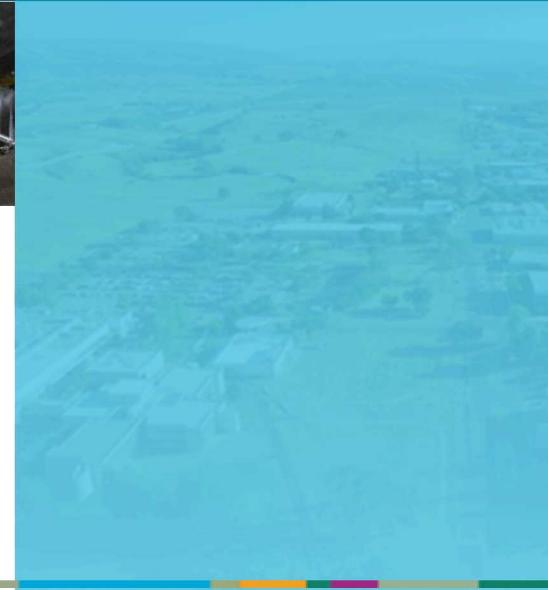


# Biodefense at Sandia National Laboratories



SAND2019-13837PE



*PRESENTED BY*

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# Biodefense and Emerging Infectious Disease Vision

Our vision is to provide the research and development required to anticipate, detect, and counter chemical and biological attacks, and to predict and arrest naturally occurring, emerging infectious diseases.

- *Threat assessment and risk mitigation*
- *Development and transition of biodefense-relevant medical diagnostics, detection systems, and therapeutics*

# Genomic Security

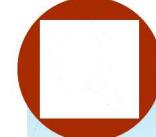


Gene editing technologies create a risk at the scale of a **Weapon of Mass Destruction**



**Technology surprise**  
nature makes it ideal for national labs that work at the intersection of science and national security

**Leverage strengths** in biology, computing, materials, cybersecurity, non-proliferation and systems analysis



**Thrust Areas**  
Threat Assessment & Awareness  
Detection and Surveillance  
Mitigation and Defense



Develop R&D capability for **understanding & countering** the national security risks presented by technology **exploitation to manipulate genomes**.  
Establish an ecosystem to **create an enduring capability to counter the threat**.

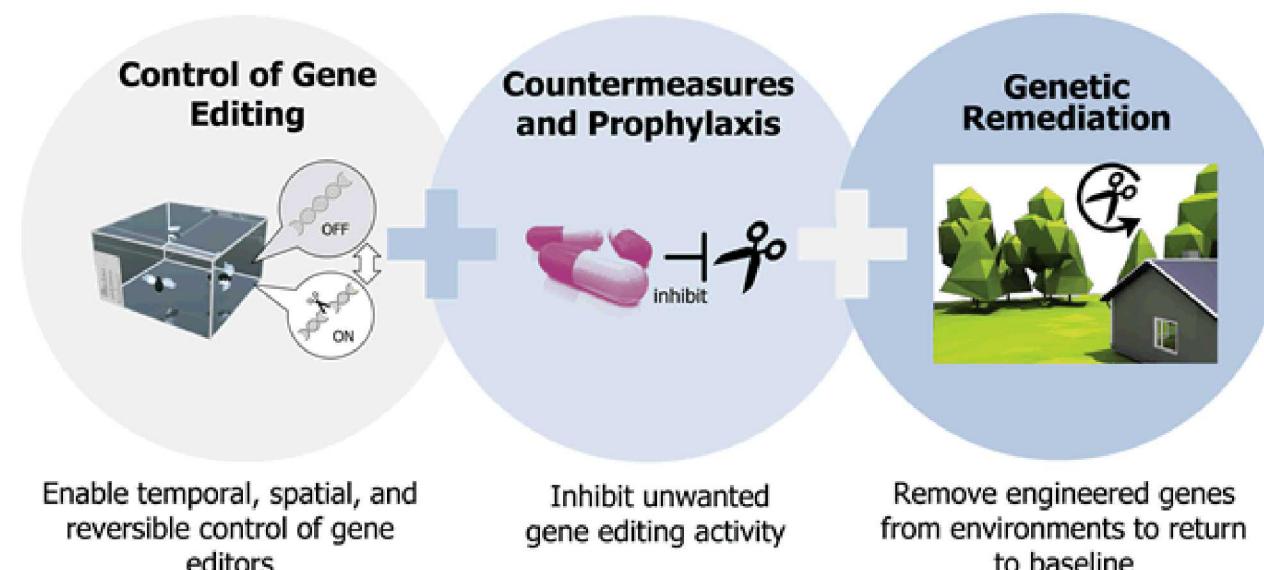
# Existing Biodefense Related Collaborations with UCB

## Lab Directed Research and Development (LDRD) Campus Executive Plus-Ups

- Cutting-Edge Synthetic Biology to Improve and Accelerate Development of Pathogen-Assassinating Probiotics (Sandia – Steven Branda, UCB Collaborator – Adam Arkin)
  - Working with Arkin lab to develop means by which the microbiomes resident to the respiratory tract may be rationally manipulated in order to increase resiliency against infection by respiratory pathogens
- Assessing the Spatiotemporal Fate of CRISPR-Associated Proteins (Sandia – Kimberley Butler, UCB Collaborator – Jennifer Doudna)
  - We work with the Doudna Lab at UC Berkeley to develop affinity tags to permit the detection of Cas proteins within living cells.

