Generating an Oncogene Transgenic Goat with Conditional Gene Expression

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Technology description

Utah State University researchers have developed a model to monitor the effects of K-ras or TGF-B1 on large animals, such as goats. Due to the fact that goats are cheaper and much easier to maintain, this model can reduce costs and improve efficiency in organ testing. The data collected from this model is used to measure the effects of human organs and can be applied to several industries within the healthcare industry.

The purpose of this model is to monitor the effects of K-ras or TGF-B1 on large animals. The use of large animal models provides an opportunity to measure the effects of K-ras or TGF-B1 on human sized organs and apply the knowledge obtained to human healthcare. USU researchers determined that the use of a goat for a K-ras or TGF-B1 model provided multiple advantages. These advantages include: Somatic cell nuclear transfer (SCNT or cloning), goats with the K-ras or TGF-B1 knock-in can be replicated more efficiently and with higher percent K-ras or TGF-B1 transfer than other large animal models, higher vitality both fetal and post-natal, and goats are cheaper and easier to maintain.

Notes:

Current models used are mice. Anatomical structures and small size make it problematic when measuring the pathophysiologic parameters of diseases. Use of transgenic large animals will significantly lower the expense and numbers of animals needed for the studies. Using goats provides the following advantages: Somatic cell nuclear transfer (SCNT or cloning), method used for transgenic large animal model is more efficient for goats than other large animals. No fetal and post-natal lethality. Goats are cheaper to raise and easier to handle. K-ras genes are mutated in many human cancers ranging from pancreatic cancer, lung cancer, breast cancer. K-ras transgenic goats for potential large animal tumor models. Specifically lung cancer.

Application area

Pharmaceutical industries

Cancer Research

Advantages

Lower Cost
Higher vitality
Higher efficiency in K-ras transfer
Provides large size to measure the effects of K-ras

Institution

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