Predisposition to Avian Tuberculosis (MAC) in Basset Hounds

by Urs Giger, PennGen Laboratory – August 2016

Systemic avian tuberculosis (also referred to as mycobacterium avium complex or MAC) in dogs is characterized by enlarged lymph nodes, fever, diarrhea, weight loss, and respiratory problems. We have recognized that some Basset Hounds and Miniature Schnauzers succumb to this infectious disease, while generally dogs and humans are resistant to this ubiquitous bacterium unless immunocompromised. This predisposition to MAC is clearly genetic/inherited. In Miniature Schnauzers MAC has an autosomal recessive inheritance pattern, but we do not yet know if every dog that is genetically at risk will develop this systemic overwhelming infection. We also do not yet know if the predisposed dogs develop other infections such as skin and ear infections.

A clinical diagnosis of MAC in Bassets is made when clinical signs occurred. Most characteristically adult Bassets develop large lymph nodes (lymphadenopathy) but also show progressively other unspecific signs such as fever, inappetence, weight loss and lethargy. A definitive diagnosis is based upon histopathology of a lymph node or similar tissue, culturing the mycobacterium avium or at autopsy as this disease is progressive and fatal. Because of the inherited immunodeficiency there is no effective treatment for infected Bassets. While the precise mode of inheritance of MAC in Basset Hounds is unknown it is likely autosomal recessive as both genders are affected and parents are generally asymptomatic. Carriers could be identified by pedigree analysis – parents and offspring of affecteds are obligate carriers (but could even be genetically affected prior to showing signs).

Our PennGen laboratory at the University of Pennsylvania has been studying MAC in Miniature Schnauzers for several years, has been working with their Health Club Committee as well as breeders, veterinarians and pet owners of affecteds, and kindly acknowledges the receipt of funding from the Gray Lady Foundation and more recently the AKC Canine Health Foundation. We most recently characterized the molecular basis of the genetic predisposition to MAC in Miniature Schnauzers and developed a DNA test for MAC predisposition in that breed.

With a recently awarded AKC canine Health Foundation grant we are keenly interested in characterizing MAC in Basset Hounds. We have already started the investigations and determined that MAC in Bassets is not caused by the same mutation and gene. Thus an expanded study is required to potentially perform a genome-wide association study as well as whole genome sequencing as we successfully did for MAC in Miniature Schnauzers. We like to develop a DNA mutation test for MAC in Bassets as we did for Miniature Schnauzers. With such a genetic test, which uses EDTA blood or cheek swabs, we could not only (1) confirm clinically diseased dogs, but also (2) identify those at risk of developing MAC before showing signs and (3) detect carriers (heterozygotes) which carry the mutant allele/gene but remain clinically asymptomatic.

We kindly ask you to contact us if you own or have knowledge a MAC affected Basset Hound. We only need a small blood sample from this dog aside the clinical and pedigree information. We want to assure you we will keep all information confidential.

Please follow the instructions for submission and ship by reliable service to: PennGen/MAC Basset, Ryan Veterinary Hospital, University of Pennsylvania, 3900 Delancey Street Rm 4013, Philadelphia, PA 19104-6010 USA; 215-573-7545. For additional questions email giger@vet.upenn.edu and PennGen@lists.upenn.edu

Thank you for your interest and participation.

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