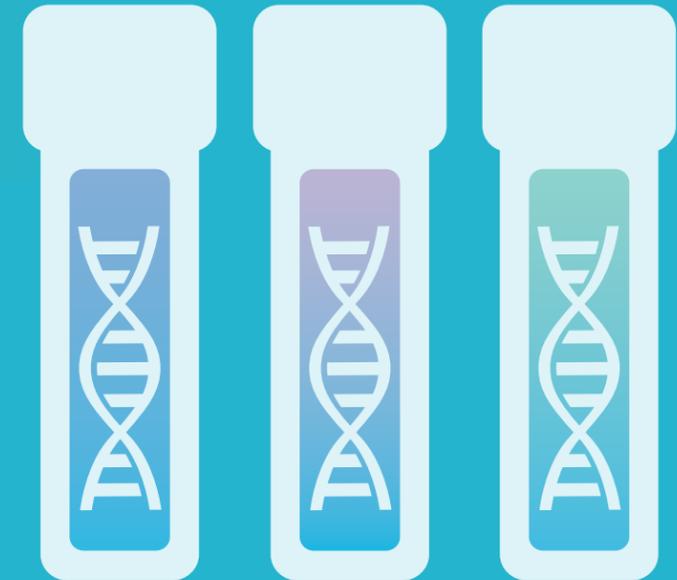




Biobanking for Animal Health:

