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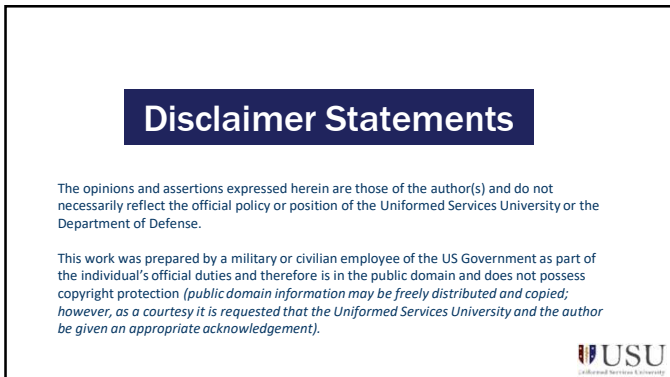
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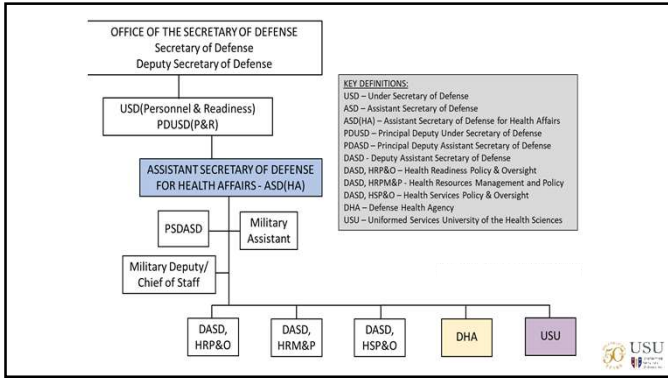
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### USU's Mission is Unique

*The mission of USU is to support the readiness of America's Warfighter and the health and well-being of the military community by educating and developing uniformed health professionals, scientists, and leaders; by conducting cutting-edge, military-relevant research, and by providing operational support to units around the world.*

**Three Mission Domains:**

1. Education
2. Research and Scholarship
3. Leadership and Leader Development

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### Components of USU

- F. Edward Hébert School of Medicine**
  - M.D. degree (military and Public Health Service)
  - Ph.D. degrees in the basic sciences (military and civilian)
- Daniel K. Inouye Graduate School of Nursing**
  - DNP (advanced practice nursing)
  - Ph.D.
- Postgraduate Dental College**
  - Master in Oral Biology
  - Advanced Education in General Dentistry Certificate
- College of Allied Health Sciences**
  - Graduate degrees
  - Undergraduate degrees
- Armed Forces Radiobiology Research Institute**
  - Education, Training, Research, and Operational components

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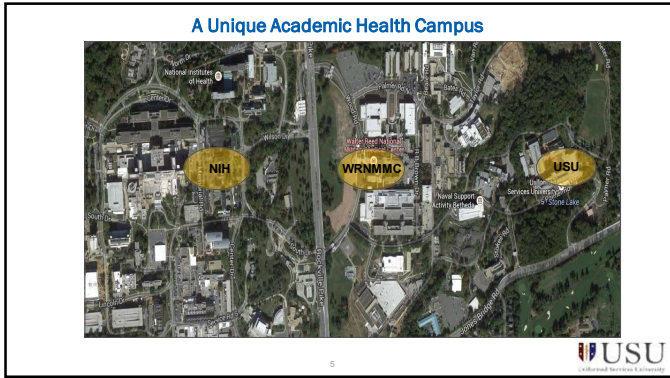
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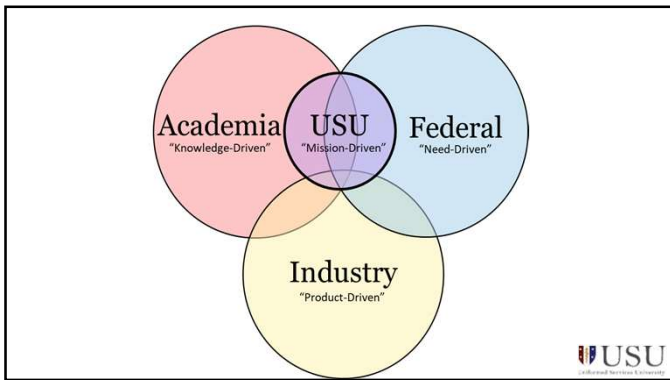
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**Research Focus on the Warfighter**

- USU balances two aspects of research:
  - Basic science & clinical science/discovery – typical of an academic center
  - Translational work – focus on DoD needs
- USU manages research funds three ways
  - Programmed funding from the DoD
  - Applications for competitive awards
  - Granting funds for competitive and discretionary awards

Photo Credit: Kortepeter personal collection

USU  
Utah State University

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### USU Research Priorities: Six Key Themes

- 1 Basic Research:**  
Developing new knowledge
- 2 Translational Research:**  
Applying basic sciences to practical applications of interest to the DoD and PHS
- 3 Clinical Research:**  
Generating and applying new knowledge to populations and individuals
- 4 System/Operations Research:**  
Generating and applying new knowledge to health systems worldwide
- 5 Population Health Research:**  
Focusing on health outcomes across various populations
- 6 Policy Research:**  
Development, application, and evaluation of knowledge around which effective policy can be based



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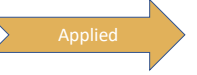
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### USU Research: From the Bench to the Bedside to the Field

			
Molecular Biology Biochemistry Cell Biology Pharmacology	Genomics Microbiology Immunology Physiology	Surgery/Trauma Care Psychology Radiobiology Nursing Practice	Preventive Medicine/Epidemiology Military Medicine Multicenter Clinical Trials Field Studies

  
 Basic

  
 Clinical

  
 Applied

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### Office of the Vice President For Research

**Enables, Supports, Oversees Research**

- Provide regulatory compliance oversight
  - IRB
  - IACUC
- Provide cutting edge technology resources
  - Bioinstrumentation Center
  - Lab Animal Research Facilities
- Manage intramural/extramural research awards
  - Research integrity/responsible conduct of research
  - Peer review
- Seek funding opportunities/partnerships

