



# Human Systems Community of Interest (HS Col) Newsletter



Mar 2021

## HUMAN SYSTEMS Col



**Vision:** Develop & deliver technologies to enable, sustain, enhance and quantify human performance for measurably improved mission effectiveness

**Mission:** Enhance mission effectiveness through:

- 1) Integrated sims for mission training & experimentation
- 2) Human-machine designs for mission effectiveness,
- 3) Assessment of operator effectiveness
- 4) Operating through battlespace stresses, and
- 5) Mastering the PMESII battle space.

**Key Products:** Integrated service roadmaps; Col taxonomy, budget & programs; seedling and ARAP proposals, success stories and new collaboration opportunities.

**Website:** <https://defenseinnovationmarketplace.dtic.mil/communities-of-interest/human-systems/>

### Key Personnel:

**OSD Chair:** Dr. Ben Petro, OUSD (R&E)

**Col Chair:** Dr. Michelle Zbylut, Army Research Institute

**Navy Lead:** Dr. John Tangney, Office of Naval Research

**Air Force Lead (Acting):** Dr. Rajesh Naik, AF Research Lab

**Army Lead:** Dr. Corde Lane, Army Research Lab

**Army Lead:** Dr. Robb Wilcox, Army Research Lab

**SOCOM Rep:** Ms. Lisa Sanders, SOCOM

**WG Chair:** Dr. Kelly Ervin, Army Research Institute

**PAE&T Lead:** Dr. Kendy Vierling, Navy

**SI&CP Lead:** Dr. Mark Draper, Air Force Research Lab

**PSWP Leads:** Dr. Peter Squire, Office of Naval Research &  
Dr. Mike LaFiandra, Army Research Lab

## Hails & Farewells

**Farewell** - Dr. Kevin Geiss moved from Director of the Airman Systems Directorate under 711 Human Performance Wing, to S&T Director, Research, Technology, and Laboratories (OUSD (R&E)) replacing Mr. Dale Ormond. Dr. Geiss spent six years as Director, including two years Chairing our Col. Many thanks from us for your exceptional leadership, and we look forward to continuing to achieve significant Human Systems-related accomplishments together in your new oversight role with the DoD Communities of Interest.

**Feedback:** Please send comments to our Newsletter Editor: [Alan.Livada.ctr@us.af.mil](mailto:Alan.Livada.ctr@us.af.mil)

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Case Number: AFRL - 2021 - 0692, OPR: 711 HPW/RH



**Senior Leader Perspective:** Recent years have marked a revolution in the Army Acquisition process, with accelerated timelines and unconventional assessment methodologies providing our Soldiers with advanced technology development and fielding at a rate previously thought unachievable by large bureaucratically-driven organizations. Next-generation developments from vehicle systems to armaments, all within the backdrop of an historic global health threat in the form of the COVID-19 pandemic, have shown that the Army's scientific and engineering professionals are more than capable of such progressive agility. A main contributor to the process has been the early inclusion of human systems integration (HSI) in the acquisition cycle. The U.S. Army Combat Capabilities and Development Command's Data and Analysis Center (DEVCOM DAC), the newest multidisciplinary scientific, data and analytic Center within Army Futures Command, has been leading the way with its unique HSI analytical capabilities.

DEVCOM DAC's tripartite HSI mission is characterized by scientific analysis and technology development directed toward 1) optimizing Soldier performance, Soldier-system interaction, and training technology effectiveness, 2) human factors engineering to ensure that Soldier performance requirements are considered during development and design, and 3) data-driven decision recommendations and technology transitions to partners in the acquisition process. These key partners include those within academia, the DEVCOM Centers and Laboratories, our tri-service partners, industry, Cross Functional Teams, and our acquisition Program Managers. Army Senior Leaders have come to rely on this integrated approach to accelerate solid technology decisions that give our Warfighters the battlefield advantage.

