BARDA RADIOLOGICAL AND NUCLEAR COUNTERMEASURES PROGRAM

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Radiological/Nuclear Events

- Overall focus on injuries from:
  - Nuclear Detonation
  - Radiological Dispersal Device (RDD) Events

- Priority on Nuclear Detonation-related injuries
  - Impact predicted to be greater

- Nuclear Detonation event will include:
  - Infrastructure damage
  - Resource limitations
  - Complex spectrum of injuries
    - Includes combined injuries
    - Changes with different scenarios

- Polypharmacy and Repurposing
  - Key tenets for portfolio strategy
**Targeted Natural History for Acute Radiation Injury**

- **Hemostasis Dysregulation**
  - Decrease in blood count
  - Pancytopenia (Neutropenia; Thrombocytopenia)
  - Severe bone marrow damage

- **Ischemia/Reperfusion**

- **Coagulopathy – Fibrinolysis/Hemostasis**

- **Inflammation/Homeostasis**

- **Cell Death/Tissue Repair & Regeneration**
  - Pneumonitis, fibrosis
  - Severe damage

- **Vascular Injury – Sepsis/Tissue Integrity & Bacterial Clearance**
  - Cellular damage through many pathways:
    - DNA damage
    - ROS pathway
    - Inflammatory response

**Blood:** (Hematopoietic)

**Intestines:** (Gastrointestinal)

**Lungs:** (Pulmonary)

- 0 Gy
- 2 Gy
- 6 Gy
- 8 Gy
- 10 Gy
- 12 Gy

Cell death & differing cell turnover rates

Leads to manifestation in organ systems
Current BARDA Portfolio and Product Testing

**Vascular Injury – Sepsis/Tissue Integrity & Bacterial Clearance**
- CLT-008 (Cellerant)
- Leukine (Sanofi)*
- Neupogen (Amgen)*
- Neulasta (Amgen)*
- Promacta (Novartis)

**Pathogen reduction – RBCs (Cerus)**
**Pathogen reduction – Platelets (Terumo)**
**Promacta (Novartis)**
**Spray dried plasma (Velico)**
**Thrombosomes (Cellphire)**

**Ischemia/Reperfusion**
- **No products tested**

**Coagulopathy – Fibrinolysis/Hemostasis**
- **Spray dried plasma (Velico)**
- **Thrombosomes (Cellphire)**
- **Task Orders**

**Cell Death/Tissue Repair & Regeneration**
- **7+ products tested**

**Inflammation/Homeostasis**
- **4+ products tested**

**Pathogen reduction – Platelets (Terumo)**
**Promacta (Novartis)**
**Spray dried plasma (Velico)**
**Thrombosomes (Cellphire)**

*in Strategic National Stockpile
Current BARDA Portfolio - Examples of Repurposing

*in Strategic National Stockpile
Interagency Partnerships in MCM Target Areas

- Memoranda of Understanding
- Interagency Strategies for AR&D
- Portfolio Exchanges
- Data Sharing
- Expertise Sharing
- Interagency PCTs for programs
- Interagency agreements to perform development activities

**MCM Target Areas**

- Vascular Injury – Sepsis/Tissue Integrity & Bacterial Clearance
- Coagulopathy – Fibrinolysis/Hemostasis
- Cell Death/Tissue Repair & Regeneration
- Inflammation/Homeostasis

**Partnerships**

- DoD – JPC-6
- DoD – AFRRI
- HHS – OASH
- NIH – NHBLI
- NASA

- DoD – JPC-6
- NIH – NHBLI
- NASA
• Strategy continues with tenets of polypharmacy and repurposing approaches

• Looking to leverage across other threat areas
  • Mechanical trauma
  • Thermal burn
  • Chemical injury
  • Infectious diseases

• Highest treatment priorities
  • Neutropenia (cellular therapies)
  • Thrombocytopenia
  • Vascular injury/Sepsis
  • Coagulopathy/Hemostatic dysregulation
  • UPCOMING: Inflammation
Online Resources

https://www.medicalcountermeasures.gov/home.aspx
• Portal to BARDA: Register to request a TechWatch meeting

• Official announcements and info for all government contract solicitations

https://www.usajobs.gov/
• Join the team!

https://www.phe.gov/about/BARDA/Pages/default.aspx
• Program description, information, news, announcements

ASPR: Saving Lives...Protecting America