

# Types of Cancer and Surgery in Rats (*Rattus norvegicus*)

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## Research Article

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### ABSTRACT

Cancer is a disease, which involves abnormal cell growth. It is caused due to mutation in cells. The cell undergoes uncontrolled division. It has the potential to invade or spread to other parts of the body. Based on the type of tumors, cancer is benign and malignant and from origin it is of different types. Along with humans, cancer is also spread to the animals. They also contain different types based on the origin. Cancer is rife in the animal kingdom. For many, the mortality rate is similar to that suffered by humans. The tumor suppressor gene (p53) will help to suppress the cancer genes in humans along with in animals. Cancer is also prevalent in wild animals. Elephants have less chance to effect because they contain trillion of cells. The incidence of cancer in humans is much higher than the incidence of cancer in elephants and whales called as "Peto's paradox".

## INTRODUCTION

Rats are genetically predisposed to a high incidence of tumors and cancers. Some tumors may be malignant while others are benign. Mostly in rats, cancer is benign tumors. In all benign cases, we can remove the tumor to reduce the fatalities of rats [1-5].

Open access journals provide more visibility and accessibility to the readers in gaining the required information. The researches all over the world, which are being exhibited and acquiring knowledge through open access journals, serve as the main source of information in various fields [6-13].

To create awareness among the people, researchers and scientists together form a society or a group. The main aim of these societies is to visualize, counsel and create awareness to people particularly who are affected with the Cancer diseases [14-24].

Open access journals in Cancer share the recent and scientific research publications to the society. Advances in Cancer prevention provide information regarding the recent researches taking place globally and helps to increase the faith in people that we can prevent cancer. Journal of Cancer Science & Therapy is a peer reviewed journal which publishes high quality articles to improve the knowledge and provide research strategies for the development of new technologies both in science and therapy. Cancer Surgery, Advances in Cancer Prevention, Breast Cancer: Current Research, Cancer Medicine & Anti-Cancer Drugs, Journal of Cancer Science & Therapy, Journal of Cancer Diagnosis gives more information globally, sharing preventive and diagnosis methods. These journals provide information on the recent advancements that are taking place globally [25-30]. These journals ensure the barrier-free distribution of its content through online open access and thus helps in improving the citations for authors and attaining a good journal impact factors. Some are aimed to sharing the information in conferences through Oncology & Cancer Conferences. Diana Anderson from university of Bradford she will give key note speech on "An empirical assay for assessing genomic sensitivity and for improving cancer diagnostics" in 16th Global Annual Oncologists Meeting. Expertise related to oncology will give key note speech theme on "Exchange & Translation of scientific Information on preventive Oncology". in World Congress on Preventive oncology in USA on July 27-28, 2017. Conferences on Theme: Fighting for a world without cancer will give a wide area of research to the society in 15th World Cancer Convention November 27-28, 2017 Dubai, UAE.

## TYPES AND SYMPTOMS

1. Keratocanthomas: Benign tumors of the skin that develop in the chest, back or tail.
2. Mammary Fibroadenomas: The most common type of reproductive tumors in rats. It can found in the mammary (breast) tissue. It can found in both female and male rats [31-38].
3. Mammary Adenocarcinomas: Malignant tumors that are found under the skin anywhere on the underside of the body, from the head to the tail, as rats have widely effected mammary (breast) tissue. Typically these tumors are soft, round, or somewhat flat growths that can be moved [39-45].

4. Pituitary Gland Tumors: Observed common in female rats. Due to the position of the tumor, symptoms include head tilting and depression. These tumors may lead to sudden death.

5. Testicular Tumors: Found in the testes of male rats <sup>[46-52]</sup>.

6. Zymbal's tumors: Found at the base of the ear in older rats; they are relatively infrequent <sup>[53-61]</sup>.

## **CAUSES**

Rats by nature are very susceptible to the development of tumors. Some are more common than others <sup>[62-69]</sup>. For example, mammary adenocarcinomas are common in rats because of their widely distributed mammary tissue. Tumors of the pituitary gland increase in occurrence in relation to increased consumption of high-calorie foods <sup>[70-75]</sup>.

## **DIAGNOSIS**

Tumor growths that can be seen or felt externally are the easiest to diagnose <sup>[76-80]</sup>. Tumors that occur in the internal organs can only be diagnosed with the assistance of X-rays and other scans.

## **SURGERY**

Benign tumors can be removed from rats through surgeries, and only a few turned out to be malignant. Benign mammary tumors can be removed by minor surgery. But even huge tumors can be removed as long as your rat is otherwise in good health and steps are taken to prevent shock. The smaller the tumor, the more easily it can be removed. Mammary tumors and fibromas are just under the skin, the surgery to remove them is minor, as opposed to major surgery which enters a body cavity, and rats usually recover quite quickly <sup>[81-86]</sup>. In fact, even rats with congestive heart failure appear to tolerate surgery well if their symptoms are controlled with medications.

## **OTHER NON-SURGICAL TREATMENTS**

Cannabis/oregano ointment that has been successfully treating a cancerous tumor that broke through the skin for 6 months. A compound that has been shown to both treat and prevent cancerous mammary tumors induced (not natural tumors) in the lab is conjugated linoleic acid (CLA). This compound has even been shown to help rats lose weight <sup>[87-90]</sup>.

Shark cartilage can help to prevent the formation of new blood vessels, which tumors need to grow. Nitroxoline is an antibiotic that has been used to treat urinary infections in Europe for about fifty years. It works by blocking the ability of bacteria to replicate. In 2010 researchers at Johns Hopkins School of Medicine discovered that it also can help to slow the growth of tumors by blocking the formation of new blood vessels. Giving nitroxoline to mice with either mammary cancer or bladder cancer found that the tumors shrank by 50 to 60%. Treatment with prednisone for some cancers other than mammary cancer can slow their growth <sup>[91-95]</sup>.

## **RAT USED AS A LABORATORY MODEL**

The primary focus of rat cancer research is the species *Rattus norvegicus* which is originated in Asia. The history of rats in biomedical research is quite extensive <sup>[96-98]</sup>. For over 150 years scientists have employed rats as models for many topics. In fact, the first domesticated laboratory mammal is believed to be the rat. It is mostly used in medical research, because rats are larger than mice, there are many areas of investigation for which they are easier to use than mice; for example, blood pressure measurements and serial blood samples are more readily obtained in rats than in mice <sup>[99-100]</sup>.

## **CONCLUSION**

Rats have certain advantages as models of disease, and they are one of the most widely used organisms in medical research. They have a high importance in cancer research. Rat is also a useful model in basic cancer research. Several rat models of monogenic (Mendelian) human hereditary cancers are available. Some were obtained spontaneously, while others were generated either by mutagenesis of tumor suppressor genes or by transgenesis of activated oncogenes.

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