

1. **Should this be excluded due to our inclusion/exclusion criteria?**

Reasons to EXCLUDE: Wrong study type, full methods not included, faulty PDF, not using NHP, using NHP but not rhesus, using an additional animal besides NHP, not studying drugs from our search.

Please use your best judgment on whether you should exclude an article because a description of the full methods are inadequate. If you are not able to understand what procedures took place because of the way the article is written, then select 'Yes' so that you do not review the article.

- **Yes**
- **No**

2. **What is the main focus of the article? (choose the best fit)**

- **Primary research**
 - Primary research is original, experimental research that often includes a Methods section describing the steps on how a study was conducted. Primary research does not include review articles.
- **Methods research**
 - These papers are written with the explicit purpose of providing other scientists with a procedure to follow that will likely be used over and over again (e.g. 'Noninvasive Imaging Technologies in Primates'). One way to determine whether your paper falls under this category is by looking at the journal name (e.g. Methods in Pharmacology and Toxicology, Nature Protocols, etc.).
- **Veterinary**
 - This category describes research that is conducted to better understand animal health or medications that are used on animals (e.g. testing the best anesthesia for a procedure in an animal).

Check all that apply for each item below for each section of the article (Title/Abstract (+ author keywords), Methods, and MeSH instructions combined).

Select all that apply. For instance, if 'monkey' is in the title and 'rhesus' is in the abstract, select both *Common* and *General*.

3. **Title/Abstract (+ author keywords)**

4. **Methods**

5. **MeSH**

- **Common: Rhesus, Rhesus Macacque, etc.**
 - Other keywords (or any combination of these terms):
 - Macacque
 - Rhesus monkey(s)
 - Macaca

- **Scientific: 'Macaca Mulatta'**
- **General: Monkey, NHP, Non-human primate**
Only select this option if the term does not include a specific type of monkey/NHP.
- **MeSH (exact match):**
 - **Animals**
 - **Macaca Mulatta**
 - **Primates**
- **# of animals**
 - If a number of animals is mentioned, click yes
 - MeSH: there will be no MeSH equivalent
- **Age of animals (adult, young, infant, etc.)**
Either of the following is acceptable: (a) the specific age or (b) general terms describing the age of the animals (e.g. adult, adolescent, young, average age of 12-15, etc.).
- **Sex of animals**
 - MeSH: Select this option if the sex of the animals is mentioned, even if a study includes both sexes and only one sex is explicitly mentioned.
- **Environment (light, temp., etc.)**
Indicate where any routine environmental conditions are described.
 - Please do not include descriptions or MeSH terms related to environmental conditions that are a main component of the research question (e.g. testing drug effects in a heated room).
- **Housing (single/group)**
Indicate whether any mention of routine housing situations are explicitly mentioned related to single or group housing (e.g. single, individual, isolation, group, colony, social, pen housing).
 - 'Housing, animal' is most likely MeSH term to address this concept.
 - Do NOT include:
 - Descriptions or MeSH terms related to housing that are a main component of the research question (e.g. testing what the drug effects are in different types of housing).
 - Description of caging without mention of group/single housing.
 - Mention of "homecage" only.
- **Enrichment**
Indicate whether any mention of enrichment appears as part of routine handling

and care. Specific types of enrichment (e.g. toys, tv time, mirrors, play time, special treats, etc.) as well as a general mention of enrichment (e.g. 'environmental enrichment was provided...') are both acceptable.

- Please do not include descriptions or MeSH terms related to enrichment that are a main component of the research question (e.g. testing whether certain types of enrichment affect drug choice).
- Operant conditioning should not be considered a source of enrichment for this question.
- The mention of visual contact with other animals is NOT considered enrichment.

○ **General access to food &/or water**

Indicate where routine food and/or water access are described.

- Please do not include descriptions or MeSH terms of food and/or water access that are a main component of the research question (e.g. choosing between drugs and food) or if the only description is about food/water used for a conditioning reward or enrichment

○ **General description of analgesia/anesthesia**

- Don't select if you select specific
- Don't select if only A/A described is for euthanasia procedure.
- MeSH:
 - Pain/prevention and control
 - Pain, Postoperative/prevention and control
 - Anesthesia and Analgesia

○ **Specific drug named for anesthesia/analgesia**

- Don't select if you select general
- Don't select if only A/A described is for euthanasia procedure.

○ **Arrive Guidelines mentioned**

- Complete a 'control F' of the document and look for 'Arrive'

○ **Ethical statement**

Typically includes mention of review/approval by an Institutional Animal Care and Use Committee (IACUC). May say in accordance with 'Guide for the Care and Use of Laboratory Animals'.

