Center for Military Medicine Research
“All in... for Service to our Nation”

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Colonel/Retired/US Army
Professor of Medicine, Division of Pulmonary, Allergy, and Critical Care Medicine
Faculty, McGowan Institute for Regenerative Medicine

Executive Director
Center for Military Medicine Research, Health Sciences
University of Pittsburgh

Florida Atlantic University
20 March 2015
Medical Echelons of Care
Battlefield Survival

- World War II – 70%
- Vietnam War – 76%
- OIF/OEF - increased to an astounding 90%
  - U.S. Department of Defense's Directorate for Information Operations and Reports

- >65% of all injuries suffered by casualties in the current conflicts in Iraq and Afghanistan are orthopedic in nature
Medical Research in the DoD

- Defense Health Program – largest funding sponsor in DoD
  - Centralized planning and programming of funds
  - Decentralized Execution
  - Leverage Services R&D Management & Science Infrastructure
  - Focus is Joint Force Health Protection
- Army-RDT&E – largest R&D management & science infrastructure
- Navy-RDT&E
- Defense Advanced Research Projects Agency-RDT&E
- Chemical and Biological Defense Program-RDT&E
- Defense-wide-RDT&E
- US Special Operations Command-RDT&E
- Air Force Human Systems-RDT&E
DoD Research Focus

- Diagnosis & Treatment of Brain Injury
- Polytrauma & Blast Injury
- Infectious Diseases
- Operational Health & Performance
- Regeneration/Rehabilitation
- Pain Management
- Psychological Health & Well-Being for Military Personnel & Families
- Medical Training Systems & Simulations
- Health Informatics
University of Pittsburgh
(Background)

• State-related research university founded in 1787
• Member: Association of American Universities
• Composed of 17 undergraduate & graduate schools and colleges located in Pittsburgh campus (132 acres)
• Home to 28,766 undergraduate, graduate & professional students
• Includes 4 additional undergraduate schools located within Western PA: Bradford, Greensburg, Johnstown & Titusville
• Five-campus system offers more than 450 degree programs
• Annual operating budget of approximately $2 billion that includes nearly $900 million in R&D expenditures
• 2nd largest non-government employer in the Pittsburgh region behind University of Pittsburgh Medical Center (UPMC)
University of Pittsburgh (Research)

- FY13 - ranks 6th in Federal dollars awarded ($662M)
- University Schools of Health Sciences combine to make Pitt a major center of health sciences education & biomedical research
- Research leadership in health sciences interfaces with all parts of campus, including engineering, the physical sciences and social sciences
- Research is translated through technology commercialization activities (Coulter Translational Research Partners II Program, the Center for Medical Innovation & the Clinical and Translational Science Institute)
- Pitt has a long-standing history in supporting DoD R&D needs
Military Medicine Research Funding at Pittsburgh

Dept. of Defense Funding History (2008-2012)

• >$125 million (University of Pittsburgh School of Medicine)
• >$60 million (University of Pittsburgh Medical Center)

FY2013: $44.5 million
Mission:
- Support medical research interests of the Departments of Defense and Veterans Affairs
- Organize collaboration among investigators at the University of Pittsburgh to promote forward planning of research initiatives in advance of award announcements to enhance readiness of the University to compete for federal funding
- Develop new research themes in collaboration with DoD investigators

Formally established: June 12, 2012
CMMR Leadership

Rocky Tuan, PhD – Director
Peter Strick, PhD – Associate Director
Ronald Poropatich, MD – Executive Director
Ann Gleeson, MS – Managing Director

www.cmmr.pitt.edu
CMMR Collaborators at the University of Pittsburgh

- McGowan Institute for Regenerative Medicine
- Fox Vision Center
- Safar Center for Resuscitation Research
- School of Medicine (Neurosurgery; Plastics; Pulmonary; Ophthalmology)
- School of Health & Rehabilitation Sciences  
  (Center for Assisted Technology; Neuromuscular Research Lab)
- School of Nursing
- Graduate School of Public Health
- Western Psychiatric Institute and Clinic
- Brain Institute
Research Focus

- Human Performance/Injury Prevention
- Regenerative Medicine & Tissue Engineering
- Traumatic Brain Injury
- Vision Restoration
- Reconstructive Surgery
- Transplantation Immunology (hand/face transplant)
- Neuroscience and “Neurotech Center”
- Pulmonary Medicine
How does an academic university advance DoD research objectives?

