ACLAM Test Template

Below is the test template for the ACLAM Examination. This document is based on the Role Delineation Document developed between May, 2007 and January, 2008 and approved by the ACLAM Board of Directors in May, 2008. The Test Template was approved by the ACLAM Board of Directors in August, 2008. The content portion of the examination is organized into six domains. Each domain contains tasks deemed important by the RDD task force based on the Role Delineation Survey results. These tasks provide the context for the knowledge topics to be tested. The Test Template Panel reviewed each of the knowledge statements in the RDD and identified the knowledge statements included in this document as those that are to be tested. Note: In order to simplify the classification of test items, the knowledge statements have been identified with the code Test Template Domain Number. Unique Number (e.g., TT1.1)

The percentage of test questions assigned to each Domain will serve as the guide for the creation of each of the examinations. The final number of items with each form will be within ± 1 percent.

		Percent of Test
Domain 1: Management of Spontaneous and Experimentally Induced Diseases and Conditions		**25%**
Tasks	*Knowledge Topics*	
T1. Prevent spontaneous or unintended disease or condition	TT1.1. diagnostic procedures as they apply to the laboratory research environment	
T2. Control spontaneous or unintended disease or condition	a. conduct of a physical examination	
T3. Diagnose disease or condition as appropriate	b. clinical pathology (e.g., hematology [CBC]; clinical chemistries and urinalysis)	
T4. Treat disease or condition as appropriate	c. other diagnostic procedures (e.g., imaging techniques; EKG)	
	TT1.2. immunobiology (e.g., antibody responses; cellular immunity; species-specific immune responses)as it applies to laboratory animals	
	TT1.3. nutrition with emphasis on effects of deficiency or toxicity as it applies to the laboratory research environment	

	TT1.4. anatomy with emphasis on features which have significance with regard to clinical medicine (e.g., rat Harderian gland) or experimental medicine (e.g., coronary artery anatomy of the pig, which allows use for induced infarcts; Circle of Willis anatomy in gerbils, which allows use in stroke models)	
	TT1.5. physiology with emphasis on normative data and characteristics (e.g., seasonal changes in squirrel monkeys; coprophagia in rabbits), metabolic differences (e.g., hypoglycemia in squirrel monkeys) or metabolism of induced disease (e.g., streptozotocin-induced diabetes mellitus), reproductive physiology, and clinically significant physiological features	
	TT1.6. parasitology with emphasis on parasitic diseases that can become established in a colony and zoonotic parasitic diseases	
	TT1.7. microbiology with emphasis on organisms of clinical significance; subclinical infections that cause physiologic, biochemical, and/or immunologic alterations; zoonotic disease organisms; organisms used experimentally to induce infection and unintended infections (e.g., infections associated with chronic vascular cannulation); and sampling and culture techniques for such organisms	
	TT1.8. anatomic pathology including pathogenesis of significant naturally occurring (e.g. tuberculosis) and experimentally induced (e.g. collagen induced arthritis) diseases; typical gross and histopathologic lesions (e.g., age-related changes, or pathologic changes of adverse phenotypes associated with genetically modified rodents); and pertinent anatomic pathology techniques (e.g., Steiner's stain)	
	TT1.9. pharmacology with emphasis on drugs used to treat spontaneous or induced disease (e.g., indications, use and contraindications of drugs; adverse reactions; adverse interactions; mechanisms of action; species-specific toxicity), and drugs used to induce disease (e.g., azoxymethane to induce neoplasia, or DSS to induce colitis)	

	TT1.10. epidemiology including species-specific susceptibility to induced disease (e.g., modes of disease transmission; latency; persistence; prevalence; incidence)	
	TT1.11. preventive medicine (e.g., immunization; quarantine; prescreening tests)	
	TT1.12. diagnostic procedures	
	a. species-specific behavioral assessment	
	b. serologic, cytologic, and molecular diagnostic tests (e.g., PCR; ELISA; IFA; HAI; MAP) and proper sampling techniques	
	TT1.13. genetics with emphasis on control and treatment of naturally occurring and experimentally induced disease, predisposition to disease, and modes of inheritance related to diseases or conditions	
Domain 2: Management of Pain and Distress		**10%**
Tasks	*Knowledge Topics*	
T1. Recognize pain and/or distress	TT2.1. anatomy and physiology of pain and distress as they pertain to laboratory animals	
T2. Minimize or eliminate pain and/or distress	TT2.2. patient monitoring as it pertains to laboratory animals	
T3. Euthanatize (Euthanize)	TT2.3. critical and post-procedural care techniques as they pertain to laboratory animals	
	TT2.4. assessment of pain and distress (e.g., behavior which is a sign of pain and/or distress; physiologic changes; pain and distress scoring systems)	
	TT2.5. causes of pain	
	TT2.6. causes of distress	
	TT2.7. effects of pain and distress on normative physiology and on research studies	
	TT2.8. pharmacological interventions for pain and distress and their effects on physiology, including age and species differences for such interventions, and depth and duration of analgesia provided by such interventions	

	TT2.9. nonpharmacological interventions for pain and distress and their effects on physiology, including age and species differences for such interventions	
	TT2.10. euthanasia	
	TT2.11. humane endpoint criteria	
Domain 3: Research		**20%**
Tasks	*Knowledge Topics*	
T1. Facilitate or provide research support	TT3.1. biomethodology techniques (e.g., collection of blood and other body fluids and tissues; handling and restraint; administration of compounds and treatments)	
T2. Advise and consult with investigators on matters related to their research	TT3.2. research methods and equipment (e.g., antibody production; adjuvants; tumor induction; imaging; data collection techniques such as telemetry; observation; behavioral assessment methods)	
T3. Design and conduct research	TT3.3. animal models (spontaneous and induced) including normative biology relevant to the research (e.g., background lesions of common strains)	
	TT3.4. genetics and nomenclature	
	TT3.5. genetic modification/engineering technology including application of molecular biology techniques	
	TT3.6. characterization of animal models (e.g., phenotyping, behavioral assessment)	
	TT3.7. gnotobiotics	
	TT3.8. experimental surgical techniques and instrumentation	
	TT3.9. principles of experimental design and statistics including scientific method	
	TT3.10. Replacement, Reduction and Refinement techniques	
	TT3.11. aseptic requirements for performing surgery	

