

# The Role of Veterinarians in Biomedical Research

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# Presentation Outline

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- **Traditional the Role of Veterinarians in Biomedical Research**
- **Gaps and Challenges**
- **Enhancing the Role of Veterinarians in Biomedical Research**
- **Recommendations**

# Traditional Role of Veterinarians in Biomedical Research

## Important Contributions

Henri-Mamer-Onésime Delafond (1805–1861) - Anthrax

Jean-Joseph-Henri Toussaint (1847-1890) - Fowl Cholera

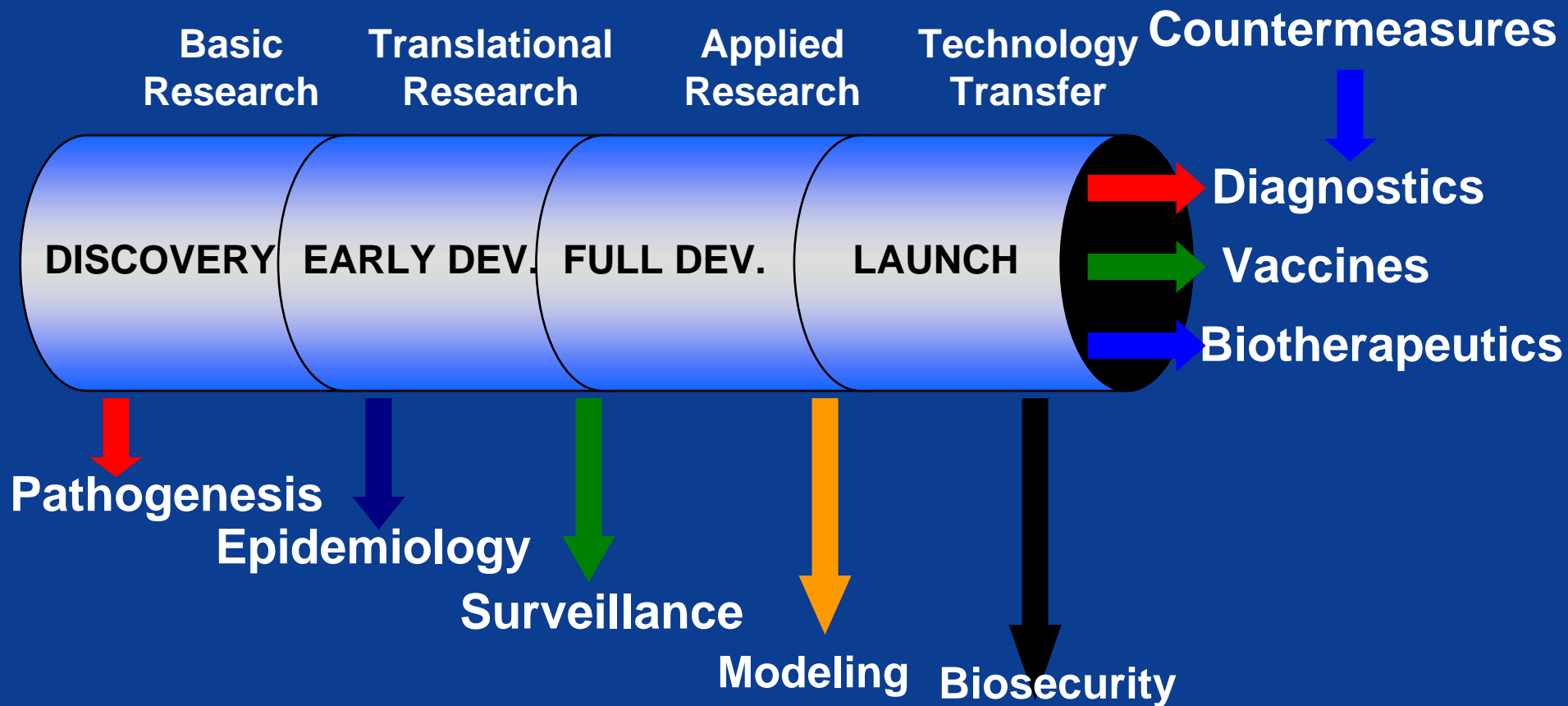
Bernhard Lauritz Frederik Bang (1848-1932) – Brucellosis

Jean-Marie Camille Guérin (1872-1961) - Tuberculosis

Robert Royston Amos Coombs (1921-2006) - Coombs Test

Peter Charles Doherty (1940 - Present) - Immunology

# Why research is important



# Biomedical Research Priorities for Animal Health

- **Molecular vaccines designed for control and eradication**
- **Rapid and accurate diagnostics**
- **Biotherapeutics and alternatives to antibiotics**
- **Infection models in relevant animal host species**
- **Genomic tools for marker-assisted selection**
- **Functional genomics studies to understand host-pathogen interactions and mechanisms of disease transmission**

