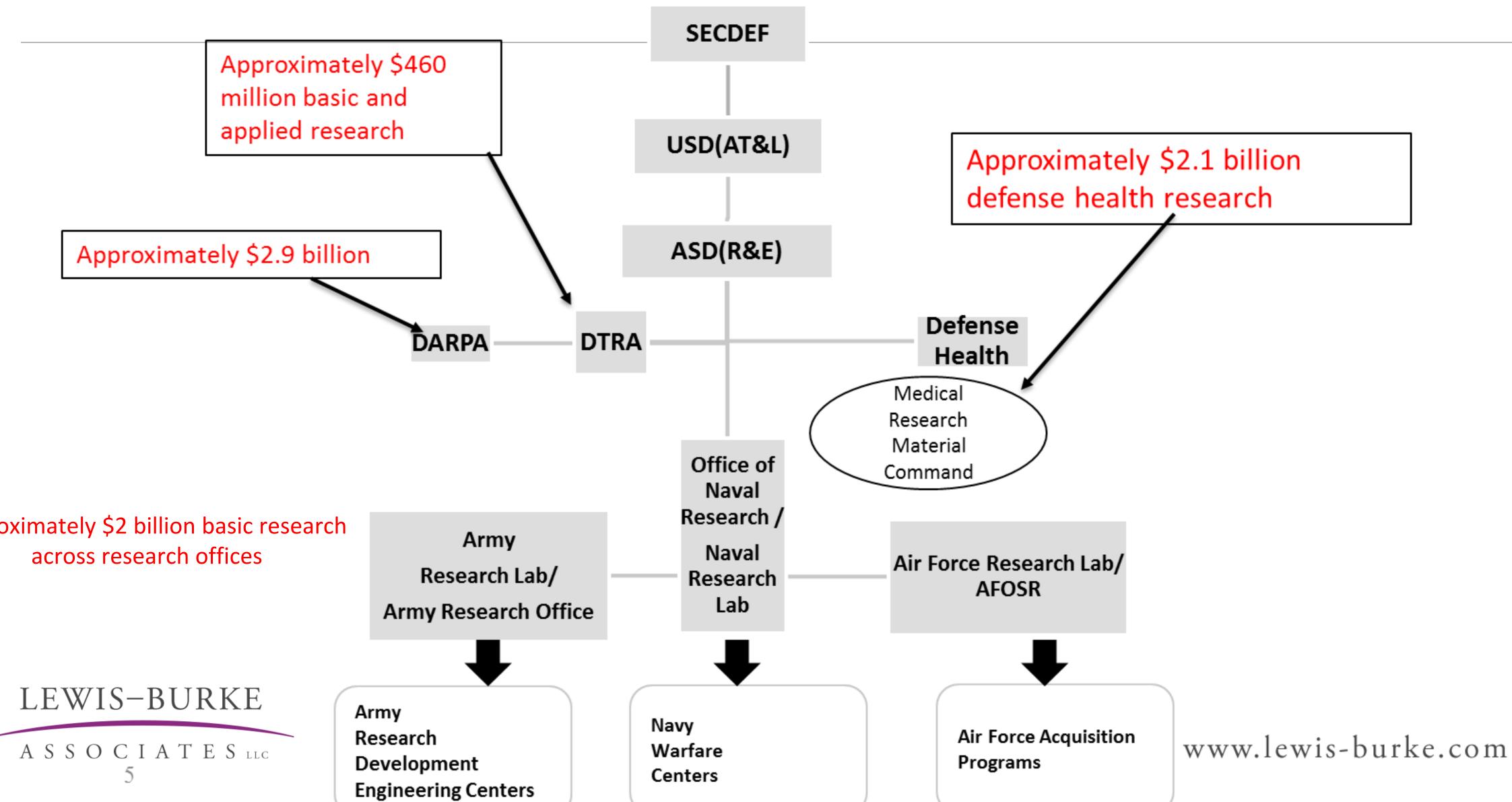
FY2017 – S&T Winners and Losers

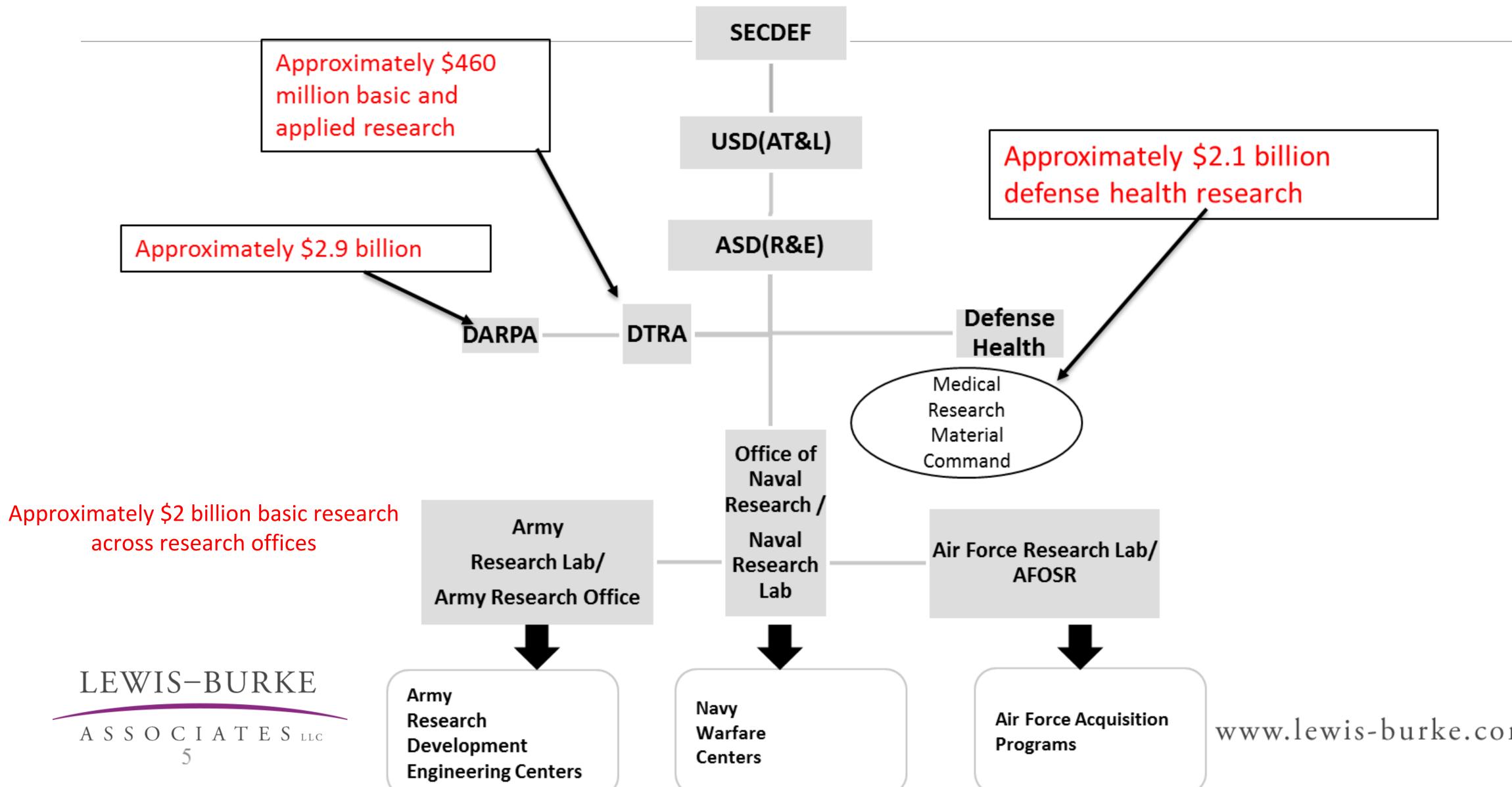
- Basic Research 6.1: Added \$174.5 M Navy cut – Army & Air Force - Defense Research Sciences; National Defense Education Program
- Applied Research 6.2: Added \$510.3 M DARPA and DIUx cut
 - Weapons & Munitions
 - Materials
 - Power projection
 - -Aerospace
 - Medical Development
- Advanced Development 6.3: Added \$1038 M DIUx, OSD joint programs, Chem/Bio cut
 - Distributed Learning Advanced Technology Development
