



Genotypic and Phenotypic Monitoring of Genetically Modified Animals

308.1 Policy

The Emory Institutional Animal Care and Use Committee (IACUC) is under a federal mandate to monitor all research activities related to animal use. Pursuant to the eighth edition of “*The Guide for The Care and Use Of Laboratory Animals (Guide)*,” policies and procedures must be in place to monitor the phenotype and genotype of genetically modified animals (GMAs) and a reporting process must be in place to notify the IACUC of unexpected phenotypic outcomes that adversely affect the health and well-being of the animals.

308.2 Phenotypic Monitoring:

Pages 28-29 of the eight edition of the *Guide* outline the responsibilities of the Principal Investigator (PI) and IACUC in regard to the generation of novel GMAs, either by creation of a new line, or by intercrossing established lines to generate a new compound genotype. The following points should be noted:

- 308.2.1** All novel GMAs should be monitored in the F1 generation for the development of unexpected phenotypes.
- 308.2.2** All unexpected phenotypes which affect the health and well being of the animal would be considered a reportable event, and should thus be reported to the IACUC on the attached form in a timely fashion. [Note that any phenotype which has been previously described in your approved IACUC protocol is not unexpected and is thus not reportable.]
- 308.2.3** If unexpected phenotypes are identified as above then additional monitoring and analysis may be warranted. This should lead to a better understanding of the condition and could result in steps that can be taken to alleviate the impact of the alteration, or to better define humane endpoints for the line in question.
- 308.2.4** All instances of events as defined above must be reported. Therefore, phenotypes which are highly recurrent within a given line should be described in an IACUC modification to avoid the necessity of continued reporting. Once the modification is approved, the phenotypic condition will not be subject to further reporting as it is no longer unexpected.

308.3 Genotypic Monitoring:

Pages 76-77 of the eight edition of the *Guide* provide guidance as to “best practice” in regard to genotypic monitoring and screening of GMAs. Specifically, the following are indicated for inbred strains:

- 308.3.1** It is important to periodically monitor genetic authenticity of the line.
- 308.3.2** Appropriate management systems should be designed to minimize genetic contamination resulting from mutation and mismatching.
- 308.3.3** Each GMA line represents a unique resource and thus care should be taken to preserve the line through standard colony management programs. Cryopreservation of lines should be considered as a safeguard against the loss of lines, and as a protection against genetic drift over time.
- 308.3.4** Carefully designed breeding strategies and accurate genotype assessment should be ensured to minimize the generation of animals with unwanted phenotypes.

308.4 Principal Investigator Responsibilities

The expectation of the IACUC is that all PIs follow the guidelines in reporting unexpected phenotypic events in a prompt manner, and to amend their IACUC protocols appropriately for ongoing strain characteristics. It is the

opinion of the IACUC that proper genetic monitoring of GMAs represents true best practice, but is left to the jurisdiction of the PI of exactly how that is accomplished for each colony of breeding animals. Thus all three year renewal protocols will ask the PI to provide assurance that best practices are followed.

309 Appendix

AE Policy - Adobe Form AE-UO

308.5 Document Properties

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Unexpected Outcomes that Affect Animal Well-being Report Form Form AE-UO

Instructions for use

This form should be used to document and report unexpected outcomes in individual or groups of animals that affect their health or well-being resulting from:

A) Direct experimental manipulation. Example: Administration of a drug that produces a harmful side-effect not previously described in the approved protocol.

B) Natural breeding or artificial DNA manipulation. Examples: The production of unexpected phenotypes of individuals within a population, especially as it relates to the introduction of novel transgenes or new genetic crosses, and only when the animal's health or well-being is comprised.

C) Unknown causes. Examples: Animals die or exhibit symptoms of illness or are harmed from unknown cause(s). This form should be submitted as soon as possible after the event and include gross necropsy findings; do not wait for the final pathology report to submit this form.

Please submit this form electronically to the IACUC Office at IACUC@emory.edu or in paper to IACUC Office, 1599 Building, 5th Floor, Room 5.207; or to the animal facility Attending Veterinarian or delegate.

PLEASE NOTE: This form is not to be used for reporting:

A) Suspected or observed violations or noncompliance. Examples: Violations of the approved protocol, IACUC policies, Animal Welfare Act Regulations and Standards, PHS Policy, the 8th edition of the "Guide for the Care and Use of Laboratory Animals", or animal facility SOPs. Please use Form AE-NC.

B) Animal injury or death due to facility issues, acts of nature or vandalism. Examples: HVAC failure resulting in heat stress or stroke, a cage or restraining device issue, leaking water bottle, cage drowning due to dysfunctional automatic watering system, or animal care personnel issue failing to observe lack of food or water in a cage, lightning strikes knocking out electricity, etc. Please use Form AE-AO

Relevant Compliance Reference:

"The Guide for the Care and Use of Laboratory Animals" Eighth Edition: pp 28-29, 75-77.

**Unexpected Outcomes that Affect Animal Well-being Report Form
Form AE-UO**

Protocol #	PI Name
Location of Unexpected Outcome Building: Room: Cage #:	Species of Animal (Please include the strain if appropriate)
Date/Time of Finding	Date of Report
Nature of Unexpected Outcome	
Person Reporting Unexpected Outcome	Report initially sent to <input type="checkbox"/> IACUC office <input type="checkbox"/> Facility AV