10th International Course

Care and use of laboratory animals

Hosted by the University of Crete
in collaboration with IMBB, FORTH
Heraklion, Crete, Greece

RATS PRACTICALS
Videos / Self-study

1. Anatomy of Rat

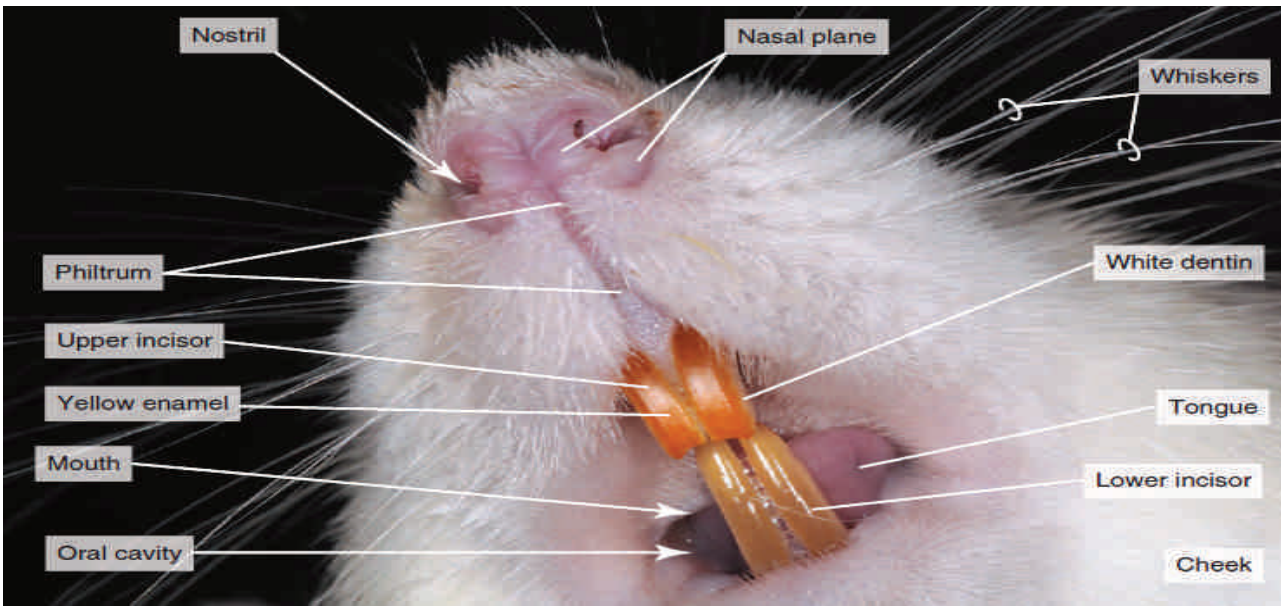
The video is attached.

