

# Scientists pinpoint how the 'speed gene' works in thoroughbred racehorses

November 6 2018

---

Scientists have pinpointed the genetic basis that explains why some thoroughbred racehorses are better equipped to race over sprint distances and others over longer distances. The Irish scientists, from Trinity College Dublin and UCD, have discovered the inner workings of a known "speed gene", which directly affects skeletal muscle growth and, in turn, race distance aptitude.

Thoroughbred horses are finely-tuned athletes with a high aerobic capacity relative to their skeletal muscle mass, which can be attributed to centuries of genetic selection for [speed](#) and stamina. Non-genetic factors such as variation in training schedule can also influence how racehorse [distance](#) aptitudes and preferences develop, but prior work by UCD Professor Emmeline Hill had demonstrated that different versions (polymorphisms) of the myostatin gene, a pronounced inhibitor of skeletal muscle growth, almost singularly account for gene-based race distance aptitude in racehorses.

This prior discovery earned the myostatin gene the moniker of "speed gene", with horses with 'CC' copies tending to develop into sprinters; those with 'CT' copies tending to develop into middle-distance performers; and those with 'TT' copies tending to be best equipped for long distances.

However, until now, scientists didn't know which element(s) of the gene held the secrets to understanding the all-important racing distance preference.

In the new study the scientists pinpointed the specific non-coding section of the "speed gene" that is exclusively responsible for limiting myostatin protein production in thoroughbreds which, in turn, affects [skeletal muscle](#) development and race distance aptitude. The findings have just been published in leading international journal *PLOS ONE*.

Associate Professor in Biochemistry at Trinity College Dublin, Richard Porter, is the senior author of the journal article. The research was collaborative, involving research scientist Mary Rooney and Associate Professor Vincent Kelly from Trinity, together with Professor Emmeline Hill from the UCD School of Agriculture and Food Science.

Dr. Porter said: "Our data provides the first mechanistic evidence as to the specific element of the "speed gene" that acts as the sole protagonist in dictating its expression in the thoroughbred. As a result, this element is the key genetic factor in determining distance aptitude in thoroughbred horses. This knowledge is extremely valuable to thoroughbred breeders and trainers, in what is a multi-billion dollar industry."

**More information:** Mary F. Rooney et al, The "speed gene" effect of myostatin arises in Thoroughbred horses due to a promoter proximal SINE insertion, *PLOS ONE* (2018). [DOI: 10.1371/journal.pone.0205664](https://doi.org/10.1371/journal.pone.0205664)

Provided by Trinity College Dublin

Citation: Scientists pinpoint how the 'speed gene' works in thoroughbred racehorses (2018, November 6) retrieved 19 April 2024 from <https://phys.org/news/2018-11-scientists-gene-thoroughbred-racehorses.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private

study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.