 - Weapons and Munitions Advanced Technology
 - Missile and Rocket Advanced Technology
 - Combat Vehicle and Automotive Advanced Technology
 - High Performance Computing Modernization Program
 - Combating Terrorism Technology Support
 - Medical Advanced Technology
 - Aviation Advanced Technology

-Advanced Materials for Weapon Systems LEWIS-BURKE

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DOD Organization





ASD (R&E): S&T Priorities (FY 17)

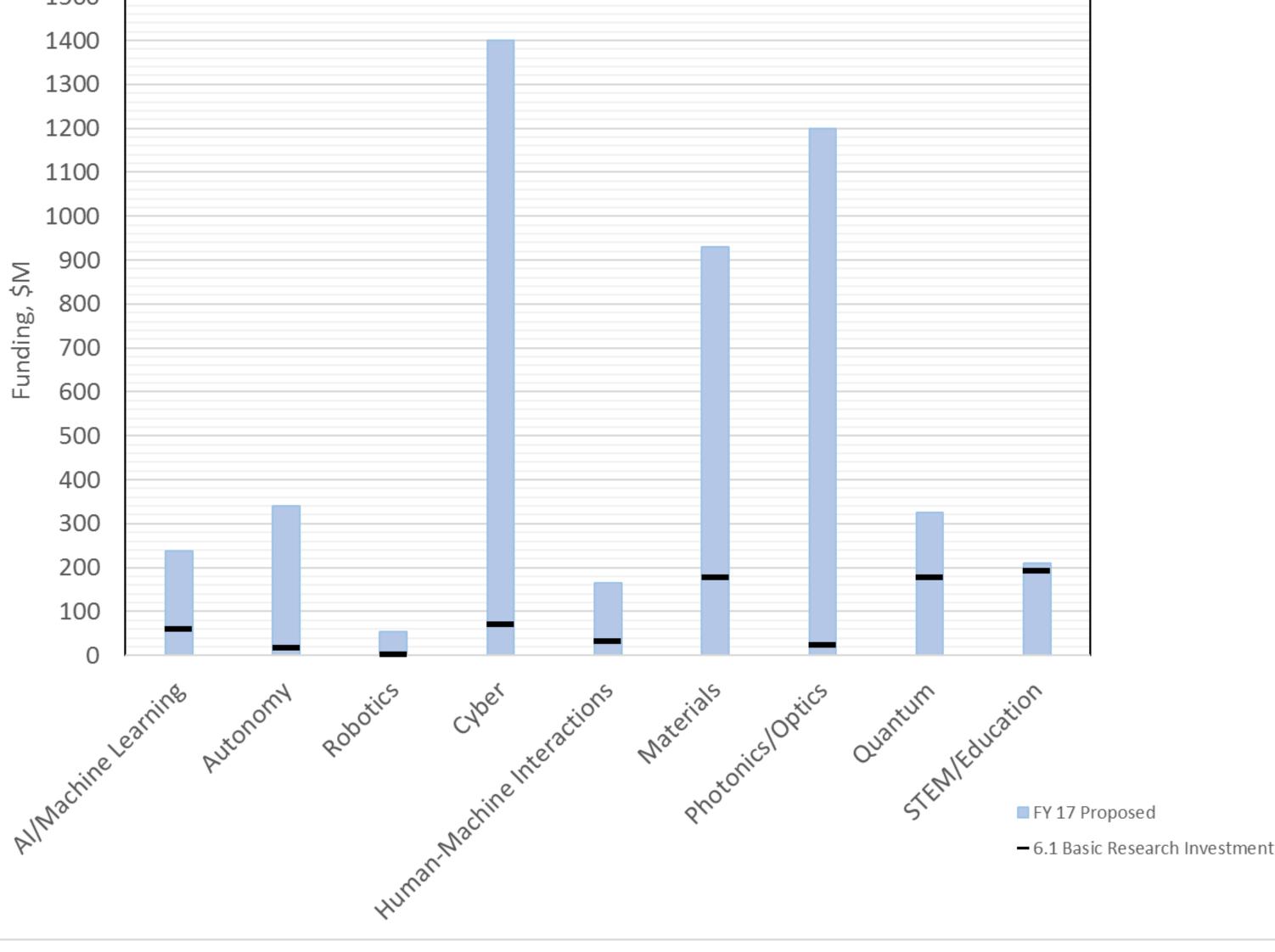
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Funding,