Morris Animal Foundation
is Taking Veterinary
Research to a New Level

By Michael Guy, DVM, MS, PhD



Morris Animal
FOUNDATION



Biobanking & Biorepository



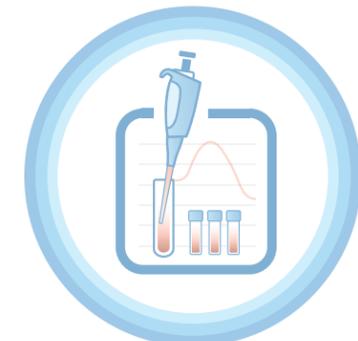
Cell Therapy Solutions



Clinical Trial Kit Production



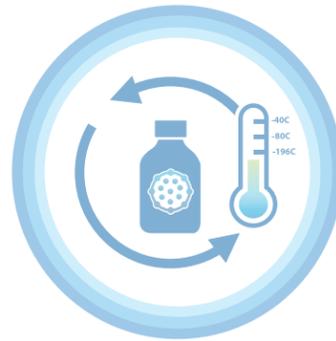
Laboratory Processing



Clinical Trial Sample Management



Biologic-API Management



Qualification / Validation Services



Cold-Chain Logistics

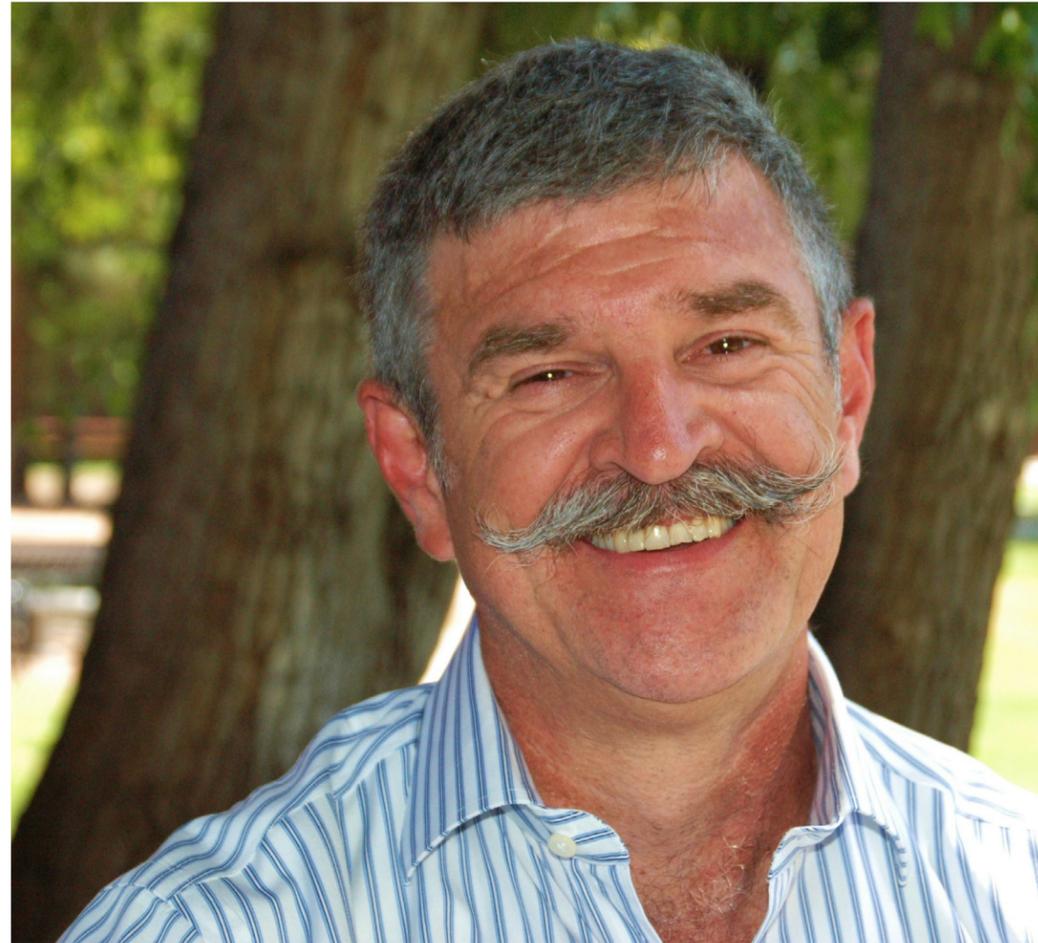


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About the Author



Michael Guy is the Director of the Canine Lifetime Health Project at the Morris Animal Foundation. He attended Veterinary School and also received his PhD in Physiology at Colorado State University. Dr. Guy has extensive experience in both the veterinary and human pharmaceutical industries as well as experience as a laboratory animal veterinarian. He has also had a private practice.

“This study requires a long-term commitment from dog owners and their veterinarians. We have the potential to learn valuable information that will not only improve canine health but will also significantly advance the entire field of veterinary medicine.”



Overview

1. Introduction
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Introduction



Introduction

The Morris Animal Foundation is working with Fisher BioServices and several other partners to take veterinary research—specifically, research into canine cancer—beyond the laboratory. Called the Golden Retriever Lifetime Study, the project is the first study to go into operation under the administrative umbrella of the Foundation’s Canine Lifetime Health Project (CLHP). The Golden Retriever Lifetime Study will enroll 3,000 dogs before age two, and collect environmental and other data as well as biospecimens, throughout the dogs’ life.

CLHP

(Foundation’s Canine Lifetime Health Project)



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Introduction

Morris Animal Foundation is a nonprofit organization that supports and funds veterinary medicine research for dogs, cats, horses and wildlife. Established in 1948, the Foundation's activities have led to improved prevention, diagnosis, and treatment of illness afflicting animals around the world. The Foundation is currently sponsoring 33 individual studies in canine cancer alone, and an additional 11 studies on cancer in other species are also in progress. However, the Golden Retriever Lifetime Study takes the Morris Animal Foundation's research program (and perhaps veterinary research in general) to a new level.

33 Individual Studies
in Canine Cancer.

+11 studies on
cancer in other species
in progress.



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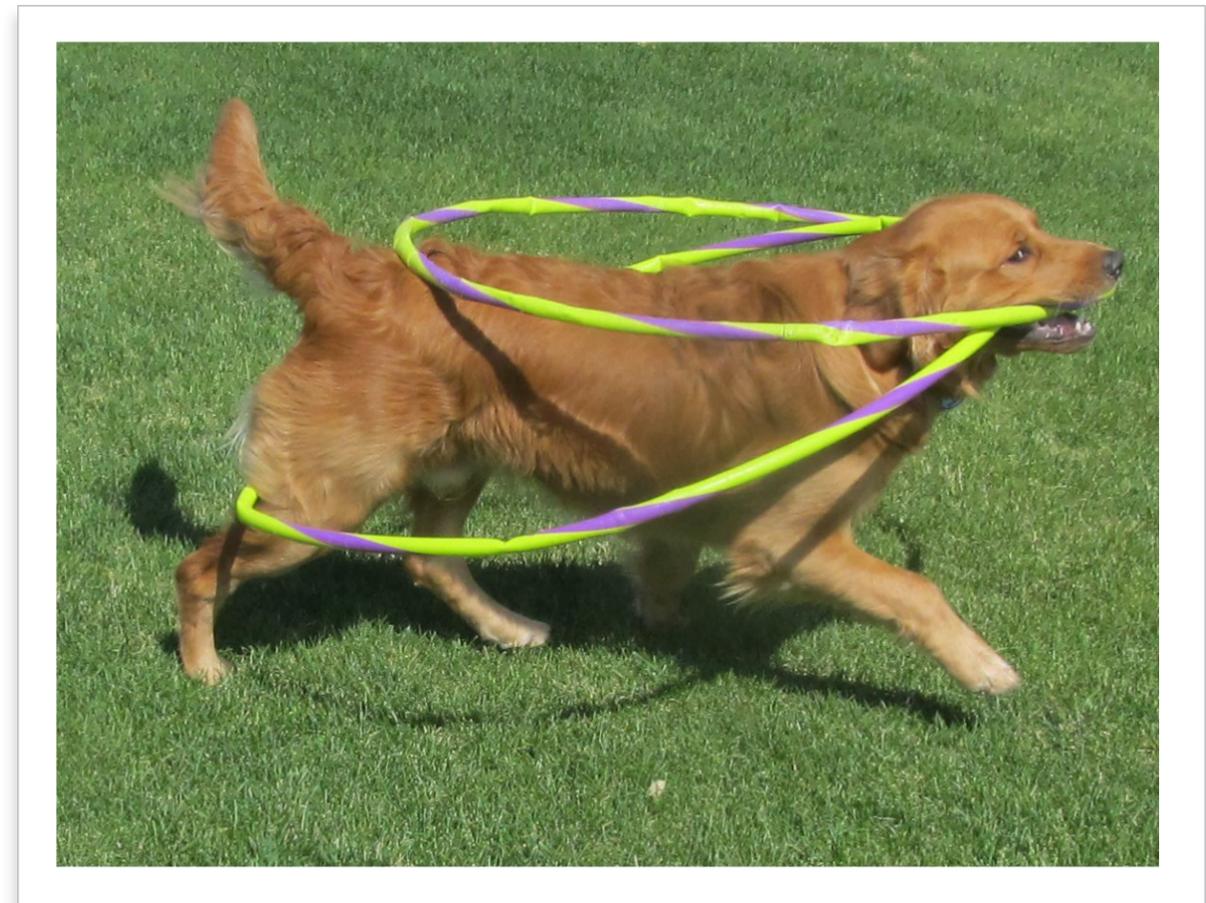
Bringing Biobanking and Epidemiological Tools to Veterinary Research



