



# RATS

## Restrain, Handling and Injection Techniques

Rene H. Fernandez, DVM, LATG.  
Assistant Director – Laboratory Animal Research  
Animal Care Facility Manager  
Florida International University



In general, rats are docile animals. Sometimes if the animals are single housed and not handled too often, they may show different degrees of aggressivity. Also, some strains are more aggressive than others. For these reasons, you should approach the animal slowly and make it aware of your presence before you attempt to pick him up. It should not be necessary to use metal mesh gloves or other means of restraint.

**There are  
different  
methods for  
picking up a rat:**



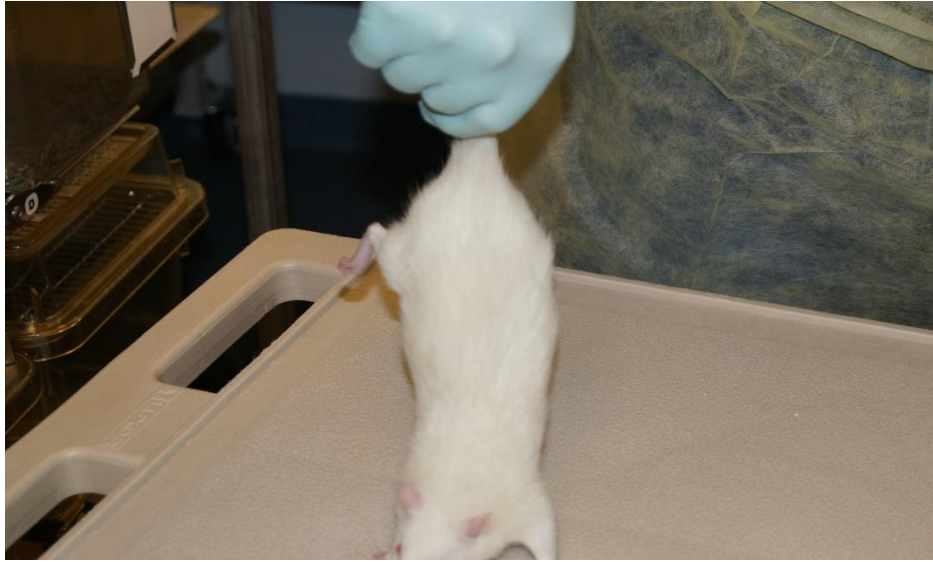
## Picking a rat up around the chest



The rat is grasped by placing the hand over the animal's back, with the thumb and forefinger used to restrain the head. You should restrain the animal firmly, but not too tightly, to permit respiratory movement.

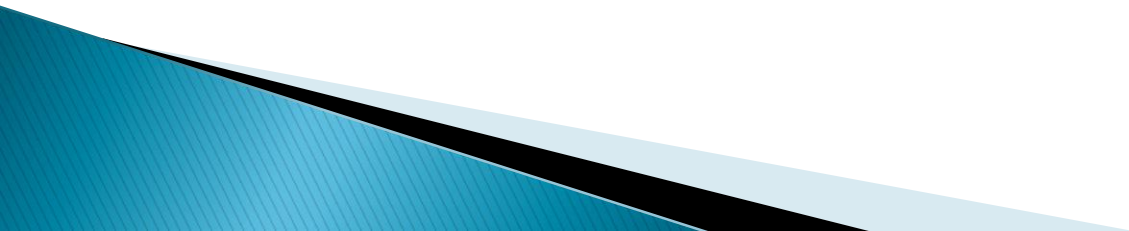
An alternate method is to place the middle and index fingers on either side of the head and to wrap the remaining fingers around the rat's body





Grasp the base of the tail. Do not grasp the end of the tail. The skin may strip off. If the animal is caged in a wire bottom cage, use caution when handling the animal. The rat can grasp the wire and the nails can be torn with a significant amount of blood loss. This method is not suitable for moving animals long distances. Holding the rat can be done using the methods for picking up the rat, or the rat can also be held on the crook of your arm.