The scientists, engineers, and analysts at DEVCOM DAC's HSI Division have long held the perspective that the Warfighter is paramount in the technology design process for military systems. Along with the broader human systems community of practice, we have compellingly fostered Soldier-centered design as the basis for sensible, efficient, and effective technology development for decades, and have not eschewed the inherent complexity that is characteristic to this viewpoint. It is energizing to see what the future holds as we design for our most valuable military assets: our human systems. **Dr. Tom Davis, Data & Analysis Center, Col Steering Group Member.**



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## Col Highlights - Past Events

**AFRL Biotech Days.** The 2<sup>nd</sup> annual AFRL Biotech Days was held virtually on 9-10 February to foster crosstalk within the AFRL biotech community. The event was hosted by the AFRL Biotech Community of Practice and led by Dr. Rajesh Naik of 711 HPW. It was a great opportunity for the community to search for collaboration and share resources. The agenda included technical talks as well as a fireside chat where thought leaders, including Dr. Michelle Roza, Principle Director of Biotech Modernization, Dr. Alexander Titus of Google, Dr. Dianne DiEuliis of NDU, Dr. Peter Emmanuel of the US Army Futures Command, and Dr. Justin Gallivan, AFRL Systems Biology ST, all shared their perspectives on the future of biotechnology research in the DoD. On the second day of the event, the AFRL biotechnology grand challenge topic authors and awardees briefed their topics and research plans for the three \$1M projects.

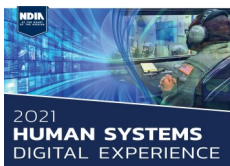
POC: Dr. Jill McQuade, 711 HPW, [jill.mcquade@us.af.mil](mailto:jill.mcquade@us.af.mil)

### Applied Research for the Advancement of S&T Priorities (ARAP) FY21 Data Call.

Our candidate was authored by Dr. Gaurav Sharma of 711 HPW, titled "Neurotechnology to Optimize Joint Warfighter-Agent Decision Making". Unfortunately, our proposal wasn't one of the four down-selected by OSD in late February. Presentations to the S&T EXCOM and announcement of the winner are TBD. Cols can request feedback if not selected. The HS Col greatly appreciates everyone's effort to nominate excellent candidates! POC: Katie Stilling, Strategic Analysis, [kstilling@sainc.com](mailto:kstilling@sainc.com)

| Major Annual Events/Activities 2021                   |         |
|---|---------|
| Reliance 21 Annual Overview<br>-- Now TBD Spring 2021 | Jan     |
| NDIA Human Systems Conference                         | Mar     |
| ARAP Winner Announced                                 | Apr/May |
| Seedling Proposal Data Call                           | Jun     |
| Independent R&D (IR&D) TIM<br>w/ Industry             | Jun     |
| COI Steering Group/All Hands Meeting                  | Sept    |
| Roadmap Review w/OUUSD (R&E)                          | Oct     |
| Human Factors Engineering TAG                         | Nov/Dec |
| I/ITSEC   | Nov/Dec |

## Col Highlights - "Next Up"



**NDIA Human Systems Conference.** This year, the NDIA Human Systems Division is holding a 2021 Human Systems Digital Experience throughout the month of March, with a part-day webinar on each Tuesday of the month. The event's focus on Maximizing Human Readiness is structured into "bite sized" collaborative sharing events to fit more easily into your schedule, while also covering all topics typically discussed during the traditional two-day Human Systems Conference.

**Where Hosted:** The event will be on GoToWebinar and Zoom.Gov.

**Registration:** [NDIA.org/Events/2021/3/2/2021-Human-Systems-Digital-Experience/Registration](https://ndia.org/Events/2021/3/2/2021-Human-Systems-Digital-Experience/Registration).