~ 40 % 6.1 budget covered by S&T priorities

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Basic Research - OSD flagship programs

- OSD office of basic research oversight to basic research
 - Army Army Research Office(part of ARL) ·Navy Office of Naval research ·Air Force AFOSR (part of AFRL)

• Multidisciplinary University Research Initiative (MURI) program supports research conducted by teams of investigators that intersect more than one traditional science and engineering discipline in order to accelerate research progress -2016 issued 23 awards totaling \$163 million over the next five years to academic institutions to perform multidisciplinary basic research

- Services solicited proposals in 23 topics important to DOD and the military services.
- Initially, 315 white papers were received, 89 of which were selected for more detailed proposals.

Vannevar Bush Faculty Fellowship (formerly NSSEFF) provides extensive, long-term financial support to distinguished university faculty and staff scientists and engineers to conduct unclassified, basic research on topics of interest to DoD – Foster long-term relationships between the science and engineering faculty program fellows and the DoD S&T enterprise.

- proposals.
- Anticipated that ~ 10 fellowships will be awarded each fiscal year

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-Awards selected based on a merit review by a panel of experts and are subject to successful negotiation between the institution and DOD.

- The Fellows will be selected based on competitive evaluations of the scientific and technical merit of the applicants' white papers and

Army Research Laboratory (ARL) Army Research Office (ARO)

ARO Research Thrusts

- Chemistry •
- Computing and Info Science
- Electronics \bullet
- Environmental \bullet
- Life Sciences ${\color{black}\bullet}$
- Materials
- Mathematics
- Mechanics ${\color{black}\bullet}$
- **Network Science** ${\bullet}$
- Nanoscience
- Physics

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ARL Core Technical Areas

- Computational Sciences
- Materials \bullet
- Sciences-for-Maneuver
- Information Sciences
- Sciences-for-Lethality and Protection
- Human Sciences
- Assessment and Analysis



Annual BAA (Broad Agency Announcement)

Air Force Research Laboratory (AFRL) Air Force Office of Scientific Research (AFOSR)

- AFOSR awards nearly 1,500 grants and contracts to more than 200 academic institutions, 160 firms and more than 250 intramural programs
- Annual BAA (Broad Agency Announcement)

AFRL Technology Focus Areas

- Next Generation Aerospace Systems
- Weapons
- Space & Nuclear Deterrence
- Intelligence, Surveillance, & Reconnaissance
- Command & Control, Cyber, Communications (C⁴)
- Affordability and Sustainment
- Human Performance
- Electronic Warfare/Electronic Protection

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	echnolog	gy Focus	Areas	
\$603M Next Gen Aerospace \$503M				
\$353M Weapons				~
Space and Nuclear Deterrence \$313M				
Intelligence, Surveillance, & Re (ISR) \$281M	econnaissance			
Command & Control, Cyber, Communications (C ⁴) \$232M				
Affordability & Sustainment \$154M				
Human Performance \$123M				
Electronic Warfare / Electronic Protection (EW/EP) \$121M Total: ~\$2.1B, FY16 PB (No Devolved \$)		public release; distribution unlimited (8		and the second s

<u>AFOSR</u>

- Engineering and Complex Systems
- Information and Networks
- Physical Sciences
- Chemistry and Biological Sciences



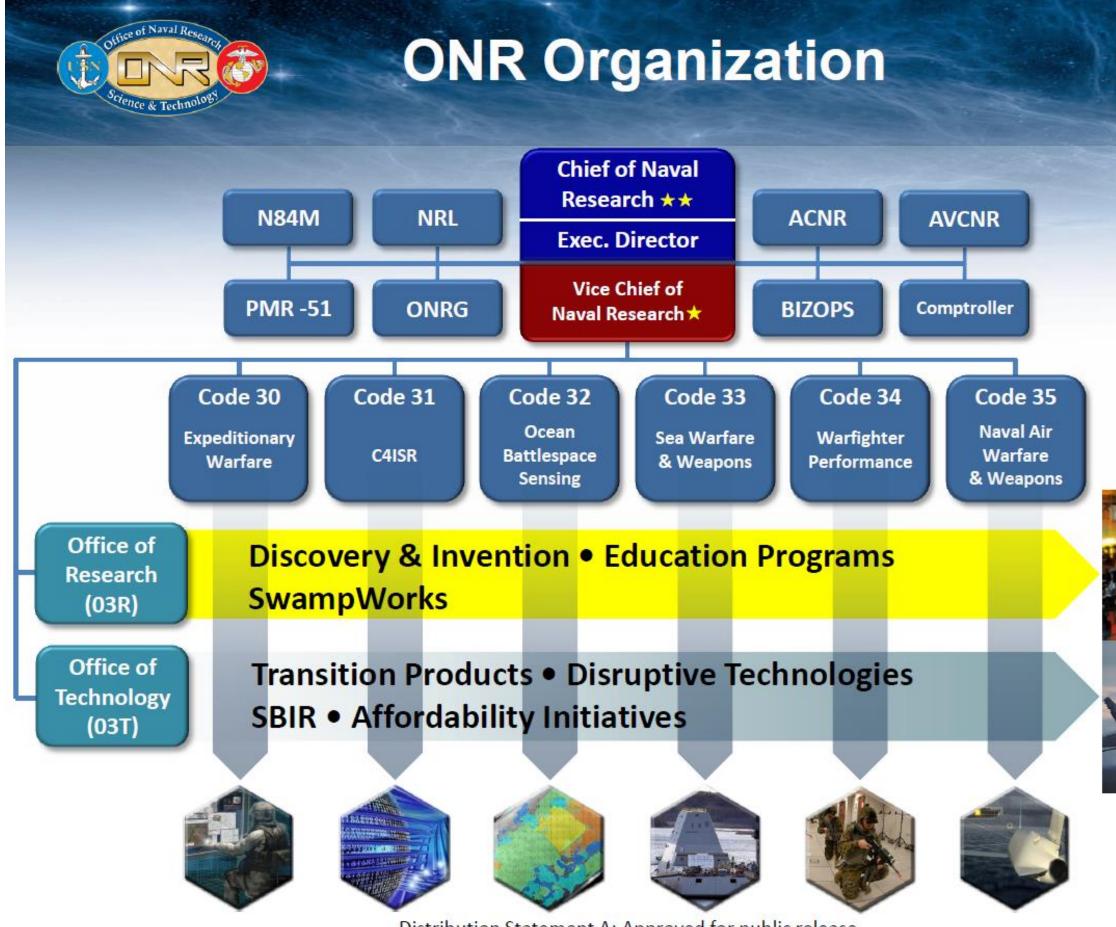
Office of Naval Research (ONR)

