



Director's Note

The mission of the UC Davis Veterinary Genetics Laboratory, or VGL as we are commonly called, is to develop and provide high quality and accurate genetic tests while promoting and enhancing research and education in animal genetics that improves animal health, performance, and well-being.

Over the years, research findings by VGL faculty and staff have identified genetic variants contributing to inherited disorders and traits of interests across domestic species and increased the understanding of wildlife mammalian evolution and ecology. These findings have expanded the utilization of DNA testing, enabled the use of marker-assisted mate selection, and have provided tools to inform clinical management decisions, conservation efforts, and solve forensic cases.

One of our current strategic goals is to lead the field of veterinary genetic testing, which includes providing exceptional services to our clients. We also aim to provide educational and outreach opportunities that will enable increased marketability and improvement of animal health. Towards both of those goals, we are excited to begin a quarterly newsletter to share information about our services as well as some of our latest research findings and other accomplishments with you. We hope that with each report you will learn something new about the world of veterinary genetics!

We are proud to be a part of the UC Davis School of Veterinary Medicine, which was again [ranked by Quacquarelli Symonds](#) as first in the nation and ranked this year as second in the world for veterinary medicine. We are even prouder to provide our clients with the services they need to advance their own mission and goals.

Thank you for your trust in us,

Rebecca Bellone

Rebecca Bellone, Ph.D
Director, Veterinary Genetics Laboratory

Case of the Quarter

Dominant White - there's more than meets the eye!



A white Shetland pony sample submitted to the VGL for coat color testing could not be explained by any of our routine tests, requiring a research study to unravel the cause. This research study was led by VGL director, Dr. Rebecca Bellone, and other VGL equine genetics researchers, and determined that dominant white 13 (W13) was the cause of all-white coats in 14 Shetland ponies and 2 American Miniature Horses. Click [here](#) to learn more about this horse research. Visit our website for more information about our [equine coat color tests](#).

Accreditation

The VGL Service and Forensics Laboratories have again received the highest level of accreditation offered

Research Highlights

to testing laboratories. Read the [news article](#) for more information about our reaccreditation by the American National Standards Institute National Accreditation Board (ANAB). Visit [our website](#) for a full list of VGL's accreditations and affiliations.



VGL Vocab Epigenetics

A few of our research highlights of the quarter have involved epigenetic studies! [Epigenetics](#) is the study of heritable phenotypes that are not caused by changes in the DNA sequence. Instead, epigenetic changes are caused by external factors, such as chemicals, diet, or stress, that alter gene expression, and consequently phenotype, without changing the underlying DNA sequence. The Greek prefix “epi” means “upon” or “above”, so essentially the term epigenetics means ‘in addition to’ the genetic sequence. Visit our [resource page](#) and follow us on [Facebook](#) and [Instagram](#) for more VGL vocab!



An international collaboration between the UC Davis Veterinary Genetics Laboratory (VGL) and the Royal Veterinary College (RVC) characterized the first case of Fragile Foal Syndrome (FFS) in the Thoroughbred. Previously, this condition was called Warmblood Fragile Foal Syndrome (WFFS) as it was initially discovered in Warmblood horses. The characterization of this condition in non-warmblood breeds highlights the importance of genetic testing in all horse breeds that carry the disease variant to reduce the incidence of affected foals. Visit our [news page](#) to read more. The full publication can be found [here](#).

In line with the VGL's mission to promote and enhance research, VGL researchers have led or contributed to seven additional publications in the first quarter of 2022, providing invaluable resources and tools for future scientific advancement. Studies by our equine genetics research team contribute to further unraveling the [genetics behind](#)

VGL Tests

Skeletal Atavism and

SynchroGait: test price reduced to \$65 and \$90, respectively! The VGL has just renewed a license agreement with Capilet Genetics to continue to provide genetic testing for [SynchroGait](#) and [Skeletal Atavism](#). The renewal came with a significant reduction in licensing costs, and we are happy to pass on those savings to our clients!

New Tests

A **New Agouti test** has been developed for dogs based on research by UC Davis Professor Dr. Danika Bannasch and colleagues. The new test looks at two separate regions of the A locus that regulate the amount of expression of the Agouti protein and is able to differentiate between phenotypes that were previously indistinguishable. Visit our [test page](#) for additional information. The full scientific publication can be found [here](#).

Lhasa Apso Albinism (French Bulldog Pink) is caused by a missense variant in the *SLC45A2* gene and affected dogs display white fur and pink skin, as well as pink nose, lips and paw pads. Research at the VGL has identified this same variant in French Bulldogs with a

[dominant white phenotypes in horses](#), a better understanding of [the role of epigenetics in gene transcription](#) and the [characterization of epigenetic markers of aging in horse tissues](#). Studies by our mammalian evolution and ecology research team offer insight into the [natural and artificial selection of body size in ancient and modern canids](#), the evolution and genetic diversity of wild animal species, such as the [island spotted skunk](#) and the [red fox](#), and validated tools for the assessment of genetic diversity in [mountain lions](#).

Visit our website to learn more about the [research](#) we do!



Upcoming Events



Picnic Day - UC Davis Open House on April 23rd

Picnic Day is one of the most anticipated events of the year and serves as the university's annual

coat color commonly referred to as pink in the breed.

Communications and Outreach

Dr. Rebecca Bellone participated in the American Haflinger Alliance's (AHA) Expert Education series in February. Dr. Bellone was interviewed by Suzi Vlietstra, one of the co-creators of the AHA, and talked about squamous cell carcinoma (SCC) in horses, including its risk factors and how knowledge of risk variants can help inform breeding decisions. Click [here](#) to watch the interview.

Solving murder cases is just part of the job for Forensic Scientists **Teri Kun** and **Christina Lindquist** of VGL's Forensic Laboratory, and one such case is featured in a recent episode of Forensics Files II - an HLN original series! The episode called "Dog Proof" aired on March 13th and describes a murder case that the VGL worked on years ago, offering insight into the work of a Forensic Scientist. The show can be viewed on certain streaming services like Hulu LiveTV, YouTubeTV, and Sling TV. To learn more about the VGL's Forensics Unit, visit our [forensics page](#).

Dr. Felipe Avila gave a talk on

Open House for families, students, alumni, staff, faculty, and the Davis and regional communities. Picnic Day will be in person this year and the VGL will have a booth set up at Hutchinson field. We will offer educational activities for children and adults, and our staff will be available to answer questions about ongoing research and genetic tests offered. Come learn about how genetic testing can help advance animal health and wellbeing! For more information about the event, visit the official [Picnic Day website](#).

Client Resources

Part of the VGL's mission is to promote education in animal genetics. In line with this, we have been developing a series of educational material for our clients and the general community. You can find educational resources about animal genetics on [our website](#) and social media accounts: [Facebook](#) and [Instagram](#).

For example, we have a [coat color genetics](#) information page for [Cats](#), [Dogs](#) and [Horses](#), and a [VGL Vocab](#) series that provides definitions and examples for commonly used genetic terms.

Clients can also find information about how to obtain a good sample for genetic testing, with instructions

“Advances in Alpaca Genomics” to the Animal Science Department of the Universidad Nacional Agraria La Molina in Peru. After the talk, Dr. Avila participated in a round table discussion. The event was held on March 17th via Zoom.

and tips tailored to each species [here](#).



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