

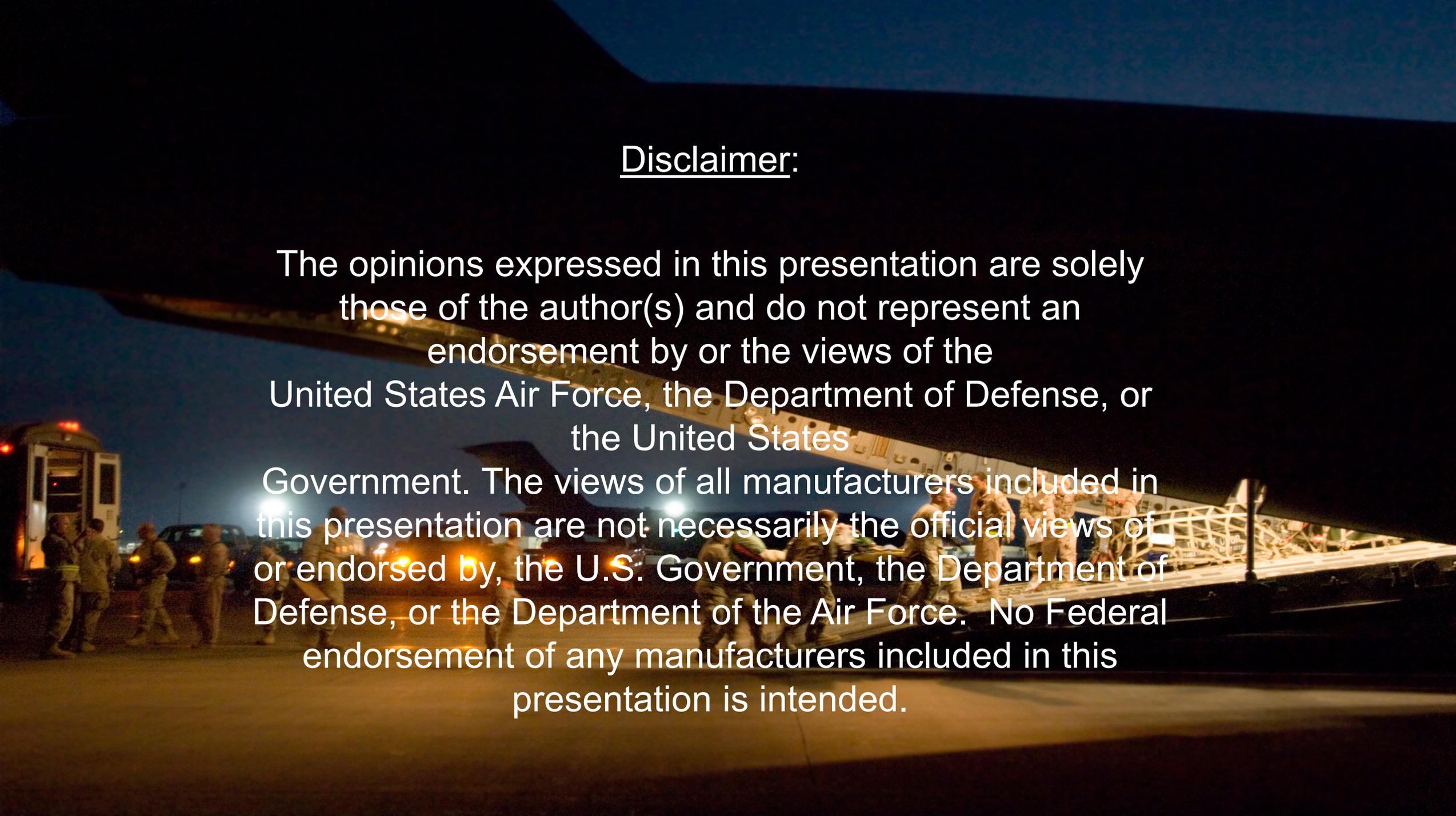


59th Medical Wing



59MDW Science and Technology Overview and Upcoming Toxicology Projects

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Trauma & Clinical Care Research
May 2020

A large military transport aircraft, possibly a C-17 Globemaster III, is parked on a tarmac at night. The aircraft's cargo door is open, and several ground crew members in military uniforms are visible around the base of the plane. The scene is illuminated by ground lights, creating a high-contrast environment against the dark sky.

Disclaimer:

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Military Medicine: A Shifting Landscape



World Events,
Global Economy,
Tech Innovations,
NDA, DHA,
Service Policies,
Mission Needs...