Don't select if article just mentions something similar to: "Caging and husbandry followed National Institutes of Health guidelines for enhanced environmental enrichment to promote primate psychological well-being. Nothing about IACUC"

○ **None**

Procedures

Select or enter the major procedures described in each of the following: (check all that apply)

For MeSH, copy and paste (from PubMed) all of the relevant terms for a particular response in the box. Include a \$ between terms. Only use Mesh terms in one procedure.

6. In the Title/Abstract (+ author keywords)
7. In the Methods
8. In the MeSH

For all of these sections, please use your best judgment in determining whether a particular procedure is involved. For instance, *operant conditioning* can be selected if '1-hour sessions for preference were conducted' is stated.

- **Catheterization:** 'Use or insertion of a tubular device into a duct, blood vessel, hollow organ, or body cavity for injecting or withdrawing fluids for diagnostic or therapeutic purposes. It differs from INTUBATION in that the tube here is used to restore or maintain patency in obstructions.' [[From MeSH](#)]
 - MeSH:
 - [Catheterization](#)
 - Other keywords:
 - Cannulation
 - Catheter placement
 - Port
 - Notes:
 - Patency = unobstructed
- **Inoculation:** '[P]rocess of producing immunity and method of vaccination that consists of introduction of the infectious agent onto an abraded or absorptive skin surface instead of inserting the substance in the tissues by means of a hollow needle, as in injection.' [[From Encyclopedia Britannica](#)] Can also be used for the introduction of a virus.
 - MeSH:
 - [Vaccination](#)
 - [Simian Immunodeficiency Virus/](#) (or other virus)
 - Other keywords
 - Infection, challenge (e.g. monkey receiving SIV)
 - Vaccination
- **Lavage:** 'The washing of a body cavity or surface by flowing water or solution for therapy or diagnosis' [[From MeSH](#)]
 - MeSH:
 - [Therapeutic irrigation](#)
 - Bronchoalveolar lavage

- Gastric lavage
 - Nasal lavage
 - Peritoneal lavage
- Other keywords:
 - Wash (e.g. vaginal wash)
- **Restraint, Physical:** 'Use of a device for the purpose of controlling movement of all or part of the body.' [[From MeSH](#)]
 - MeSH:
 - [Restraint, Physical](#)
 - Other keywords:
 - Head immobilization
 - Head holder
 - Jacket
 - Primate chair
 - Restraint chair
 - Stainless steel harness
 - Tether
 - Plexiglas chair
 - Squeeze restrainer
- **Conditioning:** A general term referring to the learning of some particular response. [[From MeSH](#)] Behavioral testing and conditioning may both occur.
 - MeSH:
 - [Conditioning, Operant](#)
 - [Conditioning \(Psychology\)](#)
 - Conditioning, Classical
 - [Behavior, Animal](#)
 - Choice Behavior
 - Reinforcement (psychology)
 - Punishment
 - Other keywords:
 - Acquisition - animal acquires a new behavior, e.g., learning to press lever to obtain drug/food/etc.
 - Choice procedure
 - Conditioned place preference/ conditioned place aversion
 - Delay discounting task
 - Delayed match-to-sample (DMS) task
 - Fixed-ratio schedule
 - Go/No-Go procedure
 - Food choice
 - Food satiation
 - Food restriction in context of training. Should not confuse with food restriction for surgery prep for example.

- Match-to-sample task
 - Operant conditioning
 - Progressive-ratio schedule
 - Reinforcement
 - Punishment
 - Reinstatement paradigm
 - Reversal learning tasks
 - Schedule-controlled responding
 - Second (or higher) -order schedule
 - Stimulus-shock termination
 - Training (animal)
- **Drug administration (not self):** The administration of drugs (used for addiction or treatment) to an animal where someone/something other than the animal determines if the drugs are delivered. The goal of administration is to give the animal the drug without them being aware or having a choice. Example: pill hidden in pudding. If animal has a choice about how much to ingest, select self-administration of drugs.
 - Abstract: If it isn't clear how a drug was administered in the Title/Abstract then don't select.
 - MeSH:
 - [Drug Administration Routes \(anything under this MeSH term\)](#)
 - Injections
 - Administration, oral
 - Do **NOT**:
 - Use for administration of *only* analgesia or anesthesia
 - Include radiopharmaceuticals, radiotracers, etc.
 - Include MeSH substances with the subheading 'administration & dosage'
 - Include "Binge drinking" [MeSH]
- **Drug discrimination testing:** Testing that involves a differential response to drugs. For an example of a drug discrimination procedure, see [PMC2890392](#).
 - MeSH:
 - [Discrimination \(Psychology\)](#)
 - [Discrimination Learning](#)
 - [Behavior, Animal](#)
 - Other keywords:
 - Discriminative stimulus in relation to drugs
 - **Do NOT:**
 - Select Conditioning if the only conditioning involved in the study was for drug discrimination testing
 - If operant conditioning was a Mesh term then add it under the drug discrimination testing option