- ONR- Leading funder of basic research across service branches
- ONR releases open BAA at start of fiscal year submit white paper prior to full application

Use "Technology Locator": <u>http://www.onr.navy.mil/Science-</u> <u>Technology/Contacts.aspx</u>

Organized by CODEs 30-35

- Code 30 Expeditionary Maneuver Warfare and Combating
 Terrorism Department
- **Code 31** Command, Control, Communications, Computers, Intelligence, Surveillance & Reconnaissance (C4ISR)
- **Code 32** Ocean Battlespace Sensing
- **Code 33** Sea Warfare and Weapons
- **Code 34** Warfighter Performance
- **Code 35** Naval Air Warfare and Weapons



Distribution Statement A: Approved for public release





DARPA

- FY17 \$2.93 B, \$40 M decrease from request
- Basic research program increased by ~ \$30M

Areas of Focus:

- Controlling Electro Magnetic (EM) Spectrum
- Distributed Lethality
- Space

-Small satellite constellations

• Hypersonics

-Missiles



Artificial Intelligence Machine Learning Neural Networks Human-Machine interactions Biology Neuroscience

- –Infectious Diseases
- -Synthetic Bio

Defense Threat Reduction Agency (DTRA)

• Basic and applied research on bio/chemical/nuclear/explosives/information sciences geared towards countering weapons of mass destruction

Total Research Budget (6.1-6.3) ~\$460 million (basic \$35 million)

- -Non-medical: Nano, cognition, information science, bioscience
- -Medical Biological Defense Transformational Medical Technologies Initiative: Diagnostic Technology, Vaccine, Therapeutic – viral, toxin, bacterial
- -Medical Chemical Defense Smallest Area: Respiratory, Cutaneous and Ocular, Neurological, Toxicology

Working with DTRA

- –Broad Agency Announcement (BAA): Science and Technology New Initiatives.
 - New way for researchers to engage DTRA program managers by submitting a quad chart and white paper narrative to gauge interest in an idea and receive informal feedback.
- -Annual call for BASIC RESEARCH TOPICS pre-application white papers typically in fall
- -Multi-year BAA, specific topics change annually based on program manager interest little feedback

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DOD Health

Government-wide Initiatives Impacting DOD Health

- Precision Medicine
- Cancer Moonshot
- **Big Data**: data sharing standards, software tools, enhanced training, centers of excellence
- **BRAIN**: targeted investment to accelerate development of neurotechnologies
- Alzheimer's and aging: new investments in research and care to address looming in patients and costs
- Global Health Security (biosurvelliance, antimicrobial resistance, and Ebola/infectious disease research and response)



DOD Health Research Priorities

- Hemorrhage blood products (storage, transportation, in theater transfusions); extend blood platelet shelf life; improved pre-hospital treatments for critical patients; alternatives to using anti-biotics for post wound care.
- Traumatic Brain Injury (TBI) classification of TBIs that can inform future technology and treatment strategies; Biomarkers to replace CAT scans (affordability)
- Mental Health suicide prevention; substance abuse, rural healthcare/telemedicine
- Pain Management Burn care, opioid use
- **Infectious Disease** prevention, diagnostics, therapeutics; surveillance; warfighter v. civilian health
- Health IT



Army Medical Research & Materiel Command (USAMRMC)

- Priority Disciplines
 - -Military Infectious Diseases (~\$36m)
 - •Walter Reed Army Institute of Research
 - •U.S. Army Medical Research Institute of Infectious Diseases
- -Combat Casualty Care (~\$27 m)
- •U.S. Army Institute of Surgical Research
- •Walter Reed Army Institute of Research
- -Military Operational Medicine (~\$57m)
- •U.S. Army Research Institute of Environmental Medicine
- •U.S. Army Aeromedical Research Laboratory
- •Walter Reed Army Institute of Research
- -Clinical and Rehabilitative Medicine Research Program (~\$18m)
- Releases annual BAA that outlines wide-ranging research interests for the fiscal year –White papers accepted on a rolling basis
- Program managers vary in their willingness to discuss ideas
 - -Conferences and symposia can be best places to connect despite travel restrictions
 - Many hesitant to take meetings, but willing to speak via phone
- Critical to link your research to a military population/mission/outcome LEWIS-BURKE

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Congressionally-Directed Medical Research Program (CDMRP)

Mission: "Responsibly manage collaborative research that discovers, develops and delivers health care solutions for Service Members, veterans, and the American public."