### Webinar Topics:

*March 2: Col Panel on Strategic Directions and Opportunities*

*March 9: Personalized Assessment, Education, & Training*

*March 16: Protection, Sustainment, and Warfighter Performance*

*March 23: Systems Interface and Cognitive Processing*

*March 30: Advocacy and Metrics*

All sessions run from 1100 – 1400 each Tuesday. We'll incorporate presentations from experts in the field and roundtable discussions with government, industry, and academia representatives to discuss key challenges and opportunities in accelerating human systems capabilities and impacts. Digital posters submitted for presentation will be available in an on-demand format throughout the month for participants to review and discuss. We look forward to seeing you online in March! Visit [NDIA.org/HSDE](https://ndia.org/HSDE) to learn more about this event. POCs: NDIA HSC Chair - Jim McCarthy, Sonalysts, Inc. at [mccarthy@sonalysts.com](mailto:mccarthy@sonalysts.com) and Dr. Kelly Hale of Draper as Deputy Chair at [khale@draper.com](mailto:khale@draper.com)

**Reliance 21 Annual Overview.** Originally scheduled for late January, the meeting was moved to a TBD date in April with the Col meeting to follow in late spring/early summer. POC: Katie Smith Stilling, Strategic Analysis, Inc., [kstilling@sainc.com](mailto:kstilling@sainc.com)

**HS Col Independent Research & Development (IR&D) TIM:** Scheduled for 21-25 Jun, the TIM's purpose is to jointly review industry IR&D efforts for potential collaboration with the government. We're co-hosting with the Bio-Medical and Biotechnology Cols and have improved our process by providing more details about Col key interest areas to assist industry in determining their best candidates. We look forward to a great event!

The announcement is posted at <https://beta.sam.gov/opp/edee3eda632a4f3da74b137ee5b10ad1/view>.

POC: Al Livada, 711 HPW, [alan.livada.ctr@us.af.mil](mailto:alan.livada.ctr@us.af.mil)



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## From Our Stakeholders and Partners (Cont'd)

**Human Performance Research Network (HPRnet) Symposium.** Held December 10 - 11 by Australia's Defence Science and Technology Group (DSTG), the Symposium highlighted their HPRnet program which is comprised of roughly 20 four-year university research efforts funded by DSTG's Next Generation Technologies Fund and the Australian Army, plus four 18-month grants funded by the US Office of Naval Research Global (ONR-G) and the U.S. Army Combat Capabilities Development Command Indo-Pacific (DEVCOM Indo-Pacific). HPRnet establishes a multidisciplinary network of university researchers across Australia connected to Defense stakeholders and focuses on advances in human performance as it relates to national defense. The coordination between funding organizations in the US and Australia serves to strengthen the ties between these scientific communities and creates new opportunities for collaboration and innovation. The HPRnet Symposium was held in conjunction with the Defence Human Sciences Symposium (DHSS), which covers a wide range of human performance/human systems research projects.

More about the HPRnet at: <https://www.dst.defence.gov.au/event/hprnet-symposium-2020>.

More about DHSS at: <https://www.dst.defence.gov.au/event/defence-human-sciences-symposium-2020>.

POC: Dr. Ben Knott, Science Director, Office of Naval Research Global, Tokyo , [benjamin.a.knott2.civ@mail.mil](mailto:benjamin.a.knott2.civ@mail.mil)

**Military Standard 1472H: DoD Design Criteria Standard for Human Engineering.** As of September 15, 2020, human factors engineers and human systems integrators now have an updated DoD design criteria standard they can use for human engineering. In 2012, Military Standard 1472G was the first revision in twenty years for the human engineering design criteria standard and there were significant gaps reviewers could not entirely address at that time.

More recently, Naval Sea Systems Command – NAVSEA 05W led the effort to address previous gaps and incorporate newer revisions for MIL-STD-1472H. For example, reviewers updated the standard to align with guidance within Secretary Ashton Carter's 2015 memo, "Implementation Guidance for the Full Integration of Women in the Armed Forces." Reviewers updated the strength and anthropometry sections to incorporate female data. Roughly 30 organizations participated in the review process which adjudicated over 1,000 comments for intermediate review and over 500 comments for final review.

