

Journal Name:	Asian Journal of Pure and Applied Mathematics
Manuscript Number:	Ms_AJPAM_1760
Title of the Manuscript:	NUMERICAL SOLUTIONS OF FRACTIONAL CHEMOTAXIS SYSTEM USING STOCHASTIC FRACTIONAL CHEMOTAXIS MODELS
Type of the Article	

PART 1: Review Comments

Compulsory REVISION comments	Reviewer's comment	Author's Feedback <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.	This manuscript is an important contribution to the scientific community, particularly in the fields of mathematical biology, immunology, and cancer research. By introducing a stochastic fractional calculus approach to chemotaxis, it addresses limitations in classical models, which often overlook the non-integer, memory-laden, and stochastic characteristics of cellular movement in complex environments. The use of fractional-order derivatives offers a more accurate representation of cellular motility, particularly in capturing sub diffusion behaviors and variability influenced by stochastic factors. I appreciate the manuscript's innovation and rigor, as it provides a foundation for further development in modeling cellular behaviors under realistic, non-Gaussian conditions that better align with empirical observations.	
Is the title of the article suitable? (If not please suggest an alternative title)	Numerical Solutions for Chemotaxis Systems Using Stochastic Fractional Calculus Models This alternative title may improve readability by making it clear that the stochastic fractional calculus is central to the modeling approach used for the chemotaxis system.	
Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.	<ol style="list-style-type: none">1. Begin with a clear statement of the study's purpose of using a stochastic fractional calculus approach for chemotaxis models.2. Briefly mention why finite difference methods and the Grunwald-Letnikov approximation were chosen to clarify their relevance.3. Specify how the model aligns with observed cellular behaviors, like subdiffusion patterns, to strengthen empirical validity.4. Add a concluding statement that highlights the study's potential impact on advancing biological modeling in immunology and cancer research. These revisions would improve clarity, focus, and overall impact.	
Are subsections and structure of the manuscript appropriate?	The manuscript's subsections and structure are generally appropriate but could be improved. The Introduction should better highlight the research gap and significance. Clearer subsections in the Methodology for each approach would enhance navigation. Separating Results into analytical and numerical subsections and adding visual aids would improve clarity. The Discussion should provide a more detailed comparison with traditional models, while the Conclusion could mention specific applications in immunology and suggest future research directions. These changes would enhance the manuscript's overall clarity and impact.	
Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.	The manuscript demonstrates a solid scientific foundation by employing advanced mathematical techniques, specifically stochastic fractional calculus, to model chemotaxis phenomena. The use of fractional derivatives allows for a more accurate representation of cellular motility in complex environments, addressing limitations in traditional deterministic models. The analytical and numerical methods applied are well-justified and appropriately chosen, showcasing the robustness of the study's approach. Additionally, the results align with empirical observations, reinforcing the model's validity and relevance in biological contexts. Overall, the manuscript is scientifically robust and offers significant contributions to the understanding of chemotaxis through innovative modeling techniques.	
Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form. :-	The references in the manuscript are generally sufficient and relevant to the topic; however, incorporating some recent studies would enhance the depth of the literature review. I recommend adding the following references, which focus on advancements in fractional calculus and stochastic modeling in biological contexts: https://dx.doi.org/10.22436/jmcs.033.03.02 , https://dx.doi.org/10.22436/jmcs.033.04.06 http://dx.doi.org/10.22436/jmcs.032.03.04	

	Including these references will strengthen the manuscript by situating it within the broader context of recent research developments in the field.	
<u>Minor</u> REVISION comments		
Is the language/English quality of the article suitable for scholarly communications?	Yes	
<u>Optional/General</u> comments	<ol style="list-style-type: none">1. The results are correct and new. The following points may be considered to improve the presentation of this paper:2. What are the additional way in which the manuscript could be improved?. A remark is suggested to be added.3. Grammatical error and some typos exist that should be checked and corrected throughout the paper.4. From the presented topics in this paper, the authors should propose some future research topics in the conclusion part.5. The listed results especially formulas and analyses should be revised to avoid any errors.6. English is generally good; I think it needs to be polished further and some typos need to be revised. Further punctuation marks should be checked throughout the paper, especially after the equations and at the end of the statements.7. Define the used symbols clearly and numerate all equations that appear. Further, reformulate the conclusion to reflect the contents of the paper.8. We know that the proposed model comes from real-world applications. So, why are the existence and uniqueness studied here?	

PART 2:

	Reviewer's comment	Author's comment <i>(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
Are there ethical issues in this manuscript?	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	

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