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**RPPR Final Report**  
as of 26-Mar-2018

Agency Code:

Proposal Number: 61778ST

**Agreement Number: W911NF-12-C-0035**

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**Final Report** for Period Beginning 14-Mar-2012 and Ending 13-Sep-2017

**Title:** Study in Organic Chemistry and Organized Media

**Begin Performance Period:** 14-Mar-2012

**End Performance Period:** 13-Sep-2017

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**Distribution Statement:** 1-Approved for public release; distribution is unlimited.

**STEM Degrees:**

**STEM Participants:**

**Major Goals:** For the period of March 14, 2012 to September 13, 2017, this effort was composed of 21 studies. This work was supported by the Army Research Office (Dr. Stephen J. Lee) under the auspices of the U.S. Army Research Office, Contract No. W911NF12C0035.

During the contract period of performance, Strategic Analysis, Inc. (SA) has provided scientific and technical support to the Army Research Office (ARO) specifically in the areas of organic chemistry, organized media, surface chemistry, and material science. A wide range of general tasks have been executed in this area with a particular focus on supporting the Reactive Chemical Systems Program in the Chemical Science Division of the ARO. Specific attention was focused on understanding technical challenges facing the above scientific areas by conducting strategic panel studies of research investments in this area, surveying and identifying relevant defense investments as well as subject matter experts complementary to the client's programs mentioned above.

General tasks performed included coordination of technical panel discussions and development of technical topic areas of interest. All of these tasks contributed to SA's ability to conduct the organic chemistry, organized media, surface chemistry, and material science technology review, identification of innovative and novel research in specific focus areas, and identification of leading subject matter experts. Additional tasks performed by SA include efforts to assess, analyze, and write reports on specific technical areas of interest to the client.

SA also provided planning and panel discussion support over the course of the contract. Details of tasks completed for each of those panels as well as the panel agenda is provided in this report.

**Detailed Summary of Tasks/Accomplishments:**

This report will present a description of information generated during the period of performance followed by a description of other pertinent tasks accomplished

**Accomplishments:** The Army Research Office (ARO) sponsored the Synthetic Molecular Systems Landscape Panel Study, which took place on April 24-25, 2012, in Arlington, VA. The workshop was setup to discuss a newly identified research thrust area, Synthetic Molecular Systems. The design of abiotic components to incorporate and mimic biological function has been recently exploited by an interagency government team as a leading multidisciplinary field that could have significant potential to impact emerging technologies. Synthetic Molecular Systems is defined as systems and technologies that obtain, maintain and/or utilize biologic or biomimetic function in the absence of cellular systems and/or through non-natural components to include non-biological, abiotic, chemical, engineered or molecular systems.

## RPPR Final Report as of 26-Mar-2018

Strategic Analysis provided support by coordinating details for this meeting. SA consulted with ARO to determine agenda items (see Appendix A) and identification of participants, researched venue availability and negotiated the contract for the hotel room block. SA created the meeting budget, created the registration website, and provided on-site registration and support. After the study, SA provided summary statistics, final attendee lists and written technical notes of the meeting to ARO. Additionally, SA reviewed, edited, composed portions of Synthetic Molecular Systems report and sent to ARO.

**Training Opportunities:** Nothing to Report

**Results Dissemination:** Nothing to Report

**Honors and Awards:** Nothing to Report

**Protocol Activity Status:**

**Technology Transfer:** Nothing to Report

### **PARTICIPANTS:**

**Participant Type:** Other Professional

**Participant:** Tara Weeks

**Person Months Worked:** 12.00

Project Contribution:

International Collaboration:

International Travel:

National Academy Member: N

Other Collaborators:

**Funding Support:**

Study in Organic Chemistry and Organized Media  
by

Strategic Analysis, Inc.

For

United States Army Research Office

December 12, 2017

Contract No: W911NF12C0035

The views, opinions and/or findings contained in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy or decision, unless so designated by other documentation.

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## **Introduction**

For the period of March 14, 2012 to September 13, 2017, this effort was composed of 21 studies. This work was supported by the Army Research Office (Dr. Stephen J. Lee) under the auspices of the U.S. Army Research Office, Contract No. W911NF12C0035.

During the contract period of performance, Strategic Analysis, Inc. (SA) has provided scientific and technical support to the Army Research Office (ARO) specifically in the areas of organic chemistry, organized media, surface chemistry, and material science. A wide range of general tasks have been executed in this area with a particular focus on supporting the Reactive Chemical Systems Program in the Chemical Science Division of the ARO. Specific attention was focused on understanding technical challenges facing the above scientific areas by conducting strategic panel studies of research investments in this area, surveying and identifying relevant defense investments as well as subject matter experts complementary to the client's programs mentioned above.

General tasks performed included coordination of technical panel discussions and development of technical topic areas of interest. All of these tasks contributed to SA's ability to conduct the organic chemistry, organized media, surface chemistry, and material science technology review, identification of innovative and novel research in specific focus areas, and identification of leading subject matter experts. Additional tasks performed by SA include efforts to assess, analyze, and write reports on specific technical areas of interest to the client.

SA also provided planning and panel discussion support over the course of the contract. Details of tasks completed for each of those panels as well as the panel agenda is provided in this report.

### **Detailed Summary of Tasks/Accomplishments:**

This report will present a description of information generated during the period of performance followed by a description of other pertinent tasks accomplished.

## **Summary of Results**

### **Synthetic Molecular Structures Landscape**

The Army Research Office (ARO) sponsored the Synthetic Molecular Systems Landscape Panel Study, which took place on April 24-25, 2012, in Arlington, VA. The workshop was setup to discuss a newly identified research thrust area, Synthetic Molecular Systems. The design of abiotic components to incorporate and mimic biological function has been recently exploited by an interagency government team as a leading multidisciplinary field that could have significant potential to impact emerging technologies. Synthetic Molecular Systems is defined as systems and technologies that obtain, maintain and/or utilize biologic or biomimetic function in the absence of cellular systems and/or through non-natural components to include non-biological, abiotic, chemical, engineered or molecular systems.

Strategic Analysis provided support by coordinating details for this meeting. SA consulted with ARO to determine agenda items (see Appendix A) and identification of participants, researched venue availability and negotiated the contract for the hotel room block. SA created the meeting budget, created the registration website, and provided on-site registration and support. After the study, SA provided summary statistics, final attendee lists and written technical notes of the meeting to ARO. Additionally, SA reviewed, edited, composed portions of Synthetic Molecular Systems report and sent to ARO.

### **NSF/ARO Locomotion Systems Science**

The state-of-the-art in the robotic sciences in comparison to the most mundane physical and cognitive features of animal locomotion is strikingly disparate. Animals expertly intermix high-throughput multidimensional sensory processing to execute nimble motor control actions in uncertain and changing environments in a manner far superior to our best engineered systems. This capability is emergent via a complex network of neural, musculoskeletal, metabolic, and cognitive subsystems whose integrated functionality is revealed only in their joined interaction. However, the mechanisms by which these interactions yield emergent capabilities remain poorly understood. This lack of understanding also inhibits further progress concerning our ability to develop novel synthetic systems emulating visceral competencies. Accordingly, the objective is to define, sharpen, and explore the most compelling and open scientific questions bearing on the efficacy of animal locomotion and efficiency. Moreover, this panel study will outline new paths forward concerning our ability to duplicate and possibly surpass the most remarkable features of natural locomotion within synthetic systems. The outcomes of this workshop will shed new light on our scientific understanding of distributed power and control, information processing, systems interactions and complexity, environmental adaptations, and mathematical modeling.

Strategic Analysis, Inc. (SA) provided pre-planning logistical support to the NSF/ARO Locomotion Panel Study that was held on May 29-31, 2012. Support was started by SA and then later transitioned to Georgia Tech, prior to the day of the study. Up to 100 attendees were projected with the original estimate at 60 attendees. Due to the increase in size, the meeting was moved from the Executive Conference Center (ECC) to the Holiday Inn Arlington.

### **2012 DoD MWD Training Seminar & K-9 Trials**

For the first time since 2001, the Department of Defense MWD Program hosted the 2012 DoD MWD Training Seminar and K-9 Trials, from April 30 to May 5, 2012, at Lackland AFB, Texas. The MWD training seminar was three full days of information and practical application training provided by expert dog trainers and was attended by over 200 participants. The K-9 Trials showcased 43 of the best K-9 teams throughout the Armed Services. The seminar and trials also included an ice-breaker reception to kick-off the trials and an awards banquet to announce the winners (see Appendix B). Strategic

Analysis, Inc. was responsible for the logistical organization of the seminar and awards banquet.

### **Joint Insensitive Munitions Technology Program (JIMTP) Fall Review 16-19 October 2012**

The Independent Advisory Panel members are advisors to the Joint Insensitive Munitions Technology Program (JIMTP) leadership team composed of the Program Manager, and each of the five Munitions Area Technology Groups. As individual members, they use their extensive experience in munitions technology development to independently evaluate the 6.2 (Applied Research) and 6.3 (Advance Technology Development) projects presented at the JIMTP Fall Review. The members review the read ahead materials provided by the JIMTP; attend and review the project presentations; and provide written comments and feedback to the JIMTP leadership team within 14 days after the completion of the meeting. Additionally, the members participate in the end of day wrap-up session with the leadership team to assist in understanding the viability of technology under development and to gain insights regarding how prepared the technology is for transition to the next investment level. Each member submitted a technical summary of their assessment of the various technologies under development using the feedback forms provided or in paragraph form. Strategic Analysis assisted by coordinating travel agreements, submitting invoices for the advisory panel and corresponding with panel members.

### **Other Assessments**

SA assessed and provided comments on HBCU proposals, Chapter 1 in the "Handbook of Chemical and Biological Agent Warfare Decontamination", ARO Draft Coatings TTO and DRC, 2013 ECBC ILIR proposals and UK DSTL CDE proposals.

### **Joint Insensitive Munitions Technology Program (JIMTP) Fall Review, November 5-8, 2013**

The Independent Advisory Panel (IAP) members are advisors to the Joint Insensitive Munitions Technology Program (JIMTP) leadership team composed of the Program Manager, and the sixteen Munitions Area Technology Group leads and co-leads. As individual IAP members, they will use their extensive experience in munitions technology development to independently evaluate the 6.2 (Applied Research) and 6.3 (Advanced Technology Development) projects presented at the JIMTP Fall Review Meeting. The members reviewed the read ahead materials provided by the JIMTP; to attend the meeting; reviewed the project presentations; and provided written comments and feedback to the JIMTP leadership team after the completion of the panel meeting. Additionally, the IAP members are required to participate in the end of day wrap-up sessions with the JIMTP leadership team to assist in understanding the viability of reviewed technologies and to add insights regarding how prepared the technology is for transition to the next level of development. Panel members were available for follow-up questions from the JIMTP MATGs for up to 60 days after the comments were submitted. Strategic Analysis assisted by coordinating travel agreements, submitting invoices for the advisory panel and corresponding with panel members.

### **2013 DoD MWD Training, October 22-25, 2013**

The 2013 Department of Defense (DOD) Military Working Dog (MWD) Training was held on October 22-25, 2013 at Lackland Air Force Base (AFB) in Lackland, Texas. This training was attended by 84 DoD MWD handlers and trainers and included four full days of classroom and hands-on training in three breakout groups (see Appendix C). Three instructors, Mr. Kevin Sheldahl, lately retired from the Bernalillo County New Mexico Sheriff's Department, Mr. Dave Kroyer of K9 Headquarters, a private firm in Hutto, Texas, and Mr. Armin Winkler, the owner of Rivanna K9 in Virginia taught topics that included drive development, muzzle aggression, decoy techniques, correction collar training, and directed off-leash searching.

Strategic Analysis, Inc. (SA) was responsible for the logistical organization of the training such as: researching and finalizing the venue, developing a website that included attendee registration and training information, coordination with Lackland AFB regarding logistics and security, keynote speaker coordination, and onsite support.

### **Surface Science, March 26, 2014**

The Surface Chemistry Coordinating Group met on March 26, January 2014 at the Executive Conference Center in Arlington, Virginia. This study brought together DoD program managers and researchers in the broad area of surface chemistry. This study allowed for open exchange and discussion of current research investment areas, anticipated future areas of investment, and coordination of programs. Each panel member was asked to provide an overview of their research or program investments in surface chemistry. Potential outcomes included greater awareness of DoD surface chemistry investments, identification of areas for collaboration, identification of areas lacking investment across the DoD, identification of follow on workshops in specific technical areas. SA provided facility support, including set up of meeting room and testing of AV equipment.