Key points:
• DoD focus is the transition of medical technologies into deployed products (less mechanism of action)
• Acquiring DoD funding is a process built on understanding the DoD needs, performance, trust and sustained relationships
• DoD goal is to accelerate new standards of care for injury prevention, treatment of casualties, rehabilitation, and training systems that can be applied in theater or in the clinical facilities of the Military Health System
Drivers of Medical Research & Development

What is driving change in the military R&D environment?

Contemporary War Casualties

- Current war casualties are driving changes in healthcare needs and therefore changes in R&D
- Specific types of casualties driving changes:
  - Traumatic Brain Injury (TBI)
  - Blast Injuries
  - Amputations
  - Other Traumas (Eye/Ear Injuries)
  - Post-Traumatic Stress Disorder (PTSD)

<table>
<thead>
<tr>
<th>% Body Area</th>
<th>WWII</th>
<th>Korea</th>
<th>Vietnam</th>
<th>OIF/OEF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head &amp; Neck</td>
<td>12%</td>
<td>21%</td>
<td>21%</td>
<td>16%</td>
</tr>
<tr>
<td>Chest</td>
<td>16%</td>
<td>14%</td>
<td>10%</td>
<td>13%</td>
</tr>
<tr>
<td>Abdomen</td>
<td>11%</td>
<td>8%</td>
<td>8%</td>
<td>9%</td>
</tr>
<tr>
<td>Extremities</td>
<td>61%</td>
<td>58%</td>
<td>60%</td>
<td>61%</td>
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</table>
Causes of Death on the Battlefield

Non-survivable injuries:
- Catastrophic TBI
- Cardiac laceration/puncture
- Thoracic great vessel injury
- Intra thoracic tracheal injury
- Open pelvis

Top cause of preventable DOW*:
- Hemorrhage 76%
- Burn 13%
- TBI 6%
- MOF 3%
- Airway 1%

Non-survivable: 81%
Potentially survivable: 19%

DOW*: Died of Wounds at Role 3+

Hemorrhage: 84%
33% Tourniquetable
67% Non-compressible/non-tourniquetable (internal injuries)
# Battlefield Care “Big Problems”

## Mortality
- Non-compressible Hemorrhage
  - Coagulopathy
- Compressible Hemorrhage
  - Extremity
  - Ax/neck/groin
- Pneumothorax
- Airway Compromise
- Central Nervous System
- Deep Vein Thrombosis
- Multisystem Organ Failure
- Sepsis

## Morbidity and Co-Morbidity
- Traumatic Brain Injury
  - Mild to Severe
- Massive Soft Tissue Injury
- Orthopedic Trauma
- Burn
- Eye Trauma
- Ear Trauma
- Craniofacial Injury
- Pain Control
- Lung Injury
- Wound Infection

## Training
- Medic
- Specialty Surgeon
- Other Providers

## Psychological Health
- PTSD
- Suicides
Restoration and Rehabilitation
“Big Problems”

<table>
<thead>
<tr>
<th>Extremity</th>
<th>Cranio-maxillofacial</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Limb salvage</td>
<td>● Deformities</td>
</tr>
<tr>
<td>● Heterotopic ossification</td>
<td>● Motor control</td>
</tr>
<tr>
<td>● Amputation – multiple and late</td>
<td>● Sensation</td>
</tr>
<tr>
<td>● Upper extremity prosthetics</td>
<td>● Burns</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Burns</th>
<th>Sensory Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Skin coverage</td>
<td>● Ocular trauma</td>
</tr>
<tr>
<td>● Scarring – aesthetic and functional</td>
<td>● Loss of vision and hearing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pain Management</th>
<th>Traumatic Brain Injury</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Chronic pain</td>
<td>● Cognitive processing disorders</td>
</tr>
<tr>
<td>● Opioid dependence</td>
<td>● Language and memory</td>
</tr>
<tr>
<td>● Battlefield usage is limited by side effects</td>
<td>● Sensory system dysfunction</td>
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</table>
Medical Product Development