106 employees  
 > 45 Civilian  
 > 28 Military  
 > 33 Contractors



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### Assistant Vice Presidents



Laura Ruse Brosch, RN, MSN, PhD

- Research Initiatives and Compliance (RIC)
  - ✓ Human Research Protection Program (HRPP)
  - ✓ Institutional Review Board (IRB)
  - ✓ Institutional Animal Care and Use Committee (IACUC)
  - ✓ Institutional Biosafety Committee (IBC)
  - ✓ Human Anatomic Material Research Committee (HAMRC)
  - ✓ Tasker Response
  - ✓ Collaborations



Toya V. Randolph, PhD, MSPH

- Research Administration (REA)
  - ✓ Intramural DOD and Extramural Research Program Management
  - ✓ Research Data Systems and Information
  - ✓ Scientific Peer Review
  - ✓ Responsible Conduct of Research Program



Bruce A Doll, DDS, PhD, MBA

- Technology Research and Innovation (TRI)
  - ✓ Biomedical Instrumentation Center (BIC)
  - ✓ Biomedical research repositories
  - ✓ Department of Laboratory Animal Resources (DLAR)
  - ✓ Institutional Official for IACUC
  - ✓ Translational research
  - ✓ Technology transfer

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### Priorities

- Leverage USU model for translational research across the DoD/MHS
  - Building research infrastructure
- Seek ways to enhance the “human weapon system”
  - Early Dx, treatment, management in far forward environment
  - Improved rehabilitation, rapid return to duty
    - Pain control, evidenced based injury prevention and treatment
  - Leverage unique and large DoD data sets
    - Data science/analysis of risk factors, patient management, optimizing readiness
- Forward-thinking, anticipating, adapting new biotechnologies
  - Smaller, faster, ruggedized



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### USU Centers

1. Center for Deployment Psychology (CDP)
2. Center for the Study of Traumatic Stress (CSTS)
3. Center for Rehabilitation Sciences Research (CRSR)
4. Center for Neuroscience and Regenerative Medicine (CNRM)
5. Consortium for Health and Military Performance (CHAMP)
6. Surgical Critical Care Initiative (SC2i)
7. Center for Global Health Engagement (CGHE)
8. Defense Veterans Center for Integrative Pain Management (DVCIPM)
9. National Center for Disaster Medicine and Public Health (NCDM&PH)
10. Infectious Disease Clinical Research Program (IDCRP)
11. Murtha Cancer Center Research Program (MCCRP)
12. Tri-Service Center for Oral Health Studies (TSCOHS)
13. Center for Health Professions Education (CHPE)
14. Defense Medical Ethics Center (DMEC)



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**IDCRP**  
 Uniformed Services University

### Infectious Disease Clinical Research Program (IDCRP)

**COL Rob O'Connell, IDCRP Director**      **David Tribble, MD, DrPH, Science Director**

**IDCRP Vision:** Reduce the impact of infectious disease in the military population through collaborative clinical research.

**IDCRP Mission:** Conduct multicenter infectious diseases clinical research, focusing on high-impact cohort and interventional trials, to inform and improve care of the Warfighter.

**IDCRP Partner Network**

**IDCRP COVID-19 Interventional and Observational Studies**

**ACTT** - NIAID/CDMID-led effort adaptive clinical trial network (7 DoD sites)  
**STORM CHASER** - Phase III placebo-controlled post-exposure prophylaxis RCT AstraZeneca IM monodonal antibody (5 DoD Sites)  
**OWS Vaccine** - JPEO- led support (65 DoD Sites)  
**EPICC** - Multi-center cohort study with 12 months follow-up (8 DoD sites)  
**USNS COMFORT** - Seroprevalence of novel coronavirus antibodies in personnel deployed in support of NYC COVID-19 surge  
**NYC Javits** - COVID-19 Ab prevalence in deployed military personnel  
**PASS** - Prospective assessment of SARS-CoV-2 Seroconversion WRN/MC HCW  
**TOSCANA** - Serosurveillance at the USNA  
**PISCES** - Prospective cohort in USUHS affiliates and households

**Research Areas:**

- SARS-CoV-2 (COVID-19)
- Acute Respiratory Infections
- Deployment and Travel-Related Infections
- Human Immunodeficiency Virus (HIV)
- Sexually-Transmitted Infections
- Wound Infections

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### IDCRP Studies in INDOPACOM

1. EPICC - ongoing
2. P2 study: RCT for diarrhea prophylaxis (Travelan product)
  - Bovine colostrum-based against ETEC
  - MIDRP funded
  - Enrolling with the Defense Pow MIA Activity (DPAA) and Schofield
3. Marine surveillance for deployment related Infx Dz dnbi
  - 3rd MEF, Okinawa; enrolling
  - Anonymous and exempt human subjects research
4. Leptospirosis study
  - Jungle warfare center in Okinawa and "lightning academy," Schofield - concept

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### Enabling Military Relevant Research

- Combat Casualty Care
- TBI and Regenerative Medicine
- Behavioral Health (e.g., PTSD, Suicide)
- Acute and Chronic Pain
- Rehabilitation Science
- Infectious Diseases & Immunity
- Cancer
- Preventive Med & Public Health
- Human Performance Optimization
- Precision and Personalized Medicine
- Disaster and Humanitarian Assistance Medicine
- Women's Health
- Global Health

**Vice President For Research**

*Enables, Supports, Oversees Research*

- Advocate for and facilitate USU research
- Provide regulatory compliance oversight
  - IRB
  - IACUC
- Foster partnerships
  - DoD, industry, academic and federal
- Provide cutting edge technology resources
  - Bioinstrumentation Center
  - Animal Research Facilities
  - Genomic Center
- Manage intramural/extramural research awards

Responsive to DoD requirements

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### My Role as VPR

- Advocate for and facilitate USU research
  - Keep the “trains” running on time
  - Seek efficiencies in processes where feasible
- Seek funding opportunities
  - Regular interface with DHA, MRDC, other DoD agencies
  - Increase NIH funding opportunities – proposal-based, cooperative agreements
- Establish partnerships for collaboration with external research partners
  - Academia
  - Industry
  - Other govt (HHS, VA, etc)

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### USU Maintains Robust R&D Funding