### **Water Research Exchange, April 15, 2014**

The Water Research Technical Exchange was held on April 15, 2014 at the Executive Conference Center in Arlington, Virginia. This technical exchange brought together experts in Army laboratories to discuss technical challenges, innovative research approaches, and strategies towards reducing the time, cost and logistics for producing and maintaining the water demand required in the field. The goal of this technical exchange was to learn about water research needs, activities, and gaps; identify overlapping areas of research, identify new scientific opportunities for future investment, and identify possible areas for collaboration and leveraging. This one-day technical exchange will explore ongoing work within the Army that address the challenges above through presentations and open discussion. Each participant organization to presented their current research and needs in water research (see Appendix D). Following overview presentations, adequate discussion time was allotted to develop a list of technical challenges that are new or not currently being addressed. The findings from this workshop will be documented in a report outlining the current research areas and both basic and applied research that address the broad range of Army needs. Specific emphasis will be to develop a matrix where complimentary research efforts may be

leveraged through coordination of existing programs or development of new areas of research. SA provided facility support, including set up of meeting room and testing of AV equipment.

#### **2014 Canine S&T Workshop, July 29 – August 1, 2014**

The 2014 Canine Science and Technology (S&T) Workshop was held on July 29 – August 1, 2104 in Raleigh, North Carolina, USA. The workshop was attended by 135 government representatives, scientific researchers, and handlers representing six different countries. The agenda included three full days of presentations followed by an offsite demonstration at K2 Solutions, Inc. (see Appendix E). The purpose of this study was to build an international S&T community by bringing together world leaders in canine research to promote advancements in canine capabilities, enable participants to better understand common challenges and encourage collaborative research efforts across an array of topic areas including: performance assessment and improvement; technology development and integration with working dogs; the roles of genetics, olfaction and cognition in chemical signature detection; and canine stress monitoring and reduction.

Strategic Analysis, Inc. (SA) was responsible for all logistical details including researching and contracting the venue, sleeping room contract negotiation, developing and administering a website that included attendee registration and workshop information, managing abstract submission and review process, venue coordination speaker coordination, offsite demonstration coordination, and on-site support

#### **2014 Chemical/Biological Filtration Strategies and Multifunctional Materials Development Working Group, October 21-22, 2014**

The Chemical/Biological Filtration Strategies and Multifunctional Materials Development Working Group Meeting was hosted by the Edgewood Chemical and Biological Center. The event was held at the Executive Conference Center in Arlington, Virginia on October 21-22, 2014.

The objective was to bring various investigators together to share recent advances in nanomaterials development and reaction chemistry related to Chemical and Biological (CB) defense. Furthermore, this workshop provided an excellent opportunity for various universities and Government laboratories to develop new ideas for future projects. The workshop focused on two major themes: air purification and multifunctional materials development for catalysis and sensing. The former tied together current maturation efforts for filtration, while the latter discussed various basic and applied research efforts focused on integrating novel technologies to meet specific catalysis and sensing goals. Both days of the meeting included full days of presentations by investigators and working lunches (see Appendix F).

Strategic Analysis, Inc. support included: creation and maintenance of the registration website, coordination of audio visual needs, room setup with the facility, abstract book creation, coordination of the no-host reception, design and production of the proceedings CD, printing of all meeting materials and on-site meeting support.

**2014 Joint Insensitive Munitions Technology Program (JIMTP) Fall Review, October 21-14, 2014**

The Independent Advisory Panel (IAP) members are advisors to the Joint Insensitive Munitions Technology Program (JIMTP) leadership team composed of the Program Manager, and the sixteen Munitions Area Technology Group leads and co-leads. As individual IAP members, they will use their extensive experience in munitions technology development to independently evaluate the 6.2 (Applied Research) and 6.3 (Advanced Technology Development) projects presented at the JIMTP Fall Review Meeting. The members reviewed the read ahead materials provided by the JIMTP; to attended the meeting; reviewed the project presentations; and provided written comments and feedback to the JIMTP leadership team after the completion of the panel meeting. Additionally, the IAP members are required to participate in the end of day wrap-up sessions with the JIMTP leadership team to assist in understanding the viability of reviewed technologies and to add insights regarding how prepared the technology is for transition to the next level of development. Panel members were available for follow-up questions from the JIMTP MATGs for up to 60 days after the comments were submitted. Strategic Analysis assisted by coordinating travel agreements, submitting invoices for the advisory panel and corresponding with panel members.

**2014 Army ST and ARCIC S&T Division Discussion on Innovation: Army Innovation Beyond 2025, December 17-18, 2014**

The Army ST and ARCIC S&T Division Discussion on Innovation was held on December 17 and 18, 2014 at the Executive Conference Center in Arlington, Virginia. Army Innovation is the act or process of introducing new ideas, devices, or methods for the Soldier. Ultimately, innovation will enable the Soldier and the Nation to maintain overmatch and remain successfully ahead of our adversaries and avoid technology surprise. Innovation is critically important to the Soldier of 2025 and this workshop is to help identify what innovation means in the Army S&T enterprise and explore how Army Innovation can be supported for success in 2025 (see Appendix G). SA provided facility support, including set up of meeting room and testing of AV equipment, on-site registration and management of breakout session logistics.

**2015 Canine Performance Training and Workshop, March 9-10, 2015**

The Canine Performance Training and Workshop 2015 was held on March 9-10, 2015 in Anchorage, Alaska. The overall objective of workshop was to provide veterinarians and veterinary technicians with current information specific to the health, well-being, training, and performance of military working dogs, with specific attention towards behavior, training, nutrition, and performance in extreme environments (see Appendix H). Strategic Analysis, Inc. coordinated venue site selection and contract management, speaker travel agreements, food and beverage and audio visual arrangements, and workshop reconciliation and closeout.

### **2015 Joint Insensitive Munitions Technology Program (JIMTP) Fall Study, October 20-23 2015**

The Independent Advisory Council (IAC) members are advisors to the Joint Insensitive Munitions Technology Program (JIMTP) leadership team composed of the Program Manager, and the sixteen Munitions Area Technology Group leads and co-leads. As individual IAC members, they will use their extensive experience in munitions technology development to independently evaluate the 6.2 (Applied Research) and 6.3 (Advanced Technology Development) projects presented at the JIMTP Fall 2015 Study. The members reviewed the read ahead materials provided by the JIMTP; attended the meeting; reviewed the project presentations; and provided written comments and feedback to the JIMTP leadership team after the completion of the study. Additionally, the IAC members were required to participate in end of day wrap-up sessions with the JIMTP leadership team to assist in understanding the viability of reviewed technologies and to add insights regarding how prepared the technology is for transition to the next level of development. The feedback was a thorough technical summary of their assessment of the various technologies under development using either the feedback forms provided by JIMTP or in paragraph form. Members were available for follow-up questions from the JIMTP MATGs for up to 60 days after the comments were submitted. Strategic Analysis assisted by coordinating travel agreements, submitting invoices for the advisory panel and corresponding with panel members.

### **2016 Joint Insensitive Munitions Technology Program (JIMTP) Spring and Fall Study, April 5-8, 2016 and October 18-21, 2016**

The Independent Advisory Council (IAC) members are advisors to the Joint Insensitive Munitions Technology Program (JIMTP) leadership team composed of the Program Manager, and the sixteen Munitions Area Technology Group leads and co-leads. As individual IAC members, they will use their extensive experience in munitions technology development to independently evaluate the 6.2 (Applied Research) and 6.3 (Advanced Technology Development) projects presented at the JIMTP Fall 2016 Review Meeting. The members were required to review the read ahead materials provided by the JIMTP; attended the meeting; reviewed the project presentations; and provided written comments and feedback to the JIMTP leadership team after the completion of the study. Additionally, the IAC members were required to participate in the end of day wrap-up sessions with the JIMTP leadership team to assist in understanding the viability of reviewed technologies and to add insights regarding how prepared the technology is for transition to the next level of development. The feedback was a thorough technical summary of their assessment of the various technologies under development using either the feedback forms provided by JIMTP or in paragraph form. Members were available for follow-up questions from the JIMTP MATGs for up to 60 days after the comments are submitted. Strategic Analysis assisted by coordinating travel agreements, submitting invoices for the advisory panel and corresponding with panel members.

### **2017 Joint Insensitive Munitions Technology Program (JIMTP) Spring Study, April 5-8, 2017**

The Independent Advisory Council (IAC) members are advisors to the Joint Insensitive Munitions Technology Program (JIMTP) leadership team composed of the Program Manager, and the fifteen Munitions Area Technology Group leads and co-leads. As individual IAC members, they will use their extensive experience in munitions technology development to independently evaluate the 6.2 (Applied Research) and 6.3 (Advanced Technology Development) projects presented at the JIMTP Spring 2017 Review Meeting. The members were required to review the read ahead materials provided by the JIMTP; attended the meeting; review the project presentations; and provide written comments and feedback to the JIMTP leadership team after the completion of the study. Additionally, the IAC members were required to participate in the end of day wrap-up sessions with the JIMTP leadership team to assist in understanding the viability of reviewed technologies and to add insights regarding how prepared the technology is for transition to the next level of development. The feedback was a thorough technical summary of their assessment of the various technologies under development using either the feedback forms provided by JIMTP or in paragraph form. Members were available for follow-up questions from the JIMTP MATGs for up to 60 days after the comments are submitted. Strategic Analysis assisted by coordinating travel agreements and submitting invoices for the advisory panel and corresponding with panel members.

### **Systems Biology Quarterly Meeting Validating Biomarkers to Objectively Diagnose PTSD, May 15-16, 2017**

The Systems Biology Quarterly Meeting Validating Biomarkers to Objectively Diagnose PTSD Group of 27 attendees met on May 15-16, 2017 (see Appendix I) at the Executive Conference Center in Arlington, Virginia. SA provided facility support, including set up of meeting room and testing of AV equipment.

### **FunGCAT Kickoff Meeting, June 13-14, 2017**

The FunGCAT Kickoff Meeting Group of 59 attendees met on June 13-14, 2017 (see Appendix J) at the Executive Conference Center in Arlington, Virginia. SA provided facility support, including set up of meeting room and testing of AV equipment.

### **ST Summer Study Kickoff 2017, June 27-28, 2017**

The ST Summer Study Kickoff Group of 21 attendees met on June 27-28, 2017 (see Appendix K) at the Executive Conference Center in Arlington, Virginia. SA provided facility support, including set up of meeting room and testing of AV equipment.

### **2017 DTRA Science Review Surface Science of Filtration / Decontamination Materials and Multifunctional Materials for Protection, September 6-7, 2017**

The 2017 DTRA Science Review, Surface Science of Filtration and Decontamination Materials and Multifunctional Materials for Protection was held on September 6-7, 2017 (see Appendix L) at North Carolina State University (NC State) in Raleigh, North Carolina. This study provided an opportunity for 89 scientists in basic research, applied research, and the engineering sciences to interact and share their work.

Strategic Analysis, Inc. support included: creation and maintenance of the registration website, coordination of audio visual needs, room setup with the facility, coordination of the no-host poster session reception, printing of all meeting materials and on-site meeting support.

**Bibliography**

Not applicable.