User Needs

Technology Opportunities & Resources

DoD

Research

Decision Gate

Program Initiation

MDD

Material Solution Analysis

ICD

Technology Development

CDD

Engineering & Manufacturing Development

CPD

Production & Deployment

Operations & Support

Decision Gate:

- 6.1 Technology Readiness Levels (TRL)
- 6.2 TRL: Drugs/Pharmaceuticals – Initial Proof of Concept (PoC) for candidate constructs demonstrated in vitro/vivo. Devices – Initial PoC for candidates demonstrated in lab models/animal studies.
- 6.3 TRL: 6.4 TRL: Procurement – FDA Approval / Launch
- 6.5 File Investigational New Drug (IND)
- 6.6 File New Drug Application (NDA)
- 6.7 FDA Approval / Launch

Technology Readiness Levels (TRL):

- TRL 3: Drugs/Pharmaceuticals – Initial Proof of Concept (PoC) for candidate constructs demonstrated in vitro/vivo. Devices – Initial PoC for candidates demonstrated in lab models/animal studies.
- TRL 6: Drugs/Pharmaceuticals – Phase 1 data meets safety requirements; supports proceeding to Phase 2 studies. Devices – Initial clinical data meets safety requirements; supports proceeding to efficacy trials. For 510(k), equivalency to predicate established; supports testing in military environment.
USAMRMC Core S & T Programs

**Military Infectious Diseases (RAD 1)**
- Medical readiness
- Vaccines
- Biotechnology
- Prophylaxis/treatment drugs
- Diagnostics/prognostics
- Vector control
- Medical C4ISR
- HIV countermeasures

**Combat Casualty Care (RAD 2)**
- Lightweight medical equipment
- Medical C4ISR
- Trauma care
- Health monitoring & diagnostic technology

**Military Operational Medicine (RAD 3)**
- Soldier selection & sustainment
- Soldier performance
- Warrior system modeling
- Health hazards protection
- Diagnostics/prognostics
- Health monitoring

**Clinical and Rehabilitative Medicine (RAD 5)**
- Neuromusculoskeletal Rehabilitation
- Regenerative Medicine and Transplants
- Vision Restoration
- Pain Management

**Medical Chemical Biological Defense**
- Medical management of CW casualties
- Medical readiness
- Drug prophylaxes/pretreatments
- Diagnostics/therapeutics
- Vaccines/therapies
- Field-portable diagnostic systems
- Medical readiness
- Biotechnology
Joint Program Committees (JPC’s)  
Tri-service funded & managed

Medical Training and Health Information Sciences (JPC 1)
- Medical Information Technology Development
- Accelerated Transition of Modeling and Simulation Technology for Medical Training/Education/Treatment

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- Rapid Screening of Fresh Whole Blood
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- Wound Infection Prevention & Management
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- Hemorrhage Control
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- Evacuation Practices
- Ground and Aeromedical Transport

Radiation Health Effects (JPC 7)
- Biomedical Technology for Radiation Countermeasures
- Radiation Biology Modeling
- Internal Contamination

Clinical & Rehabilitative Medicine (JPC 8)
- Sensory System Traumatic Injury
- Regenerative Medicine
- Neuromusculoskeletal Injuries
- Scar Contracture
- Pain Management
Primary Points of Entry

● FedBizOpps.Gov
  ► Existing Requests for Proposals

● Grants.Gov
  ► Program Announcements and Broad Agency Announcements
USAMRMC Funding Opportunities

- Broad Agency Announcement
  - BAA 15-1, October 2014
  - USAMRAA: http://www.usamraa.army.mil/
  - http://www.grants.gov (Funding No. W81XWH-BAA-15-1)
  - Continuously Open through September 2015
  - Announcement lists topic areas of current interest
  - Pre-proposals submitted and evaluated continuously
  - Full Proposals undergo external peer review

Greatest chance for success is submitting a solicited proposal!
United States Army Medical Research Acquisition Activity
USAMRAA

IMPORTANT LINKS
Center of Excellence
CMRA
PRCentral Training Presentations
HBCU-MI Briefing Presentations
Advanced Acquisition Forecast (AAF)
Trouble Accessing the USAMRAA website(s)
AbilityOne E-Commerce Website
(USAMRMC Base Supply Program)
Fort Detrick Contracting Community Portal
Sample Contract Supporting Documents
Contract Requirements Matrix
VCE-COR website
Vendor Day
General Guidelines for Awards Funded by the DOD

NEWS
NOTICE TO CONTRACTORS
[Wiki-Leaks Sanitization Procedures]

ASSISTANCE AGREEMENT FORM POSTED
SF425 Federal Financial Report and Instructions were posted on 09/21/09.