Visit the DoD standards repository ASSIST online: [https://quicksearch.dla.mil/qsDocDetails.aspx?ident\\_number=36903](https://quicksearch.dla.mil/qsDocDetails.aspx?ident_number=36903) to download MIL-STD-1472H.

POC: Dr. Liana Algarín, OSD, [liana.m.algarin.ctr@mail.mil](mailto:liana.m.algarin.ctr@mail.mil)

**Cutting Edge Conversations with the ADL Initiative Webinar Series.** HS Col members are invited to participate in the ADL Initiative Technical Webinar Series, a collection of live and pre-recorded webcasts that spotlight advances in distributed learning and related technologies. This series provides an opportunity to learn about ADL Initiative projects and how they may benefit your organization. The webinars feature ADL Initiative subject-matter experts, along with guest speakers from the education and training community.

Mark your calendar: 1400-1500, April 21 Webinar. HS Col members are invited to learn about the ADL Initiative's Science of Learning and Readiness (SOLAR) project, which is of particular interest to human systems community. SOLAR has identified best practices for the design, delivery, and management of distributed learning through an evidence-based examination of technologies implemented throughout public and private sector organizations. The ADL Initiative has assisted the application of these best practices with support from the Defense Acquisition University (DAU). The webinar will include a walkthrough of how DAU courses were refined to meet the emerging needs of the institution's learning population.

Register online: <https://adlnet.gov/resources/webinars/> and find more about SOLAR at <https://adlnet.gov/projects/solar/>.

Check out the Webinar Archive: Several informative webinars are accessible on-demand at [ADLnet.gov](https://adlnet.gov). Members of the HS Col are encouraged to check out "The Danish Army NCO Academy's Use of Lightweight Simulation Before Field Training", which includes a demonstration on how students interact with a simulator and how feedback is provided to the students.

Also available in the archive is the ADL Initiative NILE project webinar, which focuses on optimizing a learner's journey. NILE "locates" learners based on their knowledge, and uses standards-compliant interoperable learning content and tools to create personalized adaptive learning pathways. POC: [outreach@adlnet.gov](mailto:outreach@adlnet.gov)





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## From Our Stakeholders and Partners


**Public Review for Human Readiness Levels.** The OUSD(R&E) Human Systems Directorate (HSD) is focused on helping position the DoD HSI community to enable DoD modernization objectives. To this end, HSD encourages DoD Research, Development, and Acquisition (RDA) stakeholders to expand the HSI toolkit by standardizing, formalizing, and facilitating adoption of Human Readiness Levels (HRLs) for use across the DoD RDA Enterprise.

The public is invited to review the proposed standard on HRLs at <https://www.hfes.org/Publications/Technical-Standards/HFES400> or email [HFES400@hfes.org](mailto:HFES400@hfes.org). You're invited to comment on the draft HFES 400 Standard- HRL Scale in the System Development Process, and can submit via either the online submission form or by completing the Word document and emailing it to [HFES400@hfes.org](mailto:HFES400@hfes.org). Comments will be accepted until 11:59 PM EDT on Thursday, March 18, 2021.

POC: Dr. Liana Algarín, OSD, [liana.m.algarin.ctr@mail.mil](mailto:liana.m.algarin.ctr@mail.mil)

## Col Accomplishments

**Applying Space Human-Centered Tools to Joint All-Domain C2 (JADC2).** A recently completed Joint Emergent Operational Need (JEON) for Space Command and Control (C2) resulted in the transition of several technologies, including two user-centered software products initiated by 711 HPW. These tools are now being investigated for JADC2 on an AFRL research effort involving Airman Systems, Space Vehicles, and Information Directorates. The Space Defense Characterization and Control System (SDCCS) software provides interactive visualizations leveraging automated indications and warnings to identify threats to space-based services. In addition to space, SDCCS has already been used operationally for air, cyber, and maritime operations.