## Appendix: Study Agendas

### Appendix A Schedule

#### **Synthetic Molecular Systems Landscape**

April 24-25, 2012

Location: Executive Conference Center at Liberty Center, 4075 Wilson Blvd, Suite 350, Arlington, VA 22203

#### April 24, 2012

0830-0900 Continental Breakfast

0900-0945 Welcome and Introduction to Study Goals  
Dr. Jennifer Becker, *Army Research Office*

0945-1030 Dr. David Kaplan, *Tufts University*

1030-1045 Break

1045-1130 Dr. Nathan Gianneschi, *University of California- San Diego*

1130-1215 Dr. Christopher Dwyer, *Duke University*

1215-1315 Lunch

1315-1400 Dr. Neal Woodbury, *Arizona State University*

1400-1445 Dr. Christian Schafmeister, *Temple University*

1445-1500 Break

1500-1545 Dr. Neel Joshi, *Harvard University*

1545-1630 Discussion and Conclusion

#### April 25, 2012

0830-0900 Continental Breakfast

0900-0945 Dr. Sharon Glotzer, *University of Michigan*

0945-1000 Review from Day 1, Goals of Panel  
Dr. Jennifer Becker, *Army Research Office*

1000 -1145 Panel Discussion

1145-1200 Summary Remarks

## Appendix B Schedule

### 2012 DOD MWD Training Seminar and K-9 Trials

<b>Date</b>	<b>4/30/2012 (Monday)</b>	<b>Location</b>
0700-0800	Registration & Continental Breakfast	Gateway Club (Area #1)
0800-0815	Administrative Remarks	
0815-0830	Welcome Introduction: Col Gregory Reese	
0830-0945	History of the MWD: Ken Licklider	
0945-1000	Break	
1000-1200	Understanding of Detector-K9 Olfaction: Dr. David Adebimpe	
1200-1300	Lunch (on your own)	
1230-1300	<i>Optional:</i> K9 PTSD: Dr. Walt Burghardt	
1300-1400	Odor Imprinting: Ken Licklider	
1400-1415	Break	
1415-1515	Problem Solving Deferred Final Response (DFR): Dr. Stewart Hilliard	
1515-1530	Break	
1530-1645	Tactical Remote Collar Training (Classroom Portion): Brice Cavanaugh	
1645-1700	Movement to Area #2	
1700-1730	Tactical Remote Collar Training (Demonstration): Brice Cavanaugh	Area #2 (Outdoors)
<b>Date</b>	<b>5/1/2012 (Tuesday)</b>	<b>Location</b>
0700-0800	Registration & Continental Breakfast	Gateway Club (Area #1)
0800-1200	Drive Development & Decoy/Muzzle Work: Chris Jakubin	Area #2 (Outdoors)
1200-1300	Lunch (on your own)	Gateway Club (Area #1)
1300-1400	Visit the Vendors	
1400-	Introduction to E-Collar: Doug Roller	

1615		
1615-1630	Break	
1630-1730	How Dog's Learn in Detection Training: Ken Licklider	
<b>Date</b>	<b>5/2/2012 (Wednesday)</b>	<b>Location</b>
0700-0800	Registration & Continental Breakfast	
0800-0830	Fundamentals to Apply Pressure (Classroom Portion): James Allen Parker	Gateway Club (Area #1)
0830-0845	Break/Movement to Area #2	
0845-1200	Fundamentals to Apply Pressure (Hands On Portion): James Allen Parker	Area #2 (Outdoors)
1200-1300	Lunch (on your own)	Gateway Club (Area #1)
1300-1330	Visit the Vendors (Raffle at 1300)	Area #3 (Vendors)
1330-1530	Directed Off-Leash Searching and Problem Solving: Doug Roller	Gateway Club (Area #1)
1530-1545	Break	
1545-1730	Garnering a Final Response: Brice Cavanaugh	
1600-1800	Invitation only: Military Working Dog: Key Canine Attributes Workshop	
1800-2030	<b>Seminar &amp; K-9 Trials Ice-Breaker Reception &amp; Team Registration</b> <i>1815 - 1830: Speaker: Mr. John Burnam, JBMF</i> <i>2000 - 2030: Who Let the Dogs Out</i>	
1830-1930	MWD Competition K-9 Competitor Meeting	
1830-1930	MWD Competition Judge/Decoy Meeting	
<b>Date</b>	<b>5/3/2012 (Thursday) - 5/5/2012 (Saturday)</b>	<b>Location</b>
	K-9 Trials	Lackland AFB & Medina Training Annex
<b>Date</b>	<b>5/5/2012 (Saturday)</b>	<b>Location</b>
1815-2130	<b>Awards Banquet</b> <i>1815 - 1825: Social</i> <i>1825 - 2000: Introductions and Dinner</i> <i>2000 - 2130: Remarks and Awards Presentation</i>	Gateway Club (Area #1)

## **DOD MWD K-9 TRIALS FINAL RESULTS**

### **Patrol**

3rd Place: SFC Dorsey (USASOC)

2nd Place: Sgt Guajardo (341<sup>st</sup> TRS)

1st Place: MA1 Brooks (341<sup>st</sup> TRS)

### **Explosive Detection**

3rd Place: Sgt Palmer (209<sup>th</sup> MP Company)

2nd Place: TSgt Brown (341<sup>st</sup> TRS)

1st Place: MA1 Brooks (341<sup>st</sup> TRS)

### **Drug Detection**

3rd Place: SPC Ventura (230<sup>th</sup> MP Company)

2nd Place: SPC Cartwright (55<sup>th</sup> MP Company)

1st Place: Sgt Helm (55<sup>th</sup> MP Company)

### **Iron Dog**

3rd Place: SSgt Handy (90 SFS)

2nd Place: TSgt Kitts (56 SFS)

1st Place: Sgt Guajardo (341<sup>st</sup> TRS)

### **Top Dawg**

MA1 Brooks (341<sup>st</sup> TRS)

**Appendix C Schedule****2013 DoD MWD Training**

<b>Date</b>	<b>10/22/2013 (Tuesday)</b>	<b>Location</b>
0700-0730	Registration	Gateway Club  +  Bldg 7710
0730-0800	Welcome & Introductory Remarks by Dr. Hilliard	
0800-0920	Armin Winkler	
0920-0930	Break	
0930-1050	Dave Kroyer	
1050-1100	Break	
1100-1220	Kevin Sheldahl	
1220-1330	Lunch (on your own) / Meet at Bldg 7710	
1330-1430	341 TRS Demos Dogs to Instructors to Show MWD Skills, Problems	
1430-1630	Instructor Demos	
<b>Date</b>	<b>10/23/2013 (Wednesday)</b>	<b>Location</b>
0700-0750	Discussion, Question and Answer	DTS Theater and 341 TRS Training Areas
0750-0800	Break / Move to Assigned Areas	
0800-1000	Group Training Rotation 1	
1000-1030	Break / Rotate Areas	
1030-1230	Group Training Rotation 2	
1230-1340	Lunch (on your own) / Rotate Areas	
1340-1540	Group Training Rotation 3	
<b>Date</b>	<b>10/24/2013 (Thursday)</b>	<b>Location</b>
0700-0750	Discussion, Question and Answer	DTS Theater and 341 TRS Training Areas
0750-0800	Break / Move to Assigned Areas	
0800-1000	Group Training Rotation 1	
1000-1030	Break / Rotate Areas	
1030-1230	Group Training Rotation 2	
1230-1340	Lunch (on your own) / Rotate Areas	
1340-1540	Group Training Rotation 3	
<b>Date</b>	<b>10/25/2013 (Friday)</b>	<b>Location</b>
0700-0750	Discussion, Question and Answer	DTS Theater and 341 TRS Training Areas
0750-0800	Break / Move to Assigned Areas	
0800-1000	Group Training Rotation 1	
1000-1030	Break / Rotate Areas	
1030-1230	Group Training Rotation 2	
1230-1340	Lunch (on your own) / Rotate Areas	
1340-1540	Group Training Rotation 3	

## Appendix D: Schedule

### 2014 Water Research Technical Exchange

0900 – 0930	Introductions and Goals of Technical Exchange	Becker/Steevens/Dusenbury
0930 – 1000	Basic Research investments	Becker
1000 – 1030	TARDEC Research	Dusenbury
1030 - 1045	Break	
1045 – 1130	NSRDEC Research	Hampel/Dunn/Lavigne
1130– 1215	ERDC Research	Steevens
1215 – 1245	Working Lunch	
1245 – 1315	CASCOM	Kinder
1315 – 1345	USACEHR	Timmes
1345 – 1415	USUHS	Gellasch
1415 – 1445	Army Geospatial Center	Spillman
1445 – 1500	Break	
1500 – 1600	Additional Briefings	
1600 – 1700	Open Discussion	

## Appendix E: Schedule

### 2014 Canine S&T Workshop

**Tuesday, July 29, 2014**

<b>0700-0800</b>	<b>Registration and Continental Breakfast</b>
0800-0810	Welcome & Opening Remarks
0810-0820	ARO Military Working Dog Program <i>Stephen Lee, United States Army Research Office</i>
0820-0830	DHS S&T Explosives Division Canine Program <i>Don Roberts, United States Department of Homeland Security</i>
0830-0840	ONR Expeditionary Canine Sciences Program <i>Lee Mastroianni, United States Office of Naval Research</i>
0840-0850	Lackland - Holland Military Working Dog Hospital <i>Cheryl Sofaly, Lackland Air Force Base</i>
0850-0900	Dstl Canine and Biosystems Program <i>Stephen Nicklin, Defence Science Technology Laboratory</i>
0900-0910	Army Military Working Dog Program <i>Richard Vargus, Office of Provost Marshal General</i>
0910-0920	Marine Corps Military Working Dog Program <i>Michael Wells, United States Marine Corps</i>
0920-0930	DoD Military Working Dog Program <i>Douglas Miller, HQ Air Force Security Forces Center</i>
<b>0930-1000</b>	<b>Break</b>

***Session One: Relationship between Olfaction and Learning***

*Session Chair: Fay Porritt, Defence Science Technology Laboratory*

- 1000-1020 Odor Categorization By Dogs: A Proof of Principle Study  
*Helen Zulch, University of Lincoln, UK*
- 1020-1040 Maintaining Performance of Defensive Search Dogs  
*Fay Porritt, Defence Science Technology Laboratory*
- 1040-1100 Effects of Dog Breed and Chemical Similarity of Odorants on Dogs' Performance on an Olfactory Discrimination  
*Nathaniel Hall, University of Florida*
- 1100-1120 Saliency of Stimulus Characteristics in Discrimination Learning: Can Knowledge From The Visual Domain Help Us Train Detector Dogs Better?  
*Helen Zulch, University of Lincoln, UK*
- 1120-1140 Olfactory Discrimination and Generalization of Ammonium Nitrate and Structurally Related Odorants in Labrador Retrievers  
*David Dorman, North Carolina State University*
- 1140-1200 Explosives Detection by Military Working Dogs: Olfactory Generalization from Components to Mixtures  
*Lucia Lazarowski, North Carolina State University*
- 1200-1230 Session One: Question and Answer Session
- 1230-1330 Working Lunch**

***Session Two: Measurement of Cognition and its Implications***

*Session Chair: Stephen Nicklin, Defence Science Technology Laboratory*

- 1330-1350 Functional MRI of Conscious Dogs: Relationship between Brain Activity and Measures of Working Dog Performance  
*Paul Waggoner, Auburn University*
- 1350-1410 fMRI Biomarkers of Potential Service Dogs  
*Gregory Berns, Emory University*
- 1410-1430 Canine Neurological Interface Equipment  
*Nick Knebel, Battelle*
- 1430-1450 Cognition and Problem Solving Ability in Working Dogs: The Importance of Reactivity and Information Use  
*Karen Overall, University of Pennsylvania*
- 1450-1520 Break**
- 1520-1540 Individual Differences in Canine Cognition and Performance as an IED Detection Dog  
*Evan MacLean, Duke University*
- 1540-1600 Individual Differences in Distractibility of Dogs during a Visual Discrimination Task  
*Hannah Wright, University of Lincoln, UK*
- 1600-1620 Handler-Dog Interface: The Effects of Handler's Controllability on the Performance of Canine in an Explosive Detection Task  
*Avi Avital, Technion - Israel Institute of Technology*
- 1620-1655 Session Two: Question and Answer Session

1655-1715 Development of Novel Sampling and Detection Methods for Identifying Forensic Orodrants Including the Use of Dogs, Birds and Elephants  
*Kenneth Furton, Florida International University*

**Wednesday, July 30, 2014**

**0730-0830 Registration and Continental Breakfast**

**Session Three: Efficacy of Olfaction Training Aids**

*Session Chair: Don Roberts, United States Department of Homeland Security*

0830-0850 Odor Contamination Issues from Storage and Handling of Canine Training Materials  
*Patricia Caldwell, Battelle*

0850-0910 Odor Delivery for Canine Training on Binary Explosives  
*Lauryn DeGreeff, United States Naval Research Laboratory*

0910-0930 DHS S&T Development of Non-Hazardous, Non-Explosive Canine Training Aids for Peroxide Based Homemade Explosives (HME)  
*Trang Vu, John Hopkins University Applied Physics Laboratory*

0930-0950 Training Canines to Detect TATP and HMTD  
*Ludvik Pinc, University of Pardubice, CZ*

0950-1010 Session Three: Question and Answer Session

**1010-1040 Break**

**Session Four: Training Aids Measurement and Presentation**

*Session Chair: Susan Rose-Pehrsson, United States Naval Research Laboratory*

1040-1100 Towards Standard Training Aids: Metrology and Materials  
*William MacCrehan, National Institute of Standards and Technology*

