

# **THE GENETICS OF CANINE BEHAVIOR.....PREDICTING PERFORMANCE OF AMERICA'S WORKING DOGS**

Dogs have always worked alongside the men and women in our armed services, which currently enlists about 2,300 Military War Dogs in the fighting force. In America today, detection dogs that can sweep large areas or track the vapor of carried explosives are also in high demand and critical to our national security. By having these working dogs on the job, we can all safely enjoy public transportation, concerts, marathons, shopping malls, sporting events and tourist attractions. With the surging global demand, prices now exceed \$25,000 for a dog as the United States relies on brokers who source dogs from Eastern Europe.

According to the NYTimes, T.S.A. agents and United States Army officers who go on overseas buying trips say they are lucky if they look at 110 dogs and have 50 pass their preliminary behavioral and medical screenings. Of those dogs, another 15 to 20 percent don't make it through training in the United States to be put into service. The ones that wash out are shopped to other agencies or put up for adoption. Once it has a promising pup, the Pentagon spends an additional \$42,000 to train a K9 unit, a process that starts with obedience and drug and/or bomb detection at Lackland Air Force Base in San Antonio, Texas. Some of the dogs get a second round of training in how to patrol, detain an enemy and attack. A "dual-purpose" dog spends about 120 days completing both training cycles. The U.S. military spends up to \$283,000 to train one working war dog.

The scarcity of these dogs for both military and public safety use prompted the American Kennel Club (AKC) to investigate the possibility of creating either a cooperative of private dog breeders in the United States or a federally funded breeding program to provide the military and law enforcement agencies with high-quality dogs. However, with training success rates hovering between 20—50% in the military and service dog populations, simply increasing puppy numbers still translates into wasted training dollars, puppies pushed into roles in which

they cannot succeed, unmet client needs and dogs that cannot fulfill the elite requirements to protect and serve.

How do we increase success rates when decades of pedigree analysis and focused breeding programs have fallen short? That question was brought to the Theriogenology Foundation (TF), the charitable arm that unites the American College of Theriogenologists and the Society for Theriogenology. These veterinarians, dedicated to responsible breeding and genetic practices, recognized that there are no useful genetic tests for behavioral traits, suggesting a fundamentally new approach is needed. Genetic tests focused on behavior or temperament would help solve today's clear and present challenge: *to accurately predict the potential for specific task training at an early age in an individual puppy.*

Recognizing the need for new tools and technology to study genomics, the TF has now partnered with the Broad Institute of MIT and Harvard. The Broad Institute is a world renowned genomic institute launched in 2004 by MIT and Harvard University in collaboration with the Eli & Edythe Broad Foundation. Staffed by leading genomic scientists and equipped with cutting edge production platforms and analysis technologies, the Broad's primary mission is to use genomics to advance our understanding of biology and the treatment of disease.

With this directive, The Working Dog Project (WDP) was launched in September 2017. This project is the first step on the path to predicting temperament and working skills using genomic tools. The goal is to find the genetic loci associated with key behavioral traits of military and service dogs in order to guide our selection of puppies for specific training and career paths. This program will leverage the power of genomics to support better working dog breeding and training programs.

The WDP is the first project in a comprehensive program that engages working dog organizations, scientists and dog breeders. The AKC and TF have a history of collaboration for the well-being of purpose bred dogs. Since 2014, they have partnered to establish 9 residencies in companion animal theriogenology in colleges of veterinary medicine to advance post graduate veterinary education in

reproductive medicine and increase clinical competency in veterinarians serving companion animal owners. AKC Reunite, North America's largest not for profit pet ID and recovery service, joins the Theriogenology Foundation as a major financial supporter of the WDP. Historically, the canine fancier and veterinarians have been diligently committed to supporting research aimed to unlock the genetic code of many physical diseases. The current commitment is to examine the canine genome as critically for predicting behavior as we have for predicting disease.