

# Day 1 (Friday, April 14)

8:50-	<b>Registration</b>	
9:20-9:30	<b>Opening Remarks</b>	
	Michael J. Leggieri, DoD Blast Injury Research PCO, USAMRMC (USA) Daizoh Saitoh, Div. of Traumatology, NDMC Research Institute (Japan)	
	<b>Session 1: Blast Injury Medical Research Programs</b>	
	<i>Chair</i> Michael J. Leggieri, DoD Blast Injury Research PCO, USAMRMC (USA)	
9:30-9:55	<b>Military operational medicine research program overview (Invited)</b>	-17-
	Richard Shoge MOMRP, USAMRMC (USA)	
9:55-10:15	<b>Introduction of a blast tube established at National Defense Medical College (Invited)</b>	-19-
	Daizoh Saitoh Div. of Traumatology, NDMC Research Institute (Japan)	
	<b>Session 2: Defense, Protection and Assessments for CBRNE Threats</b>	
	<i>Chair</i> Raj K. Gupta, DoD Blast Injury Research PCO, USAMRMC	
10:15-10:40	<b>Current research status of CBRN Defense Technology Division (Invited)</b>	-21-
	Masaki Takeda Advanced Defense Technology Research Center, ATLA (Japan)	
10:40-10:55	<b>Coffee Break</b>	
10:55-11:20	<b>JMOD/GSRC activities in soldier protection against blast and ballistic threat (Invited)</b>	-23-
	Keisuke Fujii Ground Systems Research Center, ATLA (Japan)	
11:20-11:35	<b>CBRN threat assessment system - For hazard prediction and assessment</b>	-25-
	Akihiro Maeno Advanced Defense Technology Research Center, ATLA (Japan)	
11:35-12:00	<b>Are spectacles and goggles effective against blast overpressure? (Invited)</b>	-27-
	Jaques Reifman U.S. Army Medical Research and Materiel Command (USAMRMC) (USA)	
12:00-13:05	<b>Lunch</b>	
	<b>Tutorial 1</b>	
	<i>Chair</i> Shunichi Sato, NDMC Research Institute	
13:05-13:45	<b>Clinical aspects of traumatic brain injury</b>	-29-
	Masaru Mimura Keio University School of Medicine (Japan)	
	<b>Session 3: New Insights into Blast-induced Traumatic Brain Injury</b>	
	<i>Chair</i> Yasushi Kobayashi, NDMC	
13:45-14:10	<b>Blast-induced traumatic brain Injury displays a unique pattern of spatial neuropathology (Invited)</b>	-31-
	Namas Chandra New Jersey Institute of Technology (USA)	
14:10-14:25	<b>Temporal sequence of disruption in blood-brain barrier integrity after exposure to blast-associated shock wave</b>	-33-
	Kiyomasa Nishii Dept. of Anatomy and Neurobiology, NDMC (Japan)	
14:25-14:40	<b>Development of neutrophil imaging method for brain damage of mice injured by a blast tube</b>	-35-
	Yuji Morimoto Dept. of Integrative Physiology and Bio-Nano Medicine, NDMC (Japan)	

## Day 1 (Friday, April 14) - cont'd -

14:40-14:55 **Coffee Break**

### **Keynote 1**

*Chair* Nariyoshi Shinomiya, NDMC Research Institute

14:55-15:35 **Decoded neurofeedback and its possible application to PTSD therapy** -37-

Mitsuo Kawato

Advanced Telecommunications Research Institute International (Japan)

### **Session 4: PTSD and Behavior Impairment Relating to Mild Blast-induced TBI**

*Chair* Satoshi Tomura, NDMC Research Institute

15:35-16:00 **PTSD-related behavioral traits in a rat model of blast-related mTBI are reversed by the mGluR2/3 receptor antagonist BCI-838** (Invited) -39-

Georgina Perez-Garcia

Icahn School of Medicine, Mount Sinai, NY (USA)

16:00-16:25 **A novel mouse model of mild blast-induced traumatic brain injury** (Invited) -41-

