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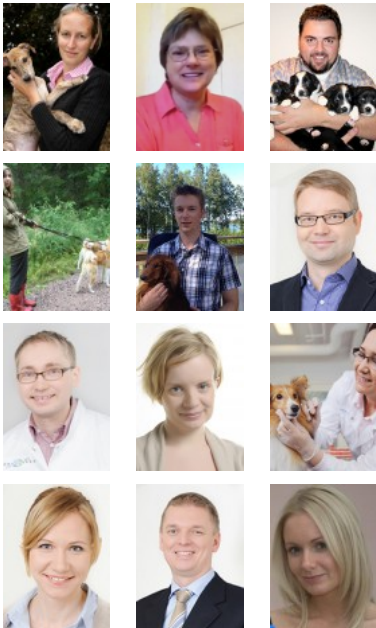


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MyDogDNA news

Exploring dog DNA testing, breed health and discoveries in canine genetics

Authors



Mixed Breed Dogs Are Not Protected From Breed Disease Heritage

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23/07/2013 AT 05:38 PM – [FREDRIK MÖLLER](#)



A canine research group, led by Thomas Bellumori, from the University of California Davis has mapped the prevalence of 22 different hereditary disorders using health information from 27 254 dogs from a major a hospital in the United States. With this huge amount of data they were able to compare the prevalence of of the known hereditary diseases between different breeds.

It has been publicly discussed for years that hereditary disorders would be a direct consequence of the selective breeding of pedigree dogs and that for this reason the purebreds would have a much greater risk of developing hereditary disorders than the mixed breed dogs. According to the latest research by Bellumori and his group, this assumption does not seem to hold. Indeed many diseases seem to be as common in mixed breed as in pedigree dogs. The result might be explained with the fact that many mutations are widely spread in the entire dog population. In this case dogs of different breeds can carry the same mutation causing offspring.

Table 1: Comparison of disease prevalence between purebred and mixed breed dogs

More common in purebred dogs	Equally common in purebred and mixed breed dogs	More common in mixed breed dogs
Aortic stenosis	Hypertrophic cardiomyopathy	Ruptured cranial cruciate ligament
Dilated cardiomyopathy	Mitral valve dysplasia	
Elbow dysplasia	Patent ductus arteriosus	
IVDD	Ventricular septal defect	
Hypothyroidism	Hemangiosarcoma	
Allergic dermatitis	Lymphoma	
Bloat	Mast cell tumor	
Cataracts	Osteosarcoma	
Epilepsy	Hip dysplasia	
Portosystemic shunt	Patellar luxation	
	Hyperadrenocorticism	
	Hypoadrenocorticism	
	Lens luxation	

Although the number gives a hint on how widespread the diseases are, it has to be remembered that the genetic causes have not been confirmed in this study. The same disease can be caused by a number of mutations that may also vary between breeds. Some of the diseases are not solely genetic and especially different cancers are usually caused by the joint effect of heritage and environment. In the article it is evaluated that pedigree dogs are more often diagnosed than mixed breed dogs, which could bias the results to the

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mixed breed favour.

In addition to the hereditary disease information, the group also collected statistics about the accidental o of dogs. In this data mixed breed dogs were clearly overrepresented. Quite curiously, it is mentioned in the article that a mixed breed dog more often dies of getting under a car. Looking at the onset ages of the diseases, which is in most of the presented cases higher than the mean age of accidental death (4.9 year: see that mixed breed dogs might not live long enough to express its diseases as often as the pedigree dc

Based on the research, it still seems that ther would however be certain diseases that would be more enr in purebreds, because the pourcentage is so much higher than in mixed breed dogs. Aortic stenosis, elbc dysplasia, IVDD, hypothyroidism and portosystemic shunt show a clear prevalence to a certain breed, witi clearly bigger part affected than in the other top five breeds on the list. This raises the question: Why? Co simply be because of poor luck or is the disease inherited together with a desirable trait? In the other dise more commonly found in purebred dogs, the breed with the highest prevalence does not stick out and th second question is: What do these breeds have in common? Unfortunately, these questions will go unanswered for now.

For further canine genetic research these results may help idetify in which breeds to search the genetic c for the diseases. Some of the diseases presented in the article already have a genetic test developed and some of these have also made their way into the MyDogDNA-analysis. However, many times a disorder ca caused by a number of mutations and a single gene test can only capture one of the genetic causes. Unfortunately, except for MyDogDNA, the results of commercial gene tests are not collected into one dat for researchers to check whether an expected amount of gene tests turn out positive compared to existin clinical data, as the one collected by Bellumori *et al.*

Table 2: Disease prevalence within different breeds

Disease	Position	Breed	Part of breed affected (
Aortic stenosis	1.	Newfoundland	6.8
	2.	Boxer	4.5
	3.	Bull Terrier	4.1
	4.	Irish Terrier	3.1
	5.	Bouvier des Flandres	2.4
Dilated cardiomyopathy	1.	Doberman Pinscher	7.3
	2.	Great Dane	7.3
	3.	Neapolitan Mastiff	6.6
	4.	Irish Wolfhound	6.1
	5.	Saluki	5.9
Elbow dysplasia	1.	Berneses Mountain Dog	13.9
	2.	Newfoundland	10.3
	3.	Mastiff	6.6
	4.	Rottweiler	6.3
	5.	Anatolian Shepherd	5.4
IVDD	1.	Dachshund	34.9
	2.	French Bulldog	27.1
	3.	Pekingese	20.6
	4.	Pembroke Welsh Corgi	15.1
	5.	Doberman Pinscher	12.7
Hypothyroidism	1.	Giant Schnauzer	11.5
	2.	Irish Setter	7.7
	3.	Keeshond	6.6
	4.	Bouvier des Flandres	6.6
	5.	Doberman Pinscher	6.3
Allergic dermatitis	1.	West Highland White Terrier	8.6
	2.	Coonhound	8.3
	3.	Wirehaired Fox Terrier	8.2
	4.	Cairn Terrier	6.9
	5.	Tibetan Terrier	5.9
Bloat	1.	Saint Bernard	3.8
	2.	Irish Setter	3.4
	3.	Blood Hound	3.4

	4.	Great Dane	2.8
	5.	Irish Wolfhound	2.7
Cataracts	1.	Silky Terrier	22.8
	2.	Miniature Poodle	21.5
	3.	Brussels Griffon	20.5
	4.	Boston Terrier	19.6
	5.	Tibetan Terrier	18.9
Epilepsy	1.	Catahoula Leopard Dog	3.9
	2.	Beagle	3.6
	3.	Schipperke	3.4
	4.	Papillon	3.4
	5.	Standard Poodle	3.2
Portosystemic shunt (PSS)	1.	Yorkshire Terrier	10.9
	2.	Norwich Terrier	7.4
	3.	Pug	5.9
	4.	Maltese	5.9
	5.	Havanese	4.4

Reference:

Thomas P. Bellumori, MD; Thomas R. Famula, PhD; Danika L. Bannasch, PhD; Janelle M. Belanger, MS; Ani Oberhauer, PhD

"Prevalence of inherited disorders among mixed-breed and purebred dogs: 27,254 cases (1995-2010)"

Journal of the American Veterinary Medical Association, June 1, 2013, Vol. 242, No. 11, Pages 1549-1555
doi: 10.2460/javma.242.11.1549

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