- Select Behavioral testing unless a separate procedure for behavioral testing was done.
- **Drug withdrawal:** The cessation of regular drug administration after an animal has developed a physical and/or psychological dependence to that drug; this process may manifest in physical and/or psychological symptoms. [Derived from [PMID 1972994](#)]
 - Keywords:
 - abstinence periods
 - X days of abstinence
 - MeSH:
 - [Substance Withdrawal Syndrome](#)
 - Withholding Treatment
- **Self-administration of drugs:** 'Under [drug self-administration] procedures, an animal subject or human volunteer performs a response, such as pressing a lever, that delivers a dose of a drug, such as cocaine or heroin. The drug (used for addiction or treatment) is typically delivered via an intravenous catheter, although other routes (e.g., oral, insufflation, inhalation) are sometimes used, particularly with humans.' [[PMC2695139](#)].
 - Abstract: If it isn't clear how a drug was administered in the Title/Abstract then don't select.
 - MeSH:
 - [Self administration](#)
 - Other keywords:
 - Infusion pump (context-specific)
 - Syringe pump (context-specific)
 - Notes:
 - 'Per os' means oral administration of drugs.
 - Also select Conditioning if that was how self administration was accomplished.
 - Do NOT:
 - Use if animal isn't making a decision about if and how much to consume of the drug. Example: pill hidden in pudding
 - Include "Binge drinking" [MeSH]
- **Behavioral testing:** Tests that involve behavioral assessments or observations. Can be used to determine the effects of an agent or to measure changes in brain function as a result of exposure to an agent. [[Based on Guidelines](#)] This may be selected in coordination with procedure conditioning if a learned task is being completed and assessment is being done.
 - MeSH:
 - [Behavior, Animal](#)

- Ataxia
 - Cognition
 - Learning
 - Memory
 - Movement
 - Motor Skills
 - Psychological Tests
 - Social Behavior
 - Other keywords:
 - Cognitive testing
 - Motor tests (e.g. coordination)
 - Sensorimotor tasks (e.g. gait, parachute reflex, lateral resistance, limb placing)
 - The word discrimination may be used in describing a test and may fall here. Mesh would be added here too in this situation but NOT for Drug discrimination ([Discrimination \(Psychology\)/](#))
 - Do NOT include:
 - Physiological phenomena that are involuntary, such as yawning, blinking, etc. These should be categorized under “Physiological monitoring”.
- **Biopsy:** 'Removal and pathologic examination of specimens in the form of small pieces of tissue from the living body.' [[From MeSH](#)]
- MeSH:
 - [Biopsy \(anything under this MeSH term \)](#)
 - Vaginal swab considered this (vaginal smear under biopsy in Mesh)
 - Bone marrow collection considered a biopsy
- **Fluid collection:** Collection of any fluid (e.g. urine, cerebral, spinal, blood, etc.).
- MeSH:
 - [Blood Specimen Collection](#)
 - [Urine Specimen Collection](#)
 - Do NOT include:
 - MeSh with subheading /blood or /urine in the MeSh section.
- **Imaging:** 'Any visual display of structural or functional patterns of organs or tissues for diagnostic evaluation. It includes measuring physiologic and metabolic responses to physical and chemical stimuli, as well as ultramicroscopy.' [[From MeSH](#)]
- MeSH:
 - [Diagnostic Imaging \(anything under this MeSH term\)](#)
 - diagnostic imaging as subheading
 - Densitometry
 - Magnetic Resonance Imaging

- Neuroimaging
 - Optical Imaging
 - Positron-Emission Tomography
 - Tomography, X-Ray Computed
 - Other keywords:
 - CAT scan
 - Densitometry
 - MRI scan
 - Neuroimaging
 - Optical imaging
 - PET scan
 - X-ray
 - Do NOT include:
 - "Radiopharmaceuticals"[MeSH] or "Carbon isotopes"[MeSH]
- **Neurophysiological procedure:** Any procedure that might be used to study the functioning nervous system.
- MeSH:
 - [Craniotomy](#)
 - [Neurosurgical Procedures \(and any terms that fall under this in MeSH\)](#)
 - Other keywords:
 - Craniotomy
 - Recording chamber
- **Nociception assay (pain test):** 'Sensing of noxious mechanical, thermal or chemical stimuli by NOCICEPTORS. It is the sensory component of visceral and tissue pain' [[From MeSH](#)]
- MeSH:
 - [Nociception](#) (introduced in 2012)
 - Pain Measurement
 - Notes:
 - Pain tests may include looking for withdrawal, licking, immobility, or vocalization. Specific tests include: tail in warm water, and capsaicin-induced thermal allodynia (capsaicin put on tail).
- **Physiologic monitoring:** 'The continuous measurement of physiological processes, blood pressure, heart rate, renal output, reflexes, respiration, etc., in a patient or experimental animal; includes pharmacologic monitoring, the measurement of administered drugs or their metabolites in the blood, tissues, or urine.' [[From MeSH](#)] Capture all physiological monitoring, including chemically-induced conditions.
- MeSH:

