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## Editor's Notes

We invite submissions from SMB members including summaries of previous mathematical biology meetings, invitations to upcoming conferences, commentaries, book reviews, or suggestions for other future columns. The deadline is the 15th of the month prior to publication.

The SMB Newsletter is published in January, May, and September by the Society for Mathematical Biology for its members. The Society for Mathematical Biology is an international society that promotes and foster interactions between the mathematical and biological sciences communities through membership, journal publications, travel support and conferences. Please visit our website: <http://www.smb.org> for more information.

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# CompuCell3D and SBW 11th User Training Workshop

Indiana University, Bloomington, IN, USA, August 9 - 15, 2015

by KHAPHETSI JOSEPH MAHASA

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Report by an SMB member

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The workshop on developing multi-scale and virtual tissue simulations with CompuCell3D and Systems Biology Workbench (SBW) was held at the Indiana University, Bloomington, USA, on August 9 - 15, 2015. The event, organized by Dr. Maciej Swat from Indiana University (IU), brought together more than 20 participants representing wide range of biomedical expertise. The workshop provided an excellent opportunity for experimental biologists, clinicians, research clinician, biophysicists, computational and mathematical biologists ranging from advanced undergraduates to senior faculty to learn how advanced modeling techniques implemented in powerful and easy-to-use software suites can facilitate the development of multi-scale and Virtual-Tissue simulations, that ultimately lead to generation of new biological and biomedical knowledge. The organizer welcomed the participants and gave a brief summary of the activities to take place during the week. The workshop started with a short review of Python scripting, followed by a limited number of lectures and hands-on computer tutorials. In general there was plenty of time devoted to the hands-on computer sessions every day. All participants actively engaged in attempting complex simulation exercises using SBW, Tellurium and CompuCell3D packages. The workshop was very stimulating and engaging with a lot of opportunities for interactions. It provided a great and informal forum for the participants to discuss their work. Furthermore, the workshop allowed participants to foster new cross-disciplinary collaborations to understand important biological questions. Most interestingly, each participant was encouraged to give a short talk presenting her/his research.

I personally gave a talk titled "*Mathematical Modeling of Tumor Escape From Immune Surveillance*", focused on how tumor cells acquire immunoresistance, after a brief encounter with immune cells which often leads to tumor escape from host immune surveillance. Surprisingly, not much has been done in terms of mathematical modeling of tumor escape from immune surveillance, yet an accumulating evidence indicates that tumor escape is a major impediment for successful immunotherapy. Hence, my current research focuses on illustrating how tumor cells develop immune-resistance that ultimately enables them to evade the immune system recognition and control. I was very pleased to hear talks by fellow participants who also model cancer development and invasion. I was excited to see talks that integrate both experimental and clinical data into comprehensive biological research utilizing CompuCell3D simulations to address some important biological questions. In particular, I was delighted to see the talk by the IU Professor James Glazier titled "*3D Multi-Cell Simulation of Tumor Growth and Angiogenesis using CompuCell3D*" that focused on the role vascular development and remodeling plays in cancer progression and metastasis. It gave me great opportunity to learn a lot about different techniques that I could apply to my own research. I was also pleasantly surprised to see a fair number of other CompuCell3D simulations that focus on cancer biology. As a PhD student who is building his understanding of cancer biology I was excited to learn several new