#### 2019 NCSES Higher Education R&D Survey

Institution	Rank	Percentile	R&D Expenditures (\$M)
The University of Chicago	56	7.0	459,171
University of California, Irvine	57	7.1	448,967
Case Western Reserve University	58	7.2	438,994
Scripps Research Institute	59	7.3	427,734
Uniformed Services University of the Health Sciences	60	7.4	417,300
Oregon Health and Science University	61	7.5	415,629
State University of New York, Buffalo	62	7.6	413,817
University of Kentucky	63	7.7	410,581
California Institute of Technology	64	7.8	399,931

NCSES is the leading provider of statistical data on the U.S. science and engineering enterprise

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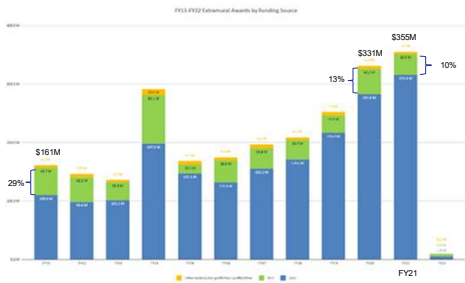
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### USU Extramural Funding by Source




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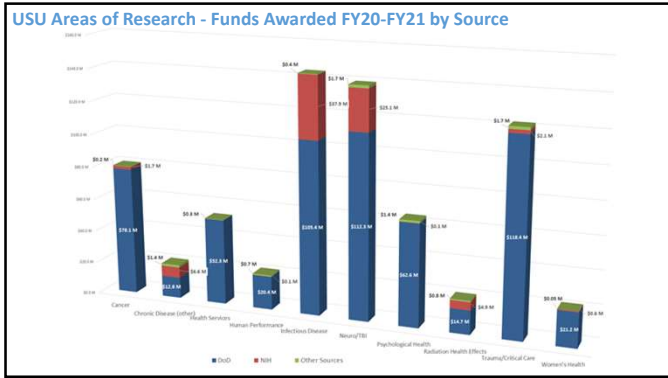
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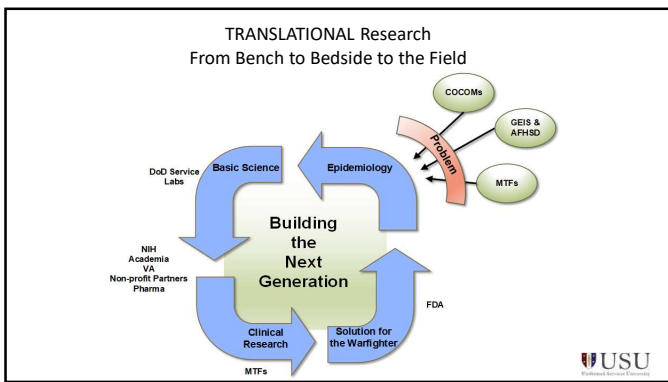
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## Indo-Pacific Research Alliance for Military Medicine (IPRAMM)

10 SEP 2021

- Tiffany D. Helling, MS
- Sr. Manager Strategic Partnerships and New Initiatives, USU Western Region
- Sr. Program Manager HV, HSP
- IPRAMM POC

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### IPRAMM Mission, Vision, Principles

**Mission:** The mission of IPRAMM is to foster successful, innovative health research partnerships in support of the Warfighter by bringing together the capabilities of DoD and non-DoD partners to support research and collaboration that address the unique needs of military service members.

**Vision:** The vision of IPRAMM is to play an effective and influential role in shaping regional DoD health research through the development of synergistic partnerships that drive innovation and accelerate discovery and translation, while maintaining flexibility and responsiveness to the changing needs of the Warfighter and the Military Health System.

**Guiding Principles:**

- Warfighter orientation and mission focus
- Trust and transparency, fostering open and proactive communications
- Requirements-driven efforts relevant to DoD and USG research priorities
- Uniqueness of collaborative research efforts
- Demonstrable and measurable value added
- Efficiency and quality of research processes and products



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### Terms of Reference

In March 2010 IPRAMM was formalized in a Terms of Reference document signed by the USU President, Dr. Richard Thomas

IPRAMM is a voluntary, informal alliance of research-oriented institutions and organizations. Nothing in the TOR alters existing command and organizational relationships for constituent members.

1. Background: The Indo-Pacific Research Alliance for Military Medicine (IPRAMM) was conceptualized in 2007 by the Uniformed Services University (USU) Womans Regins Office (USU-RO) and the USU Vice President for Research (VPR) as an informal group of research-oriented regional organizations with the intent of providing a venue for expanded research collaboration, administrative sharing and funding synergies.

Facility discussions began with four major Western Pacific Military Medical Treatment Facilities: Tripler Army Medical Center, Madigan Army Medical Center, David Grant US Air Force Medical Center and the Naval Medical Center San Diego; and quickly expanded to include key Department of Defense (DoD) Asia Pacific laboratories: the Naval Health Research Center in San Diego, the Armed Forces Research Institute of Medical Sciences (AFRIMS) in Bangkok, Thailand, and the Navy Medical Research Unit (NAMRU-2) Asia Pacific located in Singapore, which includes a Cambodian detachment (USU-CP) and VPR also saw significant opportunities to collaborate, enhance effectiveness, and achieve greater outcomes by including health, medicine and research-focused DoD and non-DoD Federal entities such as: Defense Advanced Research Projects Agency, NASA, Aeronautics Research Center, Lawrence Livermore National Laboratory, Pacific Northwest National Laboratory, US Army Medical and Material Agency, US Army Medical Materiel Development Agency, US Department of Veterans Affairs, INDOPACOM Surgeon's Office, and US Defense Health Agency.