|          | Threat type | Impact        | Urgency       | Certainty    | Score |
|----------|-------------|---------------|---------------|--------------|-------|
| Source 1 | Cyber 1     | Med<br>34/40  | High<br>43/45 | Med<br>10/15 | 87    |
| Source 2 | Space 1     | High<br>57/40 | Med<br>36/45  | Med<br>9/15  | 82    |
| Source 3 | Maritime 1  | Med           | Low           | High         | 65    |
|          | Space 2     | Low           | Med           | High         | 60    |
|          | Air 1       | Med           | Low           | Low          | 40    |

The other JEON transition, C Portal, provides a prioritized situation summary with input from automated C2 tools and other sources. C Portal was inspired by a commander who noted C2 systems are primarily focused on specific tasks, but do not provide the higher-level understanding needed by leadership. After drafting visualization concepts, newspapers ultimately provided the inspiration with the time-proven approach of sizing headlines and graphics relative to their priority. In addition to the newspaper-inspired visual layout, C Portal innovations include (1) automatic headline wording that balances user understanding and character count and (2) priority scoring from heterogeneous sources using impact to the mission, urgency of the response, and certainty of the intelligence including trust of the sources. With the standup of U.S. Space Force and the all-domain dependencies on space, the need to integrate space into the JADC2 operational picture will continue to be critical so joint collaborations are welcomed. POC: John Ianni, 711 HPW, [john.ianni@us.af.mil](mailto:john.ianni@us.af.mil)

**Office of Naval Research Future Integrated Training Environment (FITE).** FITE was developed to allow disparate simulator entities and models to effectively and efficiently interact with one another in both real time and in a correlated synthetic environment.

**Challenge:** Provide a robust and efficient capability that allows the integration and interoperability of legacy, current, and future USMC training information technology assets to enhance warfighter capability.



### Accomplishments:

- Created tool set providing a robust user interface enabling instructors to configure and deploy USMC training exercises from a simple to understand web browser
- Smart adapters enabling pair-wise coupling of simulations through an adjudicator, facilitating optimal interoperability
- Developed FITEware enabling interoperability with legacy simulation applications without requiring them to be modified by the original simulation vendor
- Held multiple demonstrations of FITE capabilities across USMC including Live Virtual Constructive Training Environment (LVC-TE), Marine Aviation Weapons and Tactics Squadron One (MAWTS-1), Expeditionary Warfare Training Group Pacific and Atlantic (EWTGPAC, EWTGLANT), Marine Corps Systems Command's Program Manager for Training System (PM TRASYS), and 29 Palms Battle Sim Center

POC: Dr. Peter Squire, ONR, [peter.squire@navy.mil](mailto:peter.squire@navy.mil)



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## Col Accomplishments (Continued)

**711 HPW Accomplished AMC A1 Priority Safe-to-Fly Outcome for C-17 SPO for Proposed Restraint Method.** 711 HPW researchers collaborated with the Aeromedical Test Lab (ATL) to accomplish multiple Horizontal Impulse Accelerator (HIA) runs, which will help enable a safe-to-fly outcome for C-17 Program Office on proposed restraint method for three pieces of equipment. The team ran tests on the HIA in two spatial directions to determine if restraint methods were sufficient in the event of a crash. Currently, medical personnel fly with medical bulk bags up to 52lbs which current restraint methods cannot handle. Through research and testing, the new proposed tie-down technique has been shown to restrain the medical bulk bags and allow for an additional 10lbs to be added to the bag, if necessary. Approval for the other two devices will be accomplished through later testing on 711 HPW's Vertical Deceleration Tower.