# Traditional Role of Veterinarians in Biomedical Research

## Universities

- Veterinarians with advanced degrees (DVM and PhD)
- Involved in basic and applied research
- Dependent on extramural sources of funding
- Critical role in veterinary education

# Traditional Role of Veterinarians in Biomedical Research

## Government

- Few veterinarians available with DVM and PhD degrees
- Basic research critical
- High demand for translational research
- Dependent on availability of intramural sources of funding
- Critical role in training veterinarians in biomedical research

# Traditional Role of Veterinarians in Biomedical Research

## Pharmaceutical Industry

- Few veterinarians available with DVM and PhD degrees
- Specialize in drug and vaccine development
- Dependent on company revenues from sales
- Critical role in bridging basic and applied research



# Gaps and Challenges

## Education

- **Personal and financial cost of post-veterinary education**
  - Avg. age of U.S veterinary graduate is 27.9 yrs old
  - Avg. debt of U.S veterinary graduate is \$129,976
  - The mean annual starting salary of U.S veterinary graduates seeking advanced education was \$28,545
- **Few veterinarians are seeking a PhD degree**
  - Only 2.1% of veterinary graduates pursued advanced education involving a higher degree (MPH, MS, PhD)
  - Of those seeking an advanced degree, only 2.3% are seeking a PhD degree

# Gaps and Challenges

## Post-graduate training

- Post-graduate training for veterinarians can take up to an additional 7-12 years after 8 years to obtain the DVM
  - Four to six years to complete a PhD program
  - Three to six years for completing a post-doctoral fellow
- Obtaining tenure at a university is getting more difficult
  - Hired as an assistant professor and then seven years is typically required to obtain tenure
  - Some universities are now requiring longer

# Gaps and Challenges

## Food animals

- **Critical need for veterinary scientists in food animal medicine**
  - Need research to support the FAO/OIE call for the progressive control of transboundary diseases
  - Need funds to establish international research collaborations (e.g., GFRA)
  - Need new vaccines designed for control and eradication
  - Need access to large animal research facilities
- **Critical need for veterinary scientists in government**
  - Need funds to support long term, high risk projects
  - Only 1.8% of USDA veterinarians working in research

# Gaps and Challenges

## Public Health

- Large majority of new and emerging diseases are zoonotic
  - Need for integrated research programs that includes veterinary scientists (e.g., Rift Valley Fever)
  - Greater impetus needed to bridge the gap between human health and animal health research
- Veterinary scientists needed to support human health
  - Need for veterinary scientists with expertise in laboratory animal medicine
  - Critical need for animal models of human diseases

# Enhancing the Role of Veterinarians in Biomedical Research

## Primary investigators

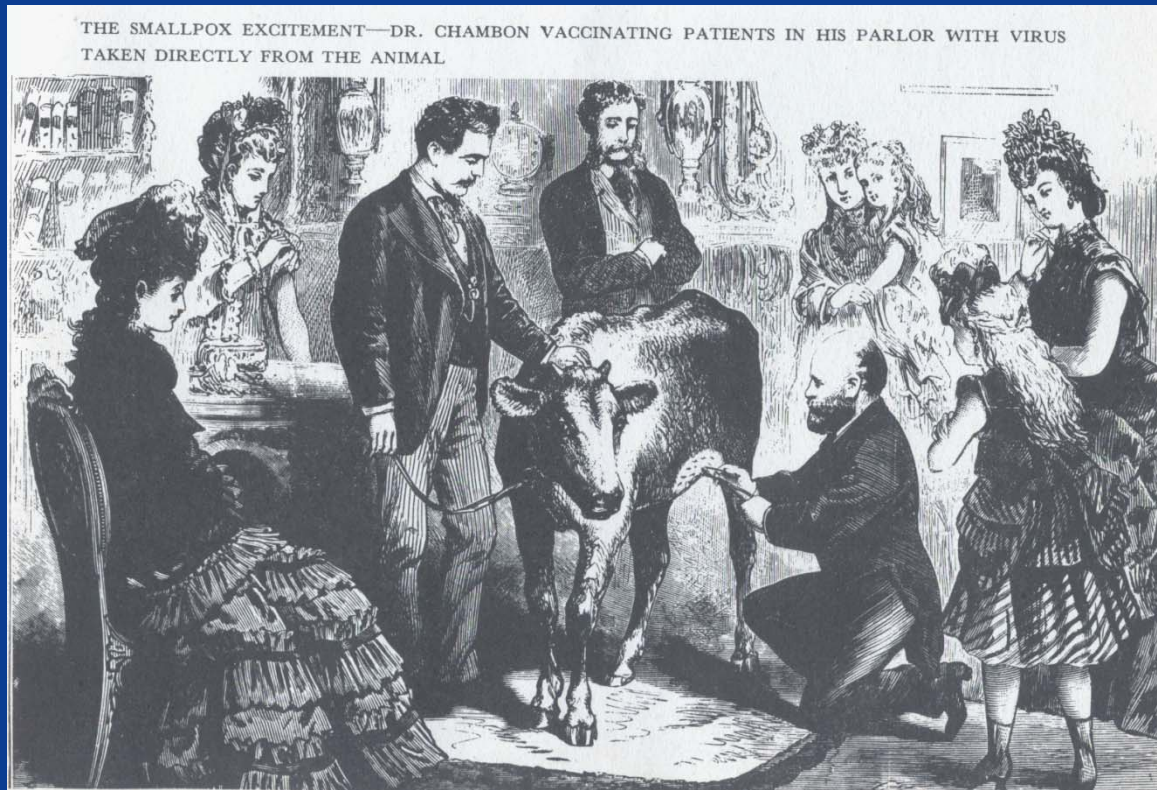
- Support scientists versus primary investigators
  - Increase opportunities for veterinary scientists to become primary investigators
  - Provide sources of funding to enable veterinary scientists to work in solving problems in animal health

