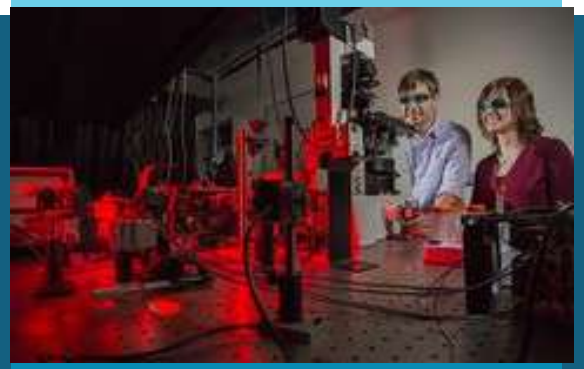
Genome Security Academic Partnerships



PRESENTED BY

Stephanie Beasly, Livermore Valley Open Campus Partnerships

Sandia National Laboratories is a multimission laboratory managed and operated by National Technology & Engineering Solutions of Sandia, LLC, a wholly owned subsidiary of Honeywell International Inc., for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-NA0003525.

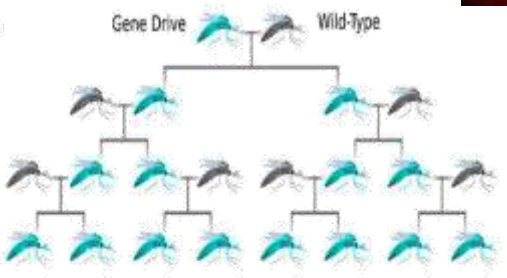
SAND2019-8809 PE

CRISPR/CAS9 IS REVOLUTIONIZING BIOTECHNOLOGY AT AN UNPRECEDENTED PACE

CRISPR developed as general tool

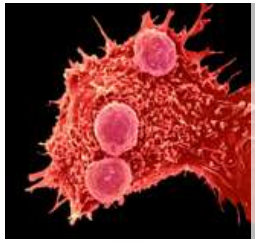
2012

CRISPR/Cas9 **Gene Drives**



2015

CRISPR/Cas9 **$150 at home kits**



2016

Bill Gates gives $75M to Target Malaria

China Launched CRISPR Gene-Editing **Human Trials**

2018

Chinese scientist claims to create **gene-edited babies**

WHO launches **global registry on human genome editing**

World Health Organization

2019

Genomic Security

Gene editing is a **potential Weapons of Mass Destruction risk**

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

Genome Editing Lifecycle

Safe Genomic Data by Design

Secure Cyber-Bio Interface

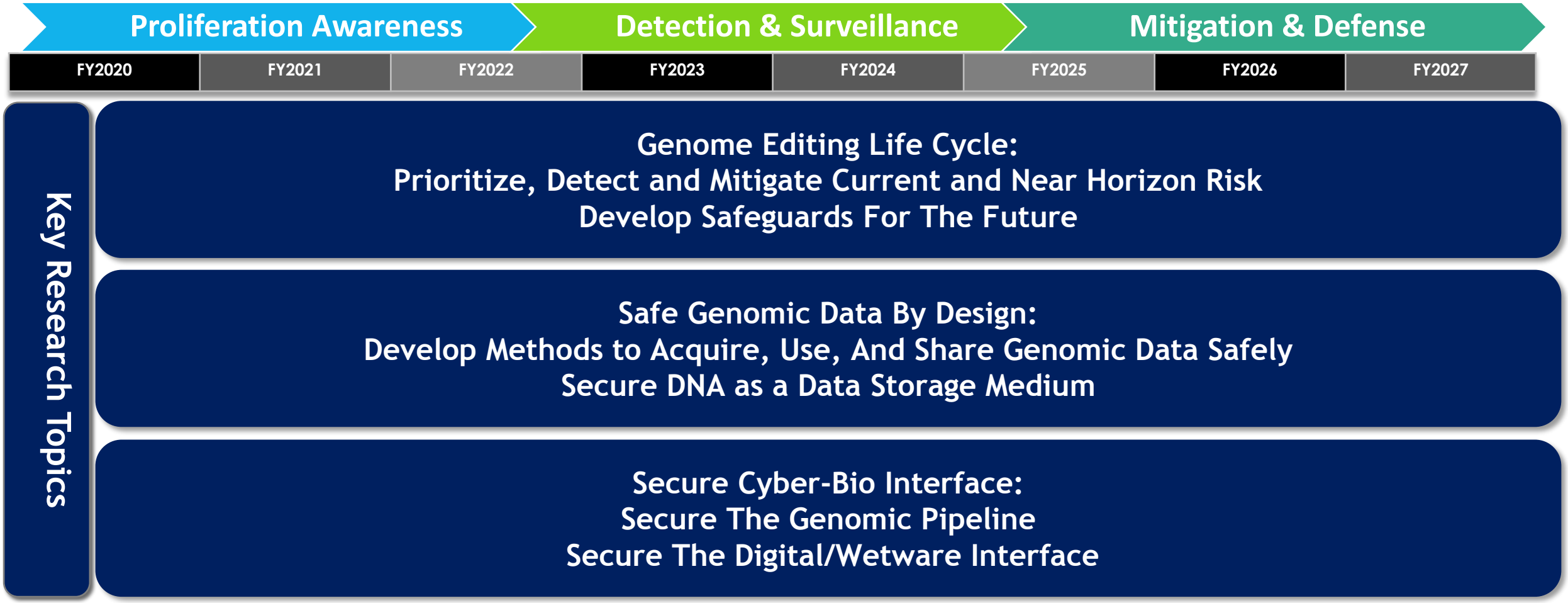
Develop R&D capability for **understanding & countering** the national security risks presented by technology **exploitation to manipulate genomes**.

Establish an ecosystem to **create a capability to counter the threat.**

Sandia's Genomic Security Program - Vision Statement

The Genomic Security Program will develop a robust research and development capability for **understanding and countering** the national security risks presented by **exploitation of advanced technology for the manipulation of genomes**

Technical Roadmap And Phasing Plan



Addressing The Problem With External Partnership

UIUC

ILLINOIS
UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

- Carl R Woese Institute for Genomic Biology
- Long standing collaboration
  - SNL member of CCGBM and Advisory board
- Key partner in IGB proposed theme-GENSEC
- Multiple AA projects

Current Efforts with UIUC

- DHS – discovery of vulnerability in sequence infrastructure
- Funded joint projects
- Presentation at BioDefense World Summit
- Joint NIH Proposal Developed

UCB

Berkeley
UNIVERSITY OF CALIFORNIA

- Jennifer Doudna – NanoCRISPR Grand Challenge
- Long Standing Collaboration
- Campus Executive Collaborations

Current Efforts with UC Berkeley

- Joint patents
- Funded joint project: DARPA SafeGenes with Jennifer Doudna, Luke Gilbert, and Jonathan Weismann
- Joint publications: Discovered RNA-targeting Cas9
- Joint proposals submitted

Others

Lawrence Livermore National Laboratory

Los Alamos NATIONAL LABORATORY EST. 1943

Pacific Northwest NATIONAL LABORATORY

BERKELEY LAB
Lawrence Berkeley National Laboratory

Questions

Stephanie Beasly

Sandia National Laboratories

sbeasly@sandia.gov