**Guidance – remove this box before submitting!**

Yellow callout boxes provide general notes. Please remove the yellow boxes before submitting. For full guidance see <https://peerj.com/about/author-instructions>

Blue highlighted example text should be replaced or removed with your own information.

|  |  |
| --- | --- |
| **DO**  –Use clear and grammatically correct English.  –Save as US Letter size format.  –Ensure line numbering is enabled.  –Align text LEFT.  –Ensure title, abstract, and author information matches what is entered online during submission. | **DO NOT**  –Embed ANY figures or tables in the text. Instead, upload a separate file for each on the file uploads page when submitting. Example – If you have 3 figures, then you will upload 3 figure files & be asked to add a figure title for each. See <https://peerj.com/about/author-instructions/#figures> for figure formats. |

**Manuscript Title**

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* Be clear, appealing, interesting and specific.
* Match the search queries used to find similar articles.
* Be concise: ideally 20-60 characters (250 character hard limit).
* Avoid acronyms, abbreviations and jargon.
* Accurately describe work.

FirstName MiddleName LastName1, FirstName MiddleName LastName2, FirstName MiddleName LastName3, FirstName MiddleName LastName4, FirstName MiddleName LastName1

1 Department Name, Institution Name, City, State/Province, Country

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3 Department Name, Institution Name, City, State/Province, Country

4 Department Name, Institution Name, City, State/Province, Country

Corresponding Author:

FirstName LastName1

Street Address, City, State/Province, Zip code, Country

Email address: corresponding\_author\_email@email.com

**Abstract**

Add your abstract here.

**Abstract Guidance – remove this box before submitting!**

* No more than approx. 500 words (or 3,000 characters).
* Self-contained and concisely describe the reason for the work, methodology, results, and conclusions. Uncommon abbreviations should be spelled out at first use. Do not include footnotes or references.
* Headings in structured abstracts should be bold and followed by a period. Each heading should begin a new paragraph. For example:

**Background.** The background section text goes here. Next line for new section.

**Methods.** Methods section here, then new line.

**Results.** Results section here, then new line.

**Discussion.** Discussion section here.

**Introduction**

Add your introduction here.

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DO NOT embed figures or tables in any section of the text. You will upload as individual files during submission. DO however cite the figures and tables in your text. They MUST be organized, and cited for the first time, in ascending numerical order. This means that Figure 1 must be the first figure in the text and be cited first, etc. See [figure instructions](https://peerj.com/about/author-instructions/#figures) and [table instructions](https://peerj.com/about/author-instructions/#table-files).

**Materials & Methods**

Add your materials and methods here.

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**Results**

Add your results here.

**Materials & Methods Guidance – remove this box before submitting!**

* Methods should be described with sufficient detail & information to replicate.
* Review the [raw data and materials sharing policies](https://peerj.com/about/policies-and-procedures/#data-materials-sharing).
* Where IRB approval was required, you MUST provide an ethics statement as part of their Materials & Methods section detailing full information regarding their approval (including the name of the granting organization, and the approval reference numbers).​​ If an approval reference number is not provided, written approval must be uploaded on the files upload page as confidential supplemental file.
* If describing a new species then you MUST include specific text in the materials & methods. See [New species policies](https://peerj.com/about/policies-and-procedures/#new-species).

**Discussion**Add your discussion here.

**Results Guidance – remove this box before submitting!**

All statistical results should be fully reported, including the test that was performed, the corresponding test statistic, degrees of freedom, the exact p-value (not, e.g. "p<0.05"), and effect sizes. For uploaded statistical figures, where appropriate, we recommend that you overlay bar graphs with scatter plots showing individual data points, or use another method to show the distribution of the data, such as boxplots, violin plots, etc.

**Cropped gel photos**

If you have primary cropped gel pictures then you MUST also upload the full-length **uncropped** pictures as a supplemental file (compressed as a single ZIP file if more than one). If the ZIP file is >30MB then upload to FigShare and provide the link to staff in the declarations section during submission.

**Conclusions**

Add your conclusions here.

**Discussion Guidance – remove this box before submitting!**

* Start with the most important findings first.
* Link your results to any previous studies and how they add value and/or why results differ from what was previously demonstrated.
* What are the strengths and weaknesses/limitations and/or unexpected outcomes of the study results? Any inconclusive results?

**Acknowledgements**

Add your acknowledgements here.

**Conclusions Guidance – remove this box before submitting!**

* Concisely restate the hypothesis and most important findings.
* Summarize the major findings, contributions to existing knowledge, and limitations.
* What are the future directions?
* Speculation is welcome, but should be identified as such.
* Conclusions MUST be well stated, linked to original research question & limited to supporting results.

**References**

**Acknowledgements Guidance – remove this box before submitting!**

* Should not be used to acknowledge funders – funding will be entered online in the declarations page as a separate Funding Statement and appear on the published paper.
* As a matter of courtesy, we suggest you inform anyone whom you acknowledge.

Add your references here.