# Key to the mysteries of the human being [1]

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## CienciaPR Contribution:

By Mónica I. Feliú Mójer/ Special for El Nuevo Día endi.com [2] There are people that spend their days culturing bacteria and yeast, dissecting flies, and looking at worms under the microscope. These people are scientists in biomedical departments of the best universities around the world, and through those organisms they discover the secrets of biology and the human body. Although at first glance there are no similarities between you and flies or mice, the truth is that you are more similar to a fly than you believe. In fact half of the genes of the fly –the fruit fly in this case- have equivalents in the human genome; a mouse is so genetically similar to humans that if you look at segments of both genomes at the same time, you wouldn't be able to tell them apart. Bacteria, yeast, worms, flies and mice, among others, are used as experimental models. An experimental model is a species used to study a biological phenomenon in particular. A wide variety of phenomena are studied in these organisms, from molecule function to the cause of diseases like diabetes and cancer, and their potential treatments. This strategy is possible thanks to the conservation of biological processes through out evolution. The cells of all living organisms work under the same rules: they talk the DNA language, and the proteins codified by that DNA tell the cell how and when to grow, divide, fight stress or die. Experimentation on these organisms makes studying biological phenomena a lot easier. This is because many of the experiments done in them would be very difficult, impossible or extremely unethical if done in humans. What makes an organism a good experimental model? There is no organism that makes a perfect experimental model; everything depends on the problem to be studied. Usually an organism is chosen according to how easy it is to handle. Some important characteristics are: size, how easy and fast they reproduce, genetic manipulation techniques available for that model, biological processes and mechanism conservation, similarity to the organism with the problem of interest- for example, the mouse is used for the study of neurological diseases, because, structurally, it's brain its similar to the human brain. Although there are many organisms that serve as experimental models, five of them are them most commonly used: bacteria (Escherichia coli), baker's yeast (Saccharomyces cerevisiae), the nematode worm (Caenorhabditis elegans), the

fruit fly (Drosophila melanogaster) and the common mouse (Mus musculus). E. coli is a bacterium commonly found in the gastrointestinal system, but thanks to it, in 1950 Watson and Crick discovered that DNA is the material that codifies the genes of all living organisms. Saccharomyces cerevisiae is a single-cell fungus that besides permitting us enjoy beer and bread, has lead us to discover many important aspects of cell division and the cell cycle. Caenorhabditis elegans is a small worm that has helped scientists understand the development of a multi-cellular organism. The fruit fly (Drosophila melanogaster) is widely used in genetics, and thanks to this sometimes annoying insect we know some of the genes that control embryonic development. The mouse (Mus musculus) is of this five experimental models, the one that is genetically closer to humans and is used in the study of phenomena ranging from obesity to cancer. Advances in medicine and biomedical research would have never been possible without the use of these organisms as guinea pigs (which, by the way, also serve as experimental models). So next time you see a worm or a mouse, instead of thinking they are creepy creatures, remember that thanks to them some scientist in the world is about to make a great discovery.

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