IPRAMM is based on a combined unity of effort to coordinate and advance military medicine by identifying and bringing together the best and brightest researchers across service branches and across the US Government, as well as across medical and scientific specialties. Increased collaboration, communication and facilitation of research through IPRAMM will result in increased competitiveness for research funding, improved efficiency in resource allocation and the development of new technologies and improvements in patient care derived from research conducted by USU and its partners. Moreover, one of the most important dividends it will pay is the contribution that IPRAMM will make to the professional and intellectual development of the next generation of military medical researchers. In alignment with the aims of the University and the broader Military Health System (MHS), scholarship and education will play a central role in this effort, and multidisciplinary training and research opportunities will be made more readily available to resident graduate students and junior medical officers through IPRAMM and its partners. Improved training and increased access to research



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### IPRAMM Member Organizations

Uniformed Services University (USU)	Naval Medical Research Unit – Asia (NAMRU-2)
Armed Forces Radiation and Radiobiology Research Institute (AFRRRI)	Mike O'Callahan Military Medical Center/Nellis Air Force Base (NAFB)
Armed Forces Research Institute for Medical Sciences (AFRIMS)	Pacific Northwest National Laboratory (PNNL)
David Grant US Air Force Medical Center (DGMCC)	Tripler Army Medical Center (TAMC)
Defense Advanced Research Projects Agency (DARPA)	US Army Medical Research & Development Command (USAMRDC)
Defense Innovation Unit (DIU)	US Defense Health Agency (DHA) Research & Development J-9
Lawrence Livermore National Laboratory (LLNL)	US Department of Veterans Affairs (VA)
Madigan Army Medical Center (MAMC)	US Indo-Pacific Command (INDOPACOM)
NASA Ames Research Laboratory (NASA ARL)	Walter Reed Army Institute of Research (WRAIR)
Naval Health Research Center San Diego (NHRC)	
Naval Hospital Guam (NHG)	
Naval Medical Center San Diego (NMCSD)	



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### IPRAMM Collaborations

- **USU SC2i + Lawrence Livermore National Laboratory:** Precision medicine for Warfighter wound infections through microbiome profiling
- **USU TAGC + Pacific Northwest National Laboratory:** Sequence analysis of human fecal microbiome in fatigue - Biomedical Resistance and Resilience in Adverse Operating Environments (BRAVE) Initiative
- **Naval Hospital Guam + DHA J7 + Defense Innovation Unit + Naval Health Research Center + Navy CIO:** USS Theodore Roosevelt COVID-19 outbreak response and management
- **Naval Medical Research Unit 2 (Asia) + Pacific Northwest National Laboratory:** -omics analyses of SARS-COV-2 +/- sera
- **NASA Ames Research Laboratory + Lawrence Livermore National Laboratory + David Grant USAF Medical Center:** Tricorder/breath analysis diagnostic device development
- **Tripler Army Medical Center + Pacific Northwest National Laboratory:** Microbiome analysis of combat training soils
- **Defense Innovation Unit + Naval Medical Center San Diego + Madigan Army Medical Center + Naval Hospital Camp Pendleton + Naval Hospital Guam + VA + Brook Army Medical Center:** Augmented reality microscope for AI-assisted cancer detection

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### IPRAMM Collaborations

- **Tripler Army Medical Center + Lawrence Livermore National Laboratory:** Development of Blood Brain barrier tissue culture model, organ on a chip (OOC) technology
- **David Grant USAF Medical Center + Tripler Army Medical Center:** Novel extra-corporeal therapies for sepsis
- **Pacific Northwest National Laboratory + USU Microbiology:** Development of novel antihelmintic agents (USU PI Dr. Edward Mitre)
- **Naval Hospital Guam + USU IDCRC + US Forces Japan:** Epidemiologic and Operations research on COVID outcomes
- **USNS Mercy + Tripler Army Medical Center + Lawrence Livermore National Laboratory:** Curriculum to build and train casualty receiving teams for expeditionary platforms
- **USU AFRRJ + Tripler Army Medical Center + Lawrence Livermore National Laboratory + NASA Ames Research Laboratory:** Education & training opportunities in INDOPACOM
- **IPRAMM + USU SOM:** Expansion of educational opportunities for USU students among IPRAMM organizations

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### IPRAMM Science Collaborative 8-9 November, LLNL

- LEADERSHIP TALKS
  - INDOPACOM Surgeon
  - USU VPR
- NEW MEMBER SPOTLIGHTS
  - NSMRL
  - 711<sup>th</sup>?
- FOCUSD COLLABORATION SESSIONS
  - Infectious Disease
  - Technology/Diagnostics
  - Operational Readiness & Prolonged Field Care
  - Research Challenges

**DRAFT Agenda**  
 Indo-Pacific Research Alliance for Military Medicine  
 Science Collaborative | DATE TBD (Nov, Dec 2022/Jan 2023)  
 LOCATION TBD (Conference Center/Member Facility/Virtual) | City, State

Day 1	
7:00 AM - 8:00 AM	Coffee & Registration (if provided)
8:00 AM - 8:30 AM	Welcome & Opening Remarks William Fulmer, MD, MPH, PhD, USU (PI) HCSO (Principal, USU) Bruce Bell, PhD, PhD, MPH, PhD, USU (PI) Assistant Vice President for International Research and Innovation, USU
8:30 AM - 8:38 AM	Roundtable Introduction of Attendees
8:38 AM - 8:48 AM	USU/AFRRJ OIG Resident Surgeon William Schmitt, MD, MPH, PhD, USU (PI) AFRRJ (Principal, USU)
8:48 AM - 8:58 AM	USU/AFRRJ OIG Research Strategic Plan Mark Kurbatov, MD, MPH, COL USA (Ret), USA President for Research, USU

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USU Military Women's Health Research (MWHR) Program

- Conceived at the 2016 Military Women's Health Research Conference
- Added to our Program of Record (POM) FY 2020, ~\$1.6 M
  - Dedicated funding has increased to \$2.2.
- Supports research covering a broad spectrum of methods: basic, translational, clinical, and/or population science
  - Focus on diseases and disorders of particular relevance to the U.S. military health system and address key interests of the women's health.
- USU Faculty must serve as the Principal Investigator (PI)
  - Formal collaborations strongly encouraged with non-USU researchers as Co-PIs or Co-Investigators

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Active MWHR Awards

- Military Readiness in Active Duty Service Women: The Impact of the Availability of Water and Basic Sanitation on Hygiene Practices and Urogenital Health (Kostas-Polston)
- Effects of Prenatal Mental Health Support Intervention on Maternal and Fetal Physiologic Response (Lutgendorf)
- Evaluation of Multifaceted Multi-Systems Equity and Disparities in Low Back Pain, Treatment and Outcomes in Women Veterans (Highland)
- Overcoming Racial Health Disparities with Interventions for Physical and Emotional Pain in the DoD and VA due to Uterine Fibroids (Catherino)

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How Can We Collaborate?