Growing Military Researchers

- Live (clinically-relevant) Simulations/Models of advanced LSI, surgical techniques
- Aligning research requirements for faculty, staff, resident scholarly activities
- Robusting STEM/Research Education



Changing Battlespace

- Advance POI and ERC of critically-ill or injured patient clinical outcomes, survival, and health/Return to Duty
- Readiness and clinical competence in en route care providers
- Disaster medicine best practice, prep & response (research & training)
- Directed Energy (diagnose & treat)



In-Garrison Care Advancements

- Warfighter, family, beneficiaries
- Expertise for conducting & integrating advances in medical research & tech
- Evidence Based Practice, Quality & Patient Safety

Translating Military Relevant Clinical Research

- Real World cost of healthcare, Personnel
- Resource Impacts/constraints: Energy, Water
- Quality Process Validation for Medical Devices and optimizing CPGs
- Monitor and measure parameters in patients
- Novel treatments to prevent wound infections and other post-injury complications



Military Health System

- OASD(HA) - Responsible for effective execution of the DoD medical mission, providing and maintaining readiness for medical services and support to members of the Military Services; their families... and others entitled to or eligible for DoD medical care and benefits, including those under TRICARE.

Defense Health Agency

- Vision: A Combat Support Agency, leads the Military Health System integrated system of readiness and health to deliver the Quadruple Aim—increased readiness, better health, better care, and lower cost.
- Mission: Unified and Ready.

AF/SG

- Vision: Air Force Warrior Medics... Mission-Focused, Excellence Driven.
- Mission: Ensure medically fit forces, provide expeditionary medics and deliver Trusted Care to all we serve.

AETC Commander

- "Help us invent the future ...one idea at a time!"

59 MDW Commander

- Vision: Exemplary Care, Global Response.
- Mission: Developing Warrior Medics Through Patient-Centered Care.

- **Strategic Asset**
 - “Home of Military Medicine”—SA Chamber of Commerce assessed \$4B direct, \$1B indirect economic impact
 - 12 MTFs/\$1.2B Budget /12,000 staff/250,000 beneficiaries
 - 37 GME programs--600 residents, 22 GHSE programs--78 residents
 - Contingency/Humanitarian response -- Teams on call 24/7 and ~150 Service Members deployed
- **Significant Medical Innovation, Research, Education, Training**
- **Brook Army Medical Center**
 - DoD’s most productive inpatient facility
 - DoD’s only CONUS Level 1 Trauma Center
 - DoD’s only Bone Marrow Transplant Unit
 - DoD’s only Burn Center
 - Center for the Intrepid
- **Wilford Hall Ambulatory Surgical Center and Clinics**
 - DoD’s largest outpatient facility
 - DoD’s largest Blood Donor Center
- **DoD’s largest centralized appointment/referral management system**



Patients First, Partners Always



59th Medical Wing Science & Technology



Vision: *Grow Medical Leaders, Drive Innovations in Patient Care and Readiness*

Mission: *Conduct clinical studies and translational research and apply knowledge gained to enhance performance, protect the force, and advance medical care and capabilities across the global health system*

Lead & Support Research

Advance Modernization Efforts

Foster and Build Collaborations

Address End User Needs

Ensure Scientific Excellence and Programmatic Relevance

Wing, SAUSHEC, AFMS, LAF, ASD/OSD, Joint Cmts / S&T, Adv Dev liaisons




**Chief Scientist
Science and Technology**
Providing operational capability through...





Readiness, Healthcare, Education, Training, and Research

<https://www.59mdw.af.mil/Units/Chief-Scientist-ST/>

JBSA Main Office: (210) 292-2097

PEOPLE

MISSION

INNOVATION



Major Programs/Capabilities



- **Clinical Investigations and Research Support (CIRS)**
 - Clinical Investigations Program, Readiness and Certification Training
- **Nursing Research / Center of Clinical Inquiry**
 - Chief Nurses consultation/24 MTFs; Research & Evidence Based Practice
- **Dental Education, Research and Consultation**
 - USAF Post Graduate Dental School and Clinics, JBSA-Lackland
 - Dental Research and Consultation Service, JBSA-Fort Sam Houston
- **Integrated Clinical Medicine and Center for Molecular Detection**
 - Rapid Pathogen Detection/Analysis, Trainee Healthcare, Precision Medicine Research
- **En Route Care Research Center**
 - Co-located at USA Institute of Surgical Research (USAISR); AE-ERC research in Collaboration with other Organizations
- **Clinical Resuscitation, Emergency Science & Toxicology Program**
 - Clinical research and simulations
 - Emergency Medicine Residents participate to fulfill graduation requirements
- **Trauma and Regenerative Medicine Research**
 - Clinical Investigations, JBSA-Lackland; USAISR/BHT & Tri-Service Research Laboratory (TSRL), JBSA Fort Sam Houston



