Therion International provides DNA profile services that are state-of-the-art and well suited for addressing questions related to captive breeding programs, population genetics and behavior.

DNA Profile Analysis for Primates

Applications:

- **Parentage Verification**
- **Estimation of Genetic Variation**
- **Estimation of Relatedness**
- **Individual Identification**
- **Population / Subspecies Differentiation**

Primate Genetic Analysis

The ability to address questions of genetic identity in non-human primates is now dramatically enhanced. The DNA profile test offered by Therion International is more powerful than conventional blood protein analysis because it detects DNA-sequence information which is highly variable. This technology provides a sensitive method for sire/dam verification and population genetic analysis.

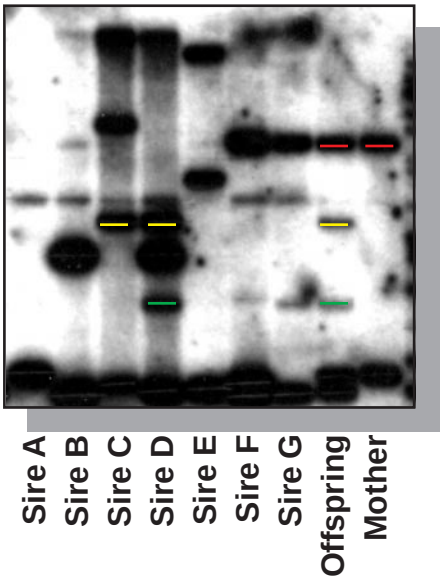
Following are descriptions of several of the many primate genetics projects which have been conducted by Therion.

Paternity Determination

Baboons

A wild female baboon was observed to have consorted with seven males during her receptive period. To verify paternity, DNA profiles were produced from the female, her offspring and the seven males with which she had consorted. The DNA probe used was OPT™-02 and a portion of the autoradiograph is shown on the right.

Parental / Offspring DNA Profiles

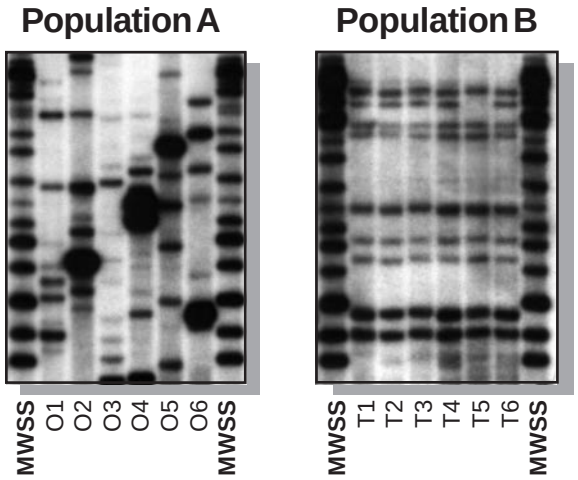


Several genetic markers (bands) found in the DNA profile of the offspring were not present in the DNA profile of the mother. One genetic marker (yellow bands indicated at right) appeared in the profiles of potential sires C and D. A second genetic marker (green bands indicated at right) was observed in the DNA profile of sire D but not in sire C. Other genetic markers and additional DNA probe assays corroborated the conclusion that sire D was the true sire of this offspring.

Estimation of Genetic Variation and Relatedness Among Individuals

To ensure the long-term survival and production of captive colonies of primates it is essential to maximize genetic variation through rigorously designed breeding programs. Pictured to the right are two sets of DNA profiles (probe OPT™-05) generated from individuals belonging to two separate colonies of New World primates. Population A exhibits high levels of genetic variation as indicated by a low level of band sharing among individuals. In contrast, population B exhibits a low level of genetic variation as indicated by high levels of band sharing among individuals. Note the nearly identical DNA profile banding patterns. To estimate relatedness among individuals, similarity indices can be generated from band-sharing coefficients for each dyadic comparison of individuals within the population.

Pygmy Marmoset



Estimation of Indices of Population Genetics

```
INPUT FILE NAME cmkbin.txt

            PROBE 1 SUMMARY
NUMBER OF SAMPLES:                28
NUMBER OF BANDS:                  97
AVERAGE BAND FREQUENCY:            .20
AVERAGE BANDS IN A SAMPLE:       19.79
ESTIMATE OF NUMBER OF LOCI:      10.63
AVG NUMBER OF ALLELES/LOCUS:      9.13
EXPECTED HETEROZYGOSITY:          .8620
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As has been reported recently in the scientific literature, the results from multi-locus DNA profiles can be used to generate estimates of classical indices of population genetics including heterozygosity and genetic distance. The table at left depicts genetic data from a captive population of 28 cynomolgus macaques. The table at right lists the expected heterozygosity and number of alleles per locus for ten captive colonies of rhesus macaques. Estimates of genetic distance among colonies can also be calculated to enhance potential cross colonies breeding management programs.

Site	Expected Heterozygosity	Expected Alleles
Population B	.81	5.1
Population C	.80	4.9
Population G	.78	4.5
Population E	.78	4.5
Population I	.77	4.3
Population J	.76	4.2
Population F	.76	4.1
Population D	.75	3.9
Population A	.74	3.9
Population H	.71	3.5

Specimen Requirements

(Please call before shipping **any** samples)

Specimen Type	Volume	Container	Shipping Instructions
Whole Blood (store under refrigeration)	5-10 ml	EDTA Purple Top Vacutainer™	Liquid— overnight on ice packs
Tissue	Call for instructions		

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