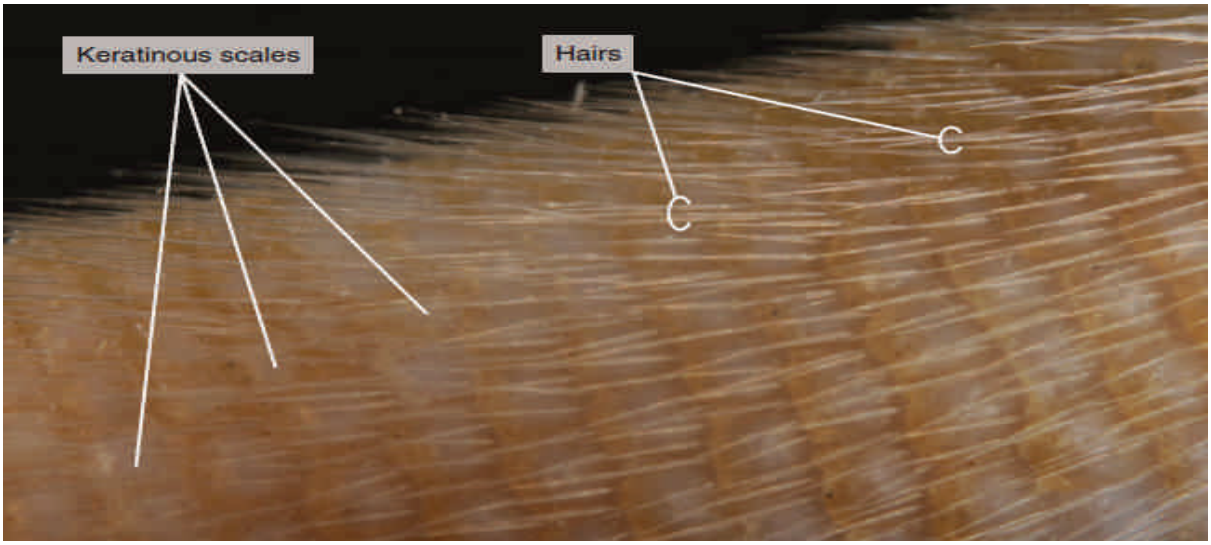
Info

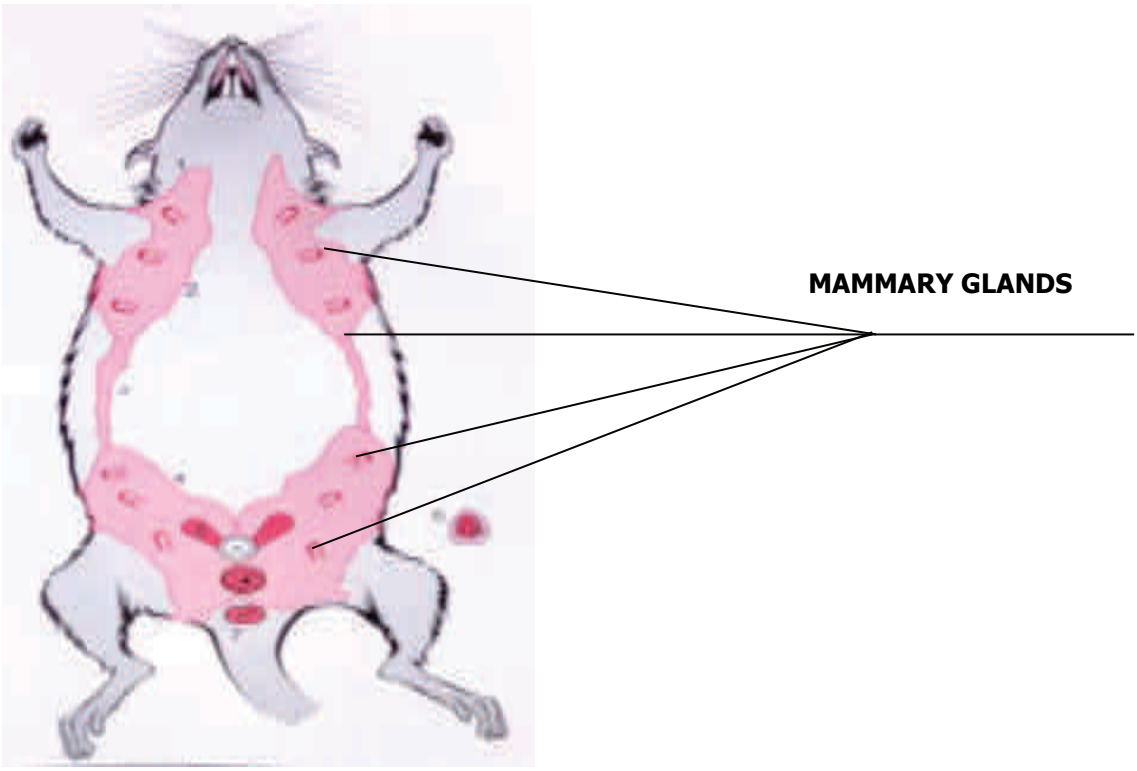
The *Rattus Norvegicus* has been widely used as an animal model system, due to its genetic and physiological similarities to human in several research fields such as physiology, pharmacology, toxicology, neurobiology, immunology, behavior, learning and nutrition. Moreover rats have a well-developed reproductive system and a rapid rate of reproduction and therefore they can be a convenient model to study that system. The study of the rat anatomy and physiology led to the understanding of a variety of physiological and pathophysiological mechanisms over the years.

