

BASIC REPORTING

I commend the authors for their clear English used throughout the manuscript. In addition, the structure conforms to PeerJ standards. The introduction and background show context with referenced literature. However, there is a weakness in the figures which are not properly labelled or described and need more detail to meet publication standards. I suggest that the authors use detailed legends below the figures to provide more information on the figures, instead of at the top.

Raw data has been shared, but not sufficient enough for some methods described. The correct provenance of the A549 and H1299 cell lines is described.

EXPERIMENTAL DESIGN

Original primary research within the scope of PeerJ. Research question is well defined and meaningful, and research fills an identified knowledge gap.

In addition, ethical standards are high and rigorous. However, some methods are not described with sufficient details or information for reproducibility while others not rigorously investigated. Please, authors should provide detailed information on MTT assay, Flow cytometry, Western Blot (see general comments below).

VALIDITY OF THE FINDINGS

Thank you for providing the underlying data, however not all have been provided. Raw data for original OD value readings from the spectrophotometer are not provided. Also, raw data after calculating %cell viability for each well using the OD values and formula (on line 145) are not provided. Data and figures on how IC₅₀ was obtained are not supplied. Please authors should provide all relevant data for easier and better comprehension.

Data provided was not statistically analyzed in this study. To make the results more meaningful, I'll suggest you determine if the differences observed between the different groups is statistically significant using p-values (specifically, Figures 3 & 4).

Figures 1 and 2 equally have no legends and the objective of the images (X10, X40, X100) need to be included.

Figure 5 would only be meaningful, if the image legends provide more detail. Improvements can be done by describing the change in cell morphology observed as well as explaining what each quadrant represents

Since statistical analysis were not done in this study, how do you measure levels of significance? In lines 188, 244 and 298 you mention significant difference in the effect and potential of EGCG whereas this cannot be determined visually.

Conclusions are well stated, linked to the original research question and limited to supporting results.

ADDITIONAL COMMENTS

General comments

The paper investigates the anti-cancer potential of different doses of ECGC on the proliferation and inducing apoptosis in lung cancer cell lines A549 and H1299 in vitro. The authors claim that ECGC is safe, effective and exhibits significant potential in lung cancer therapy by reducing cell growth and promoting apoptosis with the PI3K/Akt signaling pathway. Thus, promising as a natural therapeutic agent in the treatment of lung cancer.

However, I also have a few comments and questions by section for clarity and improved quality of the paper.

Abstract

Your abstract lacks coherence with regards to the cell lines used in this study. The background and methods make mention of H1299 cells only, while the results report both H1299 and A549 cell lines. This does not add up. It seems like the experiments were not performed on both cell lines, which is not reflective of the study. Please correct this for clarity and coherence in the abstract. Again, your abstract has no keywords. Please authors need to include keywords as this is essential for any paper.

Materials and Methods

Although the correct provenance of cell lines is described, in your materials section, only the cell lines used in the study are mentioned. I suggest you equally mention the reagents/kits as well (specifically, you should indicate the antibodies, their catalogue # and where they were purchased/obtained from.

Please can you explain how you arrived at the different dose concentrations or treatment groups (0uM, 5uM, 30uM, 50uM)? Did the authors determine the effect of ECGC on both cell lines? What was the IC₅₀ of ECGC on A549 and H1299? There is no data or figure showing this? Please include data on this if it was done.

For the MTT dye reduction test, there is no mention of the cell density seeded per well at the beginning of this MTT assay, which is crucial. I suggest that you improve the description of the assay at line 136-138 by mentioning the cell density seeded per well at the beginning of the experiment as well as line 139 by mentioning the initial color of the tetrazolium dye.

Again, it is questionable why you performed the MTT assay in a 6 well plate instead of the recommended 96 well microplate or 384 wells (line 137). Did you have a positive and negative control using the 6well plate? This makes it impossible to obtain OD readings in replicates. And also impossible to determine Mean OD values for each treatment condition. I strongly suggest that this assay be re-done using either a 96 well plate or 384 wells and all the raw data provided in the supplementary files.

Detection of apoptosis. If cells are centrifuged and collected, then it is important to mention the speed and duration. Please include this detail on line 151. On line 152, the Annexin V apoptosis detection kit's working concentration used in the experiment is not known. At what concentration was it added to the cells?

Please can the authors explain what FITC and Propidium Iodide in the images represent? (Figure 5)

Western blotting. Please what was the composition of your lysis buffer used? Line 160. This has to be mentioned as well. In addition, how long was the secondary antibody added to the membrane? And under what conditions? Was it overnight at 4°C? At room temperature?

Statistical Analysis

How were your results analyzed? Data not statistically analyzed. It would be good if the authors could statistically analyze their data to effectively compare the differences observed in the different group treatments and to know if these differences are significant or not.

Results

Are relevant to the hypothesis though some are not well represented.

Discussions

In as much as authors seek to interpret results in context of existing literature as well as compare their findings with previous studies, in this study, they are more focused on discussing others findings rather than the findings of this study.