

Dogs could be more similar to humans than we thought

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Dog and human gut microbiomes have more similar genes and responses to diet than we previously thought, according to a study published in the open access journal, *Microbiome*.

Dr Luis Pedro Coelho and colleagues from the European Molecular Biology Laboratory, in collaboration with Nestlé Research, evaluated the gut [microbiome](#) of two dog breeds and found that the [gene content](#) of the dogs microbiome showed many similarities to the human gut microbiome, and was more similar to humans than the microbiome of pigs or mice.

Dr Luis Pedro Coelho, corresponding author of the study, commented:

"We found many similarities between the gene content of the human and dog gut microbiomes. The results of this comparison suggest that we are more similar to man's best friend than we originally thought."

The researchers found that changes in the amount

of protein and carbohydrates in the diet had a similar effect on the microbiota of dogs and humans, independent of the dog's breed or sex. The microbiomes of overweight or obese dogs were found to be more responsive to a high protein diet compared to microbiomes of lean dogs; this is consistent with the idea that healthy microbiomes are more resilient.

Dr Luis Pedro Coelho, commented:

"These findings suggest that dogs could be a better model for nutrition studies than pigs or mice and we could potentially use data from dogs to study the impact of diet on [gut microbiota](#) in humans, and humans could be a good model to study the nutrition of dogs.

"Many people who have pets consider them as part of the family and like humans, dogs have a growing obesity problem. Therefore, it is important to study the implications of different diets."

The researchers investigated how diet interacted with the dog gut microbiome with a randomized controlled trial using a sample of 64 dogs, half of which were beagles and half were retrievers, with equal numbers of lean and overweight dogs. The dogs were all fed the same base diet of commercially available dog food for four weeks then they were randomized into two groups; one group consumed a high protein, low carb diet and the other group consumed a high carb, low protein diet for four weeks. A total of 129 dog stool samples were collected at four and eight weeks. The researchers then extracted DNA from these samples to create the dog gut microbiome gene catalogue containing 1,247,405 [genes](#). The dog gut gene catalogue was compared to existing gut microbiome gene catalogues from humans, mice and pigs to assess the similarities in gene content and how the [gut microbiome](#) responds to changes in [diet](#).

The authors caution that while humans and [dogs](#) host very similar microbes, they are not exactly the same microbes, but very closely related strains of the same species.

More information: Luis Pedro Coelho et al. Similarity of the dog and human gut microbiomes in gene content and response to diet, *Microbiome* (2018). [DOI: 10.1186/s40168-018-0450-3](https://doi.org/10.1186/s40168-018-0450-3)

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