- 20 topic areas
- Created as way for Congress to assert influence over biomedical research agenda
- Congress helps dictate topics, but open competitions/peer review employed in funding decisions
- CDMRP funds added annually by appropriators -Frequent talk about scaling back, but Senator Durbin a strong supporter

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• Started in 1992 to support breast cancer research – has since supported research in more than

• TBI/Psychological Health a key focus in recent years; sustained at \$125 million in FY 2016

Steps to Effectively Engage DOD

- Review program websites, BAAs, and past solicitations to find relevant programs
- Meet program managers, laboratory subject matter experts, invite government researchers to give Department seminars
- Attend conferences
 - -E.g. Annual Military Health System Research Symposium http://mhsrs.com/
- future solicitations
- Have more than one idea to propose
- Be prepared to adapt your research to meet program managers' goals
- Other considerations:
 - -Fellowships
 - –Postdoc Support (most if not all have support for rotations or funded support)
 - -Equipment
 - -Seed grants (flexibility)

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• Submit white paper ahead of application to assess fit to program, get feedback, and potentially shape

Upcoming Meetings/Conferences

- (STIx)
- July 10 (DC) DHS cyber security Expo
- July 20-21 (DC) NAVAL Future Force S&T Expo
- Fall 2017 (MD) ARL Open Campus, Open House

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• June 22-23 (Crystal City, VA) – OSD Science, Technology and Innovation exchange

• August 27-30 (Kissimmee, FL) - Annual Military Health System Research Symposium



Discussion

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Sampling of Existing Funding Opportunities

- white papers is May 19, with awards eligible for a maximum of \$3 million.
- potentially deceptive information environments." The deadline for proposals is June 6, the full funding amount is not yet known. – Note DARPA has a number of active solicitations
- \$150,000 \$1 million per year (averaging \$400k), for a period of three to five years.
- <u>July 7</u>.
- least five years.
- amounts for this solicitation are not yet known.



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• DOD's Rapid Innovation Fund (RIF) BAA is focused on facilitating the rapid insertion of innovative technologies into military systems or programs that meet critical national security needs. While directed at small businesses, the RIF BAA provides a good opportunity for universities to better understand the current DOD technology needs and begin building relationships with local industry. The deadline for

• DARPA's Active Interpretation of Disparate Alternatives BAA is focused on developing "a multihypothesis semantic engine that generates explicit alternative interpretations of events, situations, and trends from a variety of unstructured sources, for use in noisy, conflicting, and

• DOD's **Minerva Research Initiative** seeks to fund top-quality social science research that provides DOD with a better understanding of the factors influencing the geopolitical environment in which it operates. The <u>deadline for proposals is June 21</u>, with *awards ranging between*

• The **Defense University Research Instrumentation Program (DURIP)** provides acquisition funding for equipment and instrumentation used to support defense-related research activities on campus. *Projects funds range from \$50,000 - \$1.5 million*. The <u>deadline for proposals is</u>

 DOD's Multidisciplinary University Research Initiative (MURI) Broad Agency Announcement (BAA) is one of the signature DOD
research programs for the university community and stands as the benchmark for building a defense-oriented research capability on campus.
The topics of interest vary among the Branches example topics include quantum sensing; novel materials; self-assessment of autonomous and intelligent systems. The deadline for white paper's is July 17, with individual awards anticipated to be \$1.25 - \$1.5 million per year, for at

The Naval Air Systems Command BAA is intended to establish Cooperative Agreements and contracts in support of basic and applied
research to address U.S. Naval science and technology (S&T) challenges in areas such as structures, avionics, materials science, aerodynamics,
navigation, sensors, human factors, propulsion, and power. White papers can be submitted on a rolling basis until January 3, 2018. Funding



CDMRP – Various Mechanisms

For Research Proposals:







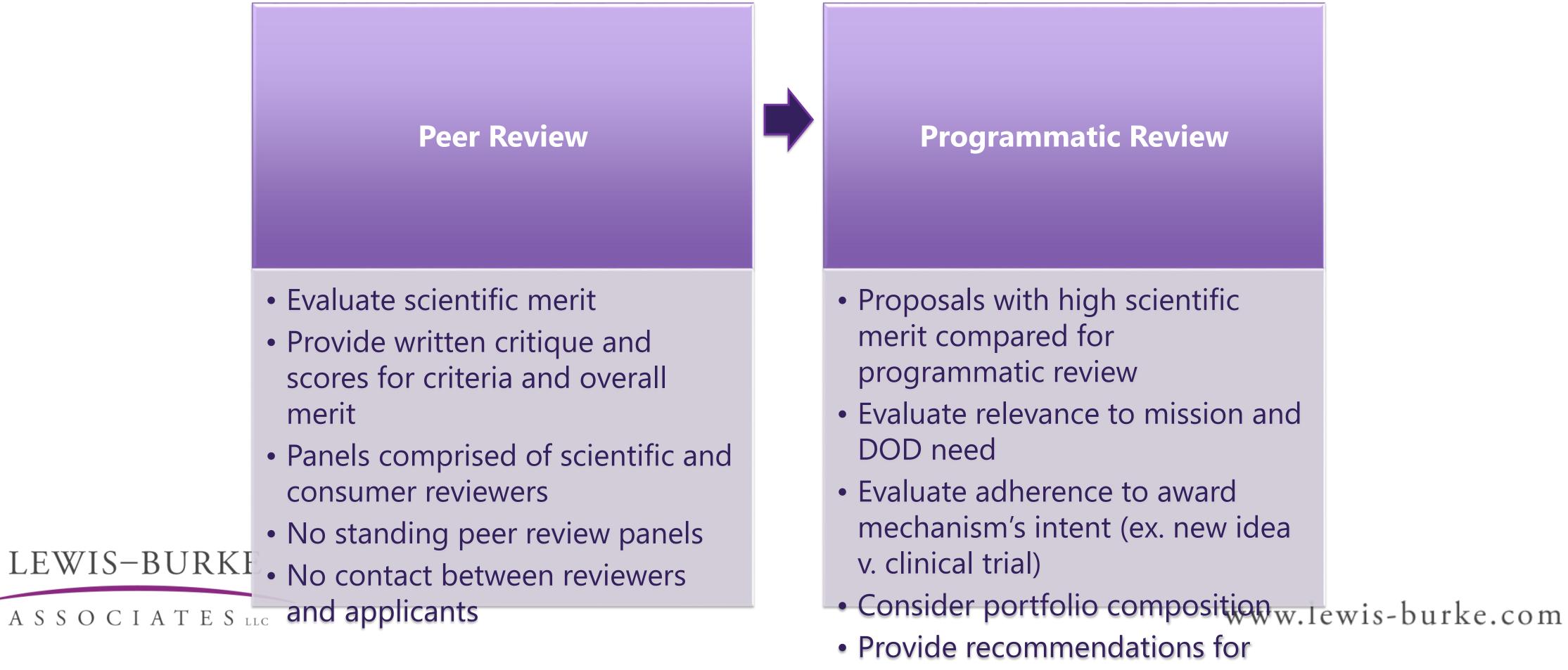
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Based on Type of Applicant



