



<b>Tumor-Bearing Animal – Standard Operating Procedures</b>			
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### 1. Overview

#### Purpose

Drexel University Animal Care and Use Committee has established these procedures to identify and resolve animal welfare issues related to experimentally-induced tumors in animals.

### 2. Procedures

- 1) For all tumor research involving animals, endpoints should be established that minimize the potential for pain and distress. The investigator should consult a veterinarian and must have a plan for preemptive euthanasia based on clearly defined endpoints in the IACUC protocol.
- 2) Animals bearing tumors should be observed at least twice weekly to assess their physical condition, and observed daily as tumors are nearing their endpoint, including weekends and holidays. Records of observations must be maintained and made available upon request.
- 3) **Without a specific exception justified in the IACUC protocol, animals must be euthanized under the following conditions:**
  - when tumors have ulcerated.
  - when the tumor interferes with the animal's mobility **and/or** its ability to acquire food or water.
  - when animals become emaciated or dehydrated due to a failure to eat and/or drink over a 24-48h time period.
  - when the animals become debilitated, e.g. due to hindlimb paralysis or general weakness.
  - when animals show persistent hypothermia.
  - when animals show bloodstained or mucopurulent discharge from any orifice.
  - when animals show labored respiration, particularly if accompanied by nasal discharge and/or cyanosis.
  - when animals become severely anemic, as indicated by symptoms such as pale feet, or hematological measures.
  - when animals become incontinent or have diarrhea over a 48-h period.
  - when ascites production leads to abdominal distension which interferes with movement or creates respiratory distress.
  - when it is necessary to maintain an animal with these conditions, the status of the animal's overall condition must be assessed daily and in consultation with the veterinary staff.
- 4) The tumor burden should not exceed 10 percent of the animal's normal body weight (10 percent for animals carrying a single tumor typically represents a subcutaneous flank tumor diameter of 15mm in a 25g mouse or 35 mm in a 250g rat). Calibration curves should be established as part of the characterization of the tumor system. Without a specific exception justified in the IACUC protocol, animals should be euthanized before tumors reach this size. For animals carrying several tumors, the total tumor burden must not exceed the maximum burden of a single tumor.
- 5) In tumor experiments in adult rodents, weight loss should not exceed 20 percent of the animal's body weight at the start of the experiment. Body weight loss should be adjusted to normal body weight gain for age matched animals.