- Understand our relative strengths
- Bring the investigators together
- USU has a variety of mechanisms to advance research and collaborations:
  - Grants
  - Cooperative Agreements
  - Contracts
  - Memorandums of Agreement
  - Memorandums of Understanding
  - Interagency Agreements
  - Cooperative Research and Development Agreements (CRADAs)
  - Data Use and Materials Transfer Agreements




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
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**The Defence and Security Science and Technology (DSST) Program**

- DND/CAF's **integrated** Defence and Security Science and Technology Program, led by ADM(DRDC), S&T Functional Authority and Chief Scientific Advisor to DND/CAF.
- One interface to deliver **S&T solutions** to fulfill emerging defence security problems and provide technological advantages to build military superiority in the ever-changing defence security environment;
- Harnesses the expertise of the DND/CAF S&T ecosystem elements through a prioritization, investment and delivery mechanism to ensure maximum innovation impact for DND/CAF



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**Overview of the DSST Program**

- Evolved from client-service to partnership mindset for greater adoption of S&T and innovation results
- Allow for more efficient use of S&T resources by upstream **integration** of DND/CAF requirements, exploiting and leveraging all S&T investment tools and establishing strategic external partnerships
  - Defence Research and Development Canada's (DRDC's) seven research centres; 
  - Defence and Security Innovation Mechanisms (e.g., Innovation for Defence Excellence and Security (IDEaS), Canadian Safety and Security Program (CSSP), OGD partnerships, etc.); 
  - S&T and innovation cells in DND/CAF organizations;
  - Academic and industrial partnerships; and
  - Alliance S&T organization partnerships.   

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PROTECTED A

**DSST Program Framework – 8 Strategic Focus Areas**



PROTECTED A

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### DSST Program FY2023/24 High-Level Themes

PEOPLE (Delivered jointly with DND/CAF)	COMBAT IN THE VIRTUAL & PHYSICAL ENVIRONMENT	ADVANCE PLATFORMS & WEAPONS	ACCELERATE COMMAND, CONTROL & INTELLIGENCE	DEFEND NORTH AMERICA	ENABLE SAFETY & SECURITY	THE INSTITUTION	EVOLUTION OF SCIENCE & TECHNOLOGY
CULTURE CHANGE	AUGMENTED-VISION	AUTONOMOUS SYSTEMS	AGILE CI	AIR SURVEILLANCE OVER CANADA WITH POLAR ORION	SURVEILLANCE & INTELLIGENCE AND INTERVENTION	STRATEGIC SCIENCE POLICY ADVICE FOR DEFENCE AND SECURITY	SENSING AND POSITION NAVIGATION & TIMING
RECONSTITUTION (DGMFRA)	CYBER OPERATIONS	ELECTRONIC WARFARE	JOINT TARGETING	HYPERSONIC AND MISSILE THREAT DEFENCE	BORDER SECURITY	OPERABILITY AND SUSTAINABILITY	COMPUTING
CAF POPULATION HEALTH	SENSOR TO SHOOTER DIGITAL OPTIMIZATION	UNDERWATER WARFARE	INTEGRATED ISR	NAVY MARITIME SENSING ARCHITECTURE	CARINE SECURITY	ENEMY, ENVIRONMENT AND CUMMATE AND SECURITY	COMMUNICATIONS
TRAINING & EDUCATION FOR FUTURE OPERATIONS	IO AND INFO MANOEUVRE	SPACE PLATFORM RESILIENCE	INTELLIGENCE	NEXT GENERATION ISR WITH DIGITAL NIGHT RECOGNITION SPACE BASED RADAR	CRITICAL INFRASTRUCTURE RESILIENCE		QUANTUM ENABLERS
FORCE DEVELOPMENT PEOPLE (DGMFRA)		INTEGRATED PLATFORM SURVIVABILITY		SYSTEMS OF SYSTEMS SOLUTIONS, INTEGRATION, CI, DETERENCE, AND FORECAST	FIRST RESPONDERS		
CBRN PROTECTION		WEAPONS SYSTEMS		SPACE LOW EARTH ORBIT (LEO) ARCHITECTURE FOR DEFENCE	PREPAREDNESS & RESILIENCE		

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### DSST's PEOPLE Program

*Supporting today's and tomorrow's forces*

**Vision:** The people of DND/CAF are well supported, diverse, and resilient — physically, psychologically and socially.

**Mission:** To provide DND/CAF with tools and advice to leverage Canada's diversity; attract the best and brightest; provide modern, world-class training to prepare for the future operational environment; support well-being, health and resilience; and promote a culture of leadership, respect and honour.

**Mandate:** Enable DND/CAF to

- o Reflect & leverage Canadian diversity;
- o Creatively attract & retain a tech-savvy generation amid a competitive milieu;
- o Ensure our people are trained, prepared and protected for future operating environments;
- o Ensure the wellbeing of our people by protecting & restoring mental & physical health.

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### DSST's PEOPLE Program (cont'd)

- Requirements from 10 x CAF/DND Level 1 organizations
- ~ 1/3 from Surgeon General (Canadian Forces Health Services)
- 5 Lines of Effort
  - Physical and Mental Health
  - Operational and Environmental Medicine
  - Training for Future Operational Environments
  - Personnel Readiness + Culture (*Coordinate with Chief of Military Personnel*)
  - CBRN Defence: Assessment, Detection, Protection, Readiness, Medical Countermeasures

#	Integrated Requirements	Priority
1	Culture Change <small>(Understanding the problem, Remediating/harms, Changing culture)</small>	HIGH
2	Women's Health [NEW] <small>(Physical, reproductive health, mental health, post deployment health, post injury rehab)</small>	HIGH
2	Population Health <small>(Long term effects of COVID, health trends and scenario modeling based on interconnectivity factors)</small>	HIGH
3	Training Technologies & Analytics/Military Professional Development <small>(Training needs and GBA+ analyses, Digital delivery and data analytics to improve training effectiveness, efficiency) (IT&amp;ampE Instructional Strategy, Leadership/Social-Behavioural Competencies)</small>	HIGH
4	Reconstitution and Force Development [DGMFRA]	HIGH
5	CBRN Protection and Defence	HIGH