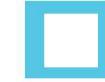
## DARPA Project

- Safe Genes Phase II – UCB, Sandia



From: <https://www.darpa.mil/program/safe-genes>

# Opportunities for Engagement



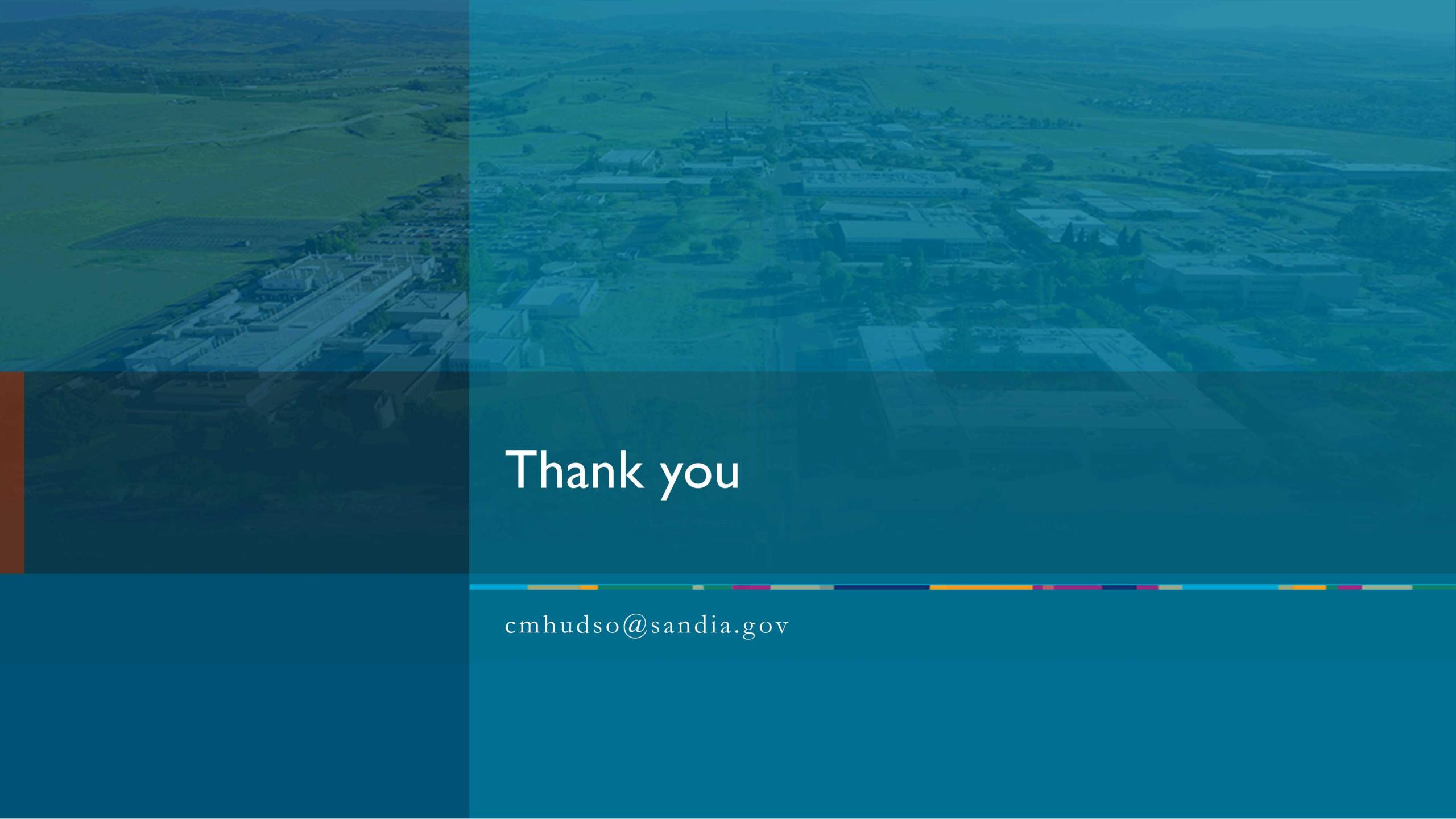
Academic Alliance - Mechanism allowing university collaborators to be part of Laboratory Directed Research and Development

- Projects frequently support student effort, faculty involvement and unique capabilities involving university and national laboratory
- LDRD calls for Bioscience center around systems biology, synthetic biology, therapeutic discovery, diagnostics and detection and synthetic biology control of gene editing

Campus Executive Program - Mechanism for investing in university collaborations, while supporting LDRD program

External funding opportunities:

- E.g., DARPA, NIH, etc – PI/Co-PI-ship opportunities
- Way to support joint efforts and engage as partners



Thank you

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