- [Monitoring, Physiologic \(and any terms that fall under this in MeSH\)](#)
 - [Growth](#)
 - Consider Mesh with the subheading /growth & development
 - [Blinking](#), [Yawning](#), or other types of involuntary physiological phenomena.
- Other keywords:
 - Actigraphy
 - Neuromuscular Monitoring
 - Telemetry
 - Electrophysiological recordings (e.g. patch clamp, voltage clamp, extracellular single-unit recording and recording of local field potentials, as well as some of the methods of calcium imaging, optogenetics)
- **Euthanasia:** '[E]nding the life of an individual animal in a way that minimizes or eliminates pain and distress.' [\[From Guidelines\]](#) Include any mention of euthanasia, even if drugs are not mentioned.
 - MeSH:
 - [Euthanasia](#)
 - Euthanasia, Animal
 - Euthanasia, Active
 - Do NOT include:
 - Do not check euthanasia simply because there was a mention of necropsy. Should at least say something about the animal being sacrificed or euthanized.
- **Other**
Add other relevant procedures in this field.
- **None**

9. Is any part of the methods described briefly, with a citation to full methods in another article?

- **Yes**
 - Check 'Yes' when the methods do not describe the procedure in full detail but do include enough basic steps for you to understand what happened. Also include for anesthesia/analgesia as well as articles in which animals come into the study already addicted and there is a citation to the previous study. Include unpublished results.
 - Example:
 - 'A full description of the SA training procedures, apparatus, and behavioral results for monkeys in the METH group has been

reported elsewhere (Schindler et al. 2011). Briefly, all monkeys had indwelling catheters surgically implanted...

- **No**
 - Do not check 'Yes' simply because there is a citation provided after a procedure.

10. Copy and paste:

- The MeSH terms that are obviously substances which were administered to animals that play a major role in answering the research question (include all subheadings)
- AND any term that has 'administration and dosage' as a subheading (excluding anesthesia or analgesia applied for surgical purposes).
 - Include:
 - Inoculants
 - Dronabinol = THC
 - Do NOT Include:
 - If the MeSH term is not an exact word match (or have an 'entry term' which is an exact match) to the substance described in the article.
 - Categories of drugs like 'Central Nervous System Stimulants' or 'Dopamine Uptake Inhibitors' *UNLESS* the subheading 'administration and dosage' was used.
 - Analgesics and anesthetics applied for surgical purposes.
 - Terms such as Delayed Action Preparations (under Dosage Forms and Drug Delivery Systems) radiotracers.
 - Other subheading variants of a MeSH term that's only been added because of the 'administration and dosage' subheading.
 - Virus's like SIV. If inoculation should be added in MeSH
 - Example: 18769473
 - Terms to include: Cocaine/administration & dosage*; Cocaine/analogs & derivatives; Cocaine/pharmacology; Cocaine/toxicity; Central Nervous System Stimulants/administration & dosage

Other Questions

11. Was the MeSH term 'Humans' used?

- **Yes**
- **No**

12. What 'alternatives' MeSH terms were used? (check all that apply)

- **None Given**
- **Animal Use Alternatives**
- **Animal Experimentation**
- **Animals, Laboratory**
- **Animal Welfare**

- **Models, Animal**
- **Disease Models, Animal**
- **Animal Testing Alternatives**
- **Animal Care Committees**
- **Animal Rights**
- **Laboratory Animal Science**

13. Was the format of the abstract 'structured'?

A [structured abstract](#) is an abstract with distinct, labeled sections (e.g., Introduction, Methods, Results, Discussion) for rapid comprehension.

- **Yes**
- **No**

14. Should this be flagged for additional review?

- Yes (Only use during QC for review by group)
- No

Question 16 appears only if response to Question 15 is 'Yes.'

15. Why does it need additional review?

- Open-ended response, which could include the following
 - Needs review of animal questions
 - Needs review of procedure questions

16. Reviewer Comments

Notes that may be useful in reviewing the data. Basically anything that doesn't fit elsewhere!