1100-1120 Real versus Simulant Explosive Scent Training Aids: A Comparison of Headspace Analysis Using GC-MS  
*Mike Re, Signature Science, LLC*

1120-1140 Ultra-Sensitive Real-Time Vapor Detection for Characterizing Canine Training Aids  
*Matthew Aernecke, MIT Lincoln Laboratory*

1140-1155 Session Four: Question and Answer Session

**1155-1300 Working Lunch**

**Session Five: Vapor Detection and Fluid Dynamics Modeling**

*Session Chair: Louis Wasserzug, CTTSO*

1300-1320 Real-Time Ultra-Trace Vapor Detection to Aid in Canine Training  
*Roderick Kunz, MIT Lincoln Laboratory*

1320-1340 Using Fluid Dynamics Modelling to Aid Canine Training  
*Timothy Foat, Defence Science Technology Laboratory*

1340-1400 ROVER: Software for Training and Analysis of Chemical Sensing Dogs  
*Adam Moses, United States Naval Research Laboratory*

1400-1415 Session Five: Question and Answer Session

**1415-1440 Break**

**Session Six: Techniques, Systems, Strategies**

*Session Chair: Kevin Elliker, Defence Science Technology Laboratory*

- 1440-1500 Feedback from the Operational Field  
*Simon Prins, Netherlands Police Agency*
- 1500-1520 A New Type of Detection Dog- The Biosurveillance Dog  
*Allen Goldblatt, National Marine Mammal Foundation*
- 1520-1540 Teaching the Rules Governing Training Interactions: A Cognitive Approach to Canine Instruction  
*Patrick Nolan, Tactical Directional Canine Systems, LLC*
- 1540-1600 Novel Techniques and Challenges in the Training of Dogs on an Olfactory Discriminations  
*Clive Wynne, Arizona State University*
- 1600-1620 Session Six: Question & Answer Session
- 1620 Adjourn**

**Thursday, July 31, 2014**

**0700-0800 Registration and Continental Breakfast**

**Session Seven: Clinical Veterinary Topics**

*Session Chair: Ella Birch, Defence Science Technology Laboratory*

- 0800-0820 Chagas Disease: An Emerging Disease in Military Working Dogs  
*Sean Majoy, Daniel E. Holland MWD Hospital*
- 0820-0840 Research Updates from Colorado State University  
*Justin Mathis, Colorado State University*
- 0840-0900 Causes of Combat Mortality of Military Working Dogs in OIF and OEF, 2007-2012: A Pilot Study of 109 Cases  
*Laura Miller, United States Army Special Operations Command*
- 0900-0920 Pharmacodynamics and Pharmacokinetics Considerations of Drugs in Working Dogs: Heat, Exercise, Stress and Performance Enhancing Agents  
*Cynthia Cole, Mars Veterinary*
- 0920-0940 Session Seven: Question and Answer Session

**0940-1010 Break**

**Session Eight: Relationship between Physiology, Olfaction, and Stress**

*Session Chair: Michael Hoggund, United States Office of Naval Research*

- 1010-1030 The Effects of Oral Metronidazole and Doxycycline Administration on Olfactory Detection Capabilities of Explosive Detection Dogs  
*Eileen Jenkins, Auburn University*
- 1030-1050 Zinc Nanoparticles Facilitate Canine Detection of Explosives  
*Vitaly Vodyanoy, Auburn University*
- 1050-1110 Canine Audiology: BAER Testing and Beyond  
*Pete Scheifele, University of Cincinnati*
- 1110-1125 Session Eight: Question and Answer Session

**1125-1230 Working Lunch**

**Session Nine: Impact of Stress on Performance**

*Session Chair: Barbara Sherman, North Carolina State University*

- 1230-1250 Evaluation of Salivary Measures of Stress in Military Working Dogs  
*Desiree Broach, Daniel E. Holland MWD Hospital*
- 1250-1310 Functional Imaging in Dogs Using SPECT and Pet Imaging Technologies: An Introduction to the Available Possibilities  
*Kathelijne Peremans, University of Ghent, Belgium*
- 1310-1330 Evaluation of a Test for Emotional Reactivity in Labrador Retrievers Used for Explosives Detection  
*Margaret Gruen, North Carolina State University*
- 1330-1345 Session Nine: Question and Answer Session
- Session Ten: Relationship of Physiology, Hydration and Thermal Burden**  
*Session Chair: Robert Gillette, RMG Enterprises, Inc.*
- 1345-1405 The Effect of Dietary Protein Intake on Total Body Water and Water Turnover During Exercise  
*Michael Davis, Oklahoma State University*
- 1405-1425 Thermal Strain Mitigation in Military Working Dogs  
*Catherine O'Brien, United States Army Research Institute of Environmental Medicine*
- 1425-1445 Prehydration Strategies for Working Dogs  
*Cynthia Otto, University of Pennsylvania*
- 1445-1505 Effects of a Ballistic Vest on Field Performance of Law Enforcement Canines  
*Sarah Stojasih, Wayne State University*
- 1505-1525 Session Ten: Question and Answer Session
- 1525-1600 Break**
- 1600-1800 **Short Briefs and In Response**  
*Sharing of Research Ideas, Pilot Data, and Responses to Presentations*  
*Chair: Paul Waggoner, Auburn University*
- Have research ideas or pilot data that you care to share in a short, 10 minute or less, briefing? Have data or information relevant to a talk or just did not have time in session to fully discuss questions or comments you may have regarding a presentation?
- 1800 Adjourn**

**Friday, August 1, 2013**

- 0700-1500 Offsite Demonstration: K2 Solutions, Inc.  
*K2 Solutions, Inc. located in Southern Pines, NC, will be organizing a Military Working Dog capability demonstration. Transportation to and from K2's Canine Facility will be provided.*

## Appendix F: Schedule

### CHEMICAL/BIOLOGICAL FILTRATION STRATEGIES AND MULTIFUNCTIONAL MATERIALS DEVELOPMENT WORKING GROUP

21-22 October 2014

Arlington, VA

#### Agenda

#### Tuesday, 21 October 2014

Time	Presenter	Topic
0700	<i>Registration &amp; Continental Breakfast</i>	
0800	Gregory Peterson	Welcome & Introduction
0830	Christopher Karwacki	Overview of FY14 Research - Multifunctional Materials for Force Protection
0900	Natalie Pomerantz	Utilizing Novel Material Concepts and Properties in Chem/Bio Garment Design
0930	<i>Break</i>	
0945	Omar Farha	Metal-Organic Frameworks
1015	Gregory Parsons	Absorptive and Reactive Surfaces Enabled by Atomic Layer Deposition
1045	Wayne Jones	Nanofibrous Photocatalysts, Sensors, and Multi-functional Materials
1115	Javier Arcibar-Orozco	Visible Light Enhanced Removal of Sulfur Mustard Gas Surrogate from a Vapor Phase on Novel Hydrous Ferric Oxide/Graphite Oxide Composites
1145	Group Discussion/Breakouts	
1200	<i>Working Lunch</i>	
1300	Christopher Karwacki	Catalyst Design Strategies
1330	Ivan Iordanov	Computational Studies - Metal Oxides
1400	Prashant Kamat	Graphene Oxide Based Multifunctional Catalyst Mat for Simultaneous Sensing and Degradation of Nitroaromatics
1430	<i>Break</i>	
1445	J. Karl Johnson	Adsorption, Diffusion, and Reaction of Gases in Functionalized Sorbents
1500	James Whitten	Correlating Adsorption with Fluorescence Changes of Metal Oxides and Metal Hydroxides
1530	Group Discussion/Breakouts	
1630	Adjourn	
1700	No-host Reception: A-Town (4100 Fairfax Drive, Arlington, VA)	

**Wednesday, 22 October 2014**

<b>Time</b>	<b>Presenter</b>	<b>Topic</b>
0700	<i>Registration &amp; Continental Breakfast</i>	
0800	Gregory Peterson	AP Nanostructured Materials For Individual Protection Overview & FY14 Accomplishments
0830	Peyman Moghadam	Computational Analysis and Screening of Materials for Capture of Toxic Compounds
0900	Hiroyasue Furukawa	New MOF Chemistry for Air Purification
0930	Jared DeCoste	Oxygen Storage
1000	<i>Break</i>	
1030	Krista Walton	Metal-Organic Frameworks for Ammonia Removal
1100	M. Douglas LeVan	Carbon Silica Composites and Other Biphasic Adsorbents for Air Purification
1130	<i>Working Lunch</i>	
1230	Brandy White	Functionalized Organosilicate Materials
1300	Matt Laskoski	Polymer-Supported Polyoxometalates for CWA Destruction
1330	Grant Glover	The use of Reactive Dyes as a Platform Technology to Attach Nanostructures to Fibers
1400	<i>Break</i>	
1415	Joseph Rossin	Zirconium Hydroxide and Its Applications in Chemical Filtration
1445	Gokhan Alptekin	Advanced Cartridge for Individual Protection Systems
1515	Group Discussion/Breakouts	
1530	Adjourn	

**Appendix G: Schedule****2014 Army ST and ARCIC S&T Division Discussion on Innovation Agenda****December 17, 2014 Wednesday**

0830 – Registration

0900 – Introductions and Goals

0930 – “Thoughts on Innovation” – COL Chris Cross

1000 – “Army Innovation” – Ms. Mary Miller, ASA(ALT), Deputy Assistant Secretary for Research and Technology

1100 – “Naval Innovation: Successes and Lessons Learned” - Dr. Larry Schuette, Director of Research, ONR

1145 – “New opportunities for collaboration among federal agencies in global S&amp;T engagement”

– Dr. Chuck Matson, Chief Scientist AFOSR

1230 – No host lunch - Rustico Restaurant

ST Innovation Talks

- 1330 – Dr. Richie Fong – ARDEC
- 1400 – Dr. Way Fountain – ECBC
- 1430 – Dr. Jaques Reifman - MRMC
- 1500 – Dr. Todd Bridges - ERDC
- 1530 – Break
- 1600 – Overview of break out groups and tasking for those groups
- 1630 – Brief meeting of each group
- 1700 – Break for Day
- 1830 – No- host group dinner at A-Town

**December 18, 2014 Thursday**

- 0800 – Registration
- 0830 – Comments from BG McPadden
- 0900 – Break-out groups meet addressing questions
- 1130 – Lunch (meeting of Facilitators)
- 1300 – Reconvene with presentation of break out group summaries/other opinions
- 1430 – Closing Remarks and Follow-On Actions
- 1500 – Meeting Close

**Appendix H: Schedule**

**Canine Performance Training and Workshop 2015**

*March 9-10, 2015  
Anchorage, Alaska*

<b>Time</b>	<b>Monday, March 9, 2015</b>	<b>Tuesday, March 10, 2015</b>
8:00-8:30	Continental Breakfast & Registration	Continental Breakfast & Registration
8:30-9:30	Denis Marcellin-Little <i>Evidence-Based Medicine for Athletic Dog Injuries</i>	Ryne Olson <i>Managing Working Dogs in Remote Arctic Conditions</i>
9:30-10:30	Denis Marcellin-Little <i>Managing Osteoarthritis in Athletic Dogs</i>	Nina Hansen <i>Veterinary Care on the Trail of the Yukon Quest 1,000 Mile International Dog Sled Race</i>
10:30-10:45	Break	Break
10:45-11:45	Skip Scheifele <i>Canine Audiology Short Course Part 1</i>	Helen Zulch <i>How Science Can Help US Train Dogs More Effectively Part 1</i>
11:45-12:45	Skip Scheifele <i>Canine Audiology Short Course Part 2</i>	Helen Zulch <i>How Science Can Help US Train Dogs More Effectively Part 2</i>

12:45-1:45	Working Lunch	Working Lunch
1:45-2:45	Jill Cline <i>What is the ideal macronutrient profile for the Military Working Dog?</i>	Mike Davis <i>Heat and Water Management in Working Dogs</i>
2:45-3:45	Chris Royer <i>Old and New Concepts in Athletic Conditioning of Dogs</i>	Mike Davis <i>Tolerance to Acute Exposure to High Altitude in Dogs</i>
3:45-4:00	Break	Break
4:00-5:00	Ken Furton <i>Effects of Environment on Odor Availability and Olfaction (tentative)</i>	Workshop Wrap-up