POC: Ben Steinhauer, 711 HPW, [benjamin.steinhauer.1@us.af.mil](mailto:benjamin.steinhauer.1@us.af.mil)

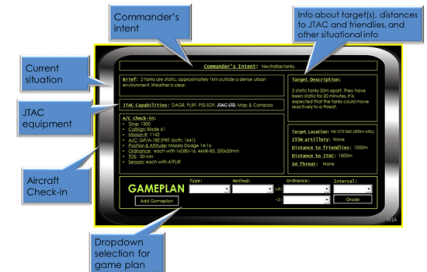
### Joint Terminal Attack Controllers Adaptive Trainer (JTAC AT)

**Challenge:** Provide a scenario-based adaptive training testbed for JTAC game plan development that tailors instruction to an individual trainee by adapting scenario difficulty and feedback based on the trainee's performance.

#### Accomplishments:

- Developed Adaptive Training for Joint Terminal Attack Controller (ATTAC). Currently, there are over 90 scenarios across three levels of difficulty: basic (35 scenarios), intermediate (36 scenarios), and advanced (23 scenarios).
- ATTAC provided error-specific feedback, which matched a student's acceptable response to the closest possible ideal answer to deliver targeted feedback for improvement
- ATTAC prototype is being evaluated at 10th Marine Regiment for use in TACP Primer Course
- Trainees showed big learning gains (avg 22% improvement from pre- to post-test) after as little as 35 minutes of training

POC: Dr. Peter Squire, ONR, [peter.squire@navy.mil](mailto:peter.squire@navy.mil)



**AFRL Delivers COVID Patient Surge Monitoring Capability to 88th Medical Group (MDG).** 711 HPW's Battlefield Assisted Trauma Distributed Observation Kit (BATDOK) team rapidly answered request for support by the 88th MDG combating Covid. Within 40 hours, the BATDOK capability was delivered, setup, and in use at the 88th MDG's Medical Surgical Unit expanding their real-time COVID health status monitoring abilities prepping for patient surge conditions. BATDOK team members working in coordination with 88th MDG leadership executed onsite installation and just-in-time training of BATDOK to medical staff earning great appreciation from the MDG leadership.

POC: Dr. Gregory Burnett, 711HPW/RH, [gregory.burnett.1@us.af.mil](mailto:gregory.burnett.1@us.af.mil)

**AFRL Researchers Detect SARS-CoV-2 in Wastewater Samples from Multiple Air Force Bases (AFBs).** 711 HPW researchers pivoted established protocols to detect and predict SARS-CoV-2 at four AFBs. They led the WASTEWATER arm of this study to enable case spike prediction using population level assessment of SARS-CoV-2 in wastewater and worked with the Air Force COVID-19 Wastewater Working Group, the Air Force Medical Support Agency and representatives from numerous CONUS bases. Four bases, including Wright Patterson AFB, provided samples to aid in protocol development for the WASTEWATER arm and SARS-CoV-2 was detected in samples from all four, although not from every sample site. Unsurprisingly, samples taken from wastewater flows downstream of base hospitals were positive. 711 HPW's SARA CoV-2 assessment equipment is the most sensitive in the Air Force and the team received requests from the Working Group to validate those on-site detection systems currently deployed. This study highlights 711 HPW's ability to respond to a direct demand signal from AF bases nationwide. POC: Michael Goodson, 711 HPW/RH, [michael.goodson.4@us.af.mil](mailto:michael.goodson.4@us.af.mil)



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## Publications/Articles

**Smell and Taste Dysfunction in Patients With COVID-19.** Sudden-onset anosmia (loss of smell) is highly specific as a sentinel indicator of infection with COVID-19, the causative agent of SARS-CoV-2. The precise manner in which the olfactory system is impaired and what that may mean for the entire neurological system has yet to be fully elucidated. A definitive link between chronic or permanent olfactory impairment and future neurologic debility is suspected, but cannot be made at this time. Our research strongly suggests that blocking transmission of SARS-CoV-2 virus between individuals must be a priority.