PROGRAM ANNOUNCEMENT (PA) POSTINGS & UPDATES
For a complete listing of Assistance Agreement Funding Opportunities posted by the U.S. Army Medical Research Acquisition Activity, please see Grants.gov and perform a search using CFDA# 12.420.

NOTICE: Any assistance instrument awarded under these Funding Opportunities will be governed by the award terms and conditions, which conform to DoD’s implementation of OMB circulars applicable to financial assistance. Terms and conditions of new awards made after December 26, 2014, may include revisions to reflect DoD implementation of new OMB guidance in 2 CFR part 200, “Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards.”

SOLICITATIONS POSTINGS & AMENDMENTS
For a complete listing of Solicitations posted by the U.S. Army Medical Research Acquisition Activity, please see FedBizOpps or the Army Single Face to Industry (ASFI) website and perform a search for W81XWH. Additionally, announcements with J&A’s can be found on FFDRIZOPPS and ASFI.
Federal Business Opportunities

Search more than 28,200* active federal opportunities.

Posted Date: Last 90 Days
Set-Aside Code: Any
Place of Performance: Any State or Territory
Type: Any
Keyword / Solicitation #: Agency: 

Search

Additional criteria and multiple selections are available on the advanced search form.
* Notices posted within the last 90 days.

ATTENTION: Agency users are responsible for properly uploading controlled, unclassified materials to FBO using the access control procedures for document packages and attachments detailed in the FBO Buyers Guide. Do not upload ANY classified materials to FBO.

Buyers / Engineers
Government users may post, manage, and award opportunities.

Username
View Opportunities
No login is required to view opportunities.

Vendors / Citizens
Vendors and citizens may search, monitor, and retrieve opportunities.

Username
Find Opportunities
No login is required to view opportunities.
USAMRMC Funding Opportunities

- Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs
  - Goal to utilize unique features of small businesses to provide innovation for U.S. Army’s mission and needs
  - [https://www.armysbir.army.mil](https://www.armysbir.army.mil)
  - SBIR must involve small business
  - STTR requires partnership of small business with universities, federally funded R&D centers, and other non-profit research institutions
  - Multiple SBIR solicitations throughout the year
    - USAMRMC releases about 20 topics each year and awards about 20 phase I and 10 phase II SBIR contracts
    - Topics change with every solicitation
SBIR and STTR Programs

● Three phases of funding
  ► Phase I: Feasibility, 6 month awards, up to $100K, with $50K option if selected for Phase II.
  ► Phase II: Selected from ~10% of Phase I awards. Up to $1M/$730K (SBIR) or $750K (STTR) for prototype development.
  ► Phase III: Selected from ~50% of Phase II for commercialization and transition into Army programs.
    ➢ Successful culmination of SBIR project.
    ➢ No SBIR Funds used, funding from other government or private sources.

● Examples of previously funded medical topics: antimicrobial drugs against wound infection pathogens, soft tissue treatment technology, ultrasound for post-trauma pain, DTI phantom development to enhance diagnosis of moderate TBI, manufacturing/development of allogenic stem cells in clinical settings.
USAMRMC Funding Opportunities

- The Congressionally Directed Medical Research Programs (CDMRP)
  - [http://cdmrp.army.mil](http://cdmrp.army.mil)

- The Telemedicine and Advanced Research Center (TATRC)
  - [http://www.tatrc.org](http://www.tatrc.org)
CDMRP Active Research Proposals:
Peer Reviewed Medical Research Program

