

LEADING THE WAY WITH DNA

DNA OPERATIONS TO LAUNCH “BETTER, STRONGER” TEST

DN A certification is a powerful tool in ensuring reliable registration records, vital to the preservation and advancement of purebred dogs.

MMI Genomics (MMIG), of Davis, California, is a long-established leader in genetic technology development. They are the AKC's principal provider of DNA-testing services.

In collaboration with the AKC, the company offers highly informative and accurate DNA testing services through AKC DNA programs.

Fanciers routinely utilize these services for individual identification, parentage testing, and certification of pedigree records.

“AKC Updates” has invited the DNA Operations and Educational Services department, and the experts at MMIG, to answer some questions about an exciting breakthrough: MMIG’s SuperPlex plus Gender Marker (SuperPlex-G) universal panel of DNA markers.

There are changes coming to the AKC DNA Certification program. Can you give us a preview?

Beginning in August you will see 14

genetic markers reported in the profile on newly issued DNA Certificates, compared to the 10 markers on the current certificates.

Thirteen of the genetic markers are STRs (a common type of stably inherited DNA marker utilized by identification- and parentage-testing labs),

enhance quality control in testing services. These services are continually improved by providing more data to better manage breed records.

The AKC Parent Breed Club Study, jointly conducted by the AKC and MMIG, provided an opportunity to choose and develop an optimal genetic-marker panel for identification and parentage testing across all AKC breeds.

With the voluntary cooperation of participating parent clubs, DNA samples were collected at national specialties from 1998 through 2000. A better, stronger, and more informative test was built from the results from this study, the largest and most comprehensive analysis of canine markers ever completed.

The study divided 17 STR markers into two panels: a primary panel of 10 STR

markers used in routine kennel inspections and voluntary testing, and a secondary panel of 7 STR markers developed specifically for the study.

Statistical analysis of data from the study indicated, on average, that the combination of 10 to 15 markers

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Sire	AE	EG	CE	FF	BC	CC	AH	CE	BC	DK	BD	AA	BD	XY	GENDER
Pup	AC	DG	CE	EF	BC	CC	AD	DE	BB	GK	BD	AB	BL	XX	

Markers from two new AKC DNA Certificates

and one new marker tests for a gene on the sex chromosomes. This gender-verification test result will be reported as XX for females and XY for males.

Why were these changes made?

To increase the information gleaned by DNA tests and to

from the two validated marker-panels could yield a universal system providing enhanced information and processing-efficiency across all AKC breeds.

Simply put, the more markers you analyze, the more information you can draw from the testing.

Also, MMIG has developed and validated a canine gender marker that differentiates between male and female. Gender identification is a crucial quality-control step in canine genotyping. MMIG has engineered a single biochemical assay to test 13 markers and provide gender verification of samples (see graphic at left).

How are the changes being implemented?

The development and validation testing took nearly a year and a half to complete. We are rigorously validating SuperPlex-G before the transition is made in August.

MMIG invested in technology advancements and put together a team of experienced research scientists to develop the SuperPlex-G panel. The human genome and other known mammalian DNA-sequence information were used to discover the corresponding canine-specific genes on the X and Y sex chromosomes.

This sophisticated DNA test is fine-tuned to assure complete confidence in the quality and accuracy of the results, which meet MMIG laboratory standards of excellence.

How does the new system affect existing DNA profiles?

It doesn't. SuperPlex-G is fully compatible with the existing DNA database. If you already have an AKC DNA Certificate, retesting with

SuperPlex-G is not necessary.

More than 250,000 DNA profiles are housed in the AKC database, the largest of its kind in the world. Since one must use the same DNA markers to make "apples to apples" data comparisons, the same 10 original mark-

ers are critical to canine genetics and health research, as breeders and researchers rely on the accuracy of pedigree information for successful breeding programs and canine-health studies.

Moreover, continued improvement of breeds requires accurate records of breedings. Many breeders are offering their puppy buyers an additional level of security by guaranteeing their pedigrees through AKC DNA testing. MMIG's latest marker system not only continues to enhance the reliability and accuracy of identification and parentage-testing results but also adds gender identification of each sample.

The new testing system will bring sig-

nificant improvements and enhancements to the DNA Certification program and Parentage Evaluation Service; the SuperPlex-G test panel will ensure even greater accuracy in the AKC Stud Book.

The AKC Parentage Evaluation Service routinely demonstrates the effectiveness of its DNA testing to discriminate even between brothers or sisters. SuperPlex-G increases the resolution power between related dogs and parentage-evaluation cases with special circumstances, which will enhance the efficiency of the Parentage Evaluation Service.

Does enhanced service come with an "enhanced" price?

There will be no price increase for a DNA profile.

The price of a prepaid DNA kit will remain \$35, and the processing fee for a free DNA kit will remain \$40. ♦

For more information on DNA programs, e-mail to dna@akc.org.



Coming in August: the new 14-marker DNA Certificate, with gender verification.

ers used in all AKC DNA certification programs to date will be included in the SuperPlex-G panel.

In the new SuperPlex-G panel, we add the gender marker and three markers from the secondary panel of seven studied in the Parent Breed Club program.

If you wish to upgrade an existing profile to SuperPlex-G, an upgrade program will be available from the AKC beginning in August. A new DNA sample is not necessary; simply submit your upgrade request to DNA Operations using the downloadable form found at www.akc.org, or call 919-816-3508 or e-mail to dna@akc.org to request a form.

The upgrade fee will be \$30, and a new 14-marker DNA certificate will be issued. (Allow six to eight weeks for processing.)

Why should we want to upgrade to SuperPlex-G?

It is a more powerful tool. Identity testing and parentage verification