

Rats (*Rattus norvegicus*)

1. Contribution to biomedicine

In the 20th century, most of the major physiological research discoveries were made in the rat model. Humanity should be grateful for the contribution of experimental rats to biomedicine. Perhaps due to the evolution of research directions, the improvement of experimental technology, the emergence of sophisticated instruments and equipment, and the cost of raising rats are much higher than that of mice, there is a trend that rats are used less and less.

2. Changes in rat body weight

Just like mice, different genders, groups or strains have slight differences in weight gain and adult body weight. Inbreeding strains of rats are smaller in size and grow at a slower rate than those in the common group (Figure 1). Generally speaking, the weight of rats most commonly used in experiments is 200-300 gm (or 6-8 weeks old). The weight increases most rapidly at this age, with an increase of about 50 gm per week (Figure 1). However, our school rats purchased from the National Animal Center are often found to be much lighter than the ones required when they arrive at the animal center. This may be because it takes about 12-20 days for these rats to leave the normal breeding environment, be packaged, and then be transported to the school. For hours, the rats in the shipping cartons may stop taking in the feed and water in the boxes due to urgency. Based on past experience, they often suddenly gain 30-50 gm in weight within 48 hours after arriving at the animal center of our school, and then the weight gain slows down. Therefore, we would like to remind our colleagues and students that animals transported to our school from outside the school should not be tested immediately. They should be allowed to return to their "normal physiological state" and "adapt to the new environment" before testing. Therefore, they need to wait for about 3- 7 days.

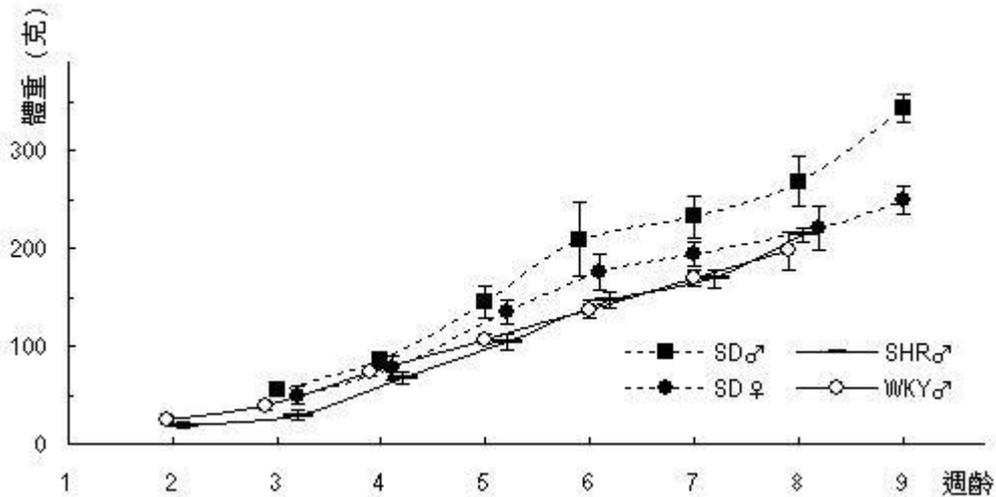


Figure 1. Weight gain (mean \pm std) of Sprague Dawley (SD), SHR and WKY rats. (Vertical axis means grams and horizontal axis means weeks of age.)

The data of SD/Crj rats were collected from 10 males and 10 females. These animals belong to 4 litters. The feed and drinking water before weaning were high-temperature sterilized PMI 5010 and RO water respectively. The feeding before weaning the cage is an IVC; after weaning, the feed is PMI 5001, the drinking water is RO water, and the breeding cage is a shoebox type cage with a filter cover. The source of SD rats in this group came from the National Animal Center, and they were introduced by Charles River Corporation of Japan (Crj) in 1996. This is from the SD rats from Charles River. Although they are an opportunistic group, their adult weight is much heavier than the SD/Hsd rats from Harlan Company (approximately 50 gm). The male SHR/NCr and WKY/NCr rats in this picture are the second generation bred from sources imported from Charles River Company (Cr) in the United States. During the data collection period, they were both raised in the isolation area on the 6th floor of the Animal Center. They were raised with high-temperature sterilized feed and drinking water, and the breeding cages were fed with IVC. Since most of these two inbred rat strains used for hypertension research only use male rats, most of the newborn female rats are euthanized when the rats are born, and only 5-7 rats per litter are maintained until weaning.

3. Rats are easy to tame

When conducting experiments, if rats are "kindly treated", they can easily become very docile like pets and often act "coquettishly", which is not easy to see in mice. Rats look like "enlarged mice" in appearance, but their anatomy is different. The most obvious visual difference is that rats do not have a gallbladder, so the saying "as timid

as a rat" refers to rats. Bar. In fact, male rats are not as aggressive as mice. Therefore, male rats raised alone can be housed in a cage with other male rats without the problem of "group fights".

4. Do not build nests

Rats are not as good at building nests as mice and hamsters, so it is not necessary to provide bedding materials that are easy to build nests in the breeding cages. Instead, it is more important to consider bedding materials with good hygroscopicity.

5. The tail skin is easy to peel off

The tail skin of rats is also different from that of mice. The tail skin is not tightly adhered to the subcutaneous tissue. Therefore, be sure not to grab the rat's tail casually to avoid "taking off" the tail skin like taking off a glove.