Authors: *Michael S Xydakis, Puya Dehgani-Mobaraki, Eric H Holbrook, Urban W Geisthoff, Christian Bauer, Charlotte Hautefort, Philippe Herman, Geoffrey T Manley, Dina M Lyon, Claire Hopkins*

Published online April 15, 2020 at The Lancet, Infectious Diseases, [https://doi.org/10.1016/S1473-3099\(20\)30293-0](https://doi.org/10.1016/S1473-3099(20)30293-0)

POC: Col Michael Xydakis, 711 HPW, [michael.xydakis@us.af.mil](mailto:michael.xydakis@us.af.mil)

**711 HPW and USAFSAM Collaborate to Identify and Publish “Alternatives to Viral Transport Medium for use in SARS-CoV-2 Sample Preparation.”** 711 HPW collaborated with USAFSAM onsite over the summer of 2020 to investigate issues with the Center for Disease Controls’s Viral Transport Medium and identify solutions. The results offer an alternative to the transport options outlined in many Emergency Use Authorizations (EUA) currently authorized for use in diagnostic testing and may be used for possible long-term storage solutions for studies investigating SARS-CoV-2.

Authors: *Chapleau RR, Fries AC, Lisanby MW, Rhode MG, Salisbury R, Starr CR*

Published 16 Dec. 2020: Alternatives to Viral Transport Medium for use in SARS-CoV-2 Sample Preparation, 14(12), LC07-LC10. <https://www.doi.org/10.7860/JCDR/2020/45218/14315>.

POC: Dr. Richard Salisbury, 711 HPW, [richard\\_jr.salisbury@us.af.mil](mailto:richard_jr.salisbury@us.af.mil)

**Quantification of Interlaboratory Cell-Free Protein Synthesis Variability.** Cell-free protein synthesis (CFPS) platforms, once primarily a research tool to produce difficult to express proteins, are increasingly being pursued by the synthetic biology community for applications including bio-manufacturing, rapid screening systems, and field-ready sensors. While consistency within individual studies is apparent in the literature, challenges with reproducing results between laboratories, or even between individuals within a laboratory, are discussed openly by practitioners. As the field continues to grow and move toward applications, a quantitative understanding of expected CFPS variability and the relative contribution of underlying sources will become increasingly important.

The research offers the first quantitative assessment of inter-laboratory variability in CFPS. Three laboratories implemented a single CFPS protocol and performed a series of exchanges, both of material and personnel, designed to quantify relative contributions to variability associated with the site, operator, cell extract preparation, and supplemental reagent preparation. It is anticipated assessment results will narrow future avenues of investigation to develop best practices that will ultimately drive down inter-laboratory variability, accelerating research progress and informing the suitability of CFPS for real-world applications.

Authors: *Stephanie D. Cole, Kathryn Beabout, Kendrick B. Turner, Zachary K. Smith, Vanessa L. Funk, Svetlana V. Harbaugh, Alvin T. Liem, Pierce A. Roth, Brian A. Geier, Peter A. Emanuel, Scott A. Walper, Jorge L. Chávez, and Matthew Lux*

Published ACS SyntheticBiology in Aug 2019 at <http://pubs.acs.org/action/showCitFormats?doi=10.1021/acssynbio.9b00178>

POCs: Dr. Jorge Chavez, [jorge.chavez\\_benavides.2@us.af.mil](mailto:jorge.chavez_benavides.2@us.af.mil) or Mr. Brian Geier, [brian.geier.2@us.af.mil](mailto:brian.geier.2@us.af.mil), both 711 HPW.