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**Program Formulation, Execution and Delivery**

**Requirements**

- Single interface (Director-level) for ECS/L1 S&T requirements

**Formulation**

- L1s S&T requirements considered collectively
- Flexible project management approach
- Integrated teams with L1s representatives consulted on prioritization
- Deliberate partnership and co-investment when appropriate
- ADM(S&T) provides direction and delegates operationalization – how work will be executed

**Exploitation**

- Discuss upfront with each ECS/L1
- Follow through to exploitation

**Partner S&T Requirements**

- Collected by annual ADM(DRDC) Call Letter to all DND/CAF L1 orgs

**Integration and Distribution of Requirements**

- Relevant Strategic Focus Area
- Active engagement with stakeholder and SMEs
- Determine resourcing and applicable programs of work for S&T solutions

**Program Execution/Delivery**

- Work with DRDC Centres and Defence Scientists/IDEAs for Program Management and delivery

**Integrated Program Teams**

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**Questions?**

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A/Dir- R&D People  
ADM(DRDC), Department of National Defence, Canada  
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National Defence / Défense nationale

ASSISTANT DEPUTY MINISTER (DEFENCE RESEARCH AND DEVELOPMENT CANADA)

**Working with the DRDC Enterprise**

Dr. Zahir Daya  
First Secretary Defence R&D  
Embassy of Canada, Washington DC  
1 February 2023

DRDC / RRDC

Canada

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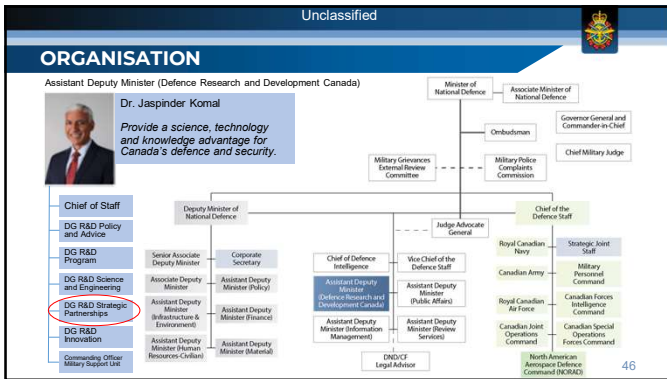
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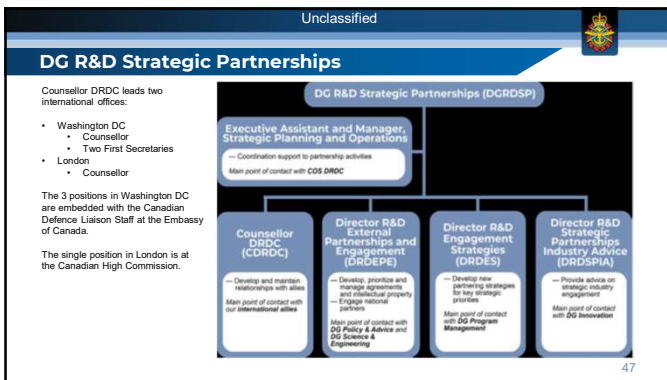
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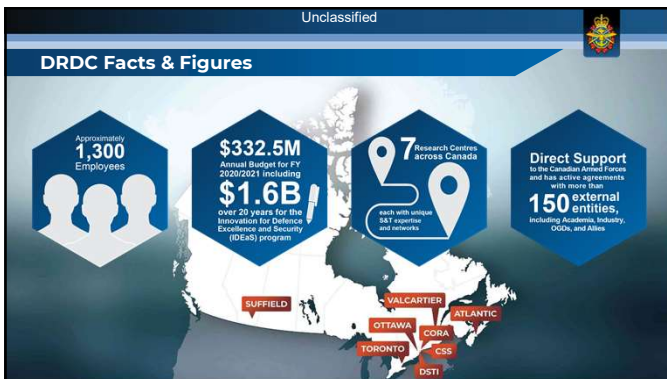
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## DRDC across Canada

- Suffield Research Centre (SRC)**  
Offers expertise in unique and sensitive R&D domains to enhance defence capabilities. Sole provider of chemical/biological threat defensive based research to DND/CAF. Suffield offers a unique experimental proving ground facility allowing for a large array of experiments and trials to DND/CAF.
- Toronto Research Centre (TRC)**  
Centre of Excellence for human effectiveness R&D in the defence and national security environment.
- Ottawa Research Centre (ORC)**  
Conducts science research to support defence and security solutions in the radio frequency sensing and data integration, electronic warfare, space and cyber domains.
- Centre for Operational Research and Analysis (CORA)**  
Provides operational research analysis (ORA) S&T decision support across the DND/CAF.
- Directorate of Scientific and Technical Intelligence (DSTI)**  
Provides all-source threat assessments of weapons and threat systems and their technologies.
- Centre for Security Science (CSS)**  
DRDC science advisor in the defence, public safety, and security domains.
- Atlantic Research Centre (ARC)**  
Centre of Excellence for maritime defence R&D; R&D capabilities in underwater warfare, maritime information warfare and naval platforms. World-leading expertise in arctic trials and experimentation.
- Valcartier Research Centre (VRC)**  
Renowned expertise in the areas of information, optics, and weapon systems with a unique capability for prototype development and experimentation to demonstrate/validate novel technologies under realistic conditions.

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## Partnering is Essential to the DRDC Delivery Model...

