

# **An International Genetic Survey of Working Canines from the United States, Israel and Poland**

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# Introduction

- ❧ Genetic diseases are found in dog breeds commonly used as working dogs
- ❧ As important members of their teams, dogs are expected to operate at peak performance for several years



- ❁ Working dogs are a significant investment for both cost of purchase and training
- ❁ Previous studies examining reasons for discharge or euthanasia failed to include genetic risks



# Study Objective & Goal

- ❁ To identify breed-specific genetic risks for inherited diseases in working dogs
- ❁ With the goal of providing a justification for screening dogs prior to breeding, buying or training



- ❧ 304 dogs were ascertained
  - 267 law enforcement dogs
    - 122 US, 87 Israel, 58 Poland
  - 37 search & rescue (SAR) dogs (US)
- ❧ Study participants included dogs in training, active duty or retired
- ❧ Handlers collected 3 cheek swabs (US) or veterinarians collected blood in EDTA (Israel, Poland)
- ❧ Dogs were screened with routine molecular genetic methods for 1-15 disease mutations based on breed

- ❀ DM occurs in more than 150 breeds of dog
- ❀ DM affects white matter of spinal cord
- ❀ Average age of onset for symptoms is 9 years
- ❀ Mutation in *SOD1*
  - Also found in humans, Lou Gehrig's Disease (amyotrophic lateral sclerosis, ALS)
- ❀ Gradual muscle atrophy, begins in hind limbs
- ❀ Progressive disease

- ❧ Previous studies cite degenerative diseases, spinal cord disease, or musculoskeletal disease, as reasons for early discharge or euthanasia of working dogs, leading to the speculation of possible DM
- ❧ Our study showed DM in a substantial number of German shepherd dogs and other working breeds tested
- ❧ Thus, DM is likely a significant challenge among law enforcement and other working dogs

- ❖ Neuromuscular disorder presents with exercise intolerance
- ❖ Many dogs diagnosed after 2 years of age
- ❖ 5-20 min. of strenuous exercise results in collapse with recovery 5-30 min.
- ❖ Episodes would be stressful to the handler and could jeopardize both handler and dog in certain situations

# Leukocyte Adhesion Deficiency III

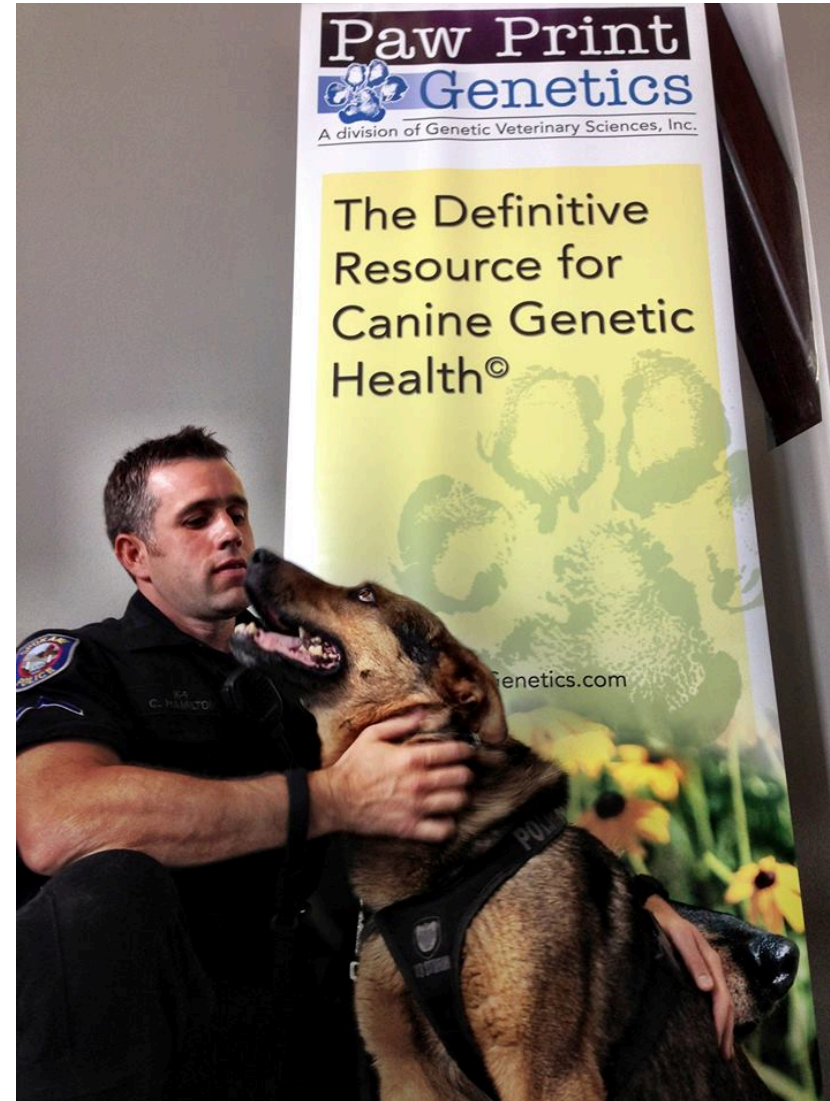
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- ❀ Blood disorder characterized with abnormal platelets, abnormal clotting and immune system dysfunction
- ❀ Dogs may present with lameness, prolonged bleeding, recurrent infections

- ❧ A substantial number of dogs studied were either carriers or at-risk for known genetic diseases
- ❧ Based on this study, before breeding, buying or training, working dogs should be screened for common, breed-specific genetic conditions
- ❧ Identifying carriers allows informed breeding decisions and avoidance of breeding carrier x carrier
- ❧ Conditions identified in this study are likely to put the dog, handler or the mission in jeopardy (EIC) or shorten a K9's career (DM)

# Summary cont.

- ❧ The loss of dogs due to early retirement or euthanasia as a result of preventable genetic conditions has emotional costs to handlers and financial costs to service organizations
- ❧ Known genetic conditions are easily avoided through relatively low cost genetic testing
- ❧ These findings and conclusions are applicable to any working or assistance dogs



# Disclosures & Acknowledgments

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- ❀ Paw Print Genetics is a fee for service lab that provides genetic testing to breeders, owners and trainers
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