Reviewer’s report

Title: Completion of the swine genome will simplify the production of swine as a large animal biomedical model

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Reviewer: Lusheng Huang

Reviewer’s report:

In this review, the authors described the importance of the pig as a biomedical model, summarized the current technologies used to produce transgenic pig and introduced several genetically engineered pig models, such as cystic fibrosis pigs, pig model for xenotransplantation and diabetes. Furthermore, the authors summarized the new technologies for gene targeting. The manuscript gives some useful information on the advance using pig as biomedical model. Some revision is need in general. Several major concerns about the manuscript were listed below.

1. From the title, completion of the swine genome will simplify the production of swine as animal biomedical model; the authors should introduce some information about pig genome and the current progress of pig full genome sequencing.

2. In the part of “how the genome completion will aid in production of new models”, the authors only described the aid in gene targeting. However, the completion of pig genome sequencing also helps to understand the molecular mechanisms of human diseases using pig as models.

3. As mentioned in the manuscript, the pig is a favorable animal model for human diseases because their size and physiology are similar to humans. More and more studies on human diseases were carried out using pigs as the models from both genetics analysis and gene knockout or knock-in. However, in this manuscript, authors only summarized the transgenic pig models for human diseases. Genetic analyses of some diseases using pig as models can lead us understand the molecular mechanisms of these diseases because many kinds of resource population can be produce by factitiously setting mating. For example, genetic studies of pig models of human disease have lead to identify novel quantitative trait loci for cutaneous melanoma (Du et al., 2007) and a novel Arg-->Cys mutation in the LDL receptor that contributes to spontaneous hypercholesterolemia (Grunwald et al., 1999). Gene expression profiling in pig models has lead to identify several markers for puerperal psychosis (Quilter et al., 2008) and to identify RACK1 as a potential marker of malignancy for human melanocytic proliferation (Egidy et al., 2008). As one of the important sides of the pig as biomedical models, the authors also should add this content to the manuscript.

4. In genetically engineered biomedical models for diabetes, the authors described too much about “what is the diabetes” and “why it is brought on”.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests