

Lab**Animal**
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MONITORING MOUSE MODELS HELPS MAINTAIN RESEARCH INTEGRITY

A conversation with **DARRELL E. HOSKINS**, associate vice president, Comparative Medicine, Transnetyx



‘Trust, but verify’, is an adage that researchers are sensible to bear in mind when using mouse models. Mice are valuable research tools because they recapitulate the complex biosystems of humans, and other animals, so well. They are efficient to care for and propagate, and there is a plethora of existing mouse data already at hand, including the full genome sequence. However, human error can corrupt research data. Darrell Hoskins explains what can go wrong with mouse models and how these errors can be prevented.

What assumptions are often made about mouse models?

There are three basic assumptions that cause the most consternation. First, there’s the misguided notion that if deliberate action isn’t taken to change the model, it will stay the same over time. That’s certainly not the case.

Second, scientists feel like the importance or relevance of genetics on their particular field of research is not as relevant or important as another field. The reality is, the more we learn about genetics, the more we understand that the genetic makeup of a model is critical.

Finally, investigators accept implicitly that models are what they are labelled. If we are focused on reproducibility, these animal models need to be checked.

What else can go wrong when dealing with animal models?

Human error is also a tremendous factor. Communication failure, documentation errors, and labelling mistakes are all potential pitfalls that can cause the inadvertent change of an animal model.

What outcomes can these assumptions and errors bring?

It all comes down to getting unwanted variability in your research outcomes. That can

alter the experiment in ways that are not immediately obvious but do have an impact on the animal being used.

Taking that a step further, for conclusions to be valid, they have to be reproducible. If you are doing research on a model that is not what you think it is, and someone tries to reproduce your data to validate it using an essentially different model, they may not get the same results. That’s unproductive for everybody involved. In the worst-case scenario, it can invalidate a study altogether.

How do genes in mouse models change over time?

In all animals, with breeding over time, there will be random mutations. Often, they will be relatively small changes, occurring incrementally. In mice, if you take a line of animals and you breed it for 20 generations, even if you’ve done nothing else to genetically manipulate those animals, you have created an entirely new substrain, just due to random mutations and variations within the genome. These things happen whether we intend for them to or not.

What do new tools like CRISPR do to affect the genetic makeup of a mouse model?

These tools don’t affect the

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genetic makeup of the mouse model, but they facilitate more rapid and more complex genetic modifications in animals. Therefore, accurately defining and regularly tracking gene modification and genetic background in these research animals becomes even more essential.

What is Transnetyx doing to help researchers maintain confidence in their models?

Accuracy is of the utmost priority of developing a congenic mouse line and ensuring your mice have avoided strain contamination. To avoid unreliable research, strain verification is critical for reproducibility.

In November 2018, Transnetyx will be launching a Genetic Monitoring service for strain and substrain background verification. The offerings will consist of a panel distinguishing between C57BL6/J versus 129 and a substrain panel distinguishing between C57BL6/J (B6J) versus C57BL6/N (B6N). By providing these services,

we save scientists time and resources, so they are assured continual focus of reproducible results.

Why don’t labs perform these analyses themselves?

Some do. But we can do in a week what these other labs or services would need several weeks to accomplish. Also, genetic monitoring of mouse models takes time that could be applied to the pure pursuit of their science. In many cases, outsourcing is just more efficient.

Why would someone use Transnetyx genetic monitoring services over others?

Our systems are automated and ensure the highest level of accuracy and speed. Our high-throughput genotyping service already stores samples for six months.

The Transnetyx Genetic Monitoring service will offer streamlined convenience with strain or substrain verification being available immediately after genotype result, which saves transit and turnaround time.

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DON’T LET YOUR WORK GO TO WASTE.

Ensure reproducible results with Genetic Monitoring.
Coming soon from Transnetyx.

You can’t reproduce results with contaminated strains. The efficacy of your research depends on your ability to ensure your mice are ideal for your experiments. And while obtaining animals from reputable sources is essential, as you breed the only way to know for sure a colony has been properly maintained is through genetic monitoring. As an extension of Transnetyx Genotyping services, our panels will help you determine full strain or substrain information and avoid genetic variations caused by strain contamination.

You know accuracy is non-negotiable. Gain confidence in your genetics by contacting **GeneticServices@Transnetyx.com** today.

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