- ... connect to world class scientific networks performing cooperative Research, Development, Test & Engineering ...
- ... strengthen alliances through shared burden that increase quality and relevance of science advice and outputs for CAF/DND objectives ...
- ... covers entire innovation spectrum including scientific and technical information exchange, shared materials and facilities, jointly developed frameworks, trials, exercises, advanced concept technology demonstrations, and consultation with communities of practice

**5-EYES**      **NAT**      **Bi-lateral / Multi-lateral**

- 5-EYES**
  - The Technical Cooperation Program (TCP) provides burden sharing across key allies (> 300 activities) along all Technology Readiness Levels (TRL) and many experimentation opportunities. From Human Resources and Performance, C4I (Cyber and Information), Electronic Warfare Systems, ISTAR, Land / Maritime / Aerospace Systems, Material and Processing Technologies, Weapon Systems, Contested Urban Environment, and Artificial Intelligence (AI);
  - Square Dance (SD) provides highly classified;
  - SRD provides highly valued security cooperation;
  - Chem Bio Rad MOU brings science & ops together.
- NAT**
  - NATO S&T Org (STO) reports to MC and CNAD. STO has network of 5000+ scientists;
  - Typically favors lower TRLs but also provides trials and demonstrators;
  - DRDC maintains strong strategic influence as top 5 contributors with broad involvement and significant leadership (150 scientists in > 200 activities). ADM(DRDC) also chairs Finance and Audit Committee.
  - STO supports the NATO Emerging and Disruptive Technology Roadmap: biotech, quantum, hypersonics, big data, AI, autonomy, space and materials.
- Bi-lateral / Multi-lateral**
  - In total: 40 active bilateral / multilateral MOUs involving 15 countries and > 150 activities including:
  - ICE-PPR 7-nation Polar Research
  - Responsive Space MOU (9 countries)
  - Bi-lat: AU, UK, FR, GE, Norway, Israel
  - Strategic cooperation with several US actors in Navy, Air Force, Army, Special Forces and other agencies.

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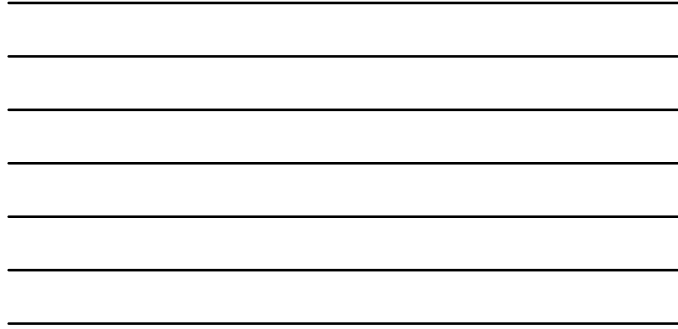
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## Strategic Partnerships in the "People" strategic focus area

To support CAF/DND to: Reflect and leverage Canadian diversity, creatively attract and retain a tech-savvy generation and a competitive milieu; optimise training to ensure our people are prepared for the future operating environment; and ensure CAF health and well being.

MULTINATIONAL PARTNERSHIPS	BI-LATERAL PARTNERSHIPS	OTHER GOVERNMENT DEPARTMENTS
<ul style="list-style-type: none"> <li>The Technical Cooperation Program - Human Factors &amp; Medicine.</li> <li>Chemical/Biological/Radiological (CBRI) MOU: protective chemical suit</li> <li>North Atlantic Treaty Organization - HFM, SAS and CBR Training</li> <li>International Cooperative Engagement Program for Polar Research (ICE-PPR) MOU: nutrition, cognition, clothing and Resourcing medical technicians.</li> <li>ERICOMAS: European Research Group on Military and Society - collaborative research on military and society. DDMRA participation.</li> </ul>	<ul style="list-style-type: none"> <li>CANUS WRAR: Walter Reed Army Institute of Research - Neuro-lipids study.</li> <li>CA-US RTD&amp;E MOU (Dome/TROP): Help Soil Dumper.</li> <li>CA-US Defence &amp; Public National Security S&amp;T Cooperation MOU: Mental health risk-resilience profiling.</li> <li>CAN-UK Letter of Agreement - RCMP Mobile App Sharing</li> <li>CAN-NLD Co-operative Defense Science and Technology MOU: Letter of Agreement - RCMP Mobile App Sharing</li> </ul>	<ul style="list-style-type: none"> <li>Statistics Canada: Conduct surveys (sexual misconduct)</li> <li>Global Affairs Canada: Elsie Initiative for Women in Peace Operations.</li> <li>NSC: National Research Council - Practices and trends and instructional technologies for military training.</li> <li>RCMP's Professional Ethics Office &amp; Defence Ethics Collaboration: Share knowledge of ethics and values.</li> <li>THE's Interdepartmental Network on Values and Ethics: share knowledge of ethics and values.</li> </ul>
<ul style="list-style-type: none"> <li>Aurora Bio Solutions: Feasible Stem cell Therapeutics</li> <li>Altiboss: Gas mask solution for members with facial hair</li> <li>TraumaCrew: leverage expertise in diagnosis &amp; treatment of Post-Traumatic-Stress-Disorder</li> <li>IC&amp;A: includes several topics sourced externally leveraging industry and academia (ie. Post-Traumatic Stress Disorder (PTSD) - Studying biofeedback, biomarkers, and brain scans)</li> </ul>	<ul style="list-style-type: none"> <li>INDUSTRY</li> </ul>	<ul style="list-style-type: none"> <li>ACADEMIA</li> <li>Concussion Ontario Network: A network of Ontario institutions researching on neuro-informatics to enhance clinical care on the emerging concussion-related issues.</li> <li>CMVHR (Canadian Institute for Military and Veteran Health Research): Leveraging a network of 43 universities across Canada for military and veteran health research.</li> <li>Collaborative R&amp;D Agreement (CRDA) Queen's University, RCMP Mobile Apps</li> <li>Service Level Agreement: Canadian Forces School of Military Engineering (CFSAME): "Aim for Success" Longitudinal Study of Training Effectiveness and Predictors for Career Readiness in CAF Engineers</li> <li>CCSR: Canadian Defence and Security Network: using traditional and social media to amplify for workshops, training and more. Includes Carleton University and Queen's and many others.</li> <li>SMRCS: Military Insights in Defence and Security: access external research and expertise to enable evidence-based policy making. Diversity in the CAF: Sexual Misconduct and Harassment Conduct, etc. Universities have been used to conduct the required research.</li> </ul>

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**Engagement instruments: industry & academia**

NAME	TRANSFER OF FUNDS	WHEN TO USE
Collaboration Research and Development Agreement (CRD or CRDA)	No	Used to formalize a collaborative research project with an industry organization or an academic institution. An equal effort/contribution is generally expected from each partner.
Material/Data Transfer Agreement (MTA/DTA)	No	Used to transfer Crown-owned Material or Data to non-government organizations, generally for evaluation or internal research purposes. Functions as a simple non-exclusive, limited term license.
Non-Disclosure Agreement (NDA)	No	Used to outline the conditions attached to information exchange. Often requested by industry to protect commercial sensitive/confidential information.
Visiting Worker Agreement (VWA)	No	Used to bring a domestic or international student, member of academia, or industry expert into DRDC for a defined period.