This video presents the anatomy of the rat, beginning with a review of the external anatomy, where the anatomical regions of the rat body are shown. Then, after the dissection of the rat's body, the thoracic and the abdominal cavities are revealed. At the latter one, the digestive system is shown and the organs that it is consisted of are extensively discussed. The abdominal cavity also contains the excretory and reproductive systems that are closely linked and are usually studied together and referred to as the urogenital system. The excretory as well as the reproductive organs of both sexes are studied in the video. The thoracic cavity contains the circulatory or cardiovascular system, as well as the respiratory system, that deliver blood supply and oxygen to the organs and tissues. At this point, both pulmonary and systemic circuits of this system are described and the basic blood vessels are shown. Finally, the nervous system is described where the basic brain structures and the spinal cord are shown.

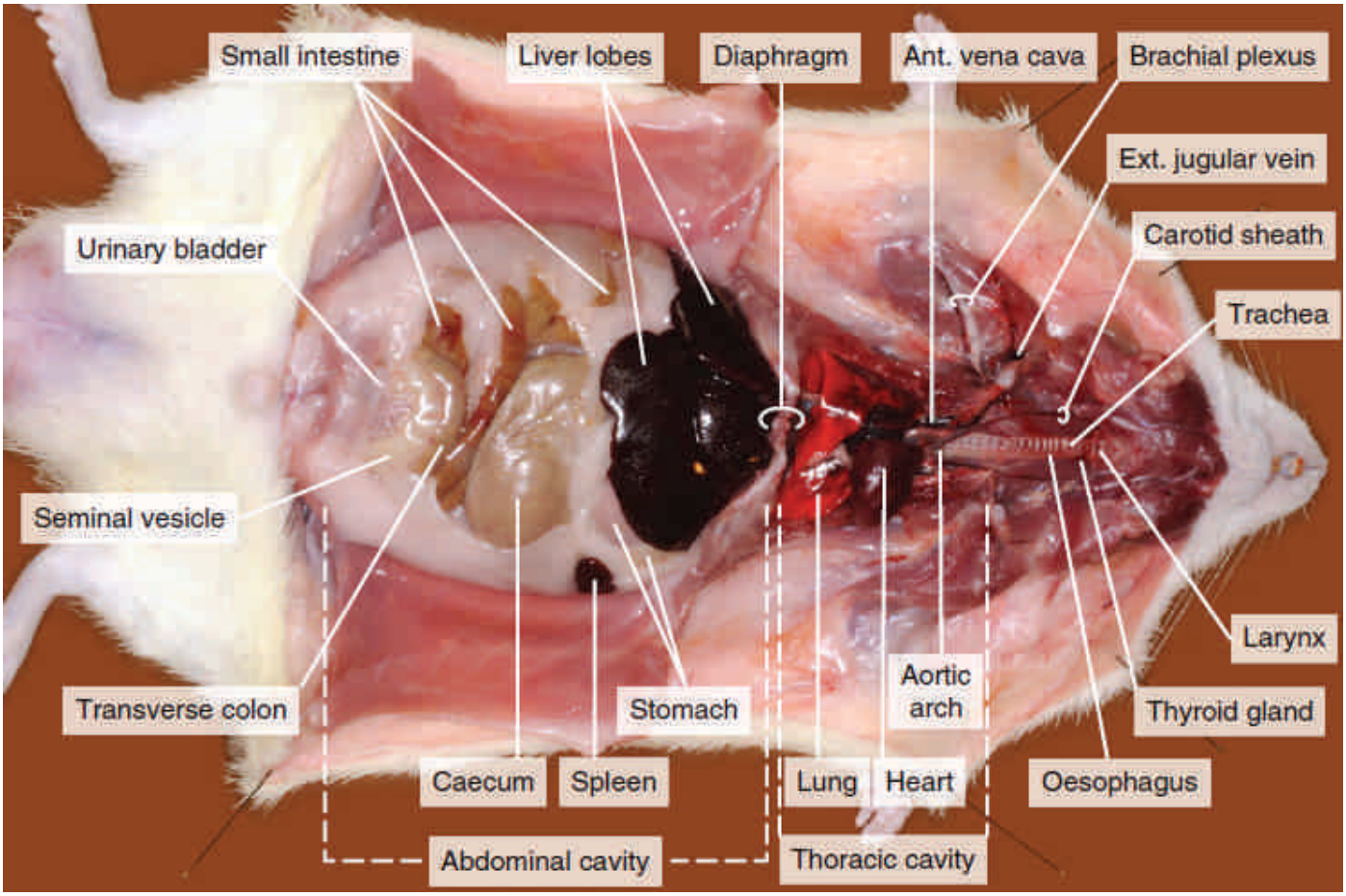
EXTERNAL FEATURES

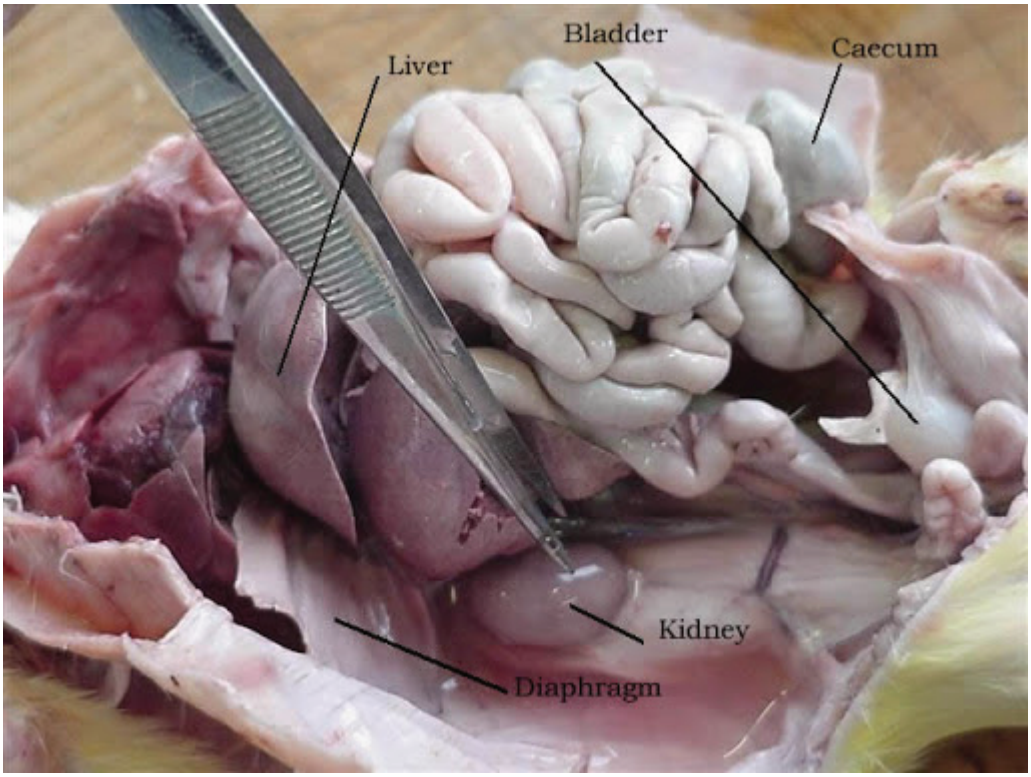



Keratinous scales
Hairs

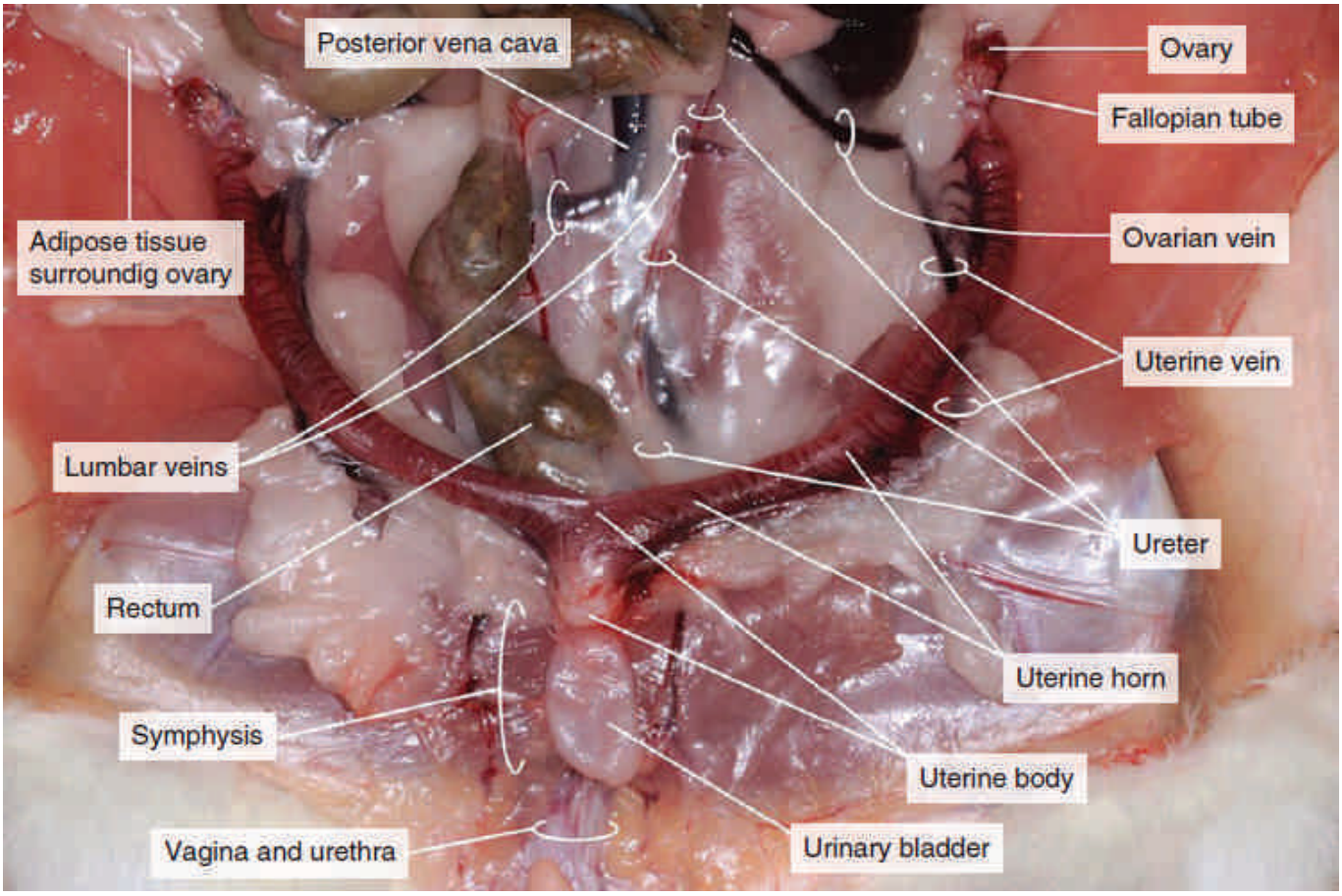

MAMMARY GLANDS

THORACIC AND ABDOMINAL CAVITIES

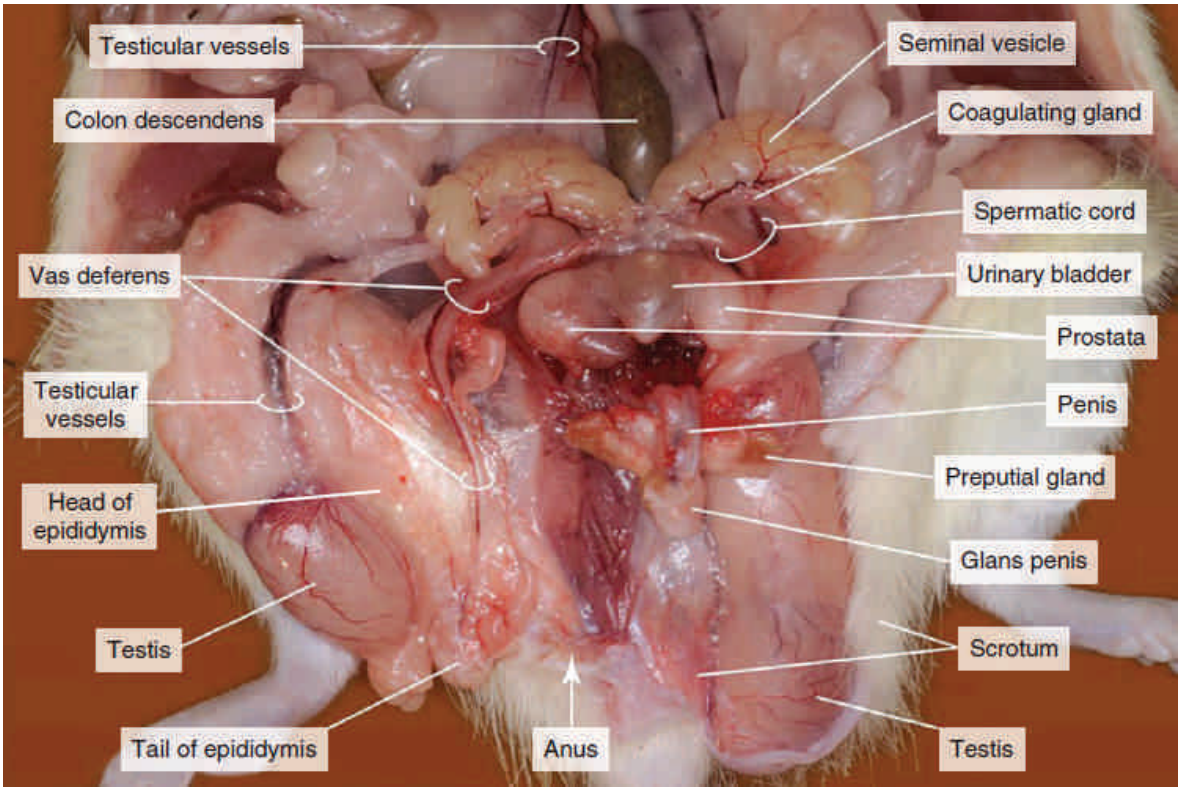




THE REPRODUCTIVE SYSTEM OF A FEMALE RAT

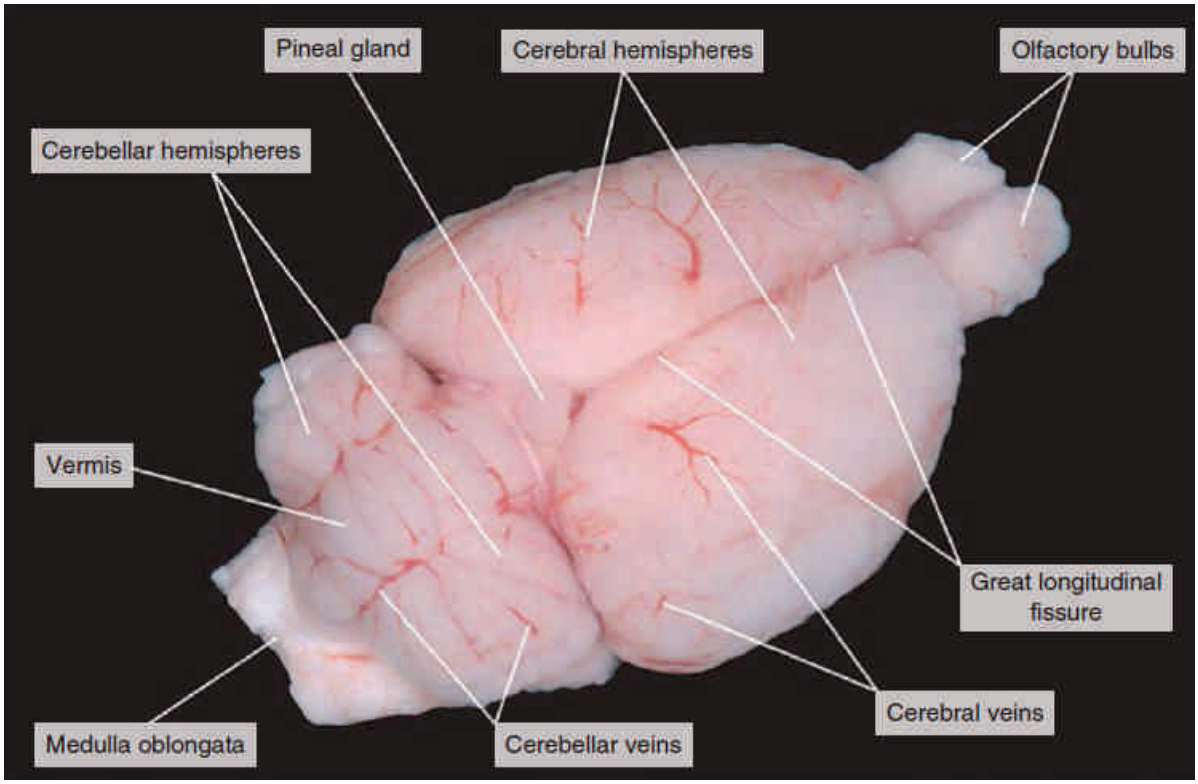


THE REPRODUCTIVE SYSTEM OF A MALE RAT

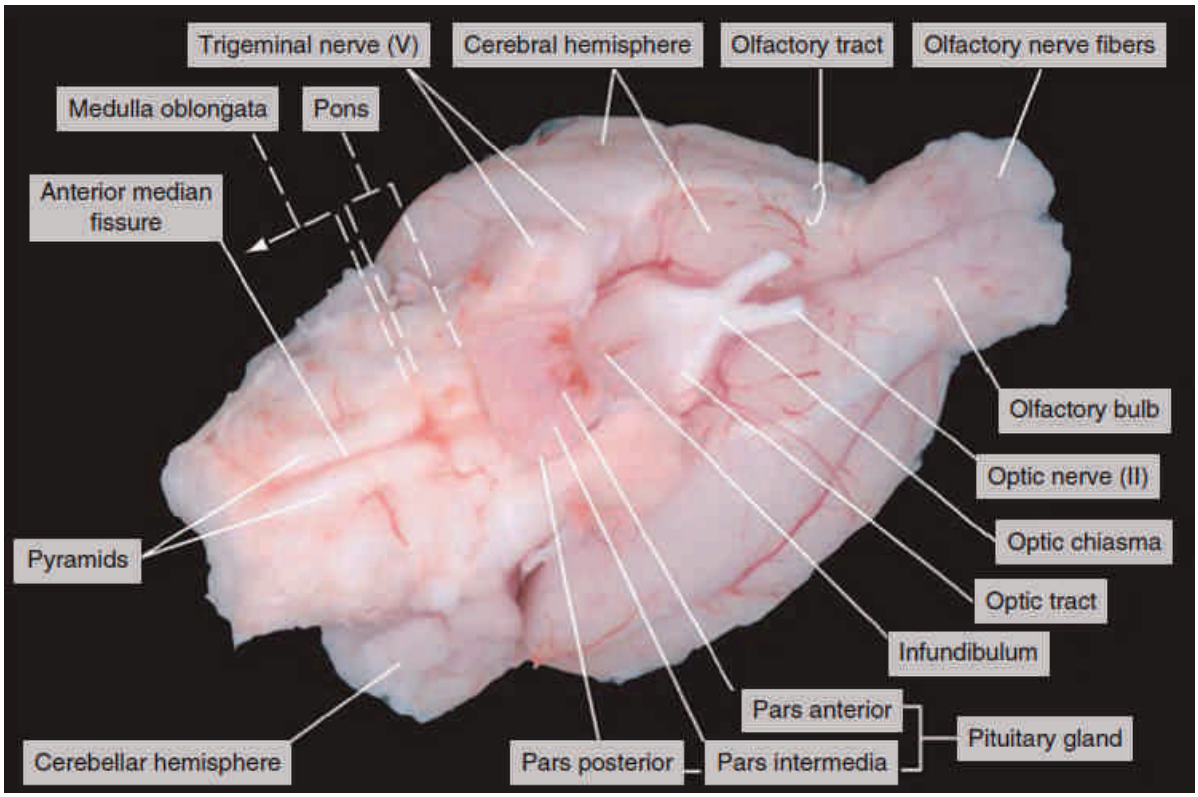


THE BRAIN OF THE RAT

DORSAL VIEW



VENTRAL VIEW



2. Oral gavage

https://www.instechlabs.com/rat-oral-gavage-watch

Info

This video demonstrates the oral gavage technique in rats. The main contents of this video are:

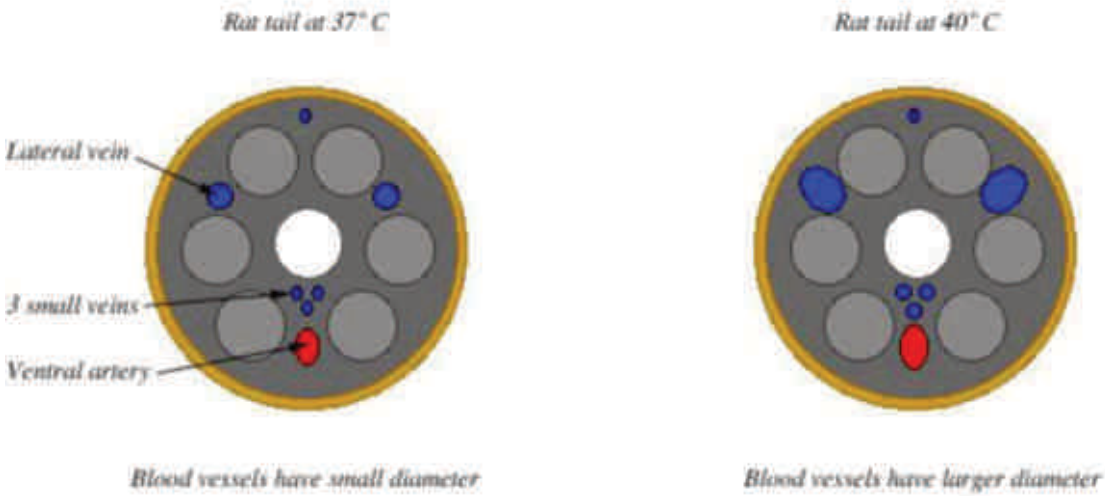
1. the use of flexible feeding tubes.