Satoshi Tomura

Div. of Traumatology, NDMC Research Institute

### **Session 5: Traumatic Wound Infections**

*Chair* Satoshi Tomura, NDMC Research Institute

16:25-16:50 **Progress toward new antibacterial therapeutics for military traumatic wound infections** (Invited) -43-

Daniel Zurawski

Walter Reed Army Institute of Research (USA)

16:50

### **Wrap Up**

17:30-

### **Get-Together (Reception)**

## Day 2 (Saturday, April 15)

### Session 6: Basics and Mechanism of Primary Blast Injuries (cont'd)

- 9:00-9:25 **Primary, repeated blast-induced mild traumatic brain injury; short and long term molecular and structural changes** (Invited)  
Denes V. Agoston  
U.S. University of Health Sciences (USA)
- 9:25-9:50 **Pulmonary injuries and systemic disruptions in rats in response to repeated daily exposures to blast overpressure** (Invited)  
Venkatasivasai Sujith Sajja  
Walter Reed Army Institute of Research (USA)
- 9:50-10:15 **Characterization of blast shockwave effects on auditory function in rodents** (Invited)  
Ying Wang  
Walter Reed Army Institute of Research (USA)
- 10:15-10:40 **Intracellular Ca<sup>2+</sup> increase evoked by shock wave irradiations** (Invited)  
Akira Tsukamoto  
Department of Applied Physics, National Defense Academy (Japan)
- 10:40-10:55 **Coffee Break**

### Session 7: Sensing and Imaging

- 10:55-11:20 **Synthesis and characterization of mixed protein templated fluorescent nanoclusters for imaging and pressure sensing** (Invited)  
Nile Bunce  
U.S. Army Research Laboratory (ARL) (USA)
- 11:20-11:45 **Protein-templated fluorescent nanoclusters for pressure-sensing and imaging** (Invited)  
Rebecca E. Jimenez  
U.S. Army Research Laboratory (ARL) (USA)
- 11:45-12:10 **In vivo imaging of cerebral tissue oxygen saturation and blood volume based on diffuse reflectance spectroscopy** (Invited)  
Izumi Nishidate  
Graduate School of Bio-applications and Systems Engineering, Tokyo University of Agriculture and Technology (Japan)
- 12:10-13:10 **Lunch**

### Session 8: Physics of Shock Wave and Its Interaction

- 13:10-13:35 **Blast-induced motion from diffraction phase loading** (Invited)  
Stephen Van Albert  
Walter Reed Army Institute of Research (USA)
- 13:35-14:00 **Blast-like strong shock generation by using detonation-driven shock tube for fundamental study on blast injury** (Invited)  
Toshiharu Mizukaki  
Dept. of Aeronautics and Astronautics, Tokai University (Japan)
- 14:00-14:25 **Explosive-induced shock wave propagation phenomena in the simulated biomedical materials** (Invited)  
Kiyonobu Ohtani  
Institute of Fluid Science, Tohoku University (Japan)
- 14:25-14:40 **Stress propagation in bio-tissue simulat under blast loading**  
Sho Ikeda  
Ground Systems Research Center, ATLA (Japan)
- 14:40-14:55 **Coffee Break**

## Day 2 (Saturday, April 15) - cont'd -

### Keynote 2

14:55-15:35 **Framework for modeling and simulation of human lethality, injury, and impairment from blast-related threats**  
Michael J. Leggieri  
DoD Blast Injury Research PCO, USAMRMC (USA)

### Session 9: Computational Modeling and Simulation

15:35-16:00 **Articulated human body model for computational assessment of explosion blast injury loads, body responses, personal protection system performance, and casualty assessment** (Invited)  
Raj K. Gupta  
DoD Blast Injury Research PCO, USAMRMC (USA)

16:00-16:25 **Experimental and computational modeling approaches to understand primary explosive blast loading on brain cell/tissue structure and functions** (Invited)  
Thuvan Piehler  
U.S. Army Research Laboratory (ARL) (USA)

16:25-16:50 **Numerical investigation of blast-induced pressure wave impact on a surrogate head model** (invited)  
Rohan Banton  
U.S. Army Research Laboratory (ARL) (USA)