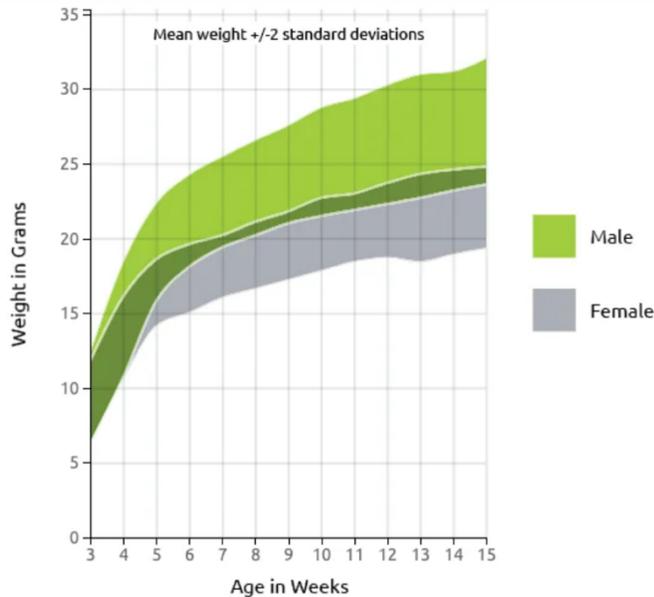


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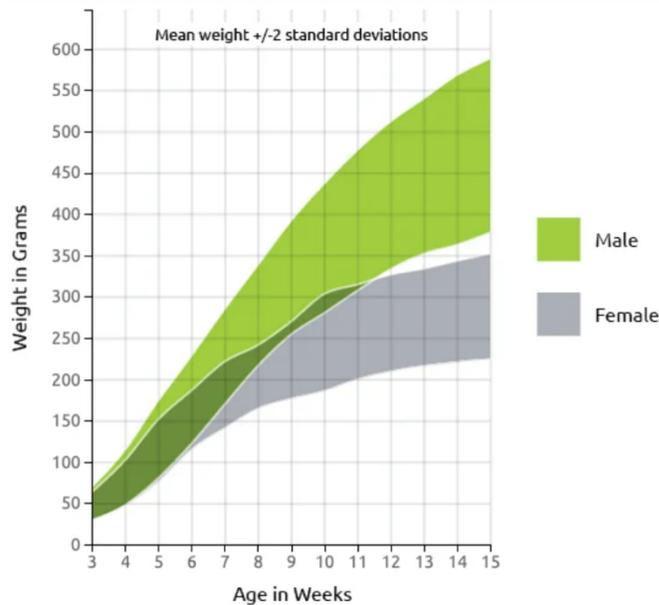
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- a) Please refer to [Charles River Laboratories](https://www.crl.com/) website to find growth rate charts for the rodents involved in your study. Below are growth rate charts of two commonly used strains at Drexel University.

i) C57BL/6 Mice



ii) Sprague Dawley Rats





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- 6) Baseline body weights must be recorded for each animal on tumor studies at the start of the project and where weight loss is an expected event, the weight of the animal must be recorded as specified in the IACUC protocol.
- 7) In the case of internal, disseminated, metastatic or other occult tumors, determination of the tumor burden may be difficult. Endpoints including weight loss and other signs of distress must be described and followed. The use of imaging (IVIS or ultrasound) can be used to determine the overall tumor burden.
- 8) In the case of hematologic neoplasia, the development and use of appropriate laboratory methods to determine the onset and progression of hematologic neoplasia before the appearance of severe clinical signs is required. These methods should be described in the IACUC protocol.

### 3. Responsibilities

#### 3.1 Drexel University IACUC Responsibilities

The Drexel University IACUC and the IACUC Office are responsible for maintaining this guidance document, training, and monitoring. All exceptions to these procedures must be approved by the IACUC. For inquiries regarding these procedures, please contact the Director of Animal Welfare, a part of the Office for Research & Innovation (ORI), or the Attending Veterinarian.

#### 3.2 Principal Investigator Responsibilities

The Investigator is responsible for ensuring that each individual conducting research involving transplantable tumors or tumor induction follows these procedures.

### 4. Resources

**Guidelines for the welfare and use of animals in cancer research**, P Workman, EO Aboagye, F Balkwill, A Balmain, G Bruder, DJ Chaplin, JA Double, J Everitt, DAH Farningham, MJ Glennie, LR Kelland, V Robinson, IJ Stratford, GM Tozer, S Watson, SR Wedge and SA Eccles. 2010. *British Journal of Cancer* 102:1555-1577. <http://www.nature.com/bjc/journal/v102/n11/full/6605642a.html>

OBSERVE: guidelines for the refinement of rodent cancer models, De Vleeschouwer, S.I., van de Ven, M., Oudin, A. *et al.* OBSERVE: guidelines for the refinement of rodent cancer models. *Nat Protoc* 19, 2571–2596 (2024). <https://doi.org/10.1038/s41596-024-00998-w>  
[OBSERVE: guidelines for the refinement of rodent cancer models | Nature Protocols](#)

### 5. Revisions

Edition 001/Effective Date: 04/11/2012 – Original Document

Edition 001/Review Date: 07/2018

Edition 002/Review and Revision Date: 05/08/2024 and Effective Date: 05/22/2024 – Revised Document.

- Updated formatting to new template.
- Section 2. Addition of growth charts for two commonly used species and resource link to Charles River Laboratories.



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- Section 2. Addition of “The use of imaging (IVIS or ultrasound) can be used to determine the overall tumor burden.”
- Section 2. The reference to leukemia has been replaced with hematologic neoplasia.
- Section 3. Addition of Drexel IACUC Responsibilities

Edition 003/Review and Revision Date: 02/12/2025 and Effective Date: 02/12/2025 – Revised Document.

- Section 4. Added new guideline publication as a resource