

Review of: "Synthesis of 1, 2-Disubstituted Benzimidazoles at Ambient Temperature Catalyzed by 1-Methylimidazolium Tetrafluoroborate ([Hmim] BF₄) and Investigating Their Anti-ovarian Cancer Properties Through Molecular Docking Studies and Calculations"

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Potential competing interests: No potential competing interests to declare.

The article gives an environmentally benign method for the synthesis of 1, 2-disubstituted benzimidazoles by the reaction of aromatic aldehydes and o-phenylenediamines (OPD) in the presence of 1-methylimidazolium tetrafluoroborate ([Hmim] BF₄) at ambient temperature under green conditions. The work can be made more impactful by major revisions to the work as described below:

- The title is very long, it may be shortened to be more effective, e.g., "Efficient Synthesis of 1,2-Disubstituted Benzimidazoles Catalyzed by [Hmim]BF₄: Anti-Ovarian Cancer Potential Explored via Molecular Docking," or something similar and more impactful.
- In the introduction, **references to the statement** "Benzimidazole and its derivatives are considered a heterocyclic motif that is used in a wide range of medicinal applications including antihypertensive, antifungal, anticancer, antiviral, anti-HIV, antidiabetic, anticonvulsant, anti-neoplastic, and anti-trichinosis properties." **are missing**.
- The **flow in the introduction is missing**. The paragraphs should have some connection and flow. The 1st paragraph talks about heterocyclic moieties, the 2nd paragraph is about ionic liquids, and the 3rd about ovarian cancer. Connect the paragraphs and create a flow for the introduction.
- In the introduction, a paragraph related to the state of **art of cancer therapy and an overview of the shortcomings of cancer therapy should be added**.
- Small molecular anti-cancer drug research has gained a lot of importance recently. **Give the significance and quote some recent literature on small molecular anti-cancer drugs being recently explored**.
- The last paragraph of the introduction gives the name of the "1-methylimidazolium tetrafluoroborate ([Hmim] BF₄) effective catalyst".. in the **PDF version of the document, "BF₄" 4 is overlapping F**. Rewrite appropriately the very important names.
- In the Experimental section, **give the details of docking tools and programs and relevant references**.
- The experimental section should give detailed **analytical data of the synthesized compounds. It is missing in the main manuscript**. Since the title of the manuscript starts with the word "Synthesis," it should be justified in the manuscript by analytical data. Also, there was **no supplementary data**. In case the data has been provided in the SI,

then mention some representative compounds in the main manuscript.

- **In Scheme 1, there are a few symbols which are not explained anywhere** a white ball inside a blue ball, and a brown coloured heart shape. Do they have some significance or are they just ornamental? In a reaction scheme, all the symbols should be well explained.
- **Add the references to Lee Pinsky's rules**
- **Figure 4 is neither explained in the “Results and Discussion” nor are details given in the figure legend.**
- Only the docking data is provided. Has there been **any significant anti-ovarian studies conducted and found to corroborate?** Please mention the studies if any.
- The conclusion states that “This procedure **suffers from many advantages** such as reduced reaction times,...to the practice of green chemistry.” The word “suffers” does not go well with advantages. Reframe this sentence to give the work a more impactful conclusion.