

Authors Response to Reviewer's Comments

Reviewed by 02765428

Manuscript Number	8375
Manuscript Title	Genetics of Canine Behavior- A Review
Review Time	2014-03-20 03:05

Another example of a topic that seems out of place is sled dogs on page 13. I don't think of endurance and speed as a behavior, but rather a physical attribute.

Added sentence at end of sled dog paragraph: Although variants responsible for improved muscle function are important, those responsible for the motivation to perform are also involved.

old 52 rewritten:

The goal of selective breeding of the farm foxes was limited strictly to behavioral criteria related to tameness. However, physical, developmental, physiological, and other behavioral differences also emerged in the tame foxes compared to the original farm-bred foxes.

Many sentences describing genetic concepts are wordy, confusing, and sometimes inaccurate. For example, line 117: "The use of SNP markers is a valuable tool that can provide quantitative information about gene expression in tissue samples derived from tame and aggressive foxes and will help identify genes implicated in behavior." SNP markers are not generally used to study expression. I recommend that the authors identify a geneticist who is willing to review, or contribute

Did review the paper with a geneticist and decided to delete the sentence as it is not used in the right context.

old 144 deleted sentence

old 478 now 462 added a reference

old 521 new 526 added "It is probably more fruitful to look for genetic differences between dogs within the same breed. For that reason, English Cocker Spaniels were studied because dogs of that breed frequently exhibit unpredictable or impulsive aggression towards their owners^[57]. Moreover the prevalence of aggression varies with coat color; red (blonde or buff) spaniels are more aggressive than black ones and solid color spaniels are more likely to be aggressive than parti-colored ones. It is not clear how the production of pheomelanin (yellow pigment) rather than melanin (black pigment) leads to or is related to aggression although melanin and dopamine share a common precursor –tyrosine. This area bears investigation."

old 562 new 571 inserted "for serotonin 2A receptors".

One paragraph was written twice – starting on line 581 and again on line 668.
Removed duplicate (second) paragraph

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old 157: The authors suggest that “very early domestication likely consisted of the intentional taming of small groups of wolves”. While the “adoption” theory of humans actively taking wolf pups and raising them to be “tame” is a romantic one, and certainly not disproved, the theory of wolf self-domestication (where the wolf is attracted to the human village refuse heap, and eventually self-selects for a decreasing flight zone, etc) is also legitimate and bears mentioning (see reference: PNAS 2009 “From wild animals to domestic pets, an evolutionary view of domestication” by Driscoll, Macdonald, and O’Brien). This viewpoint is also suggested by Coppinger and Coppinger in their book “Dogs: A startling new understanding of canine origin, behavior, and evolution”, 2001. You mention this (albeit abstractly) in lines 194-195 – please suggest I more clearly as a theory, and add appropriate references.

new Line 184: Very early domestication may have involved the intentional taming of small groups of wolves who, less fearful of humans and motivated by hunger, scavenged the camps of Mesolithic human hunters-gatherers (PNAS 2009 reference).

Paragraph line 181-186: Why do the authors not also mention the recently published (Nov 2013) Science manuscript by Thalmann, *et al.* in which complete mitochondrial genome sequence suggests domestication in Europe? (Reference: Science, 2013 Nov, 15; 342(6160):871-4, “Complete mitochondrial genomes of ancient canids suggest a European origin of domestic dogs”, by Thalmann, Shapiro, Cui, *et al.*).

Added Thalmann reference:

new Line 221: Although genetic data support the theory that the process of canine domestication began in East Asia over 15,000 years ago, a recent study compared the complete mitochondrial genome sequences of 18 European prehistoric canids to a comprehensive panel of modern dogs and wolves. The researchers found phylogenetic relatedness between the modern dogs and the ancient canids of Europe dating back to more than 30,000 years ago, thus suggesting that canine domestication first may have occurred in Europe rather than in Asia.

Line 189 and Line 277: The authors contradict themselves, saying first that there are more than 300 canine breeds in existence today and then that there are more than 400 modern dog breeds. So....which is it?

Deleted 300 canine breeds from OLD Line 189 and kept 400 breeds on OLD Line 277

Deleted narcolepsy as requested by both reviewers

old lines 533 to 542 now 542- 551 added “These studies will be discussed in detail below.”

Minor revision changes:

1. Abstract, line 24: take out “a”, since “receptors” later in the sentence is plural
removed a
2. Line 131, Line 222, Line 462, Line 615, and Line 648: No need to re-write out “single nucleotide polymorphism”, since you defined the abbreviation SNP already in line 117. Change to just “SNP”.
3. Line 212: “lifestyle” is one word removed space between life and style
4. Line 404: the words “develop” and “place” should both have an s on them (e.g. “develops” and “places”) made words singular
5. Line 455: the use of “specific” twice in this sentence is redundant. Take out specific before the word gene removed first specific
6. Line 493: stage should be singular (remove the s) removed s
7. Line 523: add an “s” to one (i.e., it should read “ones”). ones
8. Line 570: there’s a lonely “w” in this line...should it be the word “were”? added ere
9. Line 575: remove comma after neurotransmitter removed comma
10. Line 576: italicize *et al.* italicized et al
11. Line 581: Should the word “here” actually be “there”? yes, corrected to there
12. Line 596: add “the” before Restricted added the
13. Line 600: No need to re-write out “canine behavioral assessment and research questionnaire” since you already defined the abbreviation on line 287. Change to just “CBARQ”. removed full name
14. Line 636: You don’t need to write out the gene’s official name, but a parenthetical description (dopamine receptor D4) would be useful to the reader here. Similarly, in line 662, a parenthetical to inform the reader of DAT (dopamine transporter) and VNTR (variable number tandem repeat) would be useful. replaced DRD4 with dopamine D4 and spelled out dopamine transporter and variable number tandem repeat
15. Line 657: add a comma after “identified” added comma after identified
16. Paragraph lines 668 through 672: this paragraph is entirely repeated from the paragraph of lines 581-585. Remove the paragraph from lines 668-672. removed

