Canine hereditary disorders are more widespread than previously indicated

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Dogs have more hereditary diseases than previously thought. Credit: University of Helsinki

Genoscoper Ltd. has published in cooperation with the researchers of University of Helsinki and Pennsylvania (USA) so far the most comprehensive study on canine hereditary disorders. The research brings new information about genetic disorders causing diseases in different dog breeds. The results can be utilized both in dog breeding and

veterinary diagnostics. The study was published on *PLOS ONE* on 15 August 2016.

"We noted that surprisingly many canine inherited disorders are actually more widespread than indicated by their original discovery studies, which opens up the door for several future scientific investigations," explains senior author Dr. Hannes Lohi from the University of Helsinki canine genetics research group.

"The technological potential to test a dog for multiple inherited disorders at once has existed for several years. The challenge is to harness that potential for practical use in improved veterinary disease diagnostics, sustainable breeding selections, personalized pet care, and canine genetics research," says lead author Dr. Jonas Donner of Genoscoper Laboratories. Genoscoper Ltd. is a Finnish company specialized in animal genetics and gene testing.

By testing nearly 7000 dogs representing around 230 different breeds for predisposition to almost 100 genetic disorders, the research team observed that 1 in 6 dogs carried at least one of the tested disease predisposing genetic variants in their genome. Moreover, 1 in 6 of the tested genetic variants was also discovered in a dog breed in which it had not previously been reported in the scientific literature. Through clinical follow up of dogs genetically at risk, the research team was able to confirm that several disorders cause the same disease signs also in other than previously described breeds.

"Precisely as we humans, every dog is likely to carry genetic predisposition for some inherited disorder, so we expect these numbers to grow as the numbers of tested disease variants, breeds, and dogs further increase," confirms Dr. Donner.

Genetic panel screening delivers results

The study concludes that comprehensive screening for canine inherited disorders represents an efficient and powerful diagnostic and research discovery tool that has a range of applications in veterinary care, disease research, and dog breeding. The authors emphasize that availability of complex DNA-based information is important progress for improvement of the health of purebred dogs, but it should be utilized in combination with other established approaches that promote sustainable breeding and benefit breed health.

Cooperation is key to healthier dogs

"Our study demonstrates the importance of collaboration between different contributors - academics, industry and dog fanciers - to reach novel resources that not only enable better understanding of canine genetic health across breeds but also provides viable solutions to improve the health. The published study provides also an excellent example of the added value of research collaborations between academia and industry in a form that leads to a powerful innovation that start changing the everyday practice in veterinary medicine and improves the welfare of our dogs," says Lohi.

More information: Jonas Donner et al. Genetic Panel Screening of Nearly 100 Mutations Reveals New Insights into the Breed Distribution of Risk Variants for Canine Hereditary Disorders, *PLOS ONE* (2016). DOI: 10.1371/journal.pone.0161005

Provided by University of Helsinki

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