CDMRP – Review Process



Two-tier review process: peer review for scientific merit and **programmatic review** to ensure the DOD mission and needs are met

funding

CDMRP (CONTINUED)

 <u>Sample FY14 Integration Panel – Breast Cancer</u> Nimmi Ramanujam, Ph.D. (Chair) Duke University 	•
 Gregory Adams, Ph.D. Fox Chase Cancer Center 	•
• Otis Brawley, M.D.	
American Cancer Society	•
 Frank Calzone, Ph.D. (Chair Emeritus) Biotechnology Consultant 	•
 Daniel Douek, M.D., Ph.D. National Institute of Allergy and Infectious Disease (NIH) 	•
 Silvia Formenti, M.D. New York University School of Medicine 	•
 Pat Haugen South Dakota Breast Cancer Advocacy 	•
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Christopher Li, M.D., Ph.D. Fred Hutchinson Cancer Research Center Ngina Lythcott, Dr. P.H. **Black Women's Health Imperative** Mark Pegram, M.D. Stanford University Malcolm Pike, Ph.D. Memorial Sloan-Kettering Cancer Center William Redd, Ph.D. Mount Sinai School of Medicine *Joy Simha (Chair-Elect)* Young Survival Coalition Dennis Slamon, M.D., Ph.D. University of California, Los Angeles

Frances Visco, Esq.

National Breast Cancer Coalition

Alana Welm, Ph.D.

University of Utah, Huntsman Cancer Institute

CDMRP – Current Topics/Opportunities FY 2017 \$822.9 million, \$30 million < than FY 2016 level :: Bolded items reflect increases or new topics from FY 16

- Peer-Review Medical (\$300 m)
- Traumatic Brain Injury and Psychological health (\$125 m)
- Breast Cancer (\$120 m)
- Prostate Cancer (\$90 m)
- Peer-Review Cancer (\$60 m)
- Joint Warfighter Medical (\$50 m)
- Peer-Review Orthopedic (\$30 m)
- Spinal Cord (\$30 m)
- Gulf War Illness (\$20 m)
- Ovarian Cancer (\$20 m)
- Neurotoxin Exposure Treatment Parkinson's (\$16 m)
- Alzheimer (\$15 m)
- Neurofibromatosis Research (\$15 m)
- Vision **(\$15 m)**
- HIV/AIDS program increase (\$12.9 m)
- Lung Cancer Research (\$12 m)
- Reconstructive Transplant (\$12 m)

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- Trauma Clinical (\$10 m)
- Hearing Restoration (\$10 m)
- Kidney Cancer (\$10 m)
- **Orthotics and Prosthetics (\$10 m)**
- **Global HIV/AIDS prevention (\$8 m)**
- Military Burn (\$8 m)
- Epilepsy (\$7.5 m)
- Amyotrophic Lateral Sclerosis (\$7.5 m)
- Autism Research (\$7.5 m)
- Tuberous Sclerosis (\$6 m)
- Multiple Sclerosis (\$6 m)
- Tick-borne disease research (\$5 m)
- Lupus (\$5 m) Moved from PRMRP
- Alcohol and Substance Abuse (\$4 m)
- Bone Marrow Failure (\$3 m)
- Duchenne Muscular Dystrophy (\$3.2 m)

Peer Reviewed Medical Research Program (PRMRP)

- Acute Lung Injury
- Antimicrobial Resistance
- Arthritis*
- Burn Pit Exposure*
- Chronic Migraine and Post-Traumatic Headaches
- Congenital Heart Disease
- Constrictive Bronchiolitis
- Diabetes
- Diarrheal Diseases*
- Dystonia
- Early Trauma Thermal Regulation*
- Eating Disorders*
- Emerging Infectious Diseases
- Epidermolysis Bullosa*
- Focal Segmental Glomerulosclerosis
- Fragile X Syndrome
- Guillain-Barre syndrome*
- Hepatitis B and C LEWIS-BURKE

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- Hereditary Angioedema
- Hydrocephalus
- Transplants*
- Inflammatory Bowel Diseases
- Influenza
- Integrative Medicine
- Interstitial Cystitis
- Malaria
- Metals Toxicology
- Mitochondrial Disease
- Musculoskeletal Disorders*
- Nanomaterials for Bone Regeneration Nonopioid Pain Management
- Pancreatitis
- Pathogen-Inactivated Dried Cryoprecipitate
- Polycystic Kidney Disease
- Post-Traumatic Osteoarthritis

Immunomonitoring of Intestinal

- Pulmonary Fibrosis
- Respiratory Health
- Rett Syndrome
- Rheumatoid Arthritis
- Scleroderma
- Sleep Disorders
- Spinal Muscular Atrophy*
- Sustained-release Drug Delivery*
- Tinnitus
- Tuberculosis
- Vaccine Development for Infectious Disease
- Vascular Malformations
- Women's Heart Disease

***Denotes** new topic in FY 2017

CDMRP Opportunities Available Now

- **Bone Marrow Failure Research** (preapplication 7/13)
- **Ovarian Cancer** (preapplication 6/21)
- Breast Cancer (5 different mechanisms; preapplications due in early June)
- **ALS** (preapplication due 6/9)
- Lung Cancer Research Program
 - Concept Award
 - Career Development Award
 - Idea Development Award
 - Investigator-Initiated Translational Research Award
 - Translational Research Partnership Award
- Multiple Sclerosis Research Program
 - Exploration Hypothesis Development Award
 - Investigator-Initiated Research Award
- Vision Research Program
 - Clinical Trial Award
 - Technology/Therapeutic Development Award
- Early Notice:
 - Peer Reviewed Cancer Research: Brain Cancer (new for FY17), Cancer in children, adolescents, and young adults (new for FY17)
 - Epilepsy Research
 - Alzheimer's Research
 - Autism Research
 - Reconstructive Transplant Research Program (RTRP)
 - Alcohol and Substance Abuse Disorders Research Program (ASADRP)
 - Parkinson's Research Program (PRP)

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Example: Alzheimer's Research Program FY 2017 Foci

- Genomics/Proteomics: Studies or technologies (e.g., genetic, proteomic, bioinformatics and epigenetic addition, relevant technologies or tests may be considered under this focus area.
- cells, inflammatory factors, and vascular contributions) associated with TBI and subsequent AD/ADRD pathogenesis.
- Caregiver Support: Research intended to reduce the burden of care on the caregiver for individuals living with the common symptoms or deficits of TBI and AD/ADRD. Examples of research in this focus area include: Caregiver training, home-based support, behavioral interventions, and relationship interventions.
- approaches).
- the development of existing or new investigational medicines, drugs, or agents.
- health of individuals affected by TBI and subsequent AD/ADRD.

