Reviewer's report

Title: Tight Associations Between Transcription Promoter Type and Epigenetic Variation in Histone Positioning and Modification

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Reviewer's report:

The authors studied genetic and epigenetic differences between peak promoters and broad promoters. They found that some markers are associated with one type of promoter but not the other type. The question addressed is well defined and is important in the field of promoter and epigenetic study. Their results are interesting and deserve attention in this field and will be helpful to other researchers.

(Major Compulsory Revisions)

1. In the classification of peak and broad promoters, the authors used an arbitrary length of 1-4bp. The length they selected is surprise short. They should also try larger length (for example, 50bp and 200bp) to re-classify, and to test if the major conclusions still hold.

2. In the first paragraph “nucleosome position detection and dataset” of section “materials and methods”, it is said H3K9ac data are from THP-1 cells through FANTOM4 work. And it is unclear where these data are utilized. Because in other parts of the paper, H3K9ac data are all of CD4+ T cell (for example, in subsection “distribution of nucleosome containing modified histones” in section “results”). Besides, other data, including nucleosomal positioning, expression level, and other histone modification data are all of CD4+ T cell. As we all know, epigenetic evidence is quite tissue specific, so it is suggested they use H3K9ac data from CD4+ T cell as well.

(Minor Essential Revisions)

3. In page 4, “nucleosome positions are ambiguous in broad promoter”. They should change “ambiguous” to “spread” or “distributed”.

4. In the second paragraph of section “materials and methods”, when FANTOM4 is cited, the reference format (Kratz et al. 2010) is different from others in this paper.

5. Some key references in CpG island and promoter property were not cited. For example, the classification of promoters into CpG-rich and CpG-poor promoters (Ioshikhes and Zhang, 2000), the discovery of CpG-poor promoters are more conserved than CpG-rich promoters (Wang and Hannenhalli, 2006).

Level of interest: An article of importance in its field

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

Statistical review: Yes, and I have assessed the statistics in my report.