

Virtualization of Biomass Colonization: Potential of Application in Precision Medicine

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Abstract : Nowadays, computational modeling is paving new design and verification ways in a number of industrial sectors. The technology is ripe to challenge some case in the Bioengineering and Medicine frameworks: for example, looking at the strategical and ethical importance of oncology research, efforts should be made to yield new and powerful resources to tumor knowledge and understanding. With these driving motivations, we approach this gigantic problem by using some standard engineering tools such as the mathematics behind the biomass transfer. We present here some bacterial colonization studies in complex structures. As strong analogies hold with some tumor proliferation, we extend our study to a benchmark case of solid tumor. By means of a commercial software, we model biomass and energy evolution in arbitrary media. The approach will be useful to cast virtualization cases of cancer growth in human organs, while augmented reality tools will be used to yield for a realistic aid to informed decision in treatment and surgery.

Keywords : bacteria, simulation, tumor, precision medicine

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