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## Publications/Articles (Cont'd)

**Pre-stimulus brain state predicts auditory pattern identification accuracy.** Recent studies show that pre-stimulus band-specific power and phase in the electroencephalogram (EEG) can predict accuracy on tasks involving the detection of near-threshold stimuli. However, results in the auditory modality have been mixed, and few works have examined pre-stimulus features when more complex decisions are made (e.g. identifying supra-threshold sounds). Further, most auditory studies have used background sounds known to induce oscillatory EEG states, leaving it unclear whether phase predicts accuracy without such background sounds. To address this gap in knowledge, the present study examined pre-stimulus EEG as it relates to accuracy in a tone pattern identification task. In the context of the literature, findings suggest an important relationship between the complexity of task demands and pre-stimulus activity within the auditory domain. Results also raise interesting questions about the role of induced oscillatory states or rhythmic processing modes in obtaining pre-stimulus effects of phase in auditory tasks.

Authors: *Natalie E. Hansen, Assaf Harel, Nandini Iyer, Brian D. Simpson,, Matthew G. Wisniewski*

Published in NeuroImage <https://doi.org/10.1016/j.neuroimage.2019.05.054>

POC: Dr. Brian Simpson, 711 HPW, [brian.simpson.4@us.af.mil](mailto:brian.simpson.4@us.af.mil)





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## Col Contact Information

### Human Systems Col – STEERING GROUP MEMBERS

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|---------------------|--|----------------------|--|
| Army<br>(Col Chair) | Director, Army Research Institute (ARI)  | Dr. Michelle Zbylut  | <a href="mailto:michelle.l.zbylut.civ@mail.mil">michelle.l.zbylut.civ@mail.mil</a> |
| AF (Acting)         | Chief Scientist, Airman Systems Directorate<br>711 <sup>th</sup> Human Performance Wing (711 HPW), Air<br>Force Research Laboratory (AFRL) | Dr. Rajesh Naik      | <a href="mailto:Rajesh.naik@us.af.mil">Rajesh.naik@us.af.mil</a>                   |
| Army<br>(Lead)      | Director, Human Research and Engineering<br>Directorate (HRED) - Army Research Labs (ARL)  | Dr. Jason Corde Lane | <a href="mailto:Jason.c.lane8.civ@mail.mil">Jason.c.lane8.civ@mail.mil</a>         |
| Navy (Lead)         | Division Director, Human & Bioengineered Sys,<br>Code 341, Office of Naval Research (ONR)  | Dr. John Tangney     | <a href="mailto:john.f.tangney@navy.mil">john.f.tangney@navy.mil</a>               |
| SOCOM               | Director, SOF AT&L Science & Technology  | Ms. Lisa Sanders     | <a href="mailto:lisa.Sanders@socom.mil">lisa.Sanders@socom.mil</a>                 |
| Navy                | Dept Head, Warfighter Performance, Code 34, ONR  | Dr. Patrick Mason    | <a href="mailto:patrick.mason@navy.mil">patrick.mason@navy.mil</a>                 |
| Army                | Director, Soldier Performance and Optimization<br>Directorate, US Army Combat Capabilities<br>Development Command Soldier Center (CCDCSC)  | Dr. Robb Wilcox      | <a href="mailto:robb.c.wilcox.civ@mail.mil">robb.c.wilcox.civ@mail.mil</a>         |
| Army                | Data & Analysis Center   | Dr. Thomas Davis     | <a href="mailto:thomas.w.davis.civ@mail.mil">thomas.w.davis.civ@mail.mil</a>       |
| OUUSD(R&E)          | Director, Human Systems Directorate (HSD)  | Dr. Ben Petro        | <a href="mailto:james.b.petro.civ@mail.mil">james.b.petro.civ@mail.mil</a>         |

### Human Systems Col – HSD SUPPORT

|            |   |                      |  |
|------------|---|----------------------|--|
| OUUSD(R&E) | Contractor Support (Strategic Analysis) | Dr. Laura Kallal     | <a href="mailto:laura.m.kallal.ctr@mail.mil">laura.m.kallal.ctr@mail.mil</a>         |
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## Human Systems Col – SUB-AREA LEADS & MEMBERS

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## Human Systems Col – SUB-AREA LEADS & MEMBERS

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