

STATEMENT OF WORK

Introduction

A part of the search for active agents against Cancer and AIDS involves *in vivo* testing. The National Cancer Institute (NCI) maintains the Animal Production Program to supply the necessary laboratory animals needed for this *in vivo* testing. Much of the testing is performed in inbred laboratory animals such as the ones produced by the Animal Production Program contract colonies. Thus, a genetic monitoring contract is used to determine the genetic purity of the Animal Production Program inbred rodent colonies. The validation and verification of the genetic status of the NCI Animal Production Program contract inbred colonies is the primary objective of this effort. This will be accomplished by awarding one contract to perform one or more of the DNA-based methods to determine genetic purity along with backup methods utilizing biochemical markers and skin grafts.

Statement of Work

The contractor shall supply all labor, materials, equipment, facilities supplies, not otherwise provided by the Government under the terms of this contract, to perform the following tasks:

1. Monitor the genetic background of the mice and rats with a DNA-based testing method that utilizes DNA microsatellites. Simple sequence length polymorphisms (SSLPs) or microsatellites are DNA regions containing di-, tri- or tetra-nucleotide repeats that are found randomly yet abundantly throughout the genome. The number of these repeats is highly polymorphic among different strains of mice and rats allowing them to serve as genetic markers that can distinguish between DNA derived from different strains. In addition, microsatellites can be quickly and efficiently assayed by PCR-based approaches making them a highly effective tool for genetic monitoring. A multiplexed panel of microsatellite markers, shown to be polymorphic among a number of strains, was used to create unique strain specific genetic profiles. DNA from each animal in the foundation colony is analyzed with this panel of microsatellites to generate an animal-specific genetic profile that is then compared to the established genetic profile for the strain and/or colony. This type of regular monitoring allows detection of deviations from the established strain profile that have occurred in individual animals.

2. Perform validation and verification of genetic background on approximately 2000 rodents, 18 inbred mice and 1 inbred rat strain as scheduled by the Project Officer. Samples will be furnished by the government at no charge to the contractor and sent at a rate of approximately 50 to 200 samples per week. All animals will be tested year 3 of the contract. Contract years 1, 2, 4 and 5 samples will be submitted as needed to screen strains with abnormal coat color, change in production and other changes that justify testing.
3. All testing results shall be reported to the Project Officer electronically or in writing as accumulated with a maximum turn-around time of 3 weeks. Results that deviant from the expected shall be reported to the Project Officer immediately by telephone or e-mail. The format for reports will be approved by the Project Officer.
4. Create unique strain-specific genetic profiles using a multiplexed panel of microsatellite markers, shown to be polymorphic among a number of strains. For all inbred mice and rats new to the NCI Animal Production Program (APP).
5. Perform back-up methods of testing utilizing biochemical markers and skin grafts as requested by the Project officer.
6. In SCID mice, it has been documented that increased microsatellite instability occurs due to the nature of the SCID mutation. Therefore genetic monitoring in strains that carry the SCID mutation is done by single nucleotide polymorphism (SNP) analysis and gene-specific genotyping for the SCID mutation. Similar to the microsatellite analysis, a panel of SNPs is used to generate a strain-specific genetic profile and the genetic profiles of individual animals are compared to this strain profile to look for deviations. The gene-specific genotyping assay to confirm the presence of the SCID mutation will be performed on approximately 300 samples. Samples will be furnished by the government at no charge to the contractor and sent at a rate of approximately 50 to 200 samples per week. All animals will be tested year 3 of the contract. Contract years 1, 2, 4 and 5 samples will be submitted as needed to screen strains with abnormal coat color, change in production and other changes that justify testing.