Reviewer's report

Title: Human-animal Chimeras for Vaccine Development: An Endangered Species or Opportunity for the Developing World?

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Bhan et al.: Human-animal chimeras for vaccine development: an endangered species for the developing world?

The authors address the problems associated with the development and use of human-animal chimeras for vaccine development. They discuss the opposition by some philosophers, ethicists and policy makers in the west to research using such chimeras. The authors conclude that research on human-animal chimeras should be supported and performed in the developing countries.

The commentary presents a brief but well-organized review of the current ethical problems associated with the use of humanized animal models. It emphasizes the need to consider the perspective and needs of communities in developing countries and illustrate it on a recent example of a rotavirus vaccine development. Furthermore, the authors argue that the presence of chimeras in the mythology of many developing countries will make it easier to defend funding of human-animal chimeras research.

Comments:

1) It should be stressed that human-animal chimeras are not a new concept. In fact, various forms of hybrids have been used in research for over 50 years. Human insulin, growth hormones, antibodies and various other proteins have been successfully produced in bacterial and mammalian cultures and represent one of the greatest successes of modern medicine. More recently, rodent models expressing various human genes became extensively used in several research fields.

2) Recent technological and scientific progress in developing countries such as India and China resulted in an establishment of institutes providing an excellent research environment. Undoubtedly, talented scientists in these institutes will be able to address many of the problems facing their countries. However, it does not seem ethical to simply shift the moral responsibility from the west to the scientists and administrators in the developing world. Although the authors suggest a pragmatic approach, it appears to be an easy way out of a difficult discussion and decision-making process.

The scientific truth remains that in many areas of research we cannot progress without relevant animal models, including human-animal chimeras. Although the
The notion that stem cell transfer would induce “human feelings” in recipients belongs at the time to the realm of science fiction, we should never forget that animals have their own feelings and perception of fear. Careful planning of experiments and constant search for alternative approaches should be a norm. We cannot escape the discussion, no matter how difficult it is, and it should be led in a comprehensive and respective manner.

**Level of interest:** An article of importance in its field

**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.