Bringing Biobanking and Epidemiological Tools to Veterinary Research

The CLHP is a database modeled after the Army of Women, a program of the Dr. Susan Love Research Foundation. Like the Army of Women, Morris Animal Foundation created a database where dog owners who are willing to participate—and have their dogs participate—in research can register their availability. The database solicits all breeds and ages of dogs and eventually, like the Army of Women Program, approved researchers will be able to search the database to find the dogs needed for their project, thus eliminating a significant barrier in animal health research.

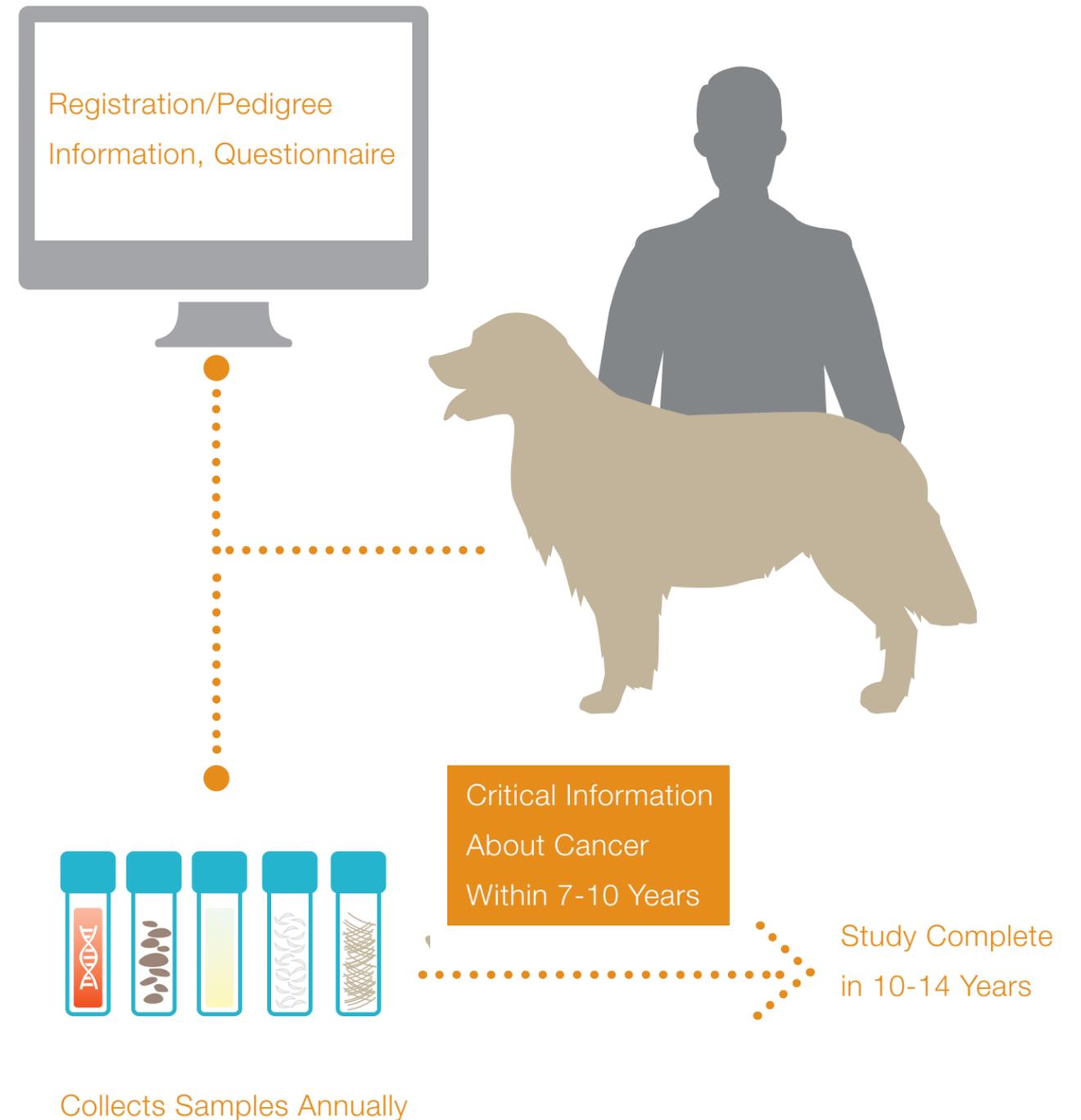
The Golden Retriever's Lifetime Study began with a pilot study of 50 owners of Golden Retrievers who had registered in the CLHP database; recruitment of the remaining 3,000 dogs through multiple channels began soon thereafter.





Bringing Biobanking and Epidemiological Tools to Veterinary Research

An owner enrolling their dog agrees to provide registration/pedigree information, and also to complete an online questionnaire about the dog every year. They must also select a veterinarian who will agree to participate, and visit the vet annually for physical examinations and collection of samples (blood, feces, urine, toenail clippings, and hair). Enrollment begins when the owner completes the initial questionnaire and then schedules an appointment with the dog's veterinarian. New registrants are asked to wait until the puppy is at least six months old so that the questionnaire data and biospecimens reflect a uniform initial age and minimum maturity.

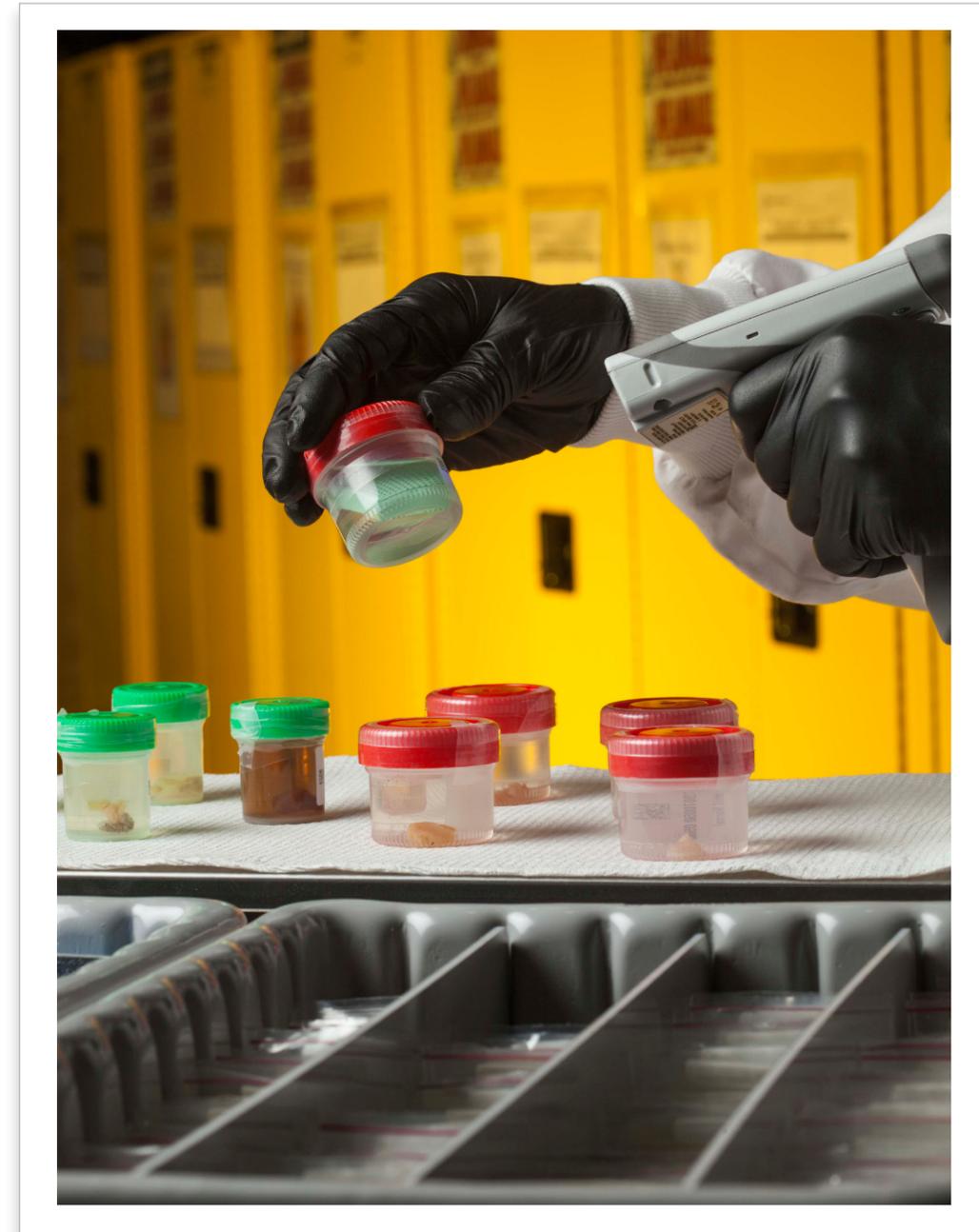


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Bringing Biobanking and Epidemiological Tools to Veterinary Research

Because data and specimen collection for the 3,000 dogs in the Study will near completion in about 10 to 14 years, it is possible that Morris Animal Foundation's efforts will yield critical information about cancer (as well as other canine health condition, such as hypothyroidism, renal failure, hip dysplasia, and epilepsy) within only seven to 10 years. Researchers will be specifically examining early obesity in the dogs and its relationship to cancer, diabetes and other health conditions.



Biobanking technician processing canine samples at Fisher BioServices.



