



## Pre-Race Inflammation in Thoroughbred Racehorses

Research in both human and equine athletes has demonstrated that adaptation to exercise can be measured by analyzing messenger RNA (mRNA) markers in blood samples. These markers can then be used to indicate when potential damage occurs, creating an opportunity for this technology to be used as a way to avoid injury.

Injuries in racehorses, whether catastrophic or career ending, are a serious welfare concern for both the horse racing industry and general public. Numerous studies looking at catastrophic injuries in racehorses have demonstrated that fractures are often associated with underlying damage, refuting the ‘bad step’ theory. More than eight years ago, our lab at the University of Kentucky’s Gluck Equine Research Center took on the mission to determine whether mRNA markers could be used for the good of the racehorse. During that time, we have published multiple peer-reviewed articles demonstrating the utility of mRNA marker measurement and recently showed that that **we can successfully identify at least 76% of horses at risk of catastrophic injury based on these markers.** For more information on mRNA analysis and our research, please see our April-June 2021 Trainer article (North American Edition - [https://issuu.com/anderson-co/docs/nat-60\\_issuu\\_v1](https://issuu.com/anderson-co/docs/nat-60_issuu_v1)).

Our ultimate goal is to develop this mRNA technology into a reliable, efficient, and non-invasive tool that will empower owners and trainers by providing an additional method for improving the welfare and longevity of their racehorses. The next step in this ongoing endeavor is to collect approximately 15,000 samples from horses racing in Southern California over approximately 12-15 months. Never before has a project of this size been undertaken with racehorses, making everyone’s participation critical.

### *How will samples be collected?*

A small blood sample (3mL) will be collected at the same time as pre-race TCO<sub>2</sub> sampling. **Horses WILL NOT be subjected to an additional needle stick for this project and total time for sample collection is estimated to take 5-10 seconds.**

Horses are likely to be sampled multiple times over the course of the study. Since we are interested in looking at changes in mRNA over time, multiple samples are extremely beneficial to this project.

### *How will study samples be used?*

- All owner, trainer, and horse information will be kept strictly confidential in accordance with a non-disclosure agreement between the University of Kentucky and CHRB. Additionally, samples will be labelled with anonymous barcodes and analyzed in a blinded fashion.
- Samples will only be used for mRNA marker research purposes. **The use of specialized collection tubes makes any other testing (such as genetic or drug testing) impossible.**

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Following collection and short-term storage at the racetrack, samples will be shipped to the Gluck Center for storage. At the end of the study, select samples will be analyzed following an injury (either fatal or non-fatal) from both the injured horse and specific, unaffected 'control' horses.

Following this study, any remaining samples will stay in storage and may be used to support future projects further exploring mRNA markers in Thoroughbred racehorses, subject to CHRB, TOC, and CTT approval. While it is impossible to predict the scope and goals of those potential projects currently, no testing of samples outside the University of Kentucky will be allowed and confidentiality regarding trainers, owners, and horses will be maintained.

### ***What are the benefits of participating in the study?***

Everyone in the racing industry recognizes the importance of decreasing injuries and improving safety for horses and jockeys. Ultimately, it is our hope that this mRNA technology can be used by veterinarians and trainers to help guide their decisions and decrease injury rates, ensuring that horses have the longest racing career possible. Participation in this study is a means by which owners and trainers can contribute towards this important goal.

### ***What are the risks of participating in the study?***

This study has been designed from the beginning to minimize the risk and impact on individual horses and trainers, while ensuring that the goals of the study can be met. Since samples are collected quickly (5 seconds) and during a time when the horse is already being stuck with a needle, participation in this study entails minimal disruption for the trainer and minimal risk to the horse. If you do not want your horse to participate in this study, please make this known at the time of TCO<sub>2</sub> sample collection.

### ***Who is funding this study?***

The University of Kentucky's Gluck Equine Research Center has provided funds to start this important study while additional outside funding is obtained. There is absolutely no cost to participants.

### ***Whom can you contact with questions about the study?***

You are encouraged to ask questions about this study at any time by contacting Dr. Allen Page either by email ([a.page@uky.edu](mailto:a.page@uky.edu)) or by phone (859-489-4144).