### Appendix I: Schedule

**Systems Biology Quarterly Meeting  
Validating Biomarkers to Objectively Diagnose PTSD  
15-16 May 2017  
Executive Conference Center, 4075 Wilson Blvd, Arlington, VA**

**Monday, 15 May 2017**

- 8:00 - 8:30** Arrive and coffee/tea and snacks
- 8:30 – 9:00** Welcome and updates: Roadmap to advance development (Hoover)
- 9:00-9:30** **Lists of studies which have/have not been completed for the 29/40 samples (Jett, Marmar, Doyle). Lists of submitted panels which could/could not be used due to above issues (Kelsey and Ruoting)**
- 9:30- 1:30** Bioinformatics & Core Reports (25 minutes each core including discussion)
- 9:30** Introduction: (Doyle)
- 9:40** Kelsey reviews current panels
- 10:05** Routing reviews other aspects of panels
- 10:30** GWAS and relationships with other analytes (Ressler & Borek)
- 10:55** *Break (15 min)*
- 11:10** Metabolism/Metabolomics and Cell Aging (Wolkowitz, Mellon, Rajaram)
- 11:35** Proteomics (Hood)
- 12:00-12:00** LUNCH
- 1:00** Endocrine (Yehuda/Flory)
- 1:25- 2:00** Updates on Data Transfer and uploads by all cores to SysBioCube (Uma & Arsen)
- 2:00-2:25** Issues with medications, smoking and others. Are the selected panels able to identify PTSD cases and controls for such conditions (some are inherent for PTSD) (Marmar)
- 2:25- 2:50** Genomics- Hammamieh/Muhie/Aarti

- 2:50-3:10** Joint application for advanced development for future years and geared towards 6.3/6.4 + funding  
Other sample sets and planning for those analyses (\$\$) and type of assay. (Jett will lead but all need to participate)
- 3:10-3:30** *Break*
- 3:30- 4:00** Updates on Publications
- 4:00-5:00** Discussion and Setting 2017 Goals (Marti, Ron, Charlie, Frank, Owen/Sindy, Kai, Janine)

**Tuesday, 16 May 2017**

Sessions will focus on integrating results and findings across cores for specific aspects of PTSD. If you have data related to these issues, please be prepared to present your findings. A discussion leader must be selected for each topic, but each core should contribute.

- 8:00 – 8:30** Arrive and coffee/tea
- 8:30-10:30** **Working discussions to consider ideal attributes for biomarker panels.**  
**Bioinformatics teams, Advanced development teams, All cores**
- 10:30 – 10:45** **Break**
- 10:45-12:30** (either sequentially or with breakout groups, depending on time each group decides is needed)  
a) Manuscripts and Pre-FDA submission documents (All)  
b) Boot Camp: Integrating biomarker discovery-cross core findings (All)

**Appendix J: Schedule**

**Functional Genomic and Computational Assessment of Threats  
(Fun GCAT) Program Kick Off  
June 13 and 14 2017  
The ECC at Liberty Center  
Arlington, VA**

Day 1

- 8:30–9:00 Registration
- 9:00–10:00 Welcome, Introductions, and Program Mechanics  
John Julias, IARPA Fun GCAT Program Manager (9:00–9:25)  
Program overview  
Introduction of all participants (Performers, T&E teams, and IARPA SETA staff)

Fun GCAT organization and management  
Kickoff meeting structure and components  
Stephen Lee, ARO (9:25–9:45)  
Roles and responsibilities  
Lines of communication

9:45-10:00 Break

10:00–12:30 Technical Talks Session #1  
Church Lab (10:00–10:45)  
Break (10:45–11:00)  
Silver Lab (11:00–11:45)  
SRI International (11:45–12:30)

12:30–1:30 Lunch (on your own)

1:30–4:00 Technical Talks Session #2  
Signature Sciences, LLC. (1:30–2:15)  
Virginia Tech (2:15–3:00)  
Break (3:00–3:15)  
Battelle Memorial (3:15–4:00)

4:00–4:15 Closing Remarks  
John Julias, IARPA Fun GCAT Program Manager

## Day 2

8:30–9:00 Registration

9:00-9:15 Jason Matheny, IARPA Director  
Welcome and IARPA overview

9:15–9:30 T&E Overview  
John Julias, IARPA Fun GCAT Program Manager

9:30–10:30 T&E Team Lightning Talks  
The Johns Hopkins University - Applied Physics Lab (9:30–9:45)  
Pacific Northwest National Laboratory (9:45–10:00)  
Lawrence Livermore National Laboratory (10:00–10:15)  
Los Alamos National Laboratory (10:15–10:30)

10:30–10:45 Break

10:45–12:05 Performer Private Breakout Session #1  
Church Lab (10:45–11:25)  
Silver Lab (11:25–12:05)

12:05–1:00 Lunch (on your own)

1:00–4:00 Performer Private Breakout Session #2

SRI International (1:00–1:40)

Signature Sciences, LLC (1:40–2:20)

Break (2:20–2:40)

Virginia Tech (2:40–3:20)

Battelle Memorial (3:20–4:00)

**Appendix K Schedule**

**ST Summer Study Kickoff 2017**

**ECC Freedom Room, 3rd Floor, 4075 Wilson Blvd, Arlington, VA 22203**

27 June 2017

<b>Time</b>	<b>Activity</b>	<b>Name</b>
0800	Arrival / Registration* <i>Please make sure to pass your clearance if you will be attending the classified presentation at 0910</i>	
0900	Introductions	Dr. Augustus Fountain
0915	*****CLASSIFIED PRESENTATION***** Russian New Generation Warfare	Mr. Tom Pappas, TRADOC
1000	Break	
1015	National Training Center (NTC) Speed of Battle Drills; Briefing on NTC Battle Action Summaries	CPT Michael Culler, FORSCOM NTC
1115	U.S. Army Robotic and Autonomous Systems Strategy	Mr. Robert Bender, ARCIC
1200	Lunch	On your own
1300	Working Session	ALL
1545	Closing Remarks	Dr. Augustus Fountain

28 June 2017

<b>Time</b>	<b>Activity</b>	<b>Name</b>
0830	Arrival and Registration	
0900	Task Development (STs only)	Dr. Robert Sadowski

1130	Lunch	On your own
1230	Timeline to Complete Study (STs only)	Dr. Robert Sadowski
1345	Wrap-up	Dr. Augustus Fountain
1400	Depart	

## Appendix L: Schedule

### **Surface Science of Filtration/Decontamination Materials and Multifunctional Materials for Protection Science Review 6-7 September 2017 / Raleigh, NC**

#### **Wednesday 6 September 2017**

Time	Title	Presenter
0730-0815	Arrival and Registration	
0815-0830	Introduction/Overview	Drs. Chris Karwacki and Glenn Lawson
0830-0915	<i>In Operando</i> Mechanistic Studies Involving Reactions of CWA Simulants with Filtration/Destruction Materials	Prof. Bryan Eichhorn, University of Maryland
0915-1000	Multidisciplinary Research for the Advancement of Filtration Materials: <i>In Situ/Operando</i> Studies of Surface Reaction Mechanisms	Prof. John Morris, Virginia Tech
1000-1015	Break	
1015-1100	<i>In Operando</i> Surface Chemistry and Environmental Influences For CWA Reactivity	Dr. Pehr Pehrsson, Naval Research Laboratory
1100-1200	Metal Organic Frameworks for Protection	Prof. Omar Farha, Northwestern University
1200-1300	Lunch	Delivered on site
1300-1400	Discussion MOF/MO catalysts	Panelists
1400-1430	Plasmonic Properties of Aluminum Nanostructures for WMD Detection and Remediation	Prof. Naomi Halas, Rice University
1430-1500	Graphene-Based Assemblies for Sensing and Degradation of Hazardous Chemical Contaminants	Prof. Prashant Kamat, University of Notre Dame
1500-1515	Break	
1515-1545	Design, Synthesis And Characterization Of Hybrid Stratified Plasmonic Nanoparticle Materials For Detection And Destruction Of Chemical Agents	Prof. Karl Johnson, University of Pittsburgh
1545-1615	Plasmonic Cu Nanoparticles On Networked Mesoporous Oxide Supports For Sunlight-Assisted Decomposition Of CW Simulants And Live Agents	Dr. Jeremy Pietron, Naval Research Laboratory
1615-1715	Discussion on Photoactivated Materials: Catalysis/Sensing and Chemical Imaging	Panelists
1715	Adjourn	
1730-2000	Poster session (30 max) and no host social Location: Golf Course Club House	N/A

## Thursday 7 September 2017

Time	Title	Presenter
0800-0830	Introduction/Overview – Engineered Materials	Greg Peterson
0830-0915	Absorptive and Reactive Surfaces Enabled by Atomic Layer Deposition	Prof. Gregory Parsons, North Carolina State
0915-0945	Decontamination of Toxic Agents Using Nanofibers	Prof. Wayne Jones, Binghamton University, SUNY
0945-1015	MOF-based Mixed-Matrix Membranes for Hazardous Chemical Capture	Prof. Seth Cohen, UCSD
1015-1030	Break	
1030-1100	Application of Reactive Dye Method to Tailor Fibers with Adsorbent Materials	Prof. Grant Glover University of South Alabama
1100-1200	Discussion on Materials Maturation/Transition Opportunities	Panelists
1200-1300	Lunch	Delivered on-site
1300-1400	Non-Woven Institute Tour	TBD
1400-1500	Materials Engineering and Maturation	Dr. Natalie Pomerantz NSRDEC
1500-1600	<i>Material Scaling</i>	Dr. Joseph Rossin
1600-1700	Industry Discussion/Transition - NC State - NWI	Panelists
1700	Adjourn	

<b>REPORT DOCUMENTATION PAGE</b>			<i>Form Approved</i> <i>OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. <b>PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.</b>				
<b>1. REPORT DATE (DD-MM-YYYY)</b> 2017-12-12		<b>2. REPORT TYPE</b> Final		<b>3. DATES COVERED (From - To)</b>
<b>4. TITLE AND SUBTITLE</b>  Study in Organic Chemistry and Organized Media			<b>5a. CONTRACT NUMBER</b> W911NF-12-C-0035	
			<b>5b. GRANT NUMBER</b> N/A	
			<b>5c. PROGRAM ELEMENT NUMBER</b> N/A	
<b>6. AUTHOR(S)</b> Barbara Smith			<b>5d. PROJECT NUMBER</b> 61778CHST12013	
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<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> Strategic Analysis, Inc. 4075 Wilson Boulevard, Suite 200, Arlington, VA 22203			<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b> 61778-CH	
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			<b>11. SPONSOR/MONITOR'S REPORT NUMBER(S)</b> N/A	
<b>12. DISTRIBUTION / AVAILABILITY STATEMENT</b> Publication of results of the research project in appropriate professional journals is encouraged as an important method of recording and reporting scientific information. One copy of each manuscript submitted for publication shall be forwarded to the ARO at the same time it is submitted to the journal in accordance with the reporting instructions in ARO Form 18 (See Subsection F.2). Following publication, copies of reprints shall be submitted to the ARO in accordance with the reporting instructions in ARO Form 18 (See Subsection F.2). The Contracting Officer may request submission of publications to other addresses.				
<b>13. SUPPLEMENTARY NOTES</b> N/A				
<b>14. ABSTRACT</b> For the period of March 14, 2012 to September 13, 2017, this effort was composed of 21 studies. This work was supported by the Army Research Office (Dr. Stephen J. Lee) under the auspices of the U.S. Army Research Office, Contract No. W911NF12C0035. During the contract period of performance, Strategic Analysis, Inc. (SA) provided scientific and technical support to Army Research Office (ARO) specifically in the areas of organic chemistry, organized media, surface chemistry, and material science. A wide range of general tasks have been executed in this area with a particular focus on supporting the Reactive Chemical Systems Program in the Chemical Science Division of the ARO. General tasks performed included coordination of technical panel discussions, development of technical topic areas of interest planning and panel discussion support, as well as efforts to assess, analyze, and write reports on specific technical areas of interest to the client.				
<b>15. SUBJECT TERMS</b> N/A				
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<b>a. REPORT</b> N/A	<b>b. ABSTRACT</b> N/A	<b>c. THIS PAGE</b> N/A		N/A
				<b>19b. TELEPHONE NUMBER (include area code)</b> 703-276-2237

