Reviewer's report

Title: Characterization of the Apoptotic Response of Human Leukemia Cells to Organosulfur Compounds

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Reviewer: Yoshimasa Nakamura

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This paper reports straightforward studies describing the structure-activity analyses of 18 novel organosulfur compounds (OSCs). The present study is important since this report supported the previous investigations showing that synthesized derivatives of dysoxysulfone, a natural OSC, possessing tumor-specific antiproliferative effects, might be promising lead candidates. Great novelty cannot be claimed for the work, but in view of the good scientific quality, this paper should be of interest to the readership of the BMC Cancer.

Minor points:
1. It would be better to include structural details for the relatives of OSCs in the manuscript to help the readers’ understanding.
2. P14, L24 - P15, L1: The authors mentioned that Group III compounds, which have tumor-specific activity like compound M, from their previous study, are compounds F1, F4, F5, F6, F7, F8, H3, H4, H7, H8, N1, and N2. All compounds are not tumor-specific but somewhat tumor-selective, because some showed toxic effect on the normal cells. Also, compound H8 showed normal cell-specificity based on the MTT assay data. The authors are invited to improve this point.
3. The result section is too lengthy and includes some descriptions repeated in the method sections.
4. P22: Scheme 3 is somewhat attractive but too speculative to include in the text. Is there any evidence to support that peroxy anion is involved, such as intracellular peroxide level is upregulated by the test compounds. Where or how this anion comes from. Activities of methyl disulfide derivatives such as F, H, and N, are low, and especially H, having the alpha-ester/methyl disulfides, shows little effect. Therefore, other structural factors such as lipophilicity should be taken into account.
5. P23, L3: Scheme 2 should read Scheme 3.

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

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