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IVERMECTIN

Animal models played a crucial role in the discovery, development and safety testing of ivermectin, a lifesaving antiparasitic drug. It's also a success story of public-private partnership. Here's a breakdown of how different animals contributed.

Discovery Phase

- **Mice** and **rats** were part of early screening for antiparasitic activity.
- The original compound, avermectin, was discovered from *Streptomyces avermitilis*, a soil bacterium isolated by Dr. Satoshi Ōmura at the Kitasato Institute's Antibiotics Research Group in Tokyo, Japan. Merck & Co. Inc. scientist Dr. William C. Campbell tested the compound with rodent models for antiparasitic effects. *Streptomyces avermitilis* was isolated by Ōmura, and its extracts were sent to the pharmaceutical company, where Campbell and colleagues conducted further testing.

Efficacy Testing With Livestock

- **Cattle**, **sheep**, **pigs** and **horses** were early targets for ivermectin use, since it was initially developed as a veterinary medicine.
- These animals were in trials to confirm ivermectin's ability to eliminate internal and external parasites, such as gastrointestinal worms, mites and lice.

Canine Studies

- **Dogs** were tested to demonstrate ivermectin's effectiveness against heartworm disease.
- Safety studies with dogs also identified potential neurotoxic effects in certain breeds with a genetic mutation (MDR1), helping to define safe dosage limits.

Nonhuman Primates (NHPs)

- **Nonhuman primates** were essential in preclinical development to model how ivermectin might behave in the human body.
- These studies helped establish how the drug works in the body and the proper dosage, paving the way for human clinical trials.

Transition to Human Use

- Following successful veterinary use and extensive testing with animal models, ivermectin was adapted for human use in the 1980s. Ivermectin was approved for human use in 1987, **following Merck's collaboration with the World Health Organization**.
- It became a groundbreaking treatment for onchocerciasis (river blindness) and lymphatic filariasis (also known as elephantiasis), ultimately saving millions of lives in endemic regions.

Nobel Prize

- In 2015, Drs. Satoshi Ōmura and William C. Campbell won the **Nobel Prize in Physiology or Medicine** for the discovery of avermectin and its development into the antiparasitic drug ivermectin — a breakthrough made possible through extensive research with animal models.