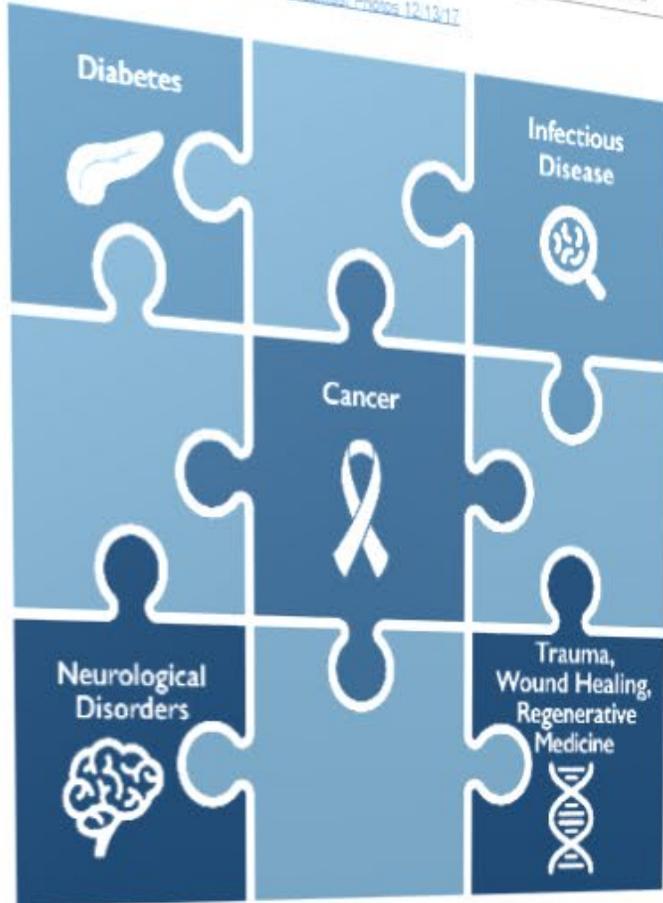
San Antonio Military Medical Research

Strong DoD-Federal-Academia-Industry Synergy



Healthcare & Bioscience Industry Action Plan Doing Well by Doing Good

[Media Coverage](#) [Phase One](#) [Breakfast Photo 12/13/17](#)



Doing Well by Doing Good: Leveraging San Antonio's Unique Biomedical Strengths to Fuel Economic Growth and Become a Resource to the World



San Antonio Military Medical Center



Center for the Intrepid



Wilford Hall Ambulatory Surgical Center



Center for Molecular Detection



Clinical Research Support



Audie L. Murphy VA Memorial Hospital



Battlefield Health & Trauma Research Institute



UT Health Science Center San Antonio



AF Post-Graduate Dental School & Clinic



Tri-Service Research Laboratory NAMRU/SA, 711th HPW



UT San Antonio

Biomed SA

"San Antonio. City of Science and Health."



Theater of Operations ↔ Garrison Care



Joint Austere Medicine Research Portfolio

**Role 3
EMEDS +25
AF Theater
Hospital**

**Role 4
OCONUS
Definitive Care**

**Role 5
US-based MTF
Full Range/
Definitive Care**

**Post-Acute Care
Dept of Veteran
Affairs**



**Role 1
Point of Injury**

**Role 2
Mobile Field
Surgical
Team/EMEDS**

Joint Integrative Clinical Medicine Research Portfolio



Performing Research and Providing Deliverables to Address Joint Medical Priorities across the Continuum of Care

PEOPLE

MISSION

INNOVATION



Joint Austere Medicine (JAM)



Mission:

Investigate innovative mechanisms to increase clinician skills and practices to utilize early detection methods, latest treatment regimens, and recovery from communicable illness and non-battlefield injuries to improve return to duty turnaround times.

Objectives:

- Provide access to and understanding of recent surgical devices, and techniques to improve patient care and enhance cost-savings and return to fight
- Conduct research to identify the most efficacious learning architecture to improve clinical readiness and ensure skills proficiency and sustainment
- Investigate resuscitation, stabilization, triage, and treatment modalities and their applicability in austere environments
- Support better health initiatives and improve return to duty rates for non-battlefield related injuries occurring in austere training and deployed environments
- Test, evaluate, and realize progressive and autonomous approaches to assist clinicians with patient care in austere environments



JAM Programs & Medical Directors



PROGRAMS

1. EN ROUTE CARE RESEARCH CENTER (ECRC)
2. CLINICAL RESUSCITATION, EMERGENCY SCIENCE, TRIAGE & TOXICOLOGY (CREST²)
3. FRONTLINE ILLNESS, EXPOSURE, & RECOVERY CARE EFFORTS (FIERCE)
4. SURGICAL & TECHNOLOGICAL ADVANCEMENTS FOR TRAUMATIC INJURIES IN COMBAT (STATIC)
5. IMPROVEMENTS IN NEUROLOGICAL, SENSORY, & PERCEPTIBLE RESEARCH (INSPR)