16:50 **Wrap Up**

17:30 **Conference Dinner**

## Day 3 (Sunday, April 16)

### Tutorial 2

*Chair* Raj K. Gupta, DoD Blast Injury Research PCO, USAMRMC

9:00-9:40	<b>Blast shock tube and animal research</b>	-75-
	Namas Chandra New Jersey Institute of Technology (USA)	

### Session 10: Use of Laser-induced Shock Wave (LISW) for Blast Injury Research

*Chair* Izumi Nishidate, TUAT

9:40-10:00	<b>Characteristics, usefulness and limitation of laser-induced shock wave for blast injury study</b> (Invited)	-77-
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Shunichi Sato  
Div. of Bioinformation and Therapeutic Systems, NDMC Research Institute (Japan)

10:00-10:20	<b>Assessment of oxidative stress on the rat brain exposed to a laser-induced shock wave</b> (Invited)	-79-
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Satoko Kawauchi  
Div. of Bioinformation and Therapeutic Systems, NDMC Research Institute (Japan)

10:20-10:35 **Coffee Break**

10:35-10:50	<b>Effects of laser-induced shock wave impact to the brain and/or lungs in rats</b>	-81-
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Keiichiro Yoshida  
Dept. of Electrical Engineering, Salesian Polytechnic (Japan)

10:50-11:15	<b>Neural basis for chronic headache after shock wave irradiation</b> (Invited)	-83-
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Akimasa Tashiro  
Dept. of Physiology, NDMC (Japan)

### Session 11: Novel Drug Delivery Systems and Therapy

*Chair* Keiji Itaka, Tokyo Medical and Dental University

11:15-11:40	<b>mRNA-based therapy for cerebral ischemia: Enhanced neuroprotective effects of astrocytes by BDNF mRNA</b> (invited)	-85-
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Yuta Fukushima  
Dept. of Neurosurgery, The University of Tokyo (Japan)

11:40-12:05	<b>Fibrinogen gamma-chain peptide-coated, ADP-encapsulated liposomes rescue mice from lethal blast lung injury via adenosine signaling</b> (Invited)	-87-
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Kohsuke Hagsawa  
Dept. of Physiology, NDMC (Japan)

12:05-12:20	<b>Effects of selective serotonin reuptake inhibitors on depression-like behavior in mild blast traumatic brain injury mice</b>	-89-
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Soichiro Seno  
Div. of Traumatology, NDMC Research Institute (Japan)

12:20-13:20 **Lunch**

### Session 12: Auditory Injury

*Chair* Richard Shoge, MOMRP, USAMRMC

13:20-13:45	<b>Recent Experiments Assessing Components of the Auditory Hazard Assessment Algorithm for Humans (AHAH)</b> (Invited)	-91-
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Nathaniel Greene  
United States Army Aeromedical Research Lab (USAARL) (USA)

13:45-14:10	<b>Warning the acoustic reflex to protect against blast-related auditory injury: Attempt to classically condition the middle ear muscle contraction</b> (Invited)	-93-
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Heath Jones  
United States Army Aeromedical Research Lab (USAARL) (USA)

## Day 3 (Sunday, April 16) - cont'd -

### Session 13: Combat Casualty Care

*Chair* Daizoh Saitoh, NDMC Research Institute

14:10-14:35	<b>Traumatic amputation and pelvic injury following blast</b> (Invited) -95- Jon Clasper Imperial College London/The Royal British Legion Centre for Blast Injury Studies (UK)
14:35-15:00	<b>Pattern of injury after under-body blast</b> (Invited) -97- Jon Clasper Imperial College London/The Royal British Legion Centre for Blast Injury Studies (UK)
15:00-15:25	<b>Genitourinary Injuries in Male U.S. Service Personnel deployed to Iraq and Afghanistan</b> (Invited) -99- Jean Ann Orman US Army Institute of Surgical Research (USA)
15:25-15:40	<b>Coffee Break</b>
15:40-16:20	<b>Open Discussion</b>
16:20-16:30	<b>Closing Remarks</b> Shashi P. Karna, U.S. Army Research Laboratory (ARL) (USA) Norihiko Yamada, Lt. Gen. (JASDF), Vice President, NDMC (Japan)