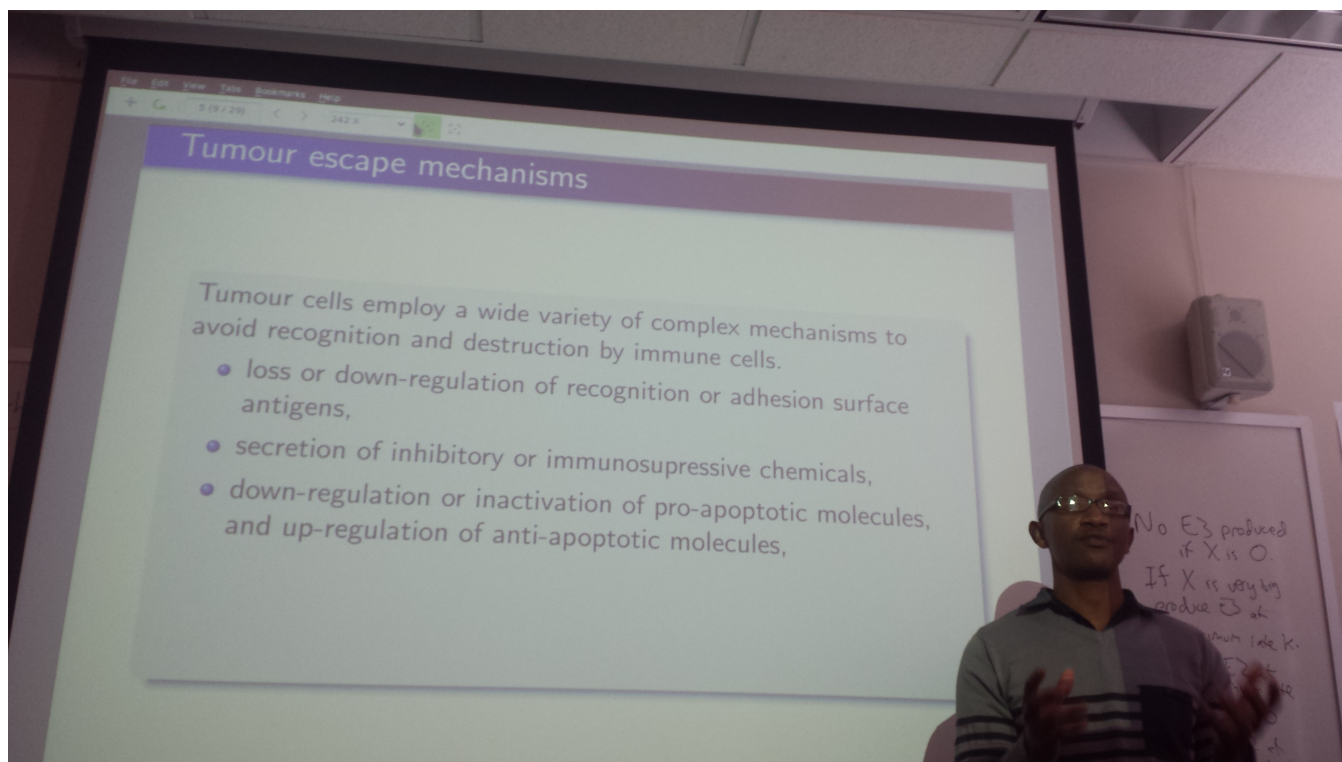
mathematical and computational approaches I could use in my own research. It was very inspiring to see the workflows that allowed other researchers build complex cancer models in the past.

I would like to thank Dr. Maciej Swat for inviting me to attend and present my research at the workshop. This was, indeed, a unique and indispensable opportunity for me to learn and enhance my knowledge of computational skills from a panoply of diverse techniques for sub-cellular, multi-scale and Virtual Tissue simulations. I also like to thank the workshop organizers for partly funding my trip to participate in the workshop. My standing gratitude also goes to South African Centre for Epidemiological Modeling and Analysis (SACEMA) for funding my PhD research and co-sponsoring my trip to the CompuCell3D and SBW 11th User Training Workshop. Finally, I would like to thank my supervisors, Drs. Rachid Ouifki and Amina Eladdadi, for their unwavering support for my project which I presented at the workshop. For more information on the workshop check out their website: <http://www.compuCell3d.org/>

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### About The Author:

Mr. Khaphetsi Mahasa is currently a PhD student at SACEMA, working with Dr. Rachid Ouifki (SACEMA, Stellenbosch University, South Africa) and Prof. Amina Eladdadi (The College of Saint Rose, Albany, NY, USA) on mathematical modeling of tumor-interactions and cancer therapy. He comes from the mountain kingdom of Lesotho where he obtained his BS in Mathematics and Statistics. Upon accomplishing his undergraduate degree, Mr. Khaphetsi Mahasa worked as a High School Mathematics teacher for three years before joining African Institute for Mathematical Sciences in South Africa (AIMS-SA) where he obtained his first Masters (MS) in Mathematical Sciences. After AIMS, he went to university of KwaZulu-Natal where he obtained his second MS in Applied Mathematics before he joined SACEMA for his PhD study.



Khaphetsi presenting at the CompuCell3D and SBW 11th User Training Workshop



Group Photo (top) & Participants at the CompuCell3D and SBW 11th User Training Workshop (bottom)