Lt Col Joseph Maddry, MD



MAJ Steven Schauer, DO



Lt Col Valerie Sams, MD



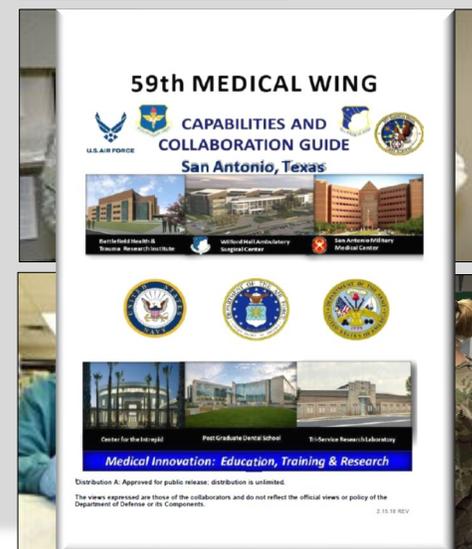
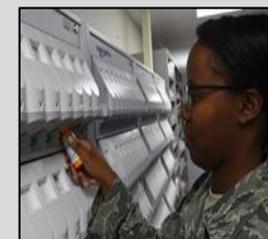
Col Erik Weitzel, MD



59MDW/ST Summary



- Lead AF Clinical Research Platform; Largest DoD GME Platform
- Joint DHP Integrated – Programs and Partners (i.e., Across JPCs; USAISR, NAMRU-SA, Others)
- GME/GHSE-RDT&E Synergized, USU-affiliated Programs; largest AF CIF & Lead Translational Research Platform
- Military Readiness, Joint Force and Medical Care Requirements-aligned
- Lead AF eIRB site / implementation, Preparing for “eIACUC”
- First and Only DoD HRPP Accredited Program (AAHRPP)
- Long-standing AAALAC Accreditation with Merit
- Broad & Deep System Capabilities, Clinical Competencies/Collaborations

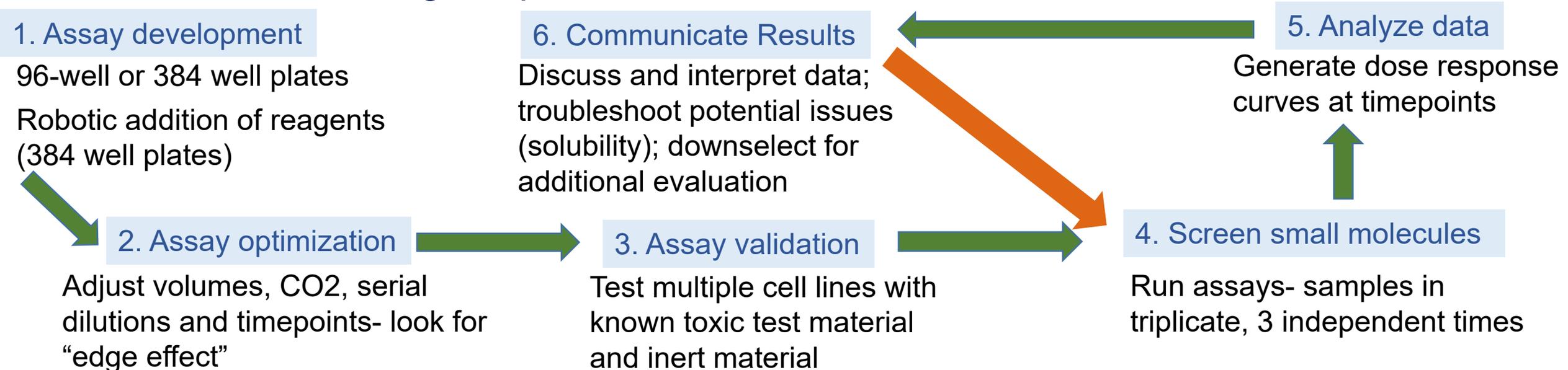




Proposed AMD Tox Approach



- High throughput screening using commonly accepted in vitro assays
 - Extracellular lactate dehydrogenase activity as measurement of cell viability
 - Tetrazolium reduction (WST-1/MTT)- measurement of mitochondrial activity
 - GFP cell line signal quantification





Proposed AMD Tox Approach



- High throughput screening using commonly accepted in vitro assays
 - Adaptation to 384 well plate
 - Autonomous reagent addition
 - Real time data collection
- Initial screening with kidney, liver, skin, and lung cell lines
- Down select for additional assays with primary cells