CDMRP
Congressionally Directed Medical Research Programs
Department of Defense

Finding and Funding the Best Research

RESEARCH PROGRAMS | FUNDING OPPORTUNITIES | CONSUMER INVOLVEMENT | SEARCH AWARDS | MEDIA CENTER | ABOUT US

Amyotrophic Lateral Sclerosis
Autism
Bone Marrow Failure
Breast Cancer
Defense Medical Research and Development
Duchenne Muscular Dystrophy
Gulf War Illness
Lung Cancer
Multiple Sclerosis
Neurofibromatosis
Ovarian Cancer
Pancreatic Cancer
Peer Reviewed Cancer
Peer Reviewed Medical
Peer Reviewed Orthopaedic
Prostate Cancer
Psychological Health/Traumatic Brain Injury
Spinal Cord Injury
Tuberculosis
Vascular Access
Previously Funded Research Programs

Medical

The Peer Reviewed Medical Research Program (PRMRP), established in fiscal year 1999 (FY99), has supported research across the full range of science and technology with an underlying goal of enhancing the health and well-being of military personnel, their families, and the veteran population. Oversight is provided through a Tri-Service/Interagency Joint Medical Review Panel as required by the Assistant Secretary of Defense for Research and Engineering. Congressional appropriations for the PRMRP totaled $594.5 million through FY12 and have supported 493 awards in more than 90 award areas. Congress appropriated $50M for the FY13 program to support 24 topics.

In history, military medical personnel have pioneered breakthroughs in emergency and active surgery, the use of antibiotics, principles of intensive care and burn care, and kidney dialysis, in response to war zone needs, benefiting the health and well-being of all Americans. Today, the mission of PRMRP is to ensure that military researchers have access to the latest scientific and technological advances that help them tackle the nation’s most pressing health problems and improve care for all Americans.

FY14 PRMRP Funding Opportunities Now Available!
FY13 PRMRP Recommended for Funding List

Peer Reviewed Medical News

PRMRP Video Highlights
The Peer Reviewed Medical Research Program (PRMRP), established in fiscal year 1999 (FY99), has supported research across the full range of science and medicine, with an underlying goal of enhancing the health and well-being of uniformed service personnel, their families, and the veteran population. Program oversight is provided through a Tri-Service/Interagency Joint Programmatic Review Panel as required by the Assistant Secretary of Defense for Health Affairs. Congressional appropriations for the PRMRP totaled $594.5 million (M) through FY12 and have supported 493 awards in more than 90 different topic areas. Congress appropriated $50M for the FY13 program to solicit proposals in 24 topic areas.

Throughout history, military medical personnel have pioneered breakthroughs in reconstructive surgery, the use of antibiotics, principles of intensive care and burn care, and kidney dialysis, in response to war zone needs, benefitting all military members and veterans. PRMRP has participated in these advances with several hundred support programs totaling hundreds of millions of dollars. However, there remains much to be learned about military medicine and PRMRP continues to support biomedical research to address and solve key medical issues.

Vision

Health, mental health, military readiness, and well-being are the vision of the Peer Reviewed Medical Research Program (PRMRP). The PRMRP's mission is to identify and support biomedical research that enhances health, military readiness, and well-being and that leads to the delivery of health care services to members of the uniformed services and their families.
Research areas considered are restricted to the following:

acupuncture, acute lung injury, advanced prosthetics, arthritis, burn pit exposure, cardiovascular health, chronic migraine & post-traumatic headache, congenital heart disease, Dengue, diabetes, DNA vaccine technology for post-exposure prophylaxis, dystonia, focal segmental glomerulosclerosis, food allergies, Fragile X syndrome, healthcare-acquired infection reduction, hepatitis B, hereditary angioedema, hydrocephalus, inflammatory bowel disease, integrative medicine, interstitial cystitis, lupus, malaria, metals toxicology, mitochondrial disease, nanomaterials for bone regeneration, osteoarthritis, pancreatitis, pathogen-inactivated dried plasma, polycystic kidney disease, post-traumatic osteoarthritis, psychotropic medications, pulmonary fibrosis, respiratory health, rheumatoid arthritis, scleroderma, sleep disorders, tinnitus, vascular malformations, and women's heart disease.
Considerations for a Successful Proposal

● Read the program announcement – carefully!
  ► DoD is different from NIH
    ➢ Fund to research gaps
  ► Programs such as the CDMRP use various mechanisms (e.g., program project, advanced technology, and concept awards)
  ► Program relevance and military relevance (critical part of the proposal!)

