This is an interesting study investigating the association between mitochondrial DNA (mtDNA) haplogroups, oxidative stress biomarkers (TBARS and free thiols), and metabolic syndrome in,486 Korean adults. The paper is well written, with a lot of interesting data, but there are several recommendations that should be considered.

1. Please describe in more detail the experimental procedures such as serum processing and storage conditions, sample volume, assay protocol, reaction conditions, number of technical replicates, and analytical quality control.
2. Please list the reagent manufacturers (DTNB, TEPP) in the Material and Method section, as well as the spectrophotometer model used in the study.
3. The authors did not define the units for thiols. It is unclear whether they are mmol/L or something else.
4. Please clarify the statistical analysis section by indicating the level of statistical significance.
5. It is stated that participants were recruited during routine health check-ups. However, the inclusion and exclusion criteria are not sufficiently described, especially regarding conditions or medications that may affect oxidative stress biomarkers (e.g., acute inflammatory diseases, chronic kidney or liver disease, malignancy, antioxidant supplementation, or other relevant comorbidities).
6. The panel of oxidative stress biomarkers assessed in this study is relatively limited. Analysis of TBARS and free thiols solely cannot provide the clear status of redox state. Please include additional markers of oxidative stress and antioxidant defense system (e.g., SOD, CAT, glutathione, superoxide anion radical, hydrogen peroxide, and nitrites).
7. Please update references list with more recent studies. Several key references cited in the Introduction section are relatively old.
8. The discussion would benefit from a more comprehensive mechanistic interpretation of the observed associations between mitochondrial DNA haplogroups and oxidative stress biomarkers.