# Enhancing the Role of Veterinarians in Biomedical Research

## Animal Health

- **Recruiting, training, and retention**
  - Increase emphasis on recruiting veterinary students early in their studies
  - Support research institutions that have the facilities and relevant research programs to train veterinary scientists
  - Provide comprehensive programs to ensure the retention of outstanding veterinary scientists
  - Reward veterinary scientists for excellence in teaching and training the next generation of veterinary scientists

# One World, One Health



In 1864 Dr. Chambon, a physician, succeeded in obtaining vaccination material from heifers and then a medical officer by the name of Vaillard was able to set up in Paris, at the Val de Grace Hospital, the first vaccination institute for the military using vaccine pulp that had been preserved with glycerol.

# Enhancing the Role of Veterinarians in Biomedical Research

## One World, One Health

- Provide support for integrated research programs that target both the animal health and human health aspects of zoonotic diseases
  - Support research programs that have the specific aim of preventing the transmission of zoonotic pathogens
- Provide funding for cross-training veterinarians and physicians in integrated research programs
  - Train biomedical researchers in veterinary vaccinology



# Enhancing the Role of Veterinarians in Biomedical Research

## Animal Genomics

- The era of genomics provides fertile ground for veterinary scientists
  - Marker-assisted selection of animals with desirable health traits (disease resistance)
  - Identify the molecular pathways associated with host-pathogen interactions (drug discovery)
  - New high throughput technologies (genetic variation)
  - Development of animal models for biomedical research

# Enhancing the Role of Veterinarians in Biomedical Research

## Leadership roles in the public and private sectors

- Senior veterinary scientists can significantly increase their impact by taking on leadership roles in the public and private sectors
  - Branch out into new career paths where science is critical for decision-making:
    - ✓ Veterinary Services
    - ✓ OIE ad hoc groups
    - ✓ Government interagency working groups
    - ✓ International research consortia
    - ✓ Pharmaceutical industry

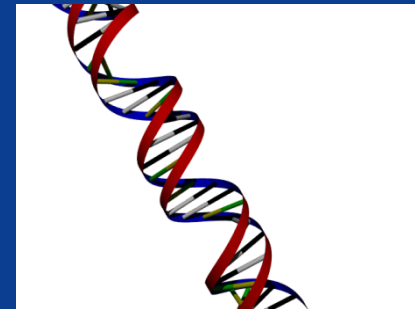
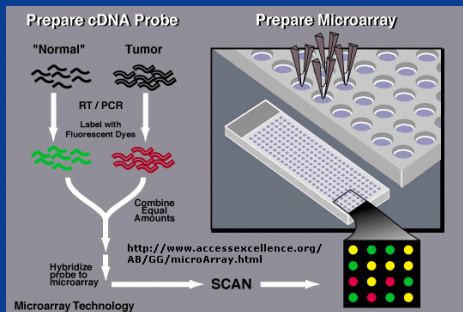
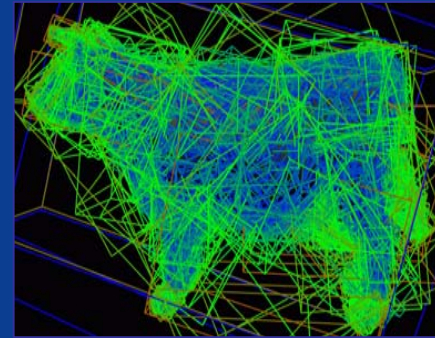
# Recommendations

- **Support post-graduate training programs to increase the number of veterinarians with DVM-PhD degrees**
- **Provide resources for recruiting, training, positions, and retaining veterinary scientists in animal health research**
- **Increase funding for animal health research**
- **Increase animal health research programs that support global food security and disease control initiatives**
- **Increase the participation of veterinary scientists in One World, One Health initiatives**
- **Provide resources necessary for veterinary scientists to participate in the genomics revolution**
- **Provide incentives for veterinary scientists to take on leadership roles in the public and private sectors**

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# Thank you!



<http://www.ars.usda.gov/>