● Collaborations with military and veterans organizations
  ► Established military or VA collaborator and/or institution
  ► How well does the proposal fit a military health issue?
    ➢ e.g. PTSD, TBI, or wound care
    ➢ Appropriate approval in place for use of military subjects

● Funding success = Scientific & Programmatic Review
Considerations for a Successful Proposal

● Use of human subjects
  ► Experience with IRB and USAMRMC ORP Policies
    ➢ https://mrmc.amedd.army.mil/index.cfm?pageid=research_protections.overview
  ► Updated IND status
  ► Cohort identified or past experience with cohort
  ► Informed consent- 10 USC 980
  ► Review Human Research Protection Office (HRPO) policy and procedures
    ➢ https://mrmc.amedd.army.mil/index.cfm?pageid=research_protections.hrpo_policies

● Use of human subject data
  ► Established or experience with record agencies
    ➢ e.g., ACSAP, PDHA, and JTTR
  ► Predetermined approval status
    ➢ e.g. exempt, minimal risk, etc.
Considerations for a Successful Proposal

- **Use of animals**
  - IACUC documents and familiarity with USAMRMC ACURO
  - Sensitive issues with combat-related research on animals
  - How well does animal model reflect the human situation?

- **Advanced Technology**
  - Transition Plan
    - e.g. moving from Phase I to a Phase II clinical trial
    - Commercialization strategy and business plan (SBIR mentality)
    - **Familiarity with technology readiness levels (TRL)**
USAMRMC Summary

- USAMRMC offers funding opportunities for research through various mechanisms
  - Broad Agency Announcement (BAA)
  - New Product Ideas (NPI)
  - SBIR and STTR contracts
  - Congressionally Directed Medical Research Programs (CDMRP)
  - Telemedicine & Advanced Technology Research Center (TATRC)
- DoD research addresses specific military needs and often benefits from collaboration with military and/or veteran communities
- DoD research awards require second level approval for human subject and animal use.
Defense Health Agency
Defense Health Agency

Background

Formed October 1, 2013
Headquarters Falls Church, Virginia
Website tricare.mil/tma

Purpose: decrease health care costs by consolidating shared services across the Army, Navy and Air Force
Defense Health Agency
10 Shared Services

Facilities
Medical Logistics
Health Information Technology (HIT)
Tricare
Pharmacy

Budget & Resource Management
Contracting/Procurement
Research Development Acquisition (RDA) – 1 June 2014
Medical Education & Training
Public Health
DHA

- Agency of the United States Department of Defense that forms a key component of the U.S. Military Health System (MHS).
- Replaces the Tricare Management Activity (TMA) as the U.S. military entity responsible for providing TRICARE.
- TMA had provided TRICARE services since 1996
- All tri-service DOD medical research (>\$400M/year) – i.e. Joint Program Committee (JPC’s) will be managed out of the DHA
Joint Program Committees (JPC’s)
Tri-service funded & managed

Medical Training and Health Information Sciences (JPC 1)
- Medical Information Technology Development
- Accelerated Transition of Modeling and Simulation Technology for Medical Training/Education/Treatment

Military Infectious Diseases (JPC 2)
- Rapid Screening of Fresh Whole Blood
- Antimicrobial Countermeasures
- Wound Infection Prevention & Management
- Diagnostic Systems for Infectious Diseases

Military Operational Medicine (JPC 5)
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- Deployment Related Psychol. Health Problems
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- Post Deployment Health Risks/PTSD

Combat Casualty Care (JPC 6)
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- Ground and Aeromedical Transport

Radiation Health Effects (JPC 7)
- Biomedical Technology for Radiation Countermeasures
- Radiation Biology Modeling
- Internal Contamination

Clinical & Rehabilitative Medicine (JPC 8)
- Sensory System Traumatic Injury
- Regenerative Medicine
- Neuromusculoskeletal Injuries
- Scar Contracture
- Pain Management

FY10 Funding: $372M

Defense Advanced Research Projects Agency (DARPA)