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strategies) intended to characterize neurological change(s) associated with TBI and subsequent AD/ADRD. In

• Mechanisms of Pathogenesis: Identification of contributing mechanisms (e.g., pathology of Tau, non-neuronal

• Quality of Life: Research intended to alleviate, stabilize, or characterize the symptoms, or deficits, common to TBI, Alzheimer's disease (AD) and Alzheimer's disease-related dementias (ADRD). Examples of research in this Focus Area include: Identification and management of co-morbidities and modifiable risk factors (e.g., sleep apnea, obesity); cognitive training interventions; studies of health and wellness and behavioral interventions.

Biomarkers: Development of strategies to diagnose, prognose, or characterize neurological changes or risk factors associated with TBI and subsequent AD/ADRD (e.g., fluid based, imaging, physiological, and clinical

• Novel Target Identification: Basic research (non-human) directly leading to the identification of new targets for

Epidemiological Research: Research focusing on the incidence, distribution, and other factors relating to the

Table 1. CDMRP Programs, Appropriations, and Applications Received and Awarded

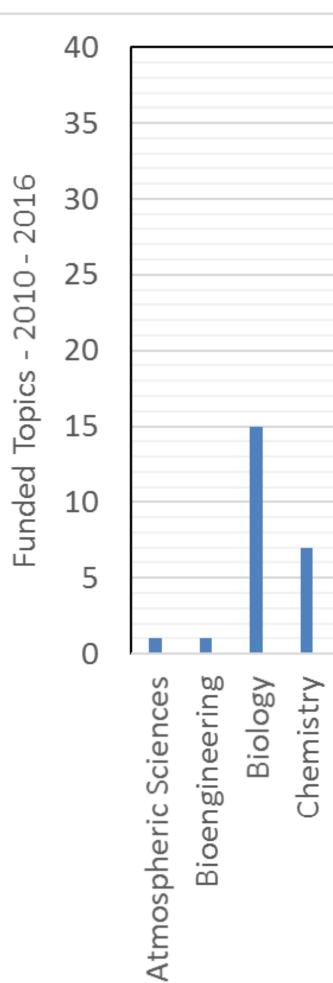
	FY15									
Research Programs Managed by the CDMRP	Funds Received (in millions)	Applications Received	Applications Funded	Funding Modifications Completed						
Alcohol and Substance Abuse Disorders ⁽¹⁾	\$4.0	n/a	-	2						
Amyotrophic Lateral Sclerosis	\$7.5	41	10	-						
Autism	\$6.0	58	7	-						
Bone Marrow Failure	\$3.2	35	5	-						
Breast Cancer	\$120.0	1,627	116	-						
Breast Cancer Research Semipostal ⁽²⁾	\$0.5	n/a	-	2						
Duchenne Muscular Dystrophy	\$3.2	27	5	-						
Epilepsy	\$7.5	25	5	-						
Gulf War Illness	\$20.0	74	26	2						
Joint Warfighter Medical ⁽³⁾	\$50.0	11	12	18						
Lung Cancer	\$10.5	329	29	1						
Military Burn	\$8.0	36	7	4						
Multiple Sclerosis	\$5.0	40	6	-						
Neurofibromatosis	\$15.0	67	21	-						
Orthotics and Prosthetics Outcomes	\$10.0	62	7	-						
Ovarian Cancer	\$20.0	234	26	-						
Parkinson's	\$16.0	23	7	4						
Peer Reviewed Alzheimer's	\$12.0	75	16	-						
Peer Reviewed Cancer	\$50.0	560	110	-						
Peer Reviewed Medical	\$247.5	1,294	166	7						
Peer Reviewed Orthopaedic	\$30.0	57	10	1						
Prostate Cancer	\$80.0	697	118	14						
Reconstructive Transplant	\$15.0	94	25	1						
Spinal Cord Injury	\$30.0	90	18	-						
Tick-Borne Disease	n/a	n/a	n/a	n/a						
Trauma Clinical	n/a	n/a	n/a	n/a						
Tuberous Sclerosis	\$6.0	43	11	1						
Vision	\$10.0	78	7	-						

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Source: CDMRP annual report - FY 2016