Domain 4: Animal Care		24%
Tasks	*Knowledge Topics*	
T1. Develop animal husbandry programs	TT4.1. species-specific husbandry (e.g., nutrition, housing, exercise)	
T2. Manage or provide indirect management/oversight of animal husbandry programs	TT4.2. environmental enrichment	
T3. Manage or provide indirect management/oversight of laboratory animal facilities	TT4.3. methods of sterilization, sanitation, and decontamination	
	TT4.4. quality assurance techniques for animal care-related equipment (e.g., verification of effective cage sanitation) and supplies (e.g., water, food, bedding)	
	TT4.5. animal procurement considerations (including sources, vendor surveillance, genetic monitoring, transportation)	
	TT4.6. breeding colony management (e.g., systems and records, genetic monitoring)	
	TT4.7. animal identification systems	
	TT4.8. pest control (e.g., methods, hazards and toxicity)	
	TT4.9. pathogen-free barriers (exclusion)	
	TT4.10. containment facilities (inclusion)	
	TT4.11. environmental causes of physiological alterations in animals and their effects on research (e.g., sound, light, temperature, humidity, housing systems)	
	TT4.12. environmental monitoring	
	TT4.13. watering and feeding (e.g., automated watering, liquid diets, ad lib or restricted diets, troubleshooting)	

Domain 5: Regulatory Responsibilities		19%
Tasks	*Knowledge Topics*	
T1. Perform direct or delegated Attending Veterinarian responsibilities	TT5.1. laws, regulations, policies and standards	
T2. Advocate for humane care and use of animals	a. Animal Welfare Act, USDA regulations, Animal Care policies	
T3. Provide advice to occupational health and safety programs	b. Health Research Extension Act, Public Health Service Policy on Humane Care and Use of Laboratory Animals, OLAW interpretive guidance	
T4. Provide advice on biological, chemical and radiation hazards in an animal research program	c. Guide for the Care and Use of Laboratory Animals (ILAR/NRC)	
T5. Serve as a member of an IACUC	d. Report of the AVMA Panel on Euthanasia	
T6. Review protocols and provide advice to investigators and the IACUC	e. Biosafety in Microbiological and Biomedical Laboratories (CDC/NIH)	
	f. Good Laboratory Practices (FDA/EPA)	
	g. Endangered Species Act/CITES	
	h. Guide for the Care and Use of Agricultural Animals in Agricultural Research and Teaching (FASS)	
	i. Live Animals Regulations (IATA – International Air Transportation Association)	
	j. USDA and CDC animal importation regulations	
	k. NIH Recombinant DNA Guidelines	
	l. Occupational Health and Safety in the Care and Use of Research Animals (ILAR/NRC)	
	m. Occupational Health and Safety in the Care and Use of Nonhuman Primates	

	TT5.2. role and function of the IACUC	
	TT5.3. protocol review	
	TT5.4. facility inspection and program review	
	TT5.5. occupational health and safety (e.g., ergonomics; OSHA; allergens; blood-borne pathogens; radiation and chemical hazards; MSDS)	
	TT5.6. role and function of the Institutional Biosafety Committee (IBC)	
	TT5.7. role and function of the Association for Assessment and Accreditation of Laboratory Animal Care – International (AAALAC)	
	TT5.8. responsible conduct of research	
Domain 6: Education		**2%**
Tasks	*Knowledge Topics*	
T1. Train personnel in animal care and use	TT6.1. societal issues involving use of animals:	
T2. Maintain current knowledge and continued competence in laboratory animal medicine	a. organizations related to and/or supportive of laboratory animal medicine and animal research (e.g., AALAS, ASLAP, ILAR, NABR, AMP)	
	b. organizations opposed to animal research (e.g., PETA, HSUS) including their philosophy and opposition strategies	
	c. philosophy and ethics of animal use	
	d. history and value of animal research	

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Species

For purposes of the test, an item that requires knowledge of the specific species to answer it correctly will be classified as a species item. The species may be identified by its common name or its binomial name.

	Percentage Range
Primary Species	60 - 70 %
Mouse (Mus musculus)	
Rat (Rattus norvegicus)	
Rabbit (Oryctolagus cuniculus)	
Macaques (Macaca spp).	
Dog (Canis familiaris)	
Pig (Sus scrofa)	
Secondary Species	18 - 28 %
African clawed frog (Xenopus spp.)	
Baboon (Papio spp.)	
Cat (Felis domestica)	
Ferret (Mustela putorius furo)	
Gerbil (Meriones spp.)	
Goat (Capra hircus)	
Guinea pig (Cavia porcellus)	
Marmoset/tamarins (Callitrichidae)	
Sheep (Ovis aries)	
Squirrel monkey (Saimiri sciureus)	
Syrian hamster (Mesocricetus auratus)	
Zebrafish (Danio rerio)	
Tertiary Species	7 - 17%
Birds	
Invertebrates	
Reptiles	
Other amphibians	
Other fish	
Other livestock species	
Other mammals	
Other nonhuman primates	
Other rodents	