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**Engagement instruments: governmental organizations**

NAME	TRANSFER OF FUNDS	WHEN TO USE
Memorandum of Understanding (MOU)	Possible (not for contracting)	An over-arching, non-legally binding arrangement outlining the provisions that allow for future collaborative projects and other activities between participants. Collaboration can include Research, Development, Test & Evaluation projects, equipment and material transfers, visits to establishments, and personnel exchanges. Participants' contributions to a project are meant to be equal, and can include a transfer of funds when warranted. MOUs can exceptionally be used as standalone arrangements.
Project Arrangement (PA) Master Annex Technical Arrangement (TA) Implementing Arrangement (IA) Subsidiary Arrangement (SA) Equipment/Material Transfer Arrangement (EMTA) Personnel Exchange	Possible	These are all describing annexes to MOUs (this list is to be considered non-exhaustive), detailing the terms of a specific activity jointly agreed upon by participants. These annexes must be governed by their respective, overarching MOU.
Task Order	Possible	Used to identify activities to be carried out with other government departments domestically, under a previously approved Master Annex. As such, task orders may not be subject to departmental reviews under DAOD 7014-1 if they contain only technical elements.
Service Level Agreement (SLA)	Possible	SLAs are put in place only within the Department for DND (not DND to OGD). We have SLAs with RMCC, DGMPPA, and VCDs (for funding of our OUTCAN positions). DND uses MOUs for arrangement with OGDs.
Letter of Arrangement (LOA)	Possible (not for contracting)	'One off' type of arrangement when there is no overarching MOU between us and another GOC Partner(s).

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**Engagement instruments: non-government entity**

NAME	TRANSFER OF FUNDS	WHEN TO USE
Contracts	Yes (from DRDC to the partner)	An acquisition involves a payment, and the transaction includes an exchange for goods or services, for which the terms and conditions are laid out in a legally binding contract between the parties. Contracts are managed by the relevant contracting authority.
Provision of Services	Yes (from partner to DRDC)	Used when non-defence agencies request the use of DND resources for a purpose not directly in support of the Defence Program, the terms of which limit defence liability and provide for reimbursement of all recoverable costs.
Licenses	Possible (from the partner to DRDC)	A legal agreement to provide organizations with access to Crown-owned intellectual property (IP) under agreed terms. Two types of license agreements are commonly used by DRDC, End User License Agreements (EULA) and Commercial License Agreements.

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## Assessment of potential partnerships

### PARTNERSHIP ASSESSMENT CRITERIA

- 1. STRATEGIC RELEVANCE OF PARTNER**
  - Aligned with DoC and DRDC/DAF objectives
  - Aligned to S&T Strategic Focus Areas (SFA)/Lines of Efforts (LoE)
  - Aligned with S&T capabilities
- 2. RECOGNIZED EXCELLENCE**
  - Recognized expertise of personnel
  - Recognized organization in the S&T field
  - Recognized management for delivering results
- 3. EFFICIENCY**
  - Equitable burden sharing
  - Organizational agility from conceptualization of partnering through to execution
  - Costs associated with partnership
- 4. EFFECTIVENESS**
  - Increasing levels of innovation and novelty
  - Generating force multiplier effect
  - Benefits to national innovation ecosystem (suggests economic benefit and grow industry, etc.)
- 5. STRENGTHENING RELATIONSHIPS**
  - Increasing mutual trust and promoting the development of organizations
  - Ensuring national security
  - Promoting Ethics, Diversity and Inclusion

CAPABILITY HEALTH ASSESSMENT  
PROGRAM ASSESSMENT CRITERIA

Collaboration Mechanism	K.A.	K.G.	S&T App	Tech Integ
DATA Information Exchange Agreement	x			
NATO STD	x	x		
TICP	x	x	x	x
Other Bilateral & Multilateral	x	x	x	x

- Knowledge Access
- Knowledge Generation
- S&T Applications, and
- Technology Integration

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## Process for a new agreement

Informal conversations for potential S&T collaborations are brought to liaison officers who then initiate the formal process which runs in parallel in both partners.

For interested partners in the US, reach out to the Embassy liaison network.

• An appropriate approval is sought to ensure alignment with the Defence and Security S&T program and to ensure the required resources exist to support the collaboration

Approval in Principle

• In consultation with the External Partnerships and Engagements team and the partners, a draft arrangement is developed

Draft Development

• In accordance with the Defence Administrative Directive and Order 7014, any MOU or subordinate arrangement must be submitted for departmental review

Departmental review

• Considering changes and recommendations from the departmental review, the arrangement is negotiated with the partner(s)

Negotiations

• Following established processes and authorities, the arrangement is submitted for signature at the appropriate level

Signature

• The arrangement is uploaded to the DRDC information management system, and the original copy is retained by the Office of the Judge Advocate General

Finalization

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## Questions?



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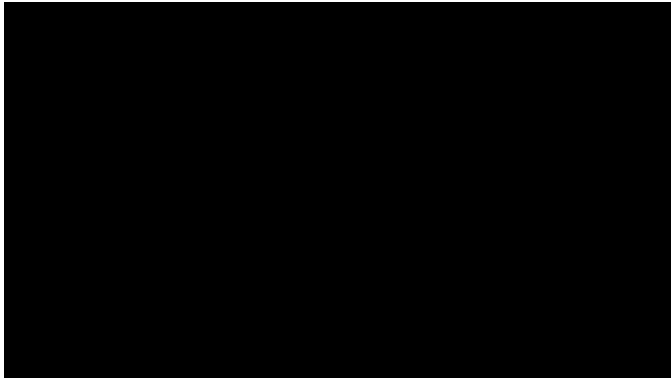
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