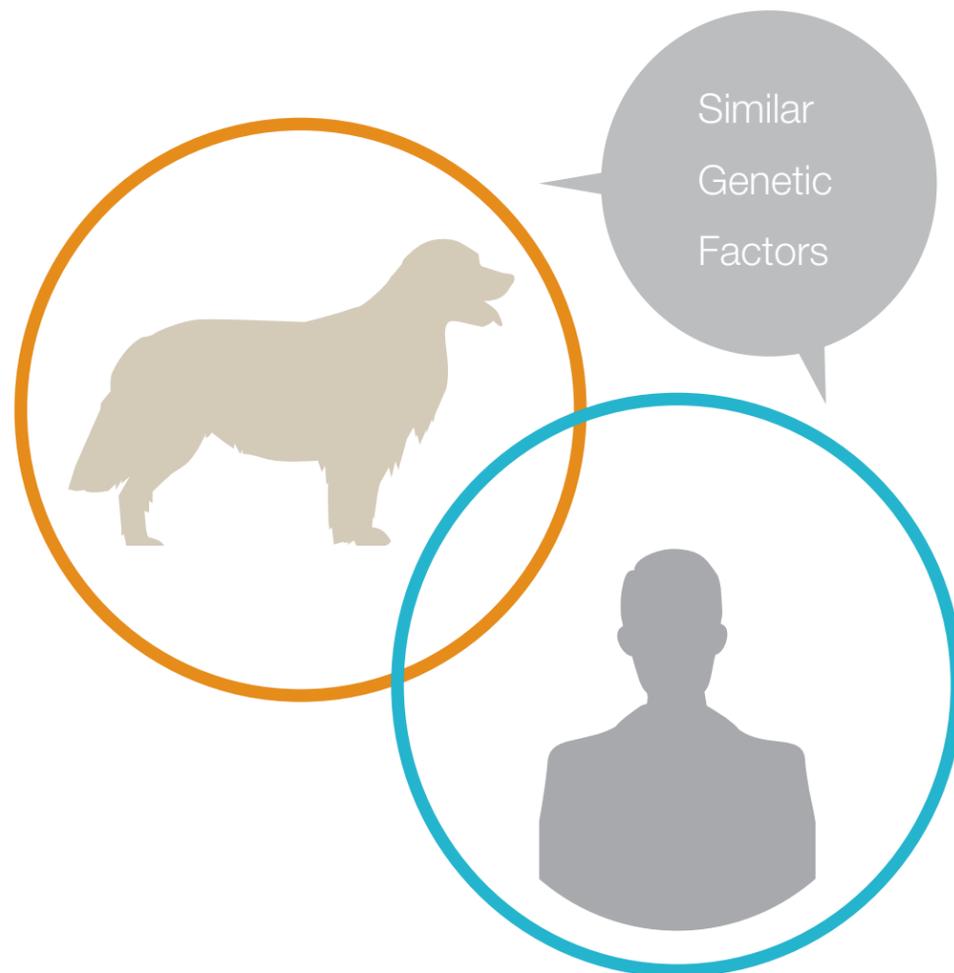
3

Canines and Cancer



Canines and Cancer

Cancer accounts for **25%**
of Deaths in Dogs



Cancer is common in dogs of all breeds, as in humans (cancer accounts for about 25 percent of deaths in dogs as a whole), but is responsible for more than half of deaths in Golden Retrievers. Why the rate is higher in Golden Retrievers is unknown, and research into the causes and treatment of cancer in this breed will benefit all dogs, as well as human cancer patients.

Canine cancers have significant comparative value in investigating their counterparts among humans; it is suspected that the genetic factors associated with osteosarcoma, hemangiosarcoma, and other cancers in dogs are the same as those associated with the disease in humans, and many new medicines developed for humans are first tested in dogs. In addition, dogs can serve as a sentinel species: they share the same environment as humans, and because of their shortened lifespan, toxins and other environmental factors that cause illness will show up in dogs before humans. Thus any research into any canine illness is potentially beneficial to people.