**REPORT OF INVENTIONS AND SUBCONTRACTS**  
(Pursuant to "Patent Rights" Contract Clause) (See Instructions on back)

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				Strategic Analysis, Inc		W911NF-12-C-0035		a. INTERIM <input type="checkbox"/> b. FINAL <input checked="" type="checkbox"/>	
b. ADDRESS (Include ZIP Code)			d. AWARD DATE (YYYYMMDD)	b. ADDRESS (Include ZIP Code)			d. AWARD DATE (YYYYMMDD)		4. REPORTING PERIOD (YYYYMMDD)
				4075 Wilson Boulevard, Suite 200, Arlington, VA 22203			2012314		a. FROM 2012314
									b. TO 2017917

**SECTION I - SUBJECT INVENTIONS**

5. "SUBJECT INVENTIONS" REQUIRED TO BE REPORTED BY CONTRACTOR/SUBCONTRACTOR (If "None," so state)

a. NAME(S) OF INVENTOR(S) <i>(Last, First, Middle Initial)</i>	b. TITLE OF INVENTION(S)	c. DISCLOSURE NUMBER, PATENT APPLICATION SERIAL NUMBER OR PATENT NUMBER	d. ELECTION TO FILE PATENT APPLICATIONS (X)				e. CONFIRMATORY INSTRUMENT OR ASSIGNMENT FORWARDED TO CONTRACTING OFFICER (X)	
			(1) UNITED STATES		(2) FOREIGN		(a) YES	(b) NO
			(a) YES	(b) NO	(a) YES	(b) NO		
N/A	N/A	N/A						

f. EMPLOYER OF INVENTOR(S) NOT EMPLOYED BY CONTRACTOR/SUBCONTRACTOR		g. ELECTED FOREIGN COUNTRIES IN WHICH A PATENT APPLICATION WILL BE FILED	
(1) (a) NAME OF INVENTOR (Last, First, Middle Initial)	(2) (a) NAME OF INVENTOR (Last, First, Middle Initial)	(1) TITLE OF INVENTION	(2) FOREIGN COUNTRIES OF PATENT APPLICATION
(b) NAME OF EMPLOYER	(b) NAME OF EMPLOYER		
(c) ADDRESS OF EMPLOYER (Include ZIP Code)	(c) ADDRESS OF EMPLOYER (Include ZIP Code)		
		N/A	N/A

**SECTION II - SUBCONTRACTS (Containing a "Patent Rights" clause)**


6. SUBCONTRACTS AWARDED BY CONTRACTOR/SUBCONTRACTOR (If "None," so state)

a. NAME OF SUBCONTRACTOR(S)	b. ADDRESS (Include ZIP Code)	c. SUBCONTRACT NUMBER(S)	d. FAR "PATENT RIGHTS"		e. DESCRIPTION OF WORK TO BE PERFORMED UNDER SUBCONTRACT(S)	f. SUBCONTRACT DATES (YYYYMMDD)	
			(1) CLAUSE NUMBER	(2) DATE (YYYYMM)		(1) AWARD	(2) ESTIMATED COMPLETION
N/A	N/A	N/A			N/A		

**SECTION III - CERTIFICATION**

7. CERTIFICATION OF REPORT BY CONTRACTOR/SUBCONTRACTOR (Not required if: (X as appropriate))

I certify that the reporting party has procedures for prompt identification and timely disclosure of "Subject Inventions," that such procedures have been followed and that all "Subject Inventions" have been reported.

a. NAME OF AUTHORIZED CONTRACTOR/SUBCONTRACTOR OFFICIAL (Last, First, Middle Initial)	b. TITLE	c. SIGNATURE	d. DATE SIGNED
Holbrook/Michael/T.	Senior Contracts Administrator		20171211

## **The Report Documentation Page (SF298) Continuation Sheet (Enclosure 2)**

(1) Foreword (optional) - N/A

(2) Table of Contents (if report is more than 10 pages) –

Introduction - Page 3

Summary of Results – Page 3

Bibliography – Page 11

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(3) List of Appendixes, Illustrations and Tables (if applicable) –

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Appendix L – Page 29

(4) Statement of the problem studied – N/A

(5) Summary of the most important results - N/A

(6) Bibliography – N/A

(7) Appendixes –

Appendix : Study Agendas

Appendix A Schedule

Synthetic Molecular Systems Landscape

April 24-25, 2012

Location: Executive Conference Center at Liberty Center, 4075 Wilson Blvd, Suite 350,

Arlington, VA 22203

April 24, 2012

0830-0900 Continental Breakfast

0900-0945 Welcome and Introduction to Study Goals

Dr. Jennifer Becker, *Army Research Office*

0945-1030 Dr. David Kaplan, *Tufts University*

1030-1045 Break

1045-1130 Dr. Nathan Gianneschi, *University of California- San Diego*

1130-1215 Dr. Christopher Dwyer, *Duke University*

1215-1315 Lunch

1315-1400 Dr. Neal Woodbury, *Arizona State University*

1400-1445 Dr. Christian Schafmeister, *Temple University*

1445-1500 Break

1500-1545 Dr. Neel Joshi, *Harvard University*

1545-1630 Discussion and Conclusion

April 25, 2012

0830-0900 Continental Breakfast

0900-0945 Dr. Sharon Glotzer, *University of Michigan*

0945-1000 Review from Day 1, Goals of Panel

Dr. Jennifer Becker, *Army Research Office*

1000 -1145 Panel Discussion

1145-1200 Summary Remarks

Appendix B Schedule

2012 DOD MWD Training Seminar and K-9 Trials

Date	4/30/2012 (Monday)	Location
0700-0800	Registration & Continental Breakfast	Gateway Club (Area #1)
0800-0815	Administrative Remarks	
0815-0830	Welcome Introduction: Col Gregory Reese	
0830-0945	History of the MWD: Ken Licklider	
0945-1000	Break	
1000-1200	Understanding of Detector-K9 Olfaction: Dr. David Adebimpe	
1200-1300	Lunch (on your own)	
1230-1300	<i>Optional:</i> K9 PTSD: Dr. Walt Burghardt	
1300-1400	Odor Imprinting: Ken Licklider	
1400-1415	Break	

1415-1515	Problem Solving Deferred Final Response (DFR): Dr. Stewart Hilliard	
1515-1530	Break	
1530-1645	Tactical Remote Collar Training (Classroom Portion): Brice Cavanaugh	
1645-1700	Movement to Area #2	
1700-1730	Tactical Remote Collar Training (Demonstration): Brice Cavanaugh	Area #2 (Outdoors)
<b>Date</b>	<b>5/1/2012 (Tuesday)</b>	<b>Location</b>
0700-0800	Registration & Continental Breakfast	Gateway Club (Area #1)
0800-1200	Drive Development & Decoy/Muzzle Work: Chris Jakubin	Area #2 (Outdoors)
1200-1300	Lunch (on your own)	
1300-1400	Visit the Vendors	Gateway Club (Area #1)
1400-1615	Introduction to E-Collar: Doug Roller	

1400-1615	Introduction to E-Collar: Doug Roller	
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1615-1630	Break	
1630-1730	How Dog's Learn in Detection Training: Ken Licklider	
<b>Date</b>	<b>5/2/2012 (Wednesday)</b>	<b>Location</b>
0700-0800	Registration & Continental Breakfast	
0800-0830	Fundamentals to Apply Pressure (Classroom Portion): James Allen Parker	Gateway Club (Area #1)
0830-0845	Break/Movement to Area #2	
0845-1200	Fundamentals to Apply Pressure (Hands On Portion): James Allen Parker	Area #2 (Outdoors)
1200-1300	Lunch (on your own)	Gateway Club (Area #1)
1300-1330	Visit the Vendors (Raffle at 1300)	Area #3 (Vendors)
1330-1530	Directed Off-Leash Searching and Problem Solving: Doug Roller	
1530-1545	Break	Gateway Club
1545-1730	Garnering a Final Response: Brice Cavanaugh	(Area #1)
1600-1800	Invitation only: Military Working Dog: Key Canine Attributes Workshop	

1800-2030	<b>Seminar &amp; K-9 Trials Ice-Breaker Reception &amp; Team Registration</b>  <i>1815 - 1830: Speaker: Mr. John Burnam, JBMF</i>  <i>2000 - 2030: Who Let the Dogs Out</i>	
1830-1930	MWD Competition K-9 Competitor Meeting	
1830-1930	MWD Competition Judge/Decoy Meeting	
<b>Date</b>	<b>5/3/2012 (Thursday) - 5/5/2012 (Saturday)</b>	<b>Location</b>
	K-9 Trials	Lackland AFB & Medina Training Annex
<b>Date</b>	<b>5/5/2012 (Saturday)</b>	<b>Location</b>
1815-2130	<b>Awards Banquet</b>  <i>1815 - 1825: Social</i>  <i>1825 - 2000: Introductions and Dinner</i>  <i>2000 - 2130: Remarks and Awards Presentation</i>	Gateway Club (Area #1)

## DoD MWD K-9 TRIALS FINAL RESULTS

Patrol

3rd Place: SFC Dorsey (USASOC)

2nd Place: Sgt Guajardo (341<sup>st</sup> TRS)

1st Place: MA1 Brooks (341<sup>st</sup> TRS)

Explosive Detection

3rd Place: Sgt Palmer (209<sup>th</sup> MP Company)

2nd Place: TSgt Brown (341<sup>st</sup> TRS)

1st Place: MA1 Brooks (341<sup>st</sup> TRS)

Drug Detection

3rd Place: SPC Ventura (230<sup>th</sup> MP Company)

2nd Place: SPC Cartwright (55<sup>th</sup> MP Company)

1st Place: Sgt Helm (55<sup>th</sup> MP Company)

Iron Dog

3rd Place: SSgt Handy (90 SFS)

2nd Place: TSgt Kitts (56 SFS)

1st Place: Sgt Guajardo (341<sup>st</sup> TRS)

Top Dawg

MA1 Brooks (341<sup>st</sup> TRS)

Appendix C Schedule

2013 DoD MWD Training

Date	10/22/2013 (Tuesday)	Location
0700-0730	Registration	Gateway Club
0730-0800	Welcome & Introductory Remarks by Dr. Hilliard	

0800-0920	Armin Winkler	+
0920-0930	Break	
0930-1050	Dave Kroyer	
1050-1100	Break	
1100-1220	Kevin Sheldahl	
1220-1330	Lunch (on your own) / Meet at Bldg 7710	
1330-1430	341 TRS Demos Dogs to Instructors to Show MWD Skills, Problems	
1430-1630	Instructor Demos	
<b>Date</b>	<b>10/23/2013 (Wednesday)</b>	<b>Location</b>
0700-0750	Discussion, Question and Answer	DTS Theater and 341 TRS Training Areas
0750-0800	Break / Move to Assigned Areas	
0800-1000	Group Training Rotation 1	
1000-1030	Break / Rotate Areas	
1030-1230	Group Training Rotation 2	
1230-1340	Lunch (on your own) / Rotate Areas	
1340-1540	Group Training Rotation 3	
<b>Date</b>	<b>10/24/2013 (Thursday)</b>	<b>Location</b>
0700-0750	Discussion, Question and Answer	DTS Theater and 341 TRS Training Areas
0750-0800	Break / Move to Assigned Areas	
0800-1000	Group Training Rotation 1	

1000-1030	Break / Rotate Areas	
1030-1230	Group Training Rotation 2	
1230-1340	Lunch (on your own) / Rotate Areas	
1340-1540	Group Training Rotation 3	
<b>Date</b>	<b>10/25/2013 (Friday)</b>	<b>Location</b>
0700-0750	Discussion, Question and Answer	DTS Theater and 341 TRS Training Areas
0750-0800	Break / Move to Assigned Areas	
0800-1000	Group Training Rotation 1	
1000-1030	Break / Rotate Areas	
1030-1230	Group Training Rotation 2	
1230-1340	Lunch (on your own) / Rotate Areas	
1340-1540	Group Training Rotation 3	

Appendix D: Schedule

2014 Water Research Technical Exchange

0900 – 0930 Introductions and Goals of Technical Exchange

Becker/Steevens/Dusenbury

0930 – 1000 Basic Research investments

Becker

1000 – 1030 TARDEC Research

Dusenbury

1030 - 1045 Break

1045 – 1130 NSRDEC Research

Hampel/Dunn/Lavigne

1130– 1215 ERDC Research	Steevens
1215 – 1245 Working Lunch	
1245 – 1315 CASCOM	Kinder
1315 – 1345 USACEHR	Timmes
1345 – 1415 USUHS	Gellasch
1415 – 1445 Army Geospatial Center	Spillman
1445 – 1500 Break	
1500 – 1600 Additional Briefings	
1600 – 1700 Open Discussion	

