

CVM serves the U.S. public by protecting human and animal health.

*Our responsibilities include:*



Animal Drugs and Devices



Human and Animal Food Safety

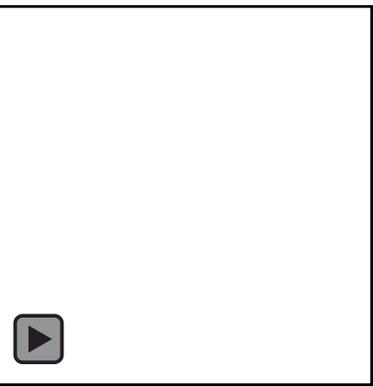


Animal Biotechnologies



# CVM Areas of Impact

- Protecting the safety of our food supply by ensuring that eggs, milk, and meat derived from animals are safe for people to eat.
- Supporting domestic agricultural productivity.
- Approving products to treat and prevent zoonotic diseases; thereby preventing illness in humans.
- Supporting the human/animal bond leading to improved physical and mental health.
- Promoting the development of innovative products.



# CVM BAA Projects

*CVM projects fall under “Veterinary” headings in the FY26 BAA Notice*

- ★ • Bioinformatics in large animal models
- ★ • In vitro dissolution methods and critical material attributes of flavor components in drug products
- PFAS bioaccumulation and distribution in dairy cattle
- Facilitating drug development in small ruminants and aquaculture
- Understanding gaps in animal drugs authorized in the U.S. vs. other countries
- Understanding substandard and falsified veterinary products in international markets



# Advancing Regulatory Science for Intentional Genomic Alterations (IGAs) in Animals

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# Bioinformatics in Large Animal Models

- IGAs in animals are changes to an animal's genomic DNA produced using modern molecular technologies, including CRISPR/Cas genome editing.
- IGAs in animals have many different intended uses, including applications in:
  - Human health (e.g., reduced allergenicity)
  - “Biopharm” animals (e.g., xenotransplantation)
  - Enhanced production and food quality (e.g., faster growth, feed efficiency, nutritional benefits).
- Current challenge: Genomics methods (e.g., sequencing) are often used to screen for unintended alterations, however there is no standard approach for the analysis of the genomics data (bioinformatics).



# Project Goal

- Develop a rigorous bioinformatics pipeline for distinguishing CRISPR/Cas-mediated genomic alterations from mutations arising from other sources in large animal models
- Initial focus on livestock species (pig, cattle, sheep, goat)
  - Particular interest in species used as source of human biologics (e.g., pigs for xenotransplantation)



# Challenges to address

1. Determining genomic regions to assess for potential off-target editing, for example:
  - Accounting for natural genetic variation
  - Extend existing tools for newer nuclease variants (Cas12a, base editors, etc.)
2. Attributing alterations to CRISPR/Cas vs. other mechanisms, for example:
  - Cas repair patterns
  - Mobile element insertions that occur independently of CRISPR activity
  - Mutations characteristic of cell culture conditions and cloning processes
3. Integration of data from multiple platforms to enhance discrimination accuracy, for example:
  - Short read sequencing, long read sequencing, optical genome mapping