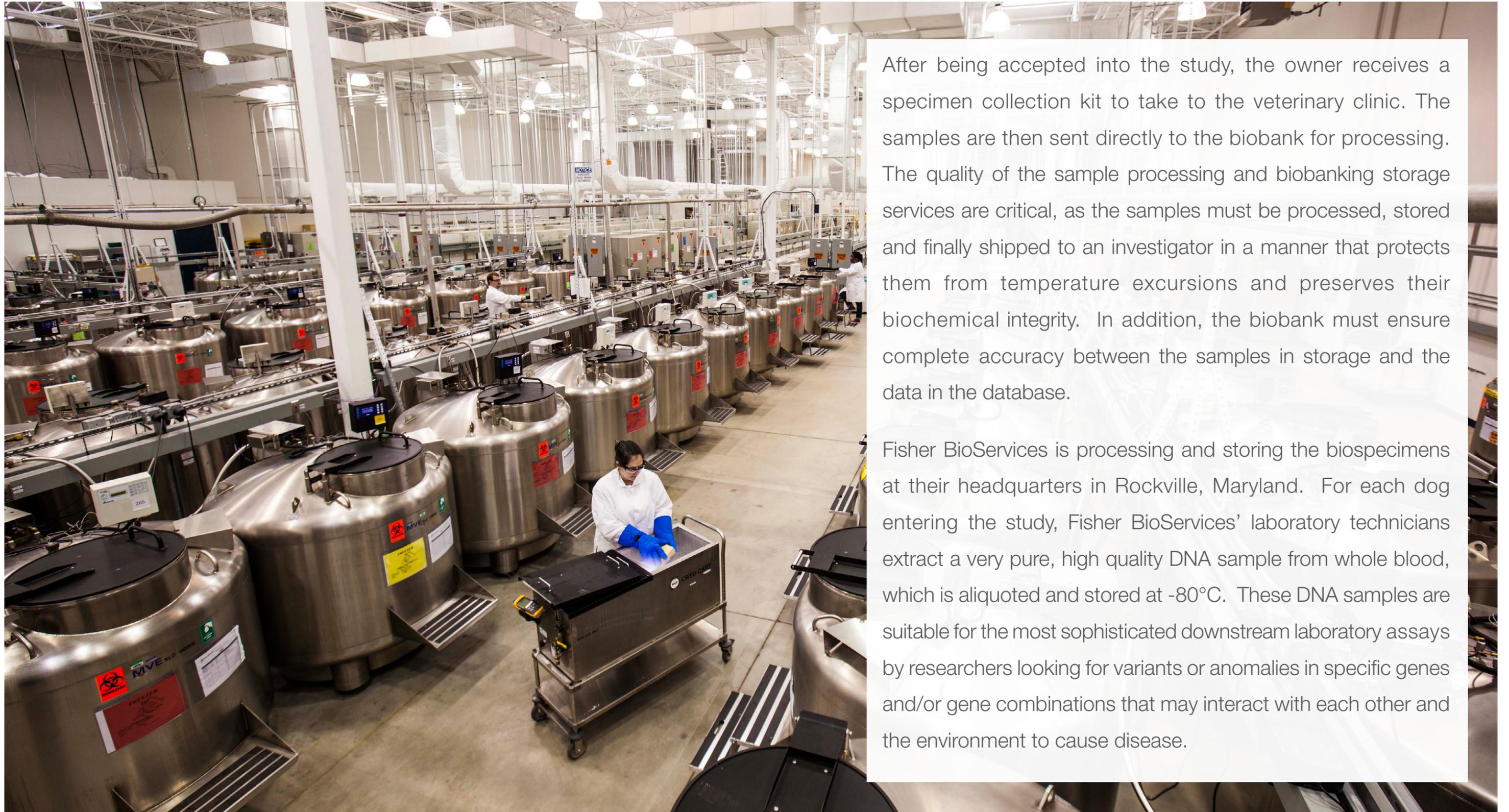


4

The Biobank



The Biobank



After being accepted into the study, the owner receives a specimen collection kit to take to the veterinary clinic. The samples are then sent directly to the biobank for processing. The quality of the sample processing and biobanking storage services are critical, as the samples must be processed, stored and finally shipped to an investigator in a manner that protects them from temperature excursions and preserves their biochemical integrity. In addition, the biobank must ensure complete accuracy between the samples in storage and the data in the database.

Fisher BioServices is processing and storing the biospecimens at their headquarters in Rockville, Maryland. For each dog entering the study, Fisher BioServices' laboratory technicians extract a very pure, high quality DNA sample from whole blood, which is aliquoted and stored at -80°C . These DNA samples are suitable for the most sophisticated downstream laboratory assays by researchers looking for variants or anomalies in specific genes and/or gene combinations that may interact with each other and the environment to cause disease.

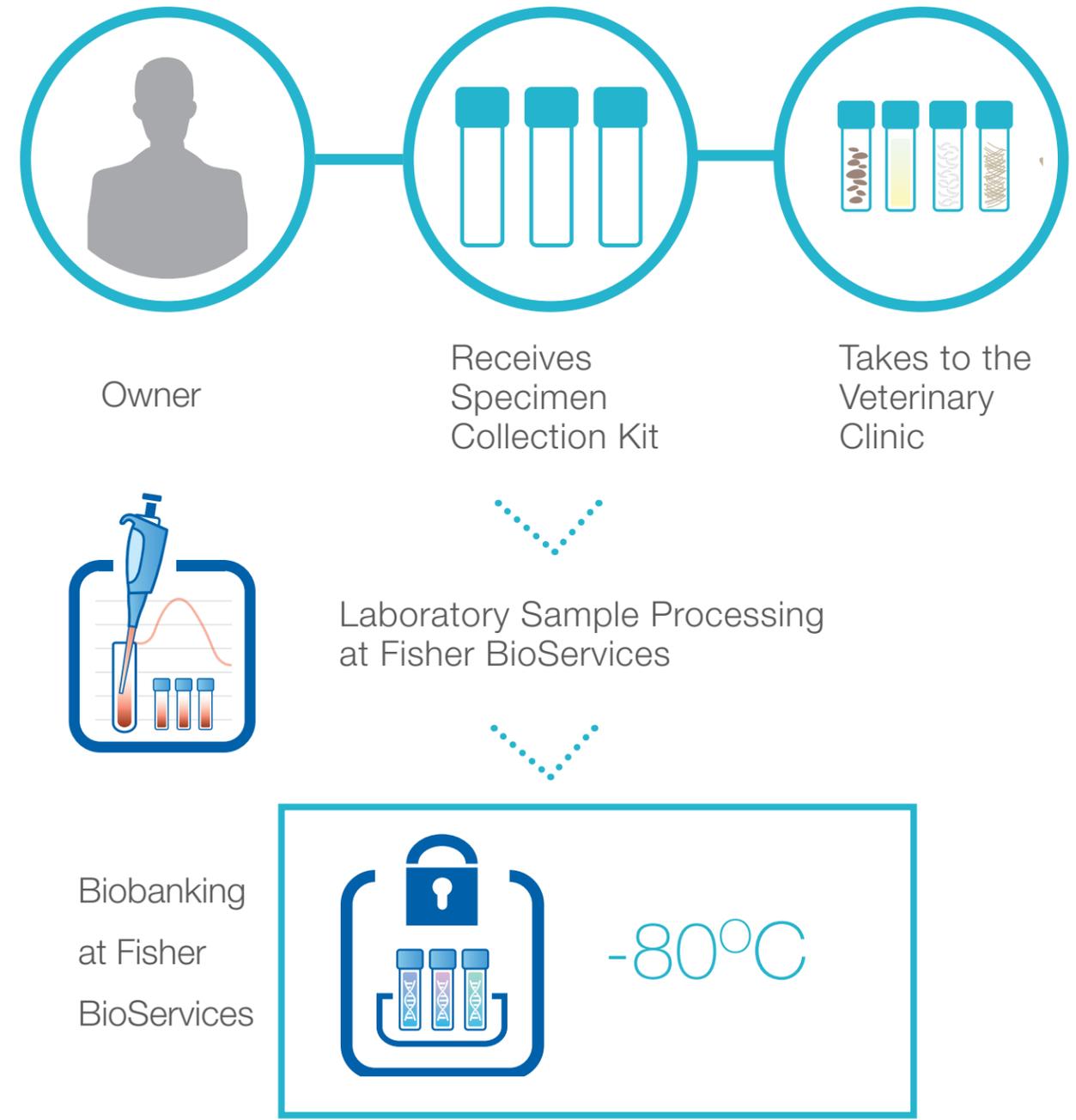


The Biobank

The laboratory is also preserving spots of whole blood on a 5x7 Whatman card, which allows storage of thousands of small blood samples at room temperature, in a small space. A small punch from one of the dried blood spots is sufficient to extract a DNA sample for certain genetic analyses.

In addition to extracting and storing initial DNA samples for each dog, Fisher BioServices is also processing and “banking” the samples collected during each annual follow-up visit, including urine, feces, whole blood, serum, hair, and toenail clippings. Some of the blood taken at the annual visit is separated and the serum aliquoted and frozen in liquid nitrogen. The remaining whole blood and the urine samples are aliquoted and stored at -80°C. The hair, toenail clippings and fecal samples are not processed but are also frozen at -80°C.

Canine Sample Management Overview



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The Biobank

Since Fisher BioServices began receiving specimens from study dogs in June of 2012, the biobank has grown to more than 12,000 samples, including all the aliquots created. At the end of the study, after the full 3,000 dogs have been enrolled and samples collected annually over a span of about 12 years, the Foundation hopes to have a biobank of nearly one million samples, annotated with the corresponding data on the study dogs' health, environment, medical information, genetics, and other information.

As the study continues and the biobank grows, the Foundation anticipates approving and potentially funding numerous research applications using the materials and data. It is possible that through the leadership and commitment of Morris Animal Foundation, we may find a cure for numerous cancers and other disorders in dogs, leading to cures in humans as well as other species.





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The Community and the Collaboration



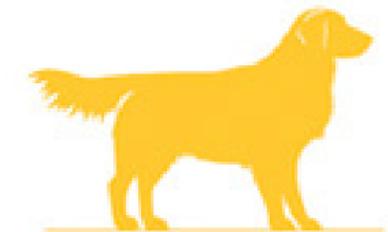
The Community and the Collaboration

Morris Animal Foundation is committing \$25 million to the Golden Retriever Lifetime Study and is being assisted by a number of equally committed and generous partners. One key partner, the Golden Retriever Club of America, is actively assisting both financially and with enrollment. Others include the Foundation's Platinum Partners: The Mark & Bette Morris Family Foundation, Blue Buffalo Foundation for Cancer Research, Petco Foundation, Hills Pet Nutrition, Zoetis and VCA/Antech.

The Golden Retriever Club of America's assistance with enrollment is especially significant. They are inviting breeders and purchasers of puppies to enroll their dogs, which has led to registration of multiple dogs from the same litter.

\$25 Million

Committing to Golden Retriever Lifetime Study



**Morris Animal
FOUNDATION**
Golden Retriever Lifetime Study



Zoetis

VCA / Antech

**The Mark & Bette
Morris Family Foundation**

**Blue Buffalo Foundation
for Cancer Research**

Petco Foundation

**Hills Pet
Nutrition**



The Community and the Collaboration

Morris Animal Foundation is also reaching out to veterinarians, who in turn have recruited significant numbers of clients and their puppies into the study. To help veterinarians in recruitment, the Foundation prepared a toolkit which includes a press release about the veterinarian's participation, a letter about the study they can give to clients who own Golden Retrievers, and brochures/pamphlets to display in their lobby or hand out at events.