Appendix E: Schedule

2014 Canine S&T Workshop

Tuesday, July 29, 2014

0700-0800 Registration and Continental Breakfast

0800-0810 Welcome & Opening Remarks

0810-0820 ARO Military Working Dog Program

*Stephen Lee, United States Army Research Office*

0820-0830 DHS S&T Explosives Division Canine Program

*Don Roberts, United States Department of Homeland Security*

0830-0840 ONR Expeditionary Canine Sciences Program

*Lee Mastroianni, United States Office of Naval Research*

0840-0850 Lackland - Holland Military Working Dog Hospital

*Cheryl Sofaly, Lackland Air Force Base*

0850-0900 Dstl Canine and Biosystems Program  
*Stephen Nicklin, Defence Science Technology Laboratory*

0900-0910 Army Military Working Dog Program  
*Richard Vargus, Office of Provost Marshal General*

0910-0920 Marine Corps Military Working Dog Program  
*Michael Wells, United States Marine Corps*

0920-0930 DoD Military Working Dog Program  
*Douglas Miller, HQ Air Force Security Forces Center*

0930-1000 Break

*Session One: Relationship between Olfaction and Learning*

*Session Chair: Fay Porritt, Defence Science Technology Laboratory*

1000-1020 Odor Categorization By Dogs: A Proof of Principle Study  
*Helen Zulch, University of Lincoln, UK*

1020-1040 Maintaining Performance of Defensive Search Dogs  
*Fay Porritt, Defence Science Technology Laboratory*

1040-1100 Effects of Dog Breed and Chemical Similarity of Odorants on Dogs' Performance on an Olfactory Discrimination  
*Nathaniel Hall, University of Florida*

1100-1120 Salience of Stimulus Characteristics in Discrimination Learning: Can Knowledge From The Visual Domain Help Us Train Detector Dogs Better?  
*Helen Zulch, University of Lincoln, UK*

1120-1140 Olfactory Discrimination and Generalization of Ammonium Nitrate and Structurally Related Odorants in Labrador Retrievers

*David Dorman, North Carolina State University*

1140-1200 Explosives Detection by Military Working Dogs: Olfactory Generalization from Components to Mixtures

*Lucia Lazarowski, North Carolina State University*

1200-1230 Session One: Question and Answer Session

1230-1330 Working Lunch

*Session Two: Measurement of Cognition and its Implications*

*Session Chair: Stephen Nicklin, Defence Science Technology Laboratory*

1330-1350 Functional MRI of Conscious Dogs: Relationship between Brain Activity and Measures of Working Dog Performance

*Paul Waggoner, Auburn University*

1350-1410 fMRI Biomarkers of Potential Service Dogs

*Gregory Berns, Emory University*

1410-1430 Canine Neurological Interface Equipment

*Nick Knebel, Battelle*

1430-1450 Cognition and Problem Solving Ability in Working Dogs: The Importance of Reactivity and Information Use

*Karen Overall, University of Pennsylvania*

1450-1520 Break

1520-1540 Individual Differences in Canine Cognition and Performance as an IED Detection Dog

*Evan MacLean, Duke University*

1540-1600 Individual Differences in Distractibility of Dogs during a Visual Discrimination Task

*Hannah Wright, University of Lincoln, UK*

1600-1620 Handler-Dog Interface: The Effects of Handler's Controllability on the Performance of Canine in an Explosive Detection Task

*Avi Avital, Technion - Israel Institute of Technology*

1620-1655 Session Two: Question and Answer Session

1655-1715 Development of Novel Sampling and Detection Methods for Identifying Forensic Orodants Including the Use of Dogs, Birds and Elephants

*Kenneth Furton, Florida International University*

Wednesday, July 30, 2014

0730-0830 Registration and Continental Breakfast

*Session Three: Efficacy of Olfaction Training Aids*

*Session Chair: Don Roberts, United States Department of Homeland Security*

0830-0850 Odor Contamination Issues from Storage and Handling of Canine Training Materials

*Patricia Caldwell, Battelle*

0850-0910 Odor Delivery for Canine Training on Binary Explosives

*Lauryn DeGreeff, United States Naval Research Laboratory*

0910-0930 DHS S&T Development of Non-Hazardous, Non-Explosive Canine Training Aids for Peroxide Based Homemade Explosives (HME)

*Trang Vu, John Hopkins University Applied Physics Laboratory*

0930-0950 Training Canines to Detect TATP and HMTD

*Ludvik Pinc, University of Pardubice, CZ*

0950-1010 Session Three: Question and Answer Session

1010-1040 Break

*Session Four: Training Aids Measurement and Presentation*

*Session Chair: Susan Rose-Pehrsson, United States Naval Research Laboratory*

1040-1100 Towards Standard Training Aids: Metrology and Materials

*William MacCrehan, National Institute of Standards and Technology*

1100-1120 Real versus Simulant Explosive Scent Training Aids: A Comparison of Headspace Analysis Using GC-MS

*Mike Re, Signature Science, LLC*

1120-1140 Ultra-Sensitive Real-Time Vapor Detection for Characterizing Canine Training Aids

*Matthew Aernecke, MIT Lincoln Laboratory*

1140-1155 Session Four: Question and Answer Session

1155-1300 Working Lunch

*Session Five: Vapor Detection and Fluid Dynamics Modeling*

*Session Chair: Louis Wasserzug, CTTSO*

1300-1320 Real-Time Ultra-Trace Vapor Detection to Aid in Canine Training

*Roderick Kunz, MIT Lincoln Laboratory*

1320-1340 Using Fluid Dynamics Modelling to Aid Canine Training

*Timothy Foat, Defence Science Technology Laboratory*

1340-1400 ROVER: Software for Training and Analysis of Chemical Sensing Dogs

*Adam Moses, United States Naval Research Laboratory*

1400-1415            Session Five: Question and Answer Session

1415-1440            Break

*Session Six: Techniques, Systems, Strategies*

*Session Chair: Kevin Elliker, Defence Science Technology Laboratory*

1440-1500            Feedback from the Operational Field

*Simon Prins, Netherlands Police Agency*

1500-1520            A New Type of Detection Dog- The Biosurveillance Dog

*Allen Goldblatt, National Marine Mammal Foundation*

1520-1540    Teaching the Rules Governing Training Interactions: A Cognitive Approach to Canine Instruction

*Patrick Nolan, Tactical Directional Canine Systems, LLC*

1540-1600    Novel Techniques and Challenges in the Training of Dogs on an Olfactory Discriminations

*Clive Wynne, Arizona State University*

1600-1620            Session Six: Question & Answer Session

1620                    Adjourn

Thursday, July 31, 2014

0700-0800            Registration and Continental Breakfast

*Session Seven: Clinical Veterinary Topics*

*Session Chair: Ella Birch, Defence Science Technology Laboratory*

0800-0820    Chagas Disease: An Emerging Disease in Military Working Dogs

*Sean Majoy, Daniel E. Holland MWD Hospital*

0820-0840            Research Updates from Colorado State University

*Justin Mathis, Colorado State University*

0840-0900   Causes of Combat Mortality of Military Working Dogs in OIF and OEF,  
2007-2012: A Pilot Study of 109 Cases

*Laura Miller, United States Army Special Operations Command*

0900-0920   Pharmacodynamics and Pharmacokinetics Considerations of Drugs in  
Working Dogs: Heat, Exercise, Stress and Performance Enhancing Agents

*Cynthia Cole, Mars Veterinary*

0920-0940            Session Seven: Question and Answer Session

0940-1010            Break

*Session Eight: Relationship between Physiology, Olfaction, and Stress*

*Session Chair: Michael Hoglund, United States Office of Naval Research*

1010-1030   The Effects of Oral Metronidazole and Doxycycline Administration on  
Olfactory Detection Capabilities of Explosive Detection Dogs

*Eileen Jenkins, Auburn University*

1030-1050   Zinc Nanoparticles Facilitate Canine Detection of Explosives

*Vitaly Vodyanoy, Auburn University*

1050-1110            Canine Audiology: BAER Testing and Beyond

*Pete Scheifele, University of Cincinnati*

1110-1125            Session Eight: Question and Answer Session

1125-1230            Working Lunch

*Session Nine: Impact of Stress on Performance*

*Session Chair: Barbara Sherman, North Carolina State University*

1230-1250 Evaluation of Salivary Measures of Stress in Military Working Dogs

*Desiree Broach, Daniel E. Holland MWD Hospital*

1250-1310 Functional Imaging in Dogs Using SPECT and Pet Imaging Technologies: An Introduction to the Available Possibilities

*Kathelijne Peremans, University of Ghent, Belgium*

1310-1330 Evaluation of a Test for Emotional Reactivity in Labrador Retrievers Used for Explosives Detection

*Margaret Gruen, North Carolina State University*

1330-1345 Session Nine: Question and Answer Session

*Session Ten: Relationship of Physiology, Hydration and Thermal Burden*

*Session Chair: Robert Gillette, RMG Enterprises, Inc.*

1345-1405 The Effect of Dietary Protein Intake on Total Body Water and Water Turnover During Exercise

*Michael Davis, Oklahoma State University*

1405-1425 Thermal Strain Mitigation in Military Working Dogs

*Catherine O'Brien, United States Army Research Institute of Environmental Medicine*

1425-1445 Prehydration Strategies for Working Dogs

*Cynthia Otto, University of Pennsylvania*

1445-1505 Effects of a Ballistic Vest on Field Performance of Law Enforcement Canines

*Sarah Stojasih, Wayne State University*

1505-1525            Session Ten: Question and Answer Session

1525-1600            Break

1600-1800            Short Briefs and In Response

*Sharing of Research Ideas, Pilot Data, and Responses to Presentations*

*Chair: Paul Waggoner, Auburn University*

Have research ideas or pilot data that you care to share in a short, 10 minute or less, briefing? Have data or information relevant to a talk or just did not have time in session to fully discuss questions or comments you may have regarding a presentation?

1800                    Adjourn

Friday, August 1, 2013

0700-1500            Offsite Demonstration: K2 Solutions, Inc.

*K2 Solutions, Inc. located in Southern Pines, NC, will be organizing a Military Working Dog capability demonstration. Transportation to and from K2's Canine Facility will be provided.*

Appendix F: Schedule

CHEMICAL/BIOLOGICAL FILTRATION STRATEGIES AND MULTIFUNCTIONAL  
MATERIALS DEVELOPMENT WORKING GROUP

*21-22 October 2014*

*Arlington, VA*

Agenda

Tuesday, 21 October 2014

Time	Presenter	Topic
0700	<i>Registration &amp; Continental Breakfast</i>	
0800	Gregory Peterson	Welcome & Introduction
0830	Christopher Karwacki	Overview of FY14 Research - Multifunctional Materials for Force Protection
0900	Natalie Pomerantz	Utilizing Novel Material Concepts and Properties in Chem/Bio Garment Design
0930	<i>Break</i>	
0945	Omar Farha	Metal-Organic Frameworks
1015	Gregory Parsons	Absorptive and Reactive Surfaces Enabled by Atomic Layer Deposition
1045	Wayne Jones	Nanofibrous Photocatalysts, Sensors, and Multifunctional Materials
1115	Javier Arcibar-Orozco	Visible Light Enhanced Removal of Sulfur Mustard Gas Surrogate from a Vapor Phase on Novel Hydrated Ferric Oxide/Graphite Oxide Composites
1145	Group Discussion/Breakouts	
1200	<i>Working Lunch</i>	
1300	Christopher Karwacki	Catalyst Design Strategies
1330	Ivan Jordanov	Computational Studies - Metal Oxides
1400	Prashant Kamat	Graphene Oxide Based Multifunctional Catalyst Mat for Simultaneous Sensing and Degradation of Nitroaromatics

1430	<i>Break</i>	
1445	J. Karl Johnson	Adsorption, Diffusion, and Reaction of Gases in Functionalized Sorbents
1500	James Whitten	Correlating Adsorption with Fluorescence Changes of Metal Oxides and Metal Hydroxides
1530	Group Discussion/Breakouts	
1630	Adjourn	
1700	No-host Reception: A-Town (4100 Fairfax Drive, Arlington, VA)	

