University of Rochester Committee on Animal Resources URMC Tumor Burden Scoring Guidelines April 14, 2010

PURPOSE: To establish guidelines for tumor burden scoring to be used in animals (mice and rats) that develop tumors. While legitimate exceptions to these guidelines are recognized, they must be followed unless a scientifically based exemption is requested, presented and approved by UCAR. These guidelines will allow URMC Principle Investigator staff and URMC animal care staff to objectively evaluate the health and welfare of animals carrying spontaneous or experimentally-induced tumors and allow for the alleviation of pain and distress associated with these tumors by intervention including humane euthanasia.

DEFINITIONS:

- 1. **BCS** = Body Condition Score on a scale from 1 to 5. Body condition scoring has been used in veterinary medicine and agricultural practices to evaluate animal condition and nutritional status for a variety of species including dogs, cats, horses, sheep, goats, beef cows and dairy cows. This technique has now been applied to laboratory mice involved in studies where wasting and death are potential endpoints (see M. Ullman-Cullere Laboratory Animal Science, 1999)
- 2. **Moribund** = Clinically irreversible condition inevitably leading to death (e.g., loss of righting reflex)
- 3. **Cachexic** = Wasting syndrome that causes generalized weakness with and a loss of weight, fat, and muscle
- 4. **Ascites** = Accumulation of excess fluid in the abdomen (e.g., compromising respirations or ambulation)
- 5. **Metastasis** = Spread of cancer

RESPONSIBILITY: Principal Investigators and their designated laboratory personnel, with the assistance and advice of the DLAM veterinarian staff, will have the responsibility for the health and welfare of their experimental animals. Every attempt will be made to reach a consensus with the principal investigator with regard to the animal's health and welfare bearing in mind the experimental endpoints. However, the final decision regarding animal health and welfare rests with a DLAM veterinarian. Justification to exceed these endpoints must be approved in advance by UCAR.

PROCEDURES: Animal models for the study of cancer typically require the animals to experience tumor growth and potentially metastatic disease. These processes can ultimately be very debilitating and distressful for the animal. Ideally, such studies are terminated once animals begin to show clinical signs of disease and the endpoint is compatible with research objectives. A balance must exist between maximizing research data acquisition and minimizing animal pain and distress. It is expected that Investigators working with tumor models have continuous and comprehensive animal health assessments of test subjects documented and available for review by DLAM. These health assessments will enable the DLAM veterinary staff, in conjunction with PI laboratory staff, to determine when euthanasia is appropriate for the animal.

GENERAL APPEARANCE AND BODY CONDITION



ATTACHMENTS: BCS Guide from M. Ullman-Cullere Laboratory Animal Science, 1999

REFERENCES:

- 1. Morton and Griffiths (1985), Veterinary Record 116: 431-43
- 2. Dr. Liang Xu and Dr. Marc Lippman permitted the use of their previously described tumor burden scoring system standard operating procedure.
- 3. Wallace J, Humane endpoints in cancer research. ILAR 41: 79-84, 2000.
- 4. University of Michigan Tumor Scoring Policy
- 5. Emory University Tumor Scoring Policy
- 6. University of Texas San Antonio Scoring and Endpoints Policy
- 7. Ullman-Culleré M and Foltz C. Body condition scoring: a rapid and accurate method for assessing health status in mice. Laboratory Animal Science 49 (3): 319-323

Body Condition Scoring (BCS) Guide Taken from M. Ullman-Cullere Laboratory Animal Science, 1999.

BC 1

Mouse is emaciated.

- Skeletal structure extremely prominent;
 - little or no flesh cover.
- Vertebrae distinctly segmented.



BC 2

Mouse is underconditioned.

- Segmentation of vertebral column evident.
- Dorsal pelvic bones are readily palpable.



BC 3

Mouse is well-conditioned.

 Vertebrae and dorsal pelvis not prominent; palpable with slight pressure.



BC 4

Mouse is overconditioned.

Spine is a continuous column.

Vertebrae palpable only with firm pressure.



BC 5

Mouse is obese.

- Mouse is smooth and bulky.
- Bone structure disappears under flesh and subcutaneous fat.

A "+" or a "-" can be added to the body condition score if additional increments are necessary (i.e. ...2+, 2, 2-...)