In addition to contracting with Fisher BioServices to manage the biobank, the Foundation is working with a contract research organization (CRO) to manage the database. The initial enrollees are just approaching the first annual follow-up, and the CRO will be monitoring the completion of the annual questionnaire updates and veterinary appointments, and providing reminders to owners who may forget (the Foundation offers the owners a reimbursement of \$75 upon completion of the yearly questionnaire, including the option to donate it back to the study).





The Community and the Collaboration

Morris Animal Foundation President and CEO, Dr. David Haworth bought this puppy (Bridger) so he could participate in the study too.

The Morris Animal Foundation is still seeking owners of Golden Retrievers to enroll themselves and their dogs in the study. Go to "<http://www.caninelifetimehealth.org>" for more information and to register.





Additional Resources

As a worldwide provider of biobanking and clinical trial sample management, Fisher BioServices can assist companies looking to store critical biological materials, biotherapeutics, manufacture sample collection kits, and process samples.

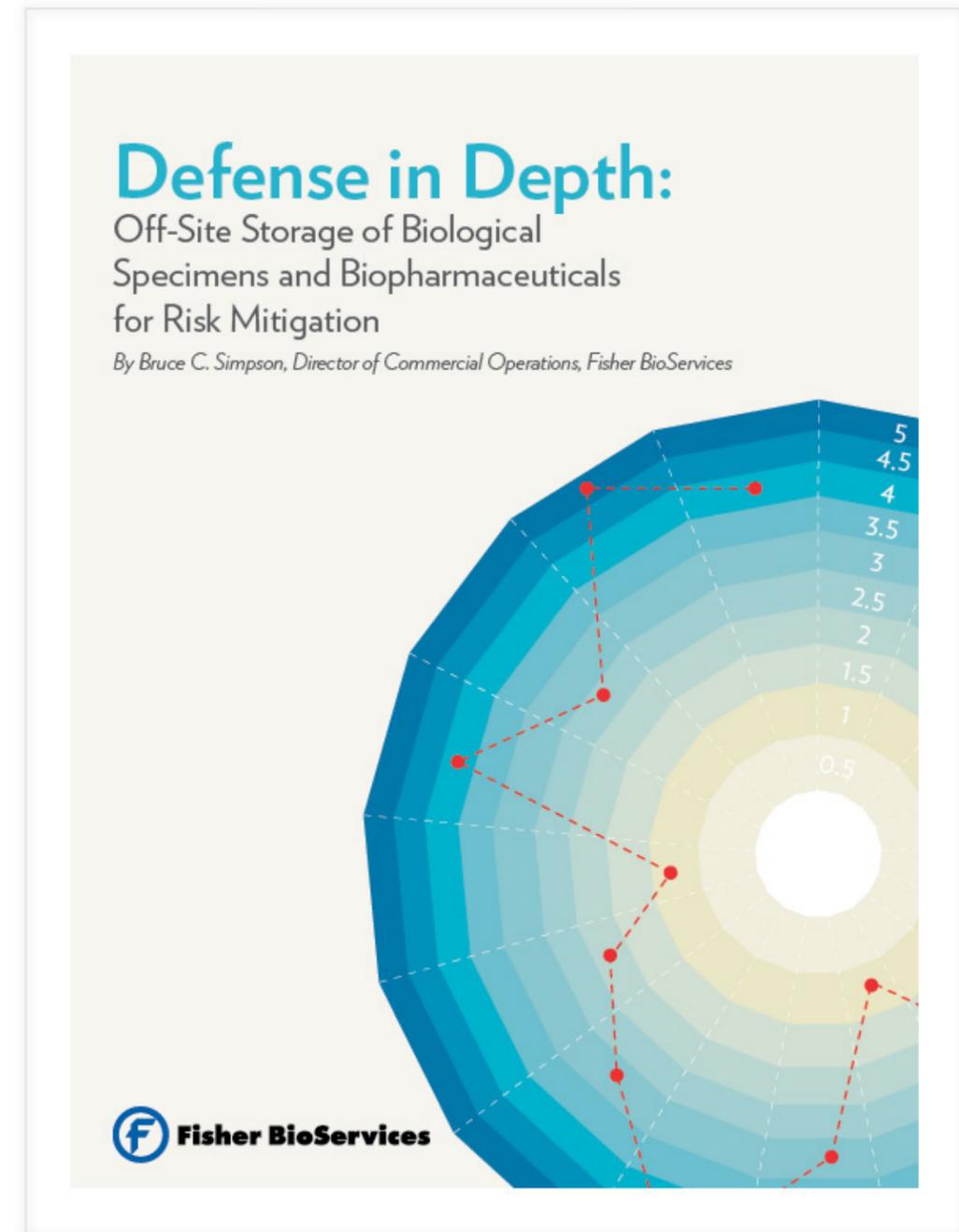
- Simple to complex sample collection kit design and production
- Sample processing, global biobanking, and data management
- Online access to inventory for data searching, requesting samples, and exporting reports

▶ Explore Your Solutions



Additional Resources

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