Success Rates Range Depending on Topic

MURI Topics



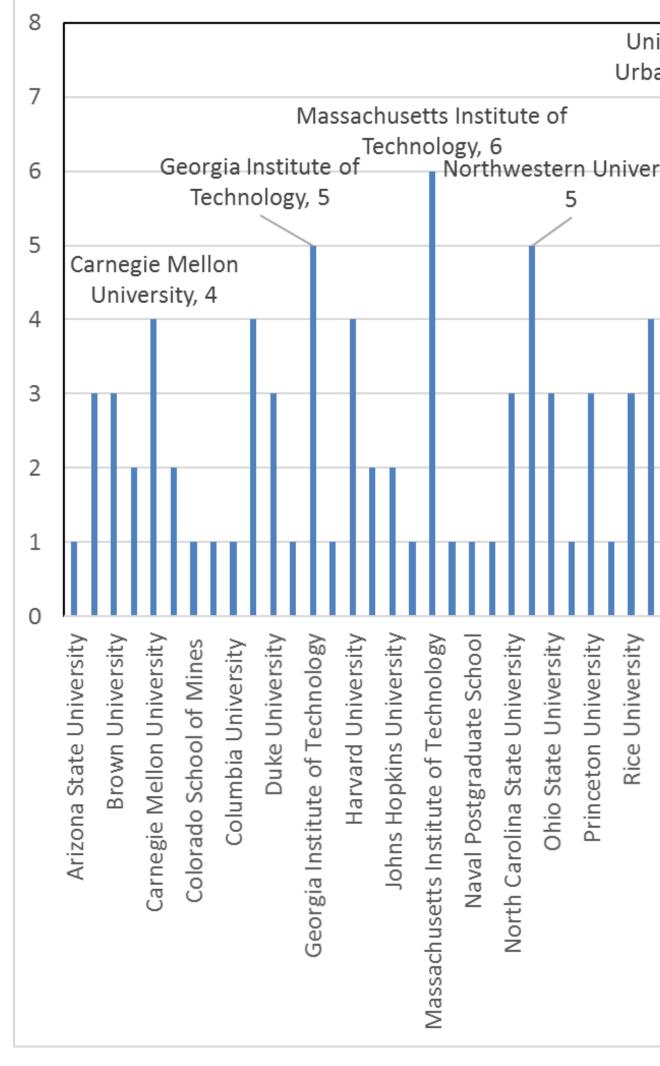
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Combustion	Computer Science/ Engineering omputer Science - Intelligent Systems	Computer Science - modelling	Cyber Data Analytics	Electrical Engineering	Electronics	Electronics-Materials	Engineering	Fluid Dynamics	Geoscience	Human Performance	Information Technology	<u>S</u>	Materials	Nanotechnology	Networks	Neuroscience	Ocean Sciences	Optics-Materials	Physics	Quantum	Social Science



Lead MURI Institutions



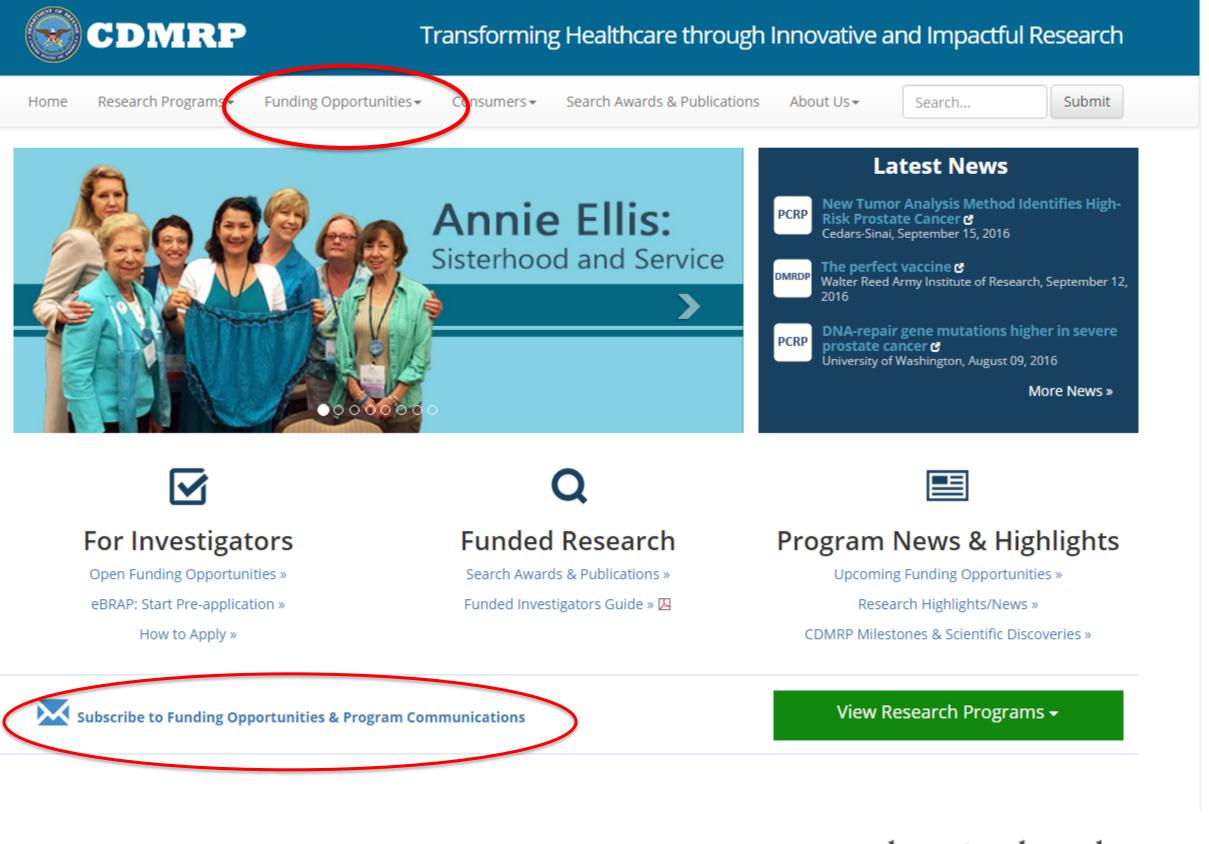
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The Old Dominion University	Tulane University	University of Arizona	University of California at Riverside	University of California, Berkeley	University of California, Los Angeles	University of California, Santa Barbara	University of Chicago	University of Connecticut	University of Maryland	University of Michigan	University of Missouri, Columbia	University of Notre Dame	University of Pennsylvania	University of Southern California	University of Texas at Austin	University of Virginia	Vanderbilt University	Woods Hole Oceanographic Institution	Yale University

FOA Resources

BRAP Online Application ×	
← → C https://ebrap.org/eBRAP/register/Register.htm	
Image: state stat	
Login Register Funding Opportunities & Forms	
Welcome to eBRAP	
Register	
I am a new: Principal Investigator	
*Select from drop down	
Start Registration	
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 Welcome to eBRAP. To access the user guide, please <u>click here</u>. 	
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Help	
 <u>Frequently Asked Questions</u> <u>Commonly Made Mistakes</u> <u>Contact the helpdesk/webmaster</u> 	





Funding Opportunity Postings:

- www.grants.gov
- FedBizOps <u>www.fbo.gov</u>
- www.eBRAP.org