- DoD agency responsible for the development of new technologies for use by the military
- Annual budget – $2.8 billion
- Responsible for funding the development of many technologies which have had a major effect on the world, including the Internet, computer networking, as well as NLS (first hypertext system) and an important precursor to the contemporary ubiquitous graphical user interface
- Established 1958 (as ARPA) in response to the Soviet launching of Sputnik (1957), with the mission of keeping U.S. military technology more sophisticated than that of the nation's potential enemies
- Small and flexible: DARPA has only about 140 technical professionals; DARPA presents itself as “100 geniuses connected by a travel agent”
- Flat organization: DARPA avoids hierarchy, essentially operating at only two management levels to ensure the free and rapid flow of information and ideas, and rapid decision-making.
DARPA Program Offices

- **Adaptive Execution Office (AEO)** Four thrust areas include technology transition, assessment, rapid productivity and adaptive systems.
- **Defense Sciences Office (DSO)** vigorously pursues the most promising technologies within a broad spectrum of the science and engineering research communities and develops those technologies into important, radically new military capabilities.
- **Information Innovation Office (I2O)** aims to ensure U.S. technological superiority in all areas where information can provide a decisive military advantage.
- **Microsystems Technology Office (MTO)** mission focuses on the heterogeneous microchip-scale integration of electronics, photonics, and micro-electromechanical systems (MEMS).
- **Strategic Technology Office (STO)** mission is to focus on technologies that have a global theater-wide impact and that involve multiple Services.
- **Tactical Technology Office (TTO)** emphasizes the "system" and "subsystem" approach to the development of aeronautic, space, and land systems as well as embedded processors and control systems.
- **Biological Technologies Office (BTO)** new office established April 2014.
Biological Technologies Office

Active Programs

- Autonomous Diagnostics to Enable Prevention and Therapeutics (ADEPT)
- Battlefield Medicine
- Biochronicity
- Chronicle of Lineage Indicative of Origins (CLIO)
- Enabling Stress Resistance
- Fracture Putty
- Living Foundries
- Microphysiological Systems
- Narrative Networks
- Neuro Function, Activity, Structure, and Technology (Neuro-FAST)
- Preventing Violent Explosive Neurologic Trauma (PREVENT)
- Prophecy (Pathogen Defeat)
- Rapid Threat Assessment
- Reliable Neuro-Interface Technology (RE-NET)
fundamental research, discoveries, and applications that integrate biology, engineering, and computer science for national security

areas of research: human-machine interfaces, microbes as production platforms, and impact of evolving ecologies and environments on U.S. readiness and capabilities

programs range from individual cells to complex biological systems including mammalian and non-mammalian organisms and the macro- and micro-environments in which they operate.
## FRONT OFFICE

<table>
<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Email</th>
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<tbody>
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## PROGRAM MANAGERS

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DARPA Young Faculty Award (YFA)

- Objective is to identify and engage rising research stars in untenured faculty positions at U.S. academic institutions and expose them to DoD needs as well as DARPA’s program development process.
- YFA program provides funding, mentoring, and industry and DoD contacts to awardees early in their careers so they may develop their research ideas in the context of DoD needs. The long-term goal of the YFA program is to develop the next generation of academic scientists, engineers and mathematicians in key disciplines who will focus a significant portion of their career on DoD and national security issues.
- Out of 407 applicants, 39 of the nation’s brightest young scientists were selected to receive grants totaling $11.7M under the 2012 DARPA YFA program. YFA recipients apply grants of approximately $300,000 toward a wide spectrum of basic research at universities.
- The YFA Solicitation is published each fall on FBO.gov and at Grants.gov. Including this year’s recipients, 168 faculty have received grants since the YFA program began in 2006.
Summary points & Recommendations

1. Understand the unique needs of DoD medical research
   (Note: this is a process, not an easy read!)
   - work to fill capability gaps
   - develop products and solutions (not mechanisms of action)
   - unique needs across each echelons of care
   - scientific & programmatic review necessary

2. Familiarize yourself with:
   - CDMRP web site – enroll for research proposal announcements
   - Grants.gov
   - FedBizOps.gov
   - SBIR/STTR topic announcements (DoD, HHS, NASA, etc)

3. Develop collaborative relationships with DoD/VA investigators
   (attend MHSRS meeting – every August in Florida!)

4. Establish Partnership Agreements with DoD lab organizations

5. Understand the unique DoD lexicon (TRL, P6, JPC, DHA)