

Interactive comment on “Evaluating the mutagenic potential of aerosol organic compounds using informatics based screening” by Stefano Decesari et al.

Anonymous Referee #1

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This paper involves an analysis of existing data bases to infer possible toxic components of ambient SOA. The analysis reported is not comprehensive, serving mainly as a proof of concept. The idea is interesting, worthy of publication, but would be more appropriate for this journal if linked to existing knowledge on aerosol chemistry and health effects. My main suggestion with this paper is that a more substantial discussion should be added to put the work in context with known aerosol toxicity, source apportionment, and epidemiology studies. There is a substantial body of published studies that have identified various aerosol sources that are strongly linked to adverse health outcomes, such as incomplete combustion; eg, vehicle tail pipe emissions and biomass burning. These produce SOA and many of these compounds seem to be

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found in the main factors of this study with high toxicity. In contrast, from other studies biogenic SOA tends to be less clearly associated with health effects (check out the published literature). So why not link Fig 2 in at least a qualitative way with published health studies through a more comprehensive discussion, possibly identifying factors or toxic compounds in this study linked to SOA from incomplete combustion, biogenic VOC SOA etc. Putting these results in a large context of published work would significantly increase the impact of these findings, at least for the readers of this journal.

Finally, it is exposure that determines health effects, that is toxicity times concentration of a given species. A discussion on this would also be very helpful. It would be useful if the authors could provide some idea of typical concentrations of these identified toxic species (or groups), maybe for a range of sites. For example, maybe only a small fraction of the biogenic SOA leads to a toxic substance, but maybe the concentration of these species are very high (or low) making it a potentially important (or not) species.

Minor comment. The format is a bit strange: Why two Introduction sections? Table 1 has no caption.

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