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Mouse is an ally in the fight against cancer [1]

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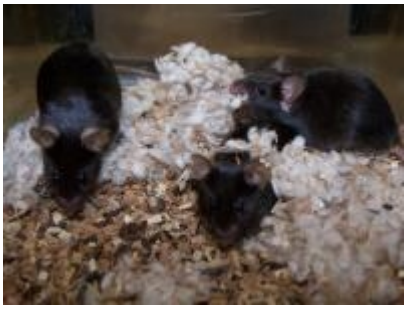

By Mónica I. Feliú Mójer / Special for El Nuevo Día endi.com [2] Human beings have shared –not voluntarily- our homes and food with mice for thousands of years. We also share most of our genes with them. From the genetic pint of view, mice and humans are more than neighbors: they are almost cousins. True, humans are not furry or walk in tour legs, and we don't go around nibbling everything in our way, but gene by gene, humans are very similar to mice. Mice, like humans, have around 40,000 genes made of up to 3 million pairs of nucleic acids that make up their genomic DNA. Given this, the most significant difference between the species is not the total number of genes, but their structure and the proteins they codify. However, there are so many similarities that mice are the number one experimental model to study basic processes of human biology, ranging from genetic predisposition to cancer and obesity to how we learn and remember. In the last 30 years, the mouse (Mus musculus) has become one of the most powerful tools in biomedical research. Thanks to the advances in genetic engineering, today scientists are able to manipulate Mus musculus genome, eliminating, introducing and mutating genes. There are thousands of these transgenic mice, with "custom made" genetic manipulations, that not only allow for the study of the function of diverse genes, but the role that those genes have in a variety of diseases. One of the diseases of more concern to modern medicine is cancer. It is estimated that in 2002 there were 10.9 million new cancer diagnoses and 6.7 million deaths related to this diseases world-wide. Cancer is the second most common cause of death among Puerto Ricans. Cancer is a group of diseases characterized by the uncontrolled growth of abnormal cells. This cellular abnormalities and uncontrolled growth occur due to DNA damage. Given the great genetic similarity between mouse and human, this rodent is a powerful tool in the study of the molecular mechanisms of this devastating disease and its possible treatments. In 1998, a gene known as

p53 was identified and this gene is the most commonly mutated gene in human cancer cases. Four years later, scientists created a mouse lacking this gene – a knockout- to study the function of p53 and how it relates to cancer. Thanks to p53 knockout some of the mechanisms that make this gene the “genome guardian” are known. This gene is a tumor suppressor – when a cell’s DNA is damaged, the protein codified by p53 stops the cell cycle or sends an autodestroy signal to the cell, avoiding that cells with mutated or damaged DNA divide, which helps prevent tumor growth. Using the p53 knockout Mouse scientists have discovered that the absence of this gene predisposes mice to develop cancer during their first weeks of life, which is why this animal has become an excellent model to study breast cancer, osteosarcoma (a type of bone cancer), brain tumors, lung and colon cancer, among other types of cancer. In exchange for all the headaches they cause, mice work tirelessly every day in the laboratory to give us a great gift: helping us understand human biology, how certain diseases occur and discovering possible treatments for them.

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