Wednesday, 22 October 2014

Time	Presenter	Topic
0700	<i>Registration &amp; Continental Breakfast</i>	
0800	Gregory Peterson	AP Nanostructured Materials For Individual Protection Overview & FY14 Accomplishments
0830	Peyman Moghadam	Computational Analysis and Screening of Materials for Capture of Toxic Compounds
0900	Hiroyasue Furukawa	New MOF Chemistry for Air Purification
0930	Jared DeCoste	Oxygen Storage
1000	<i>Break</i>	
1030	Krista Walton	Metal-Organic Frameworks for Ammonia Removal
1100	M. Douglas LeVan	Carbon Silica Composites and Other Biphasic Adsorbents for Air Purification

1130	<i>Working Lunch</i>	
1230	Brandy White	Functionalized Organosilicate Materials
1300	Matt Laskoski	Polymer-Supported Polyoxometalates for CWA Destruction
1330	Grant Glover	The use of Reactive Dyes as a Platform Technology to Attach Nanostructures to Fibers
1400	<i>Break</i>	
1415	Joseph Rossin	Zirconium Hydroxide and Its Applications in Chemical Filtration
1445	Gokhan Alptekin	Advanced Cartridge for Individual Protection Systems
1515	Group Discussion/Breakouts	
1530	Adjourn	

## Appendix G: Schedule

2014 Army ST and ARCIC S&T Division Discussion on Innovation

Agenda

December 17, 2014 Wednesday

0830 – Registration

0900 – Introductions and Goals

0930 – “Thoughts on Innovation” – COL Chris Cross

1000 – “Army Innovation” – Ms. Mary Miller, ASA(ALT), Deputy Assistant Secretary for Research and Technology

1100 – “Naval Innovation: Successes and Lessons Learned” - Dr. Larry Schuette,  
Director of

Research, ONR

1145 – “New opportunities for collaboration among federal agencies in global S&T  
engagement”

– Dr. Chuck Matson, Chief Scientist AFOSR

1230 – No host lunch - Rustico Restaurant

ST Innovation Talks

1330 – Dr. Richie Fong – ARDEC

1400 – Dr. Way Fountain – ECBC

1430 – Dr. Jaques Reifman - MRMC

1500 – Dr. Todd Bridges - ERDC

1530 – Break

1600 – Overview of break out groups and tasking for those groups

1630 – Brief meeting of each group

1700 – Break for Day

1830 – No- host group dinner at A-Town

December 18, 2014 Thursday

0800 – Registration

0830 – Comments from BG McPadden

0900 – Break-out groups meet addressing questions

1130 – Lunch (meeting of Facilitators)

1300 – Reconvene with presentation of break out group summaries/other opinions

1430 – Closing Remarks and Follow-On Actions

1500 – Meeting Close

Appendix H: Schedule

Canine Performance Training and Workshop 2015

*March 9-10, 2015*

*Anchorage, Alaska*

Time	Monday, March 9, 2015	Tuesday, March 10, 2015
8:00-8:30	Continental Breakfast & Registration	Continental Breakfast & Registration
8:30-9:30	Denis Marcellin-Little <i>Evidence-Based Medicine for Athletic Dog Injuries</i>	Ryne Olson <i>Managing Working Dogs in Remote Arctic Conditions</i>
9:30-10:30	Denis Marcellin-Little <i>Managing Osteoarthritis in Athletic Dogs</i>	Nina Hansen <i>Veterinary Care on the Trail of the Yukon Quest 1,000 Mile International Dog Sled Race</i>
10:30-10:45	Break	Break
10:45-11:45	Skip Scheifele <i>Canine Audiology Short Course Part 1</i>	Helen Zulch <i>How Science Can Help US Train Dogs More Effectively Part 1</i>
11:45-	Skip Scheifele	Helen Zulch

12:45	<i>Canine Audiology Short Course Part 2</i>	<i>How Science Can Help US Train Dogs More Effectively Part 2</i>
12:45-1:45	Working Lunch	Working Lunch
1:45-2:45	Jill Cline <i>What is the ideal macronutrient profile for the Military Working Dog?</i>	Mike Davis <i>Heat and Water Management in Working Dogs</i>
2:45-3:45	Chris Royer <i>Old and New Concepts in Athletic Conditioning of Dogs</i>	Mike Davis <i>Tolerance to Acute Exposure to High Altitude in Dogs</i>
3:45-4:00	Break	Break
4:00-5:00	Ken Furton <i>Effects of Environment on Odor Availability and Olfaction (tentative)</i>	Workshop Wrap-up

## Appendix I: Schedule

Systems Biology Quarterly Meeting

Validating Biomarkers to Objectively Diagnose PTSD

15-16 May 2017

Executive Conference Center, 4075 Wilson Blvd, Arlington, VA

Monday, 15 May 2017

8:00 - 8:30 Arrive and coffee/tea and snacks

8:30 – 9:00 Welcome and updates: Roadmap to advance development (Hoover)

9:00-9:30 Lists of studies which have/have not been completed for the 29/40 samples (Jett, Marmar, Doyle). Lists of submitted panels which could/could not be used due to above issues (Kelsey and Ruoting)

9:30- 1:30 Bioinformatics & Core Reports (25 minutes each core including discussion)

9:30 Introduction: (Doyle)

9:40 Kelsey reviews current panels

10:05 Routing reviews other aspects of panels

10:30 GWAS and relationships with other analytes (Ressler & Borek)

10:55 *Break (15 min)*

11:10 Metabolism/Metabolomics and Cell Aging (Wolkowitz, Mellon, Rajaram)

11:35 Proteomics (Hood)

12:00-12:00 LUNCH

1:00 Endocrine (Yehuda/Flory)

1:25- 2:00 Updates on Data Transfer and uploads by all cores to SysBioCube (Uma & Arsen)

2:00-2:25 Issues with medications, smoking and others. Are the selected panels able to identify PTSD cases and controls for such conditions (some are inherent for PTSD) (Marmar)

2:25- 2:50 Genomics- Hammamieh/Muhie/Aarti

2:50-3:10 Joint application for advanced development for future years and geared towards 6.3/6.4 + funding

Other sample sets and planning for those analyses (\$\$) and type of assay. (Jett will lead but all need to participate)

3:10-3:30 *Break*

3:30- 4:00 Updates on Publications

4:00-5:00 Discussion and Setting 2017 Goals (Marti, Ron, Charlie, Frank, Owen/Sindy, Kai, Janine)

Tuesday, 16 May 2017

Sessions will focus on integrating results and findings across cores for specific aspects of PTSD. If you have data related to these issues, please be prepared to present your findings. A discussion leader must be selected for each topic, but each core should contribute.

8:00 – 8:30 Arrive and coffee/tea

8:30-10:30 Working discussions to consider ideal attributes for biomarker panels.

Bioinformatics teams, Advanced development teams, All cores

10:30 – 10:45 Break

10:45-12:30 (either sequentially or with breakout groups, depending on time each group decides is needed)

a) Manuscripts and Pre-FDA submission documents (All)

b) Boot Camp: Integrating biomarker discovery-cross core findings (All)

## Appendix J: Schedule

Functional Genomic and Computational Assessment of Threats

(Fun GCAT) Program Kick Off

June 13 and 14 2017

The ECC at Liberty Center

Arlington, VA

Day 1

8:30–9:00 Registration

9:00–10:00 Welcome, Introductions, and Program Mechanics

John Julias, IARPA Fun GCAT Program Manager (9:00–9:25)

Program overview

Introduction of all participants (Performers, T&E teams, and IARPA SETA staff)

Fun GCAT organization and management

Kickoff meeting structure and components

Stephen Lee, ARO (9:25–9:45)

Roles and responsibilities

Lines of communication

9:45-10:00 Break

10:00–12:30 Technical Talks Session #1

Church Lab (10:00–10:45)

Break (10:45–11:00)

Silver Lab (11:00–11:45)

SRI International (11:45–12:30)

12:30–1:30 Lunch (on your own)

1:30–4:00 Technical Talks Session #2

Signature Sciences, LLC. (1:30–2:15)

Virginia Tech (2:15–3:00)

Break (3:00–3:15)

Battelle Memorial (3:15–4:00)

4:00–4:15 Closing Remarks

John Julias, IARPA Fun GCAT Program Manager

Day 2

8:30–9:00 Registration

9:00-9:15 Jason Matheny, IARPA Director

Welcome and IARPA overview

9:15–9:30 T&E Overview

John Julias, IARPA Fun GCAT Program Manager

9:30–10:30 T&E Team Lightning Talks

The Johns Hopkins University - Applied Physics Lab (9:30–9:45)

Pacific Northwest National Laboratory (9:45–10:00)

Lawrence Livermore National Laboratory (10:00–10:15)

Los Alamos National Laboratory (10:15–10:30)

10:30–10:45 Break

10:45–12:05 Performer Private Breakout Session #1

Church Lab (10:45–11:25)

Silver Lab (11:25–12:05)

12:05–1:00 Lunch (on your own)

1:00–4:00 Performer Private Breakout Session #2

SRI International (1:00–1:40)

Signature Sciences, LLC (1:40–2:20)

Break (2:20–2:40)

Virginia Tech (2:40–3:20)

Battelle Memorial (3:20–4:00)

Appendix K Schedule

ST Summer Study Kickoff 2017

ECC Freedom Room, 3rd Floor, 4075 Wilson Blvd, Arlington, VA 22203

27 June 2017

Time	Activity	Name
0800	Arrival / Registration* <i>Please make sure to pass your clearance if you will be attending the classified presentation at 0910</i>	

0900	Introductions	Dr. Augustus Fountain
0915	***** <b>CLASSIFIED</b> PRESENTATION***** Russian New Generation Warfare	Mr. Tom Pappas, TRADOC
1000	Break	
1015	National Training Center (NTC) Speed of Battle Drills; Briefing on NTC Battle Action Summaries	CPT Michael Culler, FORSCOM NTC
1115	U.S. Army Robotic and Autonomous Systems Strategy	Mr. Robert Bender, ARCIC
1200	Lunch	On your own
1300	Working Session	ALL
1545	Closing Remarks	Dr. Augustus Fountain

1900 No Host Dinner

28 June 2017

Time	Activity	Name
0830	Arrival and Registration	
0900	Task Development (STs only)	Dr. Robert Sadowski
1130	Lunch	On your own
1230	Timeline to Complete Study (STs only)	Dr. Robert Sadowski
1345	Wrap-up	Dr. Augustus Fountain
1400	Depart	

Appendix L: Schedule

Surface Science of Filtration/Decontamination Materials and Multifunctional Materials for Protection Science Review

6-7 September 2017 / Raleigh, NC

### Wednesday 6 September 2017

Time	Title	Presenter
0730-0815	Arrival and Registration	
0815-0830	Introduction/Overview	Drs. Chris Karwacki and Glenn Lawson
0830-0915	<i>In Operando</i> Mechanistic Studies Involving Reactions of CWA Simulants with Filtration/Destruction Materials	Prof. Bryan Eichhorn, University of Maryland
0915-1000	Multidisciplinary Research for the Advancement of Filtration Materials: <i>In Situ/Operando</i> Studies of Surface Reaction Mechanisms	Prof. John Morris, Virginia Tech
1000-1015	Break	
1015-1100	<i>In Operando</i> Surface Chemistry and Environmental Influences For CWA Reactivity	Dr. Pehr Pehrsson, Naval Research Laboratory
1100-1200	Metal Organic Frameworks for Protection	Prof. Omar Farha, Northwestern University
1200-1300	Lunch	Delivered on site
1300-1400	Discussion MOF/MO catalysts	Panelists
1400-1430	Plasmonic Properties of Aluminum Nanostructures for WMD Detection and Remediation	Prof. Naomi Halas, Rice University
1430-1500	Graphene-Based Assemblies for Sensing and Degradation of Hazardous Chemical Contaminants	Prof. Prashant Kamat, University of Notre Dame
1500-1515	Break	
1515-1545	Design, Synthesis And Characterization Of Hybrid Stratified Plasmonic Nanoparticle Materials For Detection And Destruction Of Chemical Agents	Prof. Karl Johnson, University of Pittsburgh
1545-1615	Plasmonic Cu Nanoparticles On Networked Mesoporous Oxide Supports For Sunlight-Assisted Decomposition Of CW Simulants And Live Agents	Dr. Jeremy Pietron, Naval Research Laboratory
1615-1715	Discussion on Photoactivated Materials: Catalysis/Sensing and Chemical Imaging	Panelists
1715	Adjourn	
1730-2000	Poster session (30 max) and no host social Location: Golf Course Club House	N/A