Reviewer's report

Title: Protective immunity against Toxoplasma gondii induced by DNA immunization with gene encoding a novel vaccine candidate: calcium-dependent protein kinase 3

Version: 1 Date: 16 September 2013

Reviewer: Guo Rong Yin

Reviewer's report:

- Major Compulsory Revisions

Reviewers’ comments:

In this study, authors constructed a DNA vaccine expressing T. gondii CDPK3 (TgCDPK3) and evaluated its protective efficacy against T. gondii in Kunming mice. TgCDPK3 can generate protective immunity against T. gondii infection in Kunming mice and is a promising vaccine candidate for further development of an effective vaccine against T. gondii. The conclusions have been drawn appropriately based on the data presented.

1. Did the Kunming mice in this experiment were inbred mice? Kunming mice are used as if only in China, so the experiment result is probably not good for others to repeat. Why did not use the international common laboratory mice (such as BALB/c, C57BL/6J)? Please explain.

2. If the Kunming mice used in the experiment were outbred, not inbred, there are significant individual differences between them, only 3 mice were used in the experiment, sample size was insufficient. Please explain.

3. In Background, the first paragraph#…… a wide range of hosts including humans, livestock, birds and marine mammals [1-5]. “Livestock” should be replaced by mammals, because “livestock” is only the part of the mammals.

4. In Discussion, the fifth paragraph#IL-4 and IL-10 are upregualted but this is not mentioned in the discussion, whereas IFN-#, IL-2 and IL-12 are mentioned. This gives a biased view of the results.
   It would also be of interest to know which cell population are producing these cytokines e.g. Th1, Th2 or Treg cells. Since IL-10 was also increased, please discuss IL-10 role as Treg cytokine. IL-23 was also increased, please discuss.

- Minor Essential Revisions

1. In Background, the second paragraph#“immunoprophylaxisis” is misspelled, correct should be “immunoprophylaxis”.

2. In Methods, the second paragraph#“Center of Experimental Animals” should be “Center”, because “experimental animals” and “labaratory animal” have different meanings.
- Discretionary Revisions

1. The results are interesting, but purely of a descriptive mechanisms and do not shed any light on the mechanism of protection.
2. Fig.3: This figure seems to have smaller pixels and not clear, please improve it.

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

**Quality of written English**: Needs some language corrections before being published

**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.