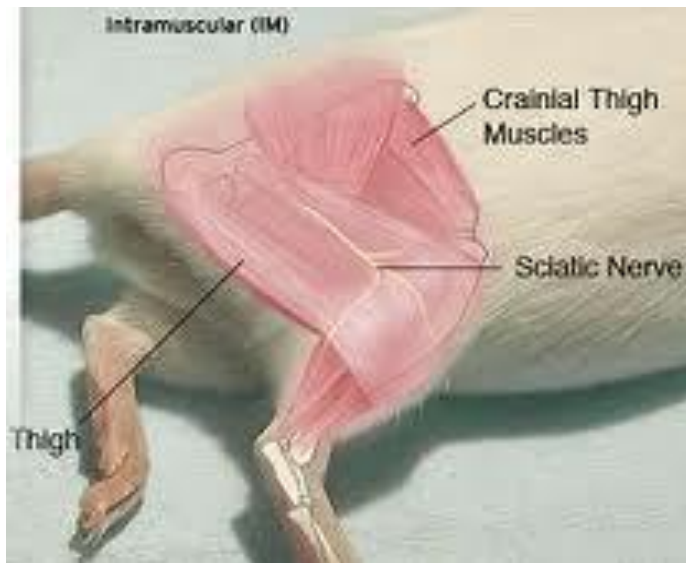
# Injections





## Intramuscular (IM) Injection I

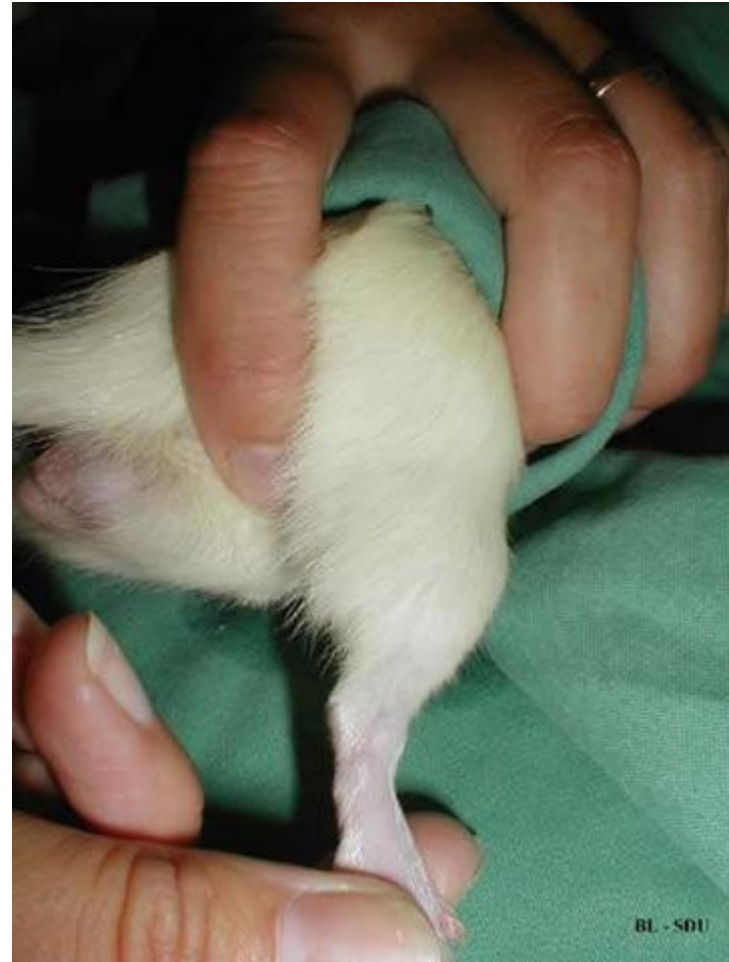
Fill syringe (hypodermic needle (25 X 5/8)) with the appropriate amount of article to be administered. The rat is then adequately restrained. The injection area is prepped with an alcohol swab. The needle is inserted into gluteal muscles. Aspirate syringe to insure proper placement. Any sign of blood in the syringe indicates improper placement–reposition. The drug is administered in a steady, fluid motion. DO NOT administer rapidly because of the likelihood of tissue trauma.





## Intramuscular Injection II–“Camilla’s Method”

Fill a syringe (hypodermic needle, 25g) with the appropriate amount of the article to be administered. The rat is then properly restrained and wrapped in a towel covering the rat further caudally leaving only the hindquarters exposed. Hold the rat gently but firmly. Area is prep with alcohol swab. Grasp the upper hind leg between the index and middle fingers. The needle is inserted into gluteal muscles. Aspirate syringe to insure proper placement. Any sign of blood in the syringe indicates improper placement–reposition. The drug is administered in a steady, fluid motion. DO NOT administer rapidly because of tissue trauma.



## Subcutaneous (SC) Injection



Fill a syringe (hypodermic needle, 25 G) with the appropriate amount of the article to be administered. The rat is then properly restrained. The injection area is prep with an alcohol swab. Insert needle parallel to the body at base of skin, fold between thumb and forefinger. Aspirate syringe to insure proper placement. Any sign of blood in the syringe indicates improper placement–reposition; also, a lack of negative pressure in the syringe indicates the needle has punctured out through the opposite side of the skin. Remove syringe and reposition. The drug is administered in a steady, fluid motion. DO NOT administer rapidly because of tissue trauma.

## Subcutaneous (SC) Injection II–Camilla’s Method.

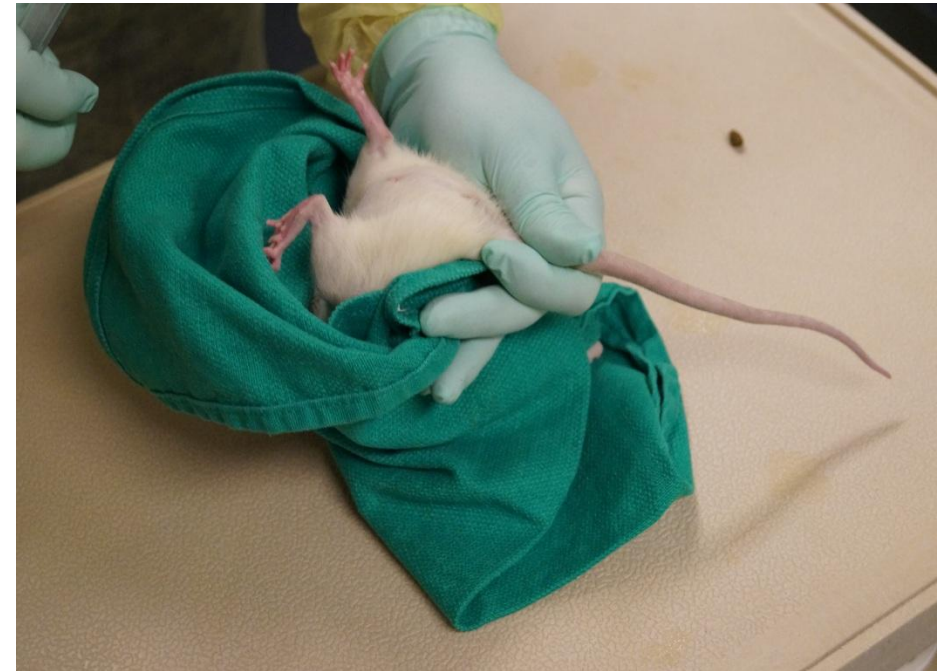
Fill a syringe (hypodermic needle, 25 gauge) with the appropriate amount of the article to be administered. The rat is then properly restrained, and wrapped in a towel. Use the thumb and index finger to grasp a skin fold, while keeping the rat restrained by gentle and firm pressure. With the opposite hand, pull softly on the tail so that the hind body stretches out. When the rat has become quiet, the same hand can be used to inject per subcutaneous injection technique described above.



## Intraperitoneal (IP) Injection I

Fill a syringe (hypodermic needle, 25g) with the appropriate amount of the article to be administered. The rat is then properly restrained by, tilting body at a 45-degree angle with the head down. This will position the intestines cranial to the injection site. Hold the rat gently but firmly. The injection area is prepped with an alcohol swab. Insert needle into lower left/right quadrant of abdomen at a 30-degree angle. Aspirate syringe to insure proper placement. Any sign of blood or other fluid indicates improper placement. To prevent inducing peritonitis, remove syringe, discard, and use new syringe, needle, and article.





## **Intraperitoneal (IP) Injection II–Camilla’s Method**

**Fill a syringe (hypodermic needle, 22–30g) with the appropriate amount of the article to be administered. The rat is then properly restrained, and wrapped in a towel covering the entire rat. Place the thumb on the caudal side of the tail base and the rest of the hand cranially restraining the rat firmly and gently. The hind part of the body is lifted carefully until the abdomen becomes visible. With opposite hand, the injection is made lateral to the linea alba at a level between the rat’s knees.**

## Intravenous (IV) Injection Utilizing Lateral Tail Veins

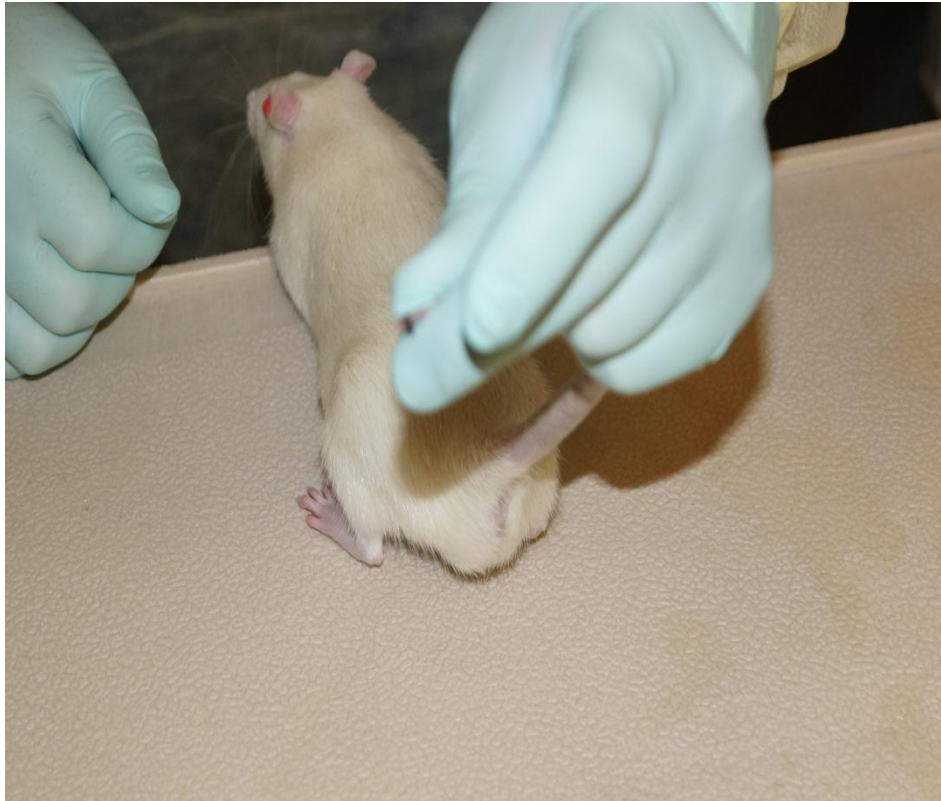
Fill a syringe (hypodermic needle, 23–30g ) with the appropriate amount of the article to be administered. The rat is then properly restrained. The injection area is prepped with an alcohol swab. With the tail under tension, insert needle into skin approximately parallel with the vein. Needle placement should be no closer to the body than half the length of the tail. Insure proper placement by inserting needle at least 3 mm into lumen of vein Administer article in a slow fluid motion to avoid rupture of vessel. Upon completion, insure good hemostasis before returning to cage. DO NOT administer the article rapidly because of the likelihood of tissue trauma.





## Gavaging the Rat

Measure the distance from the tip of nose to the first rib. This is the length of needle that should be used. Fill a 1–3cc syringe with gavage needle (a special bulbed needle used to instill an article directly into the animal's esophagus or stomach) with appropriate amount of article to be administered. The rat is then properly restrained. Place tip of needle in the animal's mouth. Slide tip down back of mouth, moving tip forward in one fluid motion. Any resistance felt indicates improper placement. Needle should slide down into esophagus easily. Once the needle is properly placed, administer the article.



## Tail Vein

The rat is adequately restrained with tip of tail exposed. The tail is properly prep with an alcohol swab. The lateral side of the tail is punctured using a 25G needle. Allow blood to flow into collection vessel. To enhance the blood flow, stroke tail gently with thumb and forefinger. Upon completion, insure good hemostasis before returning to cage.



## Saphenous Vein

Restrain rat by wrapping in a towel. Clip hair from lateral aspect of lower leg and prep with alcohol swab. Constrict saphenous vein above knee joint. Insert needle into vein at a 20-degree angle to puncture the vein. Collect the blood in a marked microtainer or microhematocrit tubes. Upon completion, insure good hemostasis by applying gentle pressure to the puncture site before returning to cage.





## Intracardiac Puncture

**MUST be done UNDER ANESTHESIA and followed by euthanasia.**

**Prepare the chest area with an alcohol swab and insert needle at base of sternum at a 20–30 degree angle just lateral to the midline (rat's left side). Aspirate syringe slowly.**