

Anything but modest: The mouse continues to contribute to humankind

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"Big things come in small packages," the saying goes, and it couldn't be more true when discussing the mouse. This little creature has become a crucial part of human history through its contributions in understanding human genetics and disease. In a review published in *Disease Models & Mechanisms* (DMM) genetics researchers from Yale University School of Medicine and Fudan University School of Life Sciences discuss the history and future of mice as a model organism. They predict that the next frontiers in mouse genetics – such as creating mice expressing human genes to create "humanized" mice – will continue to provide scientists with new tools to not only decipher clinical mysteries, but also to test novel therapies and cures.

The review's authors, Duc Nguyen and Tian Xu, discuss the many ways in which scientists manipulate mouse genes in order to study their biology. One such technique that Nguyen and Xu are working on involves inserting a segment of DNA sequence into the much lengthier full genome of the mouse.

These insertable DNA sequences are known as transposons. Use of transposons, as well as other genetic tools, allows scientists to disrupt a specific mouse gene and deduce the gene's function by studying the effect on the mouse. The hope is that the research community can combine the results of extensive mouse studies into a comprehensive library to form a functional map of the mouse genome. Such a map will help researchers navigate and explore the even more extensive human genome to pinpoint the genetic underpinnings of human disease.

Not only do the researchers discuss how mice help us understand disease, but they also highlight methods which enable research of novel disease therapies. For example, humanized mice – mice engineered to carry human genes – can provide new experimental systems for testing new therapeutics.

Link: dmm.biologists.org

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