2. the selection of the appropriate size of the tube in order to ensure proper delivery of the compound and avoid injury of the rat.
3. the use of the proper restraint technique to perform oral administration.
4. advice regarding the potential complications that may be faced during the gavaging procedure. (After completing the procedure and returning the rat to the cage, the animal's status must be always checked for possible respiratory distress signs or bleeding)!

3. Blood collection from tail vein

https://www.jove.com/v/55852/repeated-blood-collection-from-tail-vein-non-anesthetized-rats-with

Info

This video presents the technique of blood sampling from the lateral coccygeal vein (tail vein) of non-anesthetized rats. It is necessary to restrain the rat during this procedure using restrainer tubes that can be adjusted according to the size of the animal. Usually the blood sample is obtained from the lateral tail vein and normally 0.1-2.0 ml can be collected depending on the size of the rat. In order to facilitate the procedure, the tail can be warmed by dipping it in warm water for about 1min or finger pressed to induce vasodilatation. The lateral vein should be initially accessed at a short distance from the tail tip and then move along towards the base. At the point of needle's access, it is recommended the bending the tail to enable almost parallel insertion to the vein. Blood collection can be obtained using 21G-23G or butterfly needles. It is recommended to apply a topical anesthetic cream for approximately 30 minutes prior to blood sampling in order to have the tail totally steady and unmoving, reduce pain and prevent causing additional stress to the animal.



4. Pet rat

https://www.youtube.com/watch?v=Q4mdhj73R2k

Info

This video shows